

**THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND
TRAINING PROGRAMME FOR HEALTH CARE WORKERS FOR
THE PREVENTION AND MANAGEMENT OF OCULAR
COMPLICATIONS IN DIABETIC PATIENTS**

by

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DECLARATION

I hereby declare that the work which is submitted here is the result of my own independent investigation. Where help was sought, it was acknowledged. I further declare that the work is submitted for the first time at this university/faculty towards the Philosophiae Doctor degree in Higher education Studies and that it has never been submitted to any other university/faculty for the purpose of obtaining a degree.

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DEDICATION

....to my mother, June Megan Clarke-Farr

“Lord, make me an instrument of Your peace.
Where there is hatred, let me sow love;
where there is injury, pardon;
where there is doubt, faith;
where there is despair, hope;
where there is darkness, light;
and where there is sadness, joy.
O, Divine Master,
grant that I may not so much seek
to be consoled as to console;
to be understood as to understand;
to be loved as to love;
for it is in giving that we receive;
it is in pardoning that we are pardoned;
and it is in dying that we are born to eternal life.”

Prayer of St. Francis of Assisi (1182-1226)

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LIST OF ACRONYMS

CE:	Conformité Européene
CHE:	Council on Higher education
CMO:	Cystoid Macular Oedema
CSMO:	Clinically Significant Macular Oedema
CESM:	Classification of Educational Study Matter
CHEC:	Cape Higher education Consortium
DCCT:	Diabetes Control and Complications Trial
DoH:	Department of Health
DoE:	Department of Education
DOTA:	Declaration of the Americas
DR:	Diabetic Retinopathy
EMS:	Emergency Medical Services
ESRD:	End Stage Renal Disease
ETQA:	Education and Training Quality Assurer
FET:	Further Education and Training
FTE:	Full Time Equivalent
HEQC:	Higher education Quality Committee
HEQF:	Higher education Qualifications Framework
HPCSA:	Health Professions Council of South Africa
IDDM:	Insulin Dependent Diabetes Mellitus
IDF:	International Diabetes Federation
IRMA:	Intra-Retinal Microvascular Abnormalities
MoE:	Ministry of Education
NQF:	National Qualifications Framework
NVD:	Neovascularisation at the Disk
NVE:	Neovascularisation Elsewhere

OBE:	Outcomes-based Education
PDR:	Proliferative Diabetic Retinopathy
PQM:	Programme and Qualifications Mix
NHS:	National Health Service
NIDDM:	Non-Insulin Dependent Diabetes Mellitus
NPDR:	Non-proliferative Diabetic Retinopathy
NSB:	National Standards Body
RPL:	Recognition of prior learning
SANC:	South African Nursing Council
SAQA:	South African Qualifications Authority
SGB:	Standards Generating Body
SETA:	Sector Education and Training Authority
UFS:	University of the Free State
VEGF:	Vascular Endothelial Growth Factor
WESDR:	Wisconsin Epidemiologic Study of Diabetic Retinopathy
WHO:	World Health Organization

SUMMARY

- **Key terms:** Community health centres; curriculum; Delphi technique; diabetes mellitus; diabetes education; health care worker; higher education; nurse; optometrist; ocular complications of diabetes; outcomes-based education; patients; post-graduate education programme.

This research was undertaken in order to develop a post-graduate education and training programme for health care workers for the prevention and management of the ocular complications in diabetic patients. This was necessary, as there appeared to be a clear need for health care workers to receive specific education and training in this regard, as well as for additional skills and knowledge to be acquired and used to screen and detect sight-threatening complications of diabetic disease in such patients.

The overall goal of the study was therefore to enhance the education, training and skills of health care workers managing diabetic patients in order to prevent and manage sight-threatening diabetic complications, the results of which would be to make a significant contribution to the quality of health care provided to diabetic patients in the public health sector.

The specific objectives of the study were to conceptualise the processes involved in the development of a post-graduate diabetes education programme; to gain information with regard to the knowledge and education of diabetic patients and health care workers about diabetes and its ocular effects; and to identify the core competencies and curriculum that would comprise the education programme to be developed for the health care workers. Therefore the aim of the study was to develop a post-graduate education and training programme for health care

workers with a view to the prevention and management of the ocular complications that occur in diabetic patients.

The research design was based on a descriptive survey research study which included cross-sectional and panel research. A quantitative as well as a qualitative approach to the research was followed. The methods which were used and which formed the basis of the study comprised a literature review, the use of questionnaires, and the Delphi process. The literature review was undertaken in order to contextualise the research problem as well as to provide information used to compile the questionnaires for the diabetic patients, the health care workers, and the Delphi study. In the empirical study, use was made of three different questionnaires.

First, the diabetic patients completed the questionnaires in order to obtain information about the patients' knowledge about diabetes and its ocular complications as well as information on how they managed the condition. Second, the health care workers completed the questionnaires in order to provide information about their knowledge of diabetes and its ocular complications, as well as information about their education and training in this area of medicine and health care. Third, based on the literature review and the results of the questionnaires from the diabetic patients and health care workers, the Delphi questionnaire was developed for consideration by the Delphi panel with a view to the development of the education programme.

Consent was obtained from the Western Cape Department of Health for the purposes of conducting the research with the health care workers and diabetic patients. Each respondent, including the members of the Delphi panel who had

agreed to take part in the study, provided written consent to participate in the research.

The focus of the literature review was on the criteria for the development of post-graduate programmes in diabetes education. This would be in the realm of Higher education Studies. In order to develop such a programme, attention had to be paid to the processes involved with curriculum and programme development in South Africa, together with legislative requirements for the approval and offering of such programmes. The proposed programme had to be viewed against the higher education landscape in South Africa, together with the principles and policies guiding higher education.

The use of outcomes-based education had to be considered for this programme, particularly in terms of policies requiring educators to acknowledge the imperatives to redress the inequalities of the past, to open access for all learners to higher education, and to consider the recognition of prior learning as it relates to learners in pursuit of lifelong learning. Models of curriculum development were also considered in order to derive a mechanism for the development of the education programme as well as to consider how such a curriculum model would allow for the programme to be evaluated and improved.

It was also important for the literature review to analyse available diabetes education programmes and to consider whether any programmes had been developed specifically for the purposes that this research aimed to achieve. As there were no programmes available that dealt with the training of health care workers for the prevention and management of the ocular complications of diabetes, this research could then be considered to be unique and truly groundbreaking. It was also necessary to review all aspects of the medical

condition of diabetes and its systemic and ocular complications, as this information was used as background for all aspects of the research.

The Delphi questionnaire had to deal with seven major aspects pertaining to the development of the post-graduate education programme. These included aspects with regard to curriculum and programme development in the higher education sector of South Africa; questions about the education of diabetic patients; issues relating to the provision of public health in South Africa; issues relating to the academic and administrative aspects of a post-graduate diabetes education programme; issues relating to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes; issues relating to the benefits of a programme for the prevention and management of the ocular complications of diabetes; and aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes.

Twelve experts were included in the Delphi panel and were selected according to criteria including their expertise in diabetes, public health, medicine, ophthalmology, optometry, nursing, and higher education programme development. The analysis of the various rounds of the Delphi process was done manually by the researcher and the results of the Delphi process are included in the Appendices. Pre-testing of the Delphi questionnaire, as well as of the patient and health care worker questionnaires was done through pilot studies. These actions were undertaken in order to ensure the reliability, validity and trustworthiness of the study.

The findings of the empirical study involving the diabetic patients and health care workers were reported on by means of Tables and Figures as well as a

summative discussion of the findings. Likewise, the Delphi study was similarly reported and discussed. These findings were used to develop the post-graduate diabetes education programme.

The development of the programme was summarised in terms of the following premises for the development of the diabetes education programme; points of departure; the diabetes education programme in the context of higher education in South Africa; educational and public health needs that are addressed by the diabetes education programme; academic and administrative aspects pertaining to the diabetes education programme; standards and outcomes for an education programme for the prevention and management of the ocular complications of diabetes; as well as perspectives and challenges with regard to the delivery of the diabetes education programme. The researcher proposed the way forward in terms of obtaining the necessary approval by the Department of Education followed by the accreditation processes required by the Higher education Quality Committee (HEQC) in order to obtain final registration with the South African Qualifications Authority (SAQA). Finally, conclusions were drawn and the limitations of the study, together with the proposed recommendations, were provided.

This research aims to make a significant contribution towards the delivery of eye care in the public health sector in South Africa and, specifically, for the prevention and management of the ocular complications that occur in diabetic patients.

OPSOMMING

- **Sleutelsterme:** gemeenskapsgesondheidsentrums; leerplan; Delphitegniek; diabetes mellitus; diabetesonderwys; gesondheidsorgwerker; hoër onderwys; verpleegster; oogkundige; okulêre komplikasies van diabetes; uitkomsgebaseerde onderwys; pasiënte; nagraadse onderwysprogram.

Hierdie navorsing is onderneem om 'n nagraadse onderwys- en opleidingsprogram vir gesondheidsorgwerkers te ontwikkel met die oog op die voorkoming en bestuur van van okulêre komplikasies by diabetiese pasiënte. Dit was nodig omdat daar klaarblyklik 'n duidelike behoefte aan gesondheidsorgwerkers om spesifieke onderwys en opleiding in hierdie verband te ondergaan, bestaan het. Verder was dit nodig om addisionele vaardighede en kennis te verkry en te gebruik om visie-bedreigende komplikasies van diabetiese siekte in sulke pasiënte op te spoor.

Die oorhoofse doel van die studie was daarom om die onderwys, opleiding en vaardighede van gesondheidsorgwerkers wat in beheer is van diabetiese pasiënte met die oog op die voorkoming en hantering van visie-bedreigende diabetiese komplikasies, te verhoog. Die gevolge hiervan sou wees om 'n beduidende bydrae te lewer tot die kwaliteit van gesondheidsorg wat aan diabetiese pasiënte in die openbare gesondheidsektor voorsien word.

Die spesifieke doelwitte van die studie was om die prosesse wat betrokke is by die ontwikkeling van 'n nagraadse diabetesonderwysprogram te konseptualiseer; om inligting te verkry rakende die kennis en onderwys van diabetiese pasiënte en gesondheidsorgwerkers aangaande diabetes en die okulêre effekte daarvan; asook om die sleutelvaardighede en die kurrikulum waaruit die onderwysprogram wat vir die gesondheidsorgwerkers saamgestel sou word, te identifiseer. Daarom

was die doel van die studie om 'n nagraadse onderwys- en opleidingsprogram vir gesondheidsorgwerkers te ontwikkel met die oog op die voorkoming en beheer van die okulêre komplikasies wat by diabetiese pasiënte voorkom.

Die navorsingsontwerp is gebaseer op 'n beskrywende oorsignavorsingstudie wat dwarsprofiel- en paneelnavorsing ingesluit het. 'n Kwantitatiewe sowel as 'n kwalitatiewe benadering tot die studie is gevolg. Die metodes wat gebruik is en wat die basis van die studie gevorm het, het bestaan uit 'n literatuuroorsig, die gebruik van vraelyste, en die Delphiproces. Die literatuuroorsig is onderneem om die navorsingsprobleem te kontekstualiseer, asook om inligting te voorsien om die vraelyste vir die diabetiese pasiënte, die gesondheidsorgwerkers, en die Delphistudie op te stel. In die empiriese studie is drie verskillende vraelyste gebruik.

Eerstens het die diabetiese pasiënte die vraelyste voltooi met die oog daarop om inligting te verkry oor hul kennis van diabetes en die okulêre komplikasies daarvan, asook om inligting in te win oor hoe hulle die toestand beheer het. Tweedens het die gesondheidsorgwerkers die vraelyste ingevul met die oog daarop om inligting te voorsien aangaande hul kennis van diabetes en die okulêre komplikasies daarvan, asook om inligting te versamel oor hul onderwys en opleiding op hierdie gebied van die geneeskunde en gesondheidsorg. Derdens, gebaseer op die literatuuroorsig en die resultate van die vraelyste van die diabetiese pasiënte en die gesondheidsorgwerkers, is die Delphivraelys ontwikkel vir nadere ondersoek deur die Delphipaneel met die oog op die ontwikkeling van die onderwysprogram.

Toestemming is verkry van die Departement van Gesondheid van die Wes-Kaap met die oog daarop om navorsing te doen oor die gesondheidsorgwerkers en

diabetiese pasiënte. Elke respondent, insluitende die lede van die Delhipaneel wat toegestem het om aan die studie deel te neem, het geskrewe toestemming verleen om aan die navorsing deel te neem.

Die fokus van die literatuuroorsig was op die kriteria vir die ontwikkeling van nagraadse programme in diabetesonderwys. Dit val onder die afdeling Hoëronderwysstudies. Met die oog op die ontwikkeling van so 'n program, moes aandag geskenk word aan die prosesse wat betrokke is by kurrikulum- en programontwikkeling in Suid-Afrika, tesame met wetlike vereistes vir die goedkeuring en aanbieding van sulke programme. Die voorgestelde program moes gesien word in die lig van die hoëronderwyslandskap in Suid-Afrika, tesame met die beginsels en beleide wat rigting gee aan hoër onderwys.

Die gebruik van uitkomsgebaseerde leer moes in aanmerking geneem word vir hierdie program, veral in terme van beleidsaspekte wat vereis dat opvoeders die ongelykhede van die verlede moes regstel; om toeganklikheid vir alle leerders tot hoër onderwys daar te stel; en om die erkenning van voorafleer soos dit betrekking het op leerders wat lewenslange leer nastreef, te oorweeg. Modelle van kurrikulumontwikkeling is ook oorweeg met die oog daarop om 'n meganisme in plek te kry vir die ontwikkeling van die onderwysprogram, asook om te oorweeg hoe so 'n kurrikulummodel hom sou leen tot die evaluering en verbetering van die program.

Dit was verder belangrik vir die literatuuroorsig om beskikbare diabetesonderwysprogramme te ontleed en om te oorweeg of enige programme spesifiek ontwikkel is vir die doelwitte wat hierdie navorsing wou bereik. Aangesien daar geen programme beskikbaar was wat spesifiek handel het oor die opleiding van gesondheidsorgwerkers vir die voorkoming en beheer van die

okulêre komplikasies van diabetes nie, kan hierdie navorsing dus as uniek en as ware baanbrekerswerk beskou word. Dit was ook nodig om alle aspekte van die mediese toestand van diabetes en die sistemiese en okulêre komplikasies daarvan in oënskou te neem, aangesien hierdie inligting as agtergrond vir alle aspekte van die navorsing gebruik is.

Die Delphivraelys moes sewe hoofaspekte wat betrekking het op die ontwikkeling van die nagraadse onderwysprogram ondersoek. Hierdie het aspekte ingesluit rakende die kurrikulum- en programontwikkeling in die hoëronderwyssektor in Suid-Afrika; vraagstukke rakende die onderwys van diabetes pasiënte; vraagstukke met betrekking tot die voorsiening van openbare gesondheid in Suid-Afrika; vraagstukke rakende die akademiese en administratiewe aspekte van 'n nagraadse diabetesondersoekprogram; vraagstukke rakende die standaarde en uitkomst vir 'n program vir die voorkoming en beheer van die okulêre komplikasies van diabetes; vraagstukke met betrekking tot die voordele van 'n program vir die voorkoming en beheer van die okulêre komplikasies van diabetes; asook aspekte wat aangespreek moet word in 'n onderwysprogram vir die voorkoming en beheer van die okulêre komplikasies van diabetes.

Twaalf deskundiges is in die Delphipaneel ingesluit. Hulle is gekies volgens die kriteria insluitende hul deskundigheid in diabetes, openbare gesondheid, geneeskunde, oftalmologie, optometrie, verpleegkunde, asook hoëronderwysprogramontwikkeling. Die analise van die verskillende rondtes van die Delphiroses het per hand deur die navorser geskied en die resultate van die Delphiroses word in die Bylaes ingesluit. Vooraftoetsing van die Delphivraelys asook van die pasiënte- en die gesondheidsorgwerkervraelyste het deur middel van loodsstudies geskied. Hierdie aksies is onderneem om die betroubaarheid, die geldigheid en die geloofwaardigheid van die studie te verseker.

Die bevindinge van die empiriese studie wat die diabetiese pasiënte en die gesondheidsorgwerkers betrek het, is deur middel van Tabele en Figure asook 'n samevattende bespreking van die bevindinge gerapporteer. Die bevindinge van die Delphistudie is op 'n soortgelyke wyse gerapporteer en bespreek. Hierdie bevindinge is gebruik om die nagraadse diabetesonderwysprogram te ontwikkel.

Die ontwikkeling van die program is opgesom in terme van die volgende uitgangspunte vir die ontwikkeling van die diabetesonderwysprogram; vertekpunte; die diabetesonderwysprogram in die konteks van hoër onderwys in Suid-Afrika; opvoedkundige en openbare gesondheidsbehoefte wat aangespreek word deur die diabetesonderwysprogram; akademiese en administratiewe aspekte wat betrekking het op die diabetesonderwysprogram; standarde en uitkomst vir 'n onderwysprogram vir die voorkoming en beheer van die okulêre komplikasies van diabetes; asook perspektiewe en uitdagings met betrekking tot die onderrig van die diabetesonderwysprogram. Die navorser het die pad vorentoe voorgestel in terme van die verkryging van die nodige goedkeuring van die Departement van Onderwys, gevolg deur die akkreditasieprosesse wat deur die Hoëronderwyskwaliteitskomitee (HOKK) (*HEQC*) vereis word met die oog daarop om finale registrasie by die Suid-Afrikaanse Kwalifikasie-owerheid (SAKO) (*SAQA*) te verkry. Uiteindelik is gevolgtekkings gemaak en die beperkinge van die studie, tesame met die voorgestelde aanbevelings, is voorsien.

Die doel van hierdie navorsing is om 'n beduidende bydrae tot die lewering van oogsorg in die openbare gesondheidssektor in Suid-Afrika te lewer en, meer spesifiek, met die oog op die voorkoming en bestuur van die okulêre komplikasies wat by diabetiese pasiënte voorkom.

THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND TRAINING PROGRAMME FOR HEALTH CARE WORKERS FOR THE PREVENTION AND MANAGEMENT OF OCULAR COMPLICATIONS IN DIABETIC PATIENTS

CHAPTER 1

BACKGROUND AND ORIENTATION TO THE STUDY

1.1 INTRODUCTION

One of the most sight-threatening complications of diabetic disease is diabetic retinopathy. The National Guidelines for the Prevention of Blindness from the South African Department of Health (DoH) (RSA DoH 2002:12) indicate that diabetic retinopathy accounts for 8% of blindness in South Africa and that this figure is rising daily. The screening and appropriate referral of this condition is therefore an essential aspect of any public health programme designed to eliminate preventative blindness. Furthermore, the early screening for the detection and treatment of diabetic retinopathy fulfils the requirements of the World Health Organization's (WHO) requirements for a screening programme (Tomlinson 2002:70). In order for such screening to be reliable, repeatable and accurate, health care workers dealing with diabetic patients in community health clinics must have a comprehensive and diabetes-specific educational foundation in order to deal with diabetic retinopathy as well as with the various other ocular complications which may arise in diabetic patients.

The levels of education and training of health care workers at community health centres in the management and treatment of diabetic eye disease were unknown

at the commencement of this research. The research then aimed to evaluate the diabetes-specific knowledge and education of health care workers employed in the public health sector. Another important feature of the research was to evaluate the patients' knowledge of diabetes as well as to identify their own particular lifestyle factors that might have an influence on the course of their disease and the complications that might arise as a result thereof. Once these aspects had been analysed, an appropriate educational intervention could then be designed and developed in the form of the education programme for the prevention and management of the ocular complications of diabetes.

1.1.1 The role of diabetes education

Diabetes education is recognised as a key component of diabetes management (Worldwide Initiative for Diabetes Education 2003:2) with the main aims of diabetes education being to enhance knowledge and to foster behavioural change in order to promote self-education. The diabetes educator's role is therefore to help people with diabetes to learn how to manage their disease and to prevent the complications of such a disease. The main challenges for diabetes educators are common to most regions of the world and, according to the Worldwide Initiative for Diabetes Education (2003:2), more skilled educators are required to meet these growing needs.

The International Diabetes Federation (IDF) has an even more aggressive approach to diabetes education. According to its *Position Statement on Diabetes Education* (IDF 2004:1), the combination of lack of access to quality medical management and diabetes education leads to poor clinical outcomes, a reduced quality of life, as well as high health-related costs. The position of the IDF is as follows:

- All people with diabetes, no matter where they live, have the right to learn about their disease.
- Health care professionals must be educated to be responsible for the prevention and provision of diabetes care.
- People at risk as well as the wider public must know the risks and learn about prevention.
- Health ministries have to ensure that they have a comprehensive diabetes education strategic plan integrated into their National Diabetes Programme (IDF 2004:1).

The researcher therefore found it imperative that, in the South Africa context, appropriate protocols and educational initiatives should be developed in order to better manage diabetic patients and their possible ocular complications in the community/public health sector.

1.1.2 Diabetes education for ocular complications

Although there are a large number of education programmes designed for people living with diabetes, there are relatively few such programmes specifically aimed at educating patients and health care workers regarding the ocular complications that stem from diabetes.

One such programme was, however, recently developed by the California Lions Club (as cited by NewsRx.com in Diabetes Week 2002:9). In this programme, a comprehensive initiative for diabetic retinopathy education was developed which focused on diabetic patients living in Southern California. The programme featured educational materials and free eye screenings by local health care professionals. The most important aspect of the programme, however, was the education of patients about the possible ocular complications of their diabetic

disease. The Diabetes Education Study Group (1998:1-5) of the European Association for the Study of Diabetes also developed an education programme for Type II Diabetes Education and Diabetic Retinopathy. In this programme, patients were educated with regard to eye problems stemming from Type II diabetes and taught how early detection by trained health care workers could help prevent sight-threatening retinopathy. The programme also outlined important guidelines that must be adhered to by the patient in terms of controlling their diabetes and undergoing regular eye examinations. The overarching principles of diabetic patient education were developed by the National Center for Chronic Disease Prevention and Health Promotion (2004:4). These principles emphasise that patients must be informed that sight-threatening eye disease is a common complication of diabetes and that there are important benefits for the early treatment of diabetic retinopathy.

A study on the clinical cost-effectiveness of patient education models for diabetes by Loveman, Cave, Green, Royle, Dunn and Waugh (2003:22) suggested that education programmes offered as part of intensified treatment interventions could result in significant and long-lasting improvements in metabolic control and a reduction in systemic complications. It is important to note that these benefits occurred when education was part of an overall intensive treatment plan. However, the study found that it was not possible to draw conclusions about the potential effects of education *per se* in Type I diabetes and that no clear characterisation as to what features of diabetes education may be beneficial for patients with Type II diabetes.

The development of the educational programme for diabetic patients and community health care workers relied on the results obtained from the patient and health care worker questionnaires. It was important to assess the patients'

knowledge of the effects that diabetes had on their general health, as well as on their eyes, and to determine which lifestyle factors positively or negatively influenced the course of the disease and its ocular complications. Furthermore - since it was envisaged that the education programme was to be developed for both health care workers and patients - the knowledge, skills and experience of the health care workers were also assessed in relation to the management and treatment of diabetic patients with specific emphasis on the prevention of ocular complications.

1.2 STATEMENT OF THE PROBLEM

As a result of the increasing number of diabetic patients attending community health centres and clinics, the associated cases of diabetic ocular pathology are also expected to increase significantly. The Department of Ophthalmic and Wellness Sciences of the Cape Peninsula University of Technology where the researcher is employed, provides eye care services to disadvantaged communities of the Western Cape. A large number of patients attending the eye clinic present with diabetes and related ocular pathology and, upon further investigation, the extent of their knowledge and education regarding diabetes and its complications proved to be extremely limited. This further exacerbated both their systemic condition of diabetes and their risk of developing sight-threatening ocular complications.

Not only have there been few informal and no formal screening programmes for diabetic eye disease in community health clinics, but there was also no evidence of nurses and health care workers undergoing any specific educational training for the screening and identification of patients suffering from the ocular complications of diabetes. Furthermore, owing to the increasing number of patients seeking treatment at community health centres, there were no specific

days set aside specifically for diabetic patients to attend the community clinic as the practice had been historically (Hartley 2004). This means that diabetic patients are treated as part of the daily routine of the clinic/health centre, with no specific emphasis being placed on diabetes or its ocular complications in the community health care centres of clinics.

Against this background, it appeared that there was a lack of a comprehensive diabetes education programme for the health care workers or for the diabetic patients themselves. Such a programme should aim to provide the necessary skills to optimally screen and manage the treatment for diabetes in order to prevent the sight-threatening complications of the disease. It was felt that research should be conducted into the diabetes-specific education and training of health care workers, as well as into the knowledge and understanding of the diabetic patients about their condition and its possible complications. Given the above-mentioned problems, the following research questions regarding the current situation in community health care clinics were addressed:

- What is the degree of education and training of health care workers specifically for the management of diabetic patients?
- What knowledge, skills and education do health care workers have for the lifestyle risk factors that may contribute to diabetic eye complications?
- What knowledge and education do the diabetic patients have with regard to diabetes and the lifestyle risk factors that may contribute to diabetic eye complications?
- What educational interventions are required for the health care workers and the patients in order to best manage and prevent sight-threatening complications in diabetic patients?

It is proposed that, at the conclusion of the research process, these questions will be answered and that appropriate proposals and interventions will have been developed to address these issues.

1.3 THE GOAL, AIM AND OBJECTIVES OF THE STUDY

1.3.1 The overall goal of the study

The overall goal of the study was to enhance the education, training and skills of health care workers managing diabetic patients in order to prevent and manage sight-threatening diabetic complications. Such an initiative should make a significant contribution to the quality of health care provided to diabetic patients in the public sector, while the educational programme developed is groundbreaking in its approach to training health care workers for screening and managing the ocular complications of diabetes.

1.3.2 The aim of the study

The study was aimed at developing a post-graduate education and training programme for health care workers with a view towards the prevention and management of the ocular complications occurring in diabetic patients. It should therefore enable health care workers to effectively detect, manage and refer diabetic patients at risk of developing sight-threatening ocular complications. Furthermore, an important feature of the model would be the ability of the patients to receive specific education at the community health clinics about the ocular complications of their disease.

1.3.3 The objectives of the study

To achieve the aim of the research, the following objectives were pursued:

- Conceptualising the processes involved in the development of a post-graduate education programme. In order to achieve this, an extensive literature review was undertaken of the educational criteria for the development of post-graduate education and training programmes. In addition, the literature review entailed a critical analysis of existing diabetes education programmes. A literature survey on diabetes and the possible ocular complications that might occur in diabetic patients was also conducted.
- Gaining information with regard to the knowledge and education of diabetic patients and health care workers about diabetes and its ocular effects. This was achieved by means of a research instrument involving questionnaire surveys for these two groups of participants.
- Identifying the core competencies and curriculum that would comprise the education programme to be developed for the health care workers. The results of the literature review and the questionnaires from the diabetic patients and health care workers informed the development of the Delphi questionnaire as well as the subsequent Delphi process which was used to identify these outcomes.
- The information obtained from the results of the questionnaires and the Delphi process was used to develop the post-graduate education and training programme for the prevention and management of ocular complications in diabetic patients.

1.4 SCOPE OF THE STUDY

The scope of this study is in the field of Higher education Studies. The study is also interdisciplinary in that some aspects of the research lie in the fields of health education and, more specifically, in the fields of optometry, nursing and public health. This emphasises the concept that education forms the foundation of these professions. In addition, the study also focuses specifically on curriculum

development for the purposes of developing a post-graduate education and training programme for health care workers. The diabetic patient and health care worker participants involved in the study were from the Western Cape region of South Africa. The following geographic and demographic demarcations were involved:

- The municipal Districts of the City of Cape Town.
- The West Coast/Winelands region.
- The Overstrand region.

The actual demographic profile of the participants of the research was all persons participating in the research who were diabetic as well as the health care workers. The research had no specific inclusion or exclusion criteria based on age, race, gender or socio-economic status.

In terms of the study population, the research entailed the following inclusion criteria for participation in the research:

- Nurses and clinic managers dealing with diabetic patients in community health centres and clinics.
- Optometrists involved with diabetic patients in the public health sector.
- Diabetic patients from community health centres and clinics.
- Other health care workers, including medical practitioners and ophthalmologists managing and treating diabetic patients.
- Academic staff involved in the education and training of nurses, optometrists, health care workers and diabetic patients.

The population group benefiting from the results of the research would be the diabetic patients, as well as the nurses and health care workers.

1.5 SIGNIFICANCE AND VALUE OF THE STUDY

The development of an education programme for health care workers dealing with diabetic patients will have significant advantages, not only for the patients and workers themselves, but also for the higher education institution offering such a programme. Currently there is no post-graduate education and training programme in South Africa for health care workers managing diabetic patients with potentially sight-threatening diabetes complications. The Western Cape Department of Health for Chronic Diseases proposed that the educational training of ophthalmic nurses at community level should take place with specific reference to the screening and identification of diabetic retinopathy (Bonnici 2003). The implementation of such a programme should then provide the opportunity for such post-graduate training.

The value of this proposed education programme will go even further and will not restrict such training to ophthalmic nurses, but will include all health care workers treating diabetic patients, thereby enhancing the delivery of significantly improved health services to such patients. Most importantly, appropriate educational training of these workers should help to prevent the occurrence of sight-threatening complications in diabetic patients.

1.6 DESIGN OF THE STUDY AND METHODS OF INVESTIGATION

1.6.1 Research design

The study design was based on a descriptive survey research design. Included in the study design was cross-sectional as well as panel research. Initially, a thorough literature study was conducted on diabetes and the ocular complications

of Type I and Type II diabetes. A comprehensive review was undertaken of the processes involved with education programme development in general as well as of education programmes in particular that have been developed for diabetes educators and diabetic patients.

The use of the questionnaires provided both quantitative and qualitative responses from health care workers and patients. Inherent in the questionnaires were open-ended questions and areas for the participants to express thoughts and opinions on the specific research objectives. Quantitative analysis was performed through coding of individual questions and qualitative analysis was achieved through collation and analysis of the open-ended responses from the participants. Thereafter a phenomenological approach in terms of the Delphi technique was followed with a view to the development of the education programme.

Phenomenology can be described "a research method that attempts to understand participants' perspectives and views of social realities" (Leedy 1997:161). It was decided that in developing an education programme in the health sciences field, the phenomenological approach, involving a group of carefully selected experts in this field, would be the most appropriate research methodology. Furthermore, the Delphi method that was used to develop the education programme was also both quantitative and qualitative in nature.

1.6.2 Methods of investigation

The following specific methods were used:

- A *comprehensive literature study* was undertaken in order to review educational programme development, particularly in the South African context, as well as of diabetes and its ocular complications.
- A *patient questionnaire* was used to determine the patients' knowledge of diabetes and diabetic eye disease as well as of their own individual risk factors affecting the course of their diabetes and its possible complications.
- A *Health Care Worker Questionnaire* was used to assess the knowledge, education and training of health care workers, specifically in terms of diabetic eye disease.
- The *Delphi technique* was thereafter used for the development of the diabetes education programme.

The education programme developed by this technique had to satisfy and manage the shortcomings in knowledge of the health care workers and patients identified by the questionnaires. The Delphi technique was chosen as the research instrument for this phase of the study. The use of the Delphi technique for the development of health-related education programmes is well established (Jones & Hunter 1995:376). For qualitative research studies where opinions are being sought, the Delphi approach may be especially useful and as such this would be particularly relevant for the development of a diabetes education programme. For the purposes of this study, the patient and the health care worker questionnaires were available in English, isiXhosa and Afrikaans, while the Delphi questionnaires were available in English. The aim of this was to satisfy the demographic language requirements of the participants in the selected research region.

1.6.3 Sample selection

1.6.3.1 *Target population*

The target population for the study was the health care workers dealing with diabetic patients, as well as the diabetic patients from the region of the Western Cape Province of South Africa.

1.6.3.2 *Survey population*

The survey population consisted of nurses and health care workers from the municipal districts of the City of Cape Town, the West Coast/Winelands district, as well as the Overstrand regions of the Western Cape Province. The survey population also included the diabetic patients attending community health care centres in such areas.

1.6.3.3 *Sample size*

The sample size consisted of 52 community health care workers/nurses and 98 diabetic patients from community health care centres/clinics from the municipal districts of the City of Cape Town, the West Coast/Winelands district, and the Overstrand regions of the Western Cape Province.

1.6.3.4 *Description of the sample*

52 nurses were invited to participate in the research study and questionnaires were provided to the nurses/health care workers working in community health care centres, clinics and hospitals in order to determine the knowledge, education and training of such health care workers. Questionnaires were also provided to 98 diabetic patients attending the community health clinics in order to assess their knowledge of the disease and its associated risk factors.

1.6.4 Research techniques

1.6.4.1 *The Delphi technique*

After the patient and health care worker questionnaires had been analysed, the Delphi technique was employed for the purpose of developing the education programme. In the case of this study, a panel of 12 experts in the field of diabetes, nursing, optometry, ophthalmology and education was selected. The following criteria and areas of specialisation were then formulated in order to provide a benchmark for the selection of experts to serve on the Delphi panel:

- Specialised knowledge and experience concerning programme development in higher education.
- Specialised knowledge and experience of statute/policy formulation through the relevant Professional Board of the Health Professions Council of South Africa.
- Experience and post-graduate qualifications in both optometry and education.
- Specialised knowledge and experience in ophthalmology, specifically in vitreo-retinal surgery and diabetic retinopathy.
- Specialised knowledge and experience in nursing and community/public health.
- Specialised knowledge and experience with regard to world health and the epidemiology of public health problems.
- Specialised knowledge and experience of medical research.
- Specialised knowledge and experience concerning diabetes and its effects in the public health context.
- Specialised knowledge and experience of chronic diseases in terms of policy-making for the DoH of South Africa, as well as representation of organisations specifically dealing with the effects of diabetes and the eyes.

1.6.5 Data analysis

1.6.5.1 *The questionnaires*

The data obtained by means of the questionnaires which had been completed by the health care workers and the diabetic patients was analysed by the researcher assisted by a statistician from the Cape Peninsula University of Technology. This statistician had specific experience and expertise in questionnaire and data analysis. The data from the closed-response questions was captured on computer and statistically analysed, while the open-ended questions were summarised. The opinions expressed were then interpreted and discussed in the results.

1.6.5.2 *The Delphi technique*

The data obtained by means of the Delphi questionnaires was also analysed by the researcher, who was assisted by a statistician from the Cape Peninsula University of Technology. The open-ended questions were processed and interpreted by the researcher and the opinions and ideas of the expert respondents were used to adapt the formulated set of criteria for each subsequent round of Delphi. This process was repeated until 80% consensus had been reached on each statement or item on the questionnaire. Recommendations made by the respondents were incorporated and integrated into the questionnaire for each successive round and submitted to the respondents for further comment. After the last round a final set of criteria was compiled, which served for the development of the education programme.

1.6.6 Reliability, validity and trustworthiness

Joppe (2000:1) defines reliability as: "The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable." It

is important for this study that reliability is consistent in the research instrument, namely the questionnaire used, in order that the same results would be consistently obtained on repeated trials. The reliability in this research was established by means of well-constructed questionnaires that were carefully piloted and reviewed by experts in questionnaire compilation. Further reliability of the study was ensured by a fully inclusive sample, both for the questionnaires and the Delphi process, and the fact that a very high response rate was achieved in each.

The Writing Centre at the Colorado State University (2004:1) suggests that "...validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study's success at measuring what the researchers set out to measure." The validity of the findings of this research was maintained as a result of the expertise of the participants in the Delphi panel; the broad collaboration by means of which the research instruments were designed; and by the study leader and support mechanisms provided to the researcher.

According to Seale (1999:466) to ensure reliability in qualitative research, the examination of trustworthiness is crucial. Babbie and Mouton (2001:277-278) believe that, since a quantitative study cannot be considered valid unless it is reliable, a qualitative study cannot be called transferable unless it is credible and it cannot be deemed credible unless it is dependable. Therefore the trustworthiness of this study is evidenced through the reliability and validity of the quantitative research instrument - in this case, the questionnaires, as well as the credibility of the qualitative (and quantitative) instrument, the Delphi study, and

the Delphi panel. Further trustworthiness of the study was ensured by means of the selection of subject experts and specialists for the Delphi panel.

1.6.7 Ethical considerations

1.6.7.1 *Health care workers and patients*

All health care workers and patients agreed to participate in this research and gave informed consent for participation in the study in addition to giving permission for their details and results to be used for the statistical analysis of the findings. Their own anonymity as well as that of their responses was ensured. All patient examinations and interactions conformed to the Ethical Regulations of the Cape Peninsula University of Technology, as well as to the Ethical Rules governing registered practitioners of the Health Professions Council of South Africa (HPCSA). Written consent for this research had also been obtained from the Chief Director: District Health Services, Dept. of Health, Provincial Administration of the Western Cape (cf. Appendix E).

1.6.7.2 *The Delphi panel*

The panel of Delphi experts had to provide personal information such as demographic details, their educational qualifications, experience, and their area of expertise in order to enable a meaningful study to be conducted. They were, however, not permitted to obtain any information about the other members of the team. Their own anonymity as well as that of their responses was ensured. They furthermore completed informed consent forms for participation in the research. All information collected was dealt with in a strictly confidential manner and no names or personal information was made known.

1.7 DEFINING THE TERMINOLOGY

The most important terminology pertaining to this research study is listed briefly and concisely in alphabetical order as follows. Where no reference for the term is provided, the description was formulated by the researcher for the purposes of the research study.

- **Diabetes mellitus**

This literally means a “flowing through of sweetness” due to the passing of large quantities of urine containing sugar. Although it is not a single condition but rather a group of disorders with many features in common, its hallmark is abnormal blood glucose homeostasis (Ariffin, Hill & Leigh 1992:3).

- **Diabetic retinopathy**

Kanski (1994:344) describes diabetic retinopathy as a microangiopathy effecting the retinal precapillary arterioles, capillaries and venules. Larger vessels may also be involved and retinopathy has features of both microvascular occlusion and leakage.

- **Diabetes education**

This refers to the cognitive transfer of theoretical and clinical concepts, knowledge and appropriate diabetes management skills to the learner.

- **Community health centres**

These are health care facilities at the primary level in the South African public and district health system. They are staffed by nurses and other health care workers and medical practitioners on a full-time or part-time basis. Patients attending these centres are usually from the local surrounding geographic areas.

- **Curriculum**

The formative and summative learning outcomes comprising an educational programme or qualification will form the curriculum. The specified outcomes will form the collective aims and objectives of the qualification.

- **Delphi technique**

This is a formal consensus method commonly used in health services research. According to Jones and Hunter (1995:376), the Delphi method “seeks to maximise the benefits from having informed panels consider a problem (often termed *process gain*) while minimising the disadvantages associated with collective decision-making (*process loss*)”.

- **Patients**

This term refers collectively to individuals attending community health centres and clinics for the purposes of seeking medical attention, health screening, and/or treatment.

- **Post-graduate education**

This refers to the acquisition of skills and knowledge by the learner at a tertiary level academic training institution. The training and education is at a post-graduate level in a specialised field after completing an undergraduate qualification in a similar and appropriate field.

- **Reliability**

For the purposes of research it is important that the method of research is reliable. Babbie and Mouton (2001:1190) state that “...reliability is a matter of whether a particular technique, applied repeatedly to the same subject, would yield the same result each time.”

- **Validity**

This refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration (Babbie & Mouton 2001:1190).

- **Health care professional**

This is a member of the health care team dedicated to the prevention of disease and promotion of health and wellness and the treatment of health-related disorders. For the purposes of this study, health care professionals include medical practitioners, nurses, optometrists, and other allied health professionals dealing with diabetic patients.

- **Ocular complications**

For purposes of this study the term “ocular complications” refers to the pathological conditions occurring in the eye and adnexa as a consequence of the disease of diabetes. These include, but are not limited to, refractive changes; decreased visual performance; nerve palsies; corneal changes; cataracts; rubeosis irides; ocular hypertension; glaucoma; neuro-ophthalmic disorders; and diabetic retinopathy.

1.8 ARRANGEMENT OF THE THESIS

To provide an overview of the subject area, the methods used to find solutions and the final outcome of the research process will be reported on as follows:

Chapter 1, entitled “Background and Orientation to the Study”, provides a detailed introduction to the field of study and provides a broad overview of the entire research process.

Chapter 2, entitled “Criteria for the Development of Post-graduate Programmes in Diabetes Education”, provides a comprehensive review of the literature, specifically the criteria and processes involved with the development of post-graduate education programmes. This chapter contextualises the research problem and deals with the processes, systems and legislative bodies that would need to be considered during the curriculum development process. Models of curriculum development are discussed and a discussion of international diabetes education programmes ensues. In addition, the internationally accepted standards for diabetes education are reviewed.

Chapter 3, entitled “The Management of Ocular Complications in Diabetic Patients”, provides an overview of the medical condition of diabetes, including the ocular complications arising from diabetes. The chapter outlines the prevalence of the disease as well as its complications in order to emphasise and highlight the importance of the research and the devastating effects that this disease has on the eyes. A full description of the socio-economic consequences of the disease and its ocular complications is also provided.

Chapter 4, entitled “Research Methodology”, deals with the research design and methods. The research design is described and a detailed explanation of the methods and procedures is provided. The theoretical perspectives on the research design and procedures are explained together with a full description of the sample selection and target population. An overview of the procedure for analysing the data is provided and, in addition, the aspects of reliability, validity and trustworthiness of the study are dealt with.

Chapter 5, entitled “Results and Findings of the Research”, reports the results and findings of the study. The results of the questionnaires from the diabetic

patients and the health care workers are detailed separately together with a summative discussion on each. The quantitative data from the questionnaires is reflected in the form of tables and figures, whilst the qualitative data is fully coded and reported on. The results of the Delphi questionnaire are provided, together with an analysis and a discussion of the findings.

Chapter 6, entitled "The Development of a Post-graduate Education and Training Programme for Health Care Workers for the Prevention and Management of Ocular Complications in Diabetic Patients", provides a description of the culmination of the study, namely the diabetes education programme. The premises for the development of the programme are outlined, followed by a contextualisation of the programme in higher education in South Africa. The education and public health needs that are addressed by the programme are described with a full discussion of the proposed programme thereafter. Perspectives and challenges with regard to the delivery of the programme conclude the chapter.

Chapter 7, entitled "Conclusions and Recommendations", provides closure to the study. The limitations of the study, together with further recommendations for research, are contained in this chapter.

1.9 CONCLUSION

Chapter 1 provided the background and introduction to the research undertaken regarding the development of an education programme for the prevention and management of the ocular complications of diabetes. It was necessary to explain the importance of developing an education programme aimed at preventing the ocular complications of diabetes and to outline the role-players involved with this public health activity. It was also important to highlight the problems experienced

with managing and treating diabetic patients and to consider the role that health workers could play in managing such patients.

The methods used in the research were explained, namely, *inter alia*, a literature study; developing questionnaires to be completed by the diabetic patients; developing questionnaires to be completed by the health care workers; developing a questionnaire for consideration by the Delphi panel; performing an empirical study; and eventually writing up the development of the education programme in the thesis. The scope of the study and its significance and value were also discussed, as were the study design and methods of investigation. Finally, the arrangement of the thesis was set out and explained.

Having established the introduction and orientation to the study, the following Chapter entitled "Criteria for the Development of Post-Graduate Programmes in Diabetes Education" will specifically review the criteria that would be involved in the development of a post-graduate programme in diabetes education. The chapter will identify the key educational components that would comprise such a programme, as well as the various processes, systems and legislative bodies involved with curriculum development and programme accreditation. The chapter will also consider the local and international programmes that have been developed for diabetes education, together with suggested standards for diabetes education.

The lack of education programmes specifically dealing with the ocular complications of diabetes will also be discussed in order to contextualise this research study, while the need for such a programme will be described in detail.

CHAPTER 2

CRITERIA FOR THE DEVELOPMENT OF POST-GRADUATE PROGRAMMES IN DIABETES EDUCATION

2.1 INTRODUCTION

This chapter will provide an overview of the processes involved with the development of education programmes in the higher education sector of South Africa. It will begin with a description of the statutory bodies and relevant governmental acts that pertain to the delivery of higher education and will detail the principles underpinning the philosophy of tertiary education. The chapter will then comprehensively review models and processes of curriculum development and how these could be applied to the development of post-graduate education programmes. Thereafter, the chapter will review more specifically current available diabetes education programmes, both internationally and in South Africa.

2.1.1 List of acronyms in South African higher education

In order to provide an understanding of the various role-players and statutory bodies involved in the South African higher education landscape, it would be necessary to identify the acronyms commonly referred to for such bodies. The following is a list of the most frequent acronyms encountered in higher education in South Africa (RSA HEQC 2004:v):

- **CHE** Council on Higher education
- **DoE** Department of Education
- **ETQA** Education and Training Quality Assurer

- **FET** Further Education and Training
- **HEQC** Higher education Quality Committee
- **HEQF** Higher education Qualifications Framework
- **NQF** National Qualifications Framework
- **PQM** Programme and Qualifications Mix
- **NSB** National Standards Body
- **RPL** Recognition of Prior Learning
- **SAQA** South African Qualifications Authority
- **SGB** Standards Generating Body
- **SETA** Sector Education and Training Authority

The reader should note that these are not the only acronyms which will be used during the course of this thesis. A comprehensive list of all the acronyms used appears in front of Chapter 1.

2.1.2 Higher education structures and statutory bodies in South Africa

It is important for this research, that the structures and statutory bodies dealing with higher education are described. According to SAQA, higher education structures and similar statutory bodies are governed by the Higher education Act 101 of 1997 (RSA 1997). The Act has the following purpose:

- To regulate higher education.
- To provide for the establishment, composition and functions of a CHE.
- To provide for the appointment and functions of an independent assessor.
- To provide for the registration of private higher education institutions.
- To provide for quality assurance and quality promotion in higher education.
- To provide for transitional arrangements and the repeal of certain laws.

- To provide for all other matters concerned with higher education.

The Higher education Act is based on a number of principles, which may be broadly summarised in terms of quality assurance, transformation, and the needs of the community. These principles are essential to the changing and developing South African environment and are especially important in the context of the transformation of the higher education sector.

According to the preamble to the Higher education Act 101 of 1997 (RSA 1997), the aim of the act was to establish a single co-ordinated higher education structure which promotes co-operative governance and provides for programme-based higher education. Part of this would entail the restructuring and transformation of programmes and institutions in order to respond better to the human resource, economic and development needs of the Republic. In order to redress past discrimination and ensure representivity and equal access, the Act also aims to provide optimal opportunities for learning and the creation of knowledge.

The Act (RSA 1997) furthermore places strong emphasis on social upliftment and a commitment to democratic principles. It specifically refers to the promotion of values which underlie an open and democratic society based on human dignity, equality and freedom (including freedom of religion, belief and opinion). This would include the tolerance of people's differing ideas and the appreciation of our rich diversity. It recognises that higher education institutions have a responsibility towards the needs of the country and the communities served by the institutions whilst still enjoying freedom and autonomy in their relationship to the State within the context of public accountability. In the last place, the Act (RSA 1997) promotes excellence in higher education, particularly in terms of freedom of

speech and expression, creativity, research and the national need for advanced skills and scientific knowledge.

The structures and statutory bodies involved with the legislation, approval and promotion of higher education in South Africa are described in the following sections.

2.1.2.1 *Council on Higher education (CHE)*

The CHE was established in 1997 as a juristic person according to the Higher education Act 101 of 1997 (RSA 1997). The main function of the Council is to advise the Minister of Education on any aspect of higher education and, in particular, to:

- arrange and co-ordinate conferences;
- promote and audit quality assurance in higher education institutions;
- accredit programmes of higher education;
- provide advice on research, the higher education system structure, funding, student financial aid, governance of higher education systems as well as language policy.

2.1.2.2 *The South African Department of Education (DoE)*

The South African DoE promotes as its mission statement, the following (RSA DoE 2003b): "To provide leadership in the construction of a South African education and training system for the 21st century." The Vision of the Department, which is informed by its mission statement, furthermore states that "Our vision is of a South Africa in which all our people have access to lifelong education and training opportunities, which will in turn contribute towards improving the quality of life and building a peaceful, prosperous and democratic society" (RSA DoE 2003b).

In terms of its role in higher education, the purpose of the Department of Education is “to provide strategic direction in the development of an effective higher education system and to manage the government’s responsibilities for the regulation of the higher education system” (RSA DoE 2003c). The function of the Department is therefore to provide leadership by means of the following:

- The development of legislation and rendering of legal advice.
- The development of policy and support to the higher education system.
- Liaison with constituencies in higher education.
- The registration of private higher education institutions.
- The implementation of the National Plan for Higher education.
- The allocation and transfer of subsidy to public higher education institutions (RSA DoE 2003c).

2.1.2.3 *The South African Qualifications Authority (SAQA)*

SAQA was established as a juristic person in 1995 according to Act No. 58 of 1995, the South African Qualifications Authority Act (RSA 1995). The Act (RSA 1995) was promulgated in order to provide for the development and implementation of an NQF and for the purpose of establishing SAQA, as well as to provide for matters concerned therewith.

According to this Act (RSA 1995) the functions of SAQA include the following:

- To advise the Minister of Education on matters affecting the registration of standards and qualifications.
- To formulate and publish policies and criteria for the registration of bodies responsible for establishing education and training standards or qualifications.

- To formulate and publish policies and criteria for the accreditation of bodies responsible for monitoring and auditing achievements in terms of such standards or qualifications.
- To implement the registration or accreditation of bodies to oversee education and training standards and qualifications.
- To implement the registration of national standards and qualifications.
- To ensure compliance with provisions for accreditation.
- To take steps to ensure that standards and registered qualifications are internationally comparable.

As the Act was promulgated specifically to provide for the development and implementation of an NQF, a further description of this framework follows.

2.1.2.4 *The National Qualifications Framework (NQF)*

The NQF was established by the SAQA Act No. 58 of 1995 (RSA 1995) and was approved by the Minister of Education for the purpose of registering national standards and qualifications. The definition of a qualification for this purpose means "...the formal recognition of the achievement of the required number and range of credits and such other requirements at specific levels of the National Qualifications Framework as may be determined by the relevant bodies registered for such purposes by the South African Qualifications Authority" (RSA 1995). Furthermore, according to the SAQA Act (RSA 1995), the objectives of the NQF are to:

- create an integrated national framework for learning achievements;
- facilitate access to, and mobility and progression within education, training and career paths;
- enhance the quality of education and training;

- accelerate the redress of past unfair discrimination in education, training and employment opportunities; and thereby to
- contribute to the full personal development of each learner and the social and economic development of the nation at large (RSA 1995).

More recently, the South African Ministry of Education issued the Draft Higher education Qualifications Framework document (RSA MoE 2004). The characteristics of the framework are summarised below. According to the Ministry of Education (RSA MoE 2004:11) the higher education qualifications framework is designed to:

- complement the Ministry of Education's planning and funding policies;
- be sufficiently flexible to accommodate different types of higher education institutions and enable institutions to pursue their own curriculum goals with creativity and innovation;
- facilitate the education of graduates who will contribute to the social, cultural and economic development of South Africa and participate successfully in the global economy and knowledge society;
- enhance the development of a vibrant, high quality research system;
- be compatible with international qualifications frameworks in order to ensure international recognition and comparability of standards;
- be suitably flexible in order to accommodate the development of new qualification types and specialisations as the need arises;
- be simple, clear, easy to understand and user-friendly for the higher education system and its clients;
- facilitate qualification articulation across the higher education system and assist learners to identify potential progression routes, particularly in the context of lifelong learning; and to

- articulate with the rest of the National Qualifications Framework (RSA MoE 2004:11).

The following Table 2.1 illustrates the format of the National Qualifications Framework according to the South African Ministry of Education (RSA MoE 2004:19):

TABLE 2.1: Summary of the NQF: Qualifications, levels and minimum credits

NQF LEVEL	MINIMUM CREDITS PER QUALIFICATION (AND AT EXIT LEVEL)	QUALIFICATION TYPE
10	360 (360)	Doctoral Degree
9	180 (120)	Master's Degree
8	120 (120) 120 (120)	Honours Degree Post-graduate Diploma
7	360/480+ (120) 120 (120)	Bachelor's Degree Advanced Diploma
6	360 (240) 120 (120)	Diploma Advanced Certificate
5	120 (120)	Higher Certificate

Source: RSA MoE (2004:19)

2.2 RESTRUCTURING HIGHER EDUCATION IN SOUTH AFRICA

The restructuring of the higher education landscape in South Africa is a necessary and inevitable consequence of the historical inequalities of the previous education system in South African. According to Kgaphola (1999:60) education in general as well as higher education in particular, carries the burden of providing the intellectual and cultural leadership to accomplish the transformation of South Africa. Furthermore, Kgaphola (1999:60) surmises that, to meet such an obligation, it would be necessary for the higher education system itself to be "oriented away from its exclusionist philosophy of the past towards a catalytic and national development-based paradigm". Such a shift would ultimately aim to move towards a more unifying and inclusive system that would benefit the lives of all South Africans.

The Draft White Paper on Higher education (RSA DoE 1997:1) reflects the perspective that higher education plays a central role in the social, cultural and economic development of modern societies. However, with this new role comes a number of challenges unique to the South African environment. These include redressing past inequalities; transforming the higher education system to serve a new social order; meeting critical national needs; as well as responding to new realities and opportunities.

According to Kgaphola (1999:60), "the post-apartheid government has identified a number of weaknesses derived from the old higher education dispensation, and has pronounced a broad programme and some specific measures to overcome them." Kgaphola (1999:63) then suggests a number of generic attributes that graduates would need to possess in order to revive the South African economy and its social systems. These attributes would include:

- Possessing adequate core professional and specialised skills to practice their respective professions.
- Being technologically literate and being able to function in a knowledge-driven economy.
- Being multi-skilled and adaptable in orientation.
- Possessing communication skills.
- Being creative, intellectually developed and enterprising in attitude.
- Being culturally sensitised and worldly wise in order to be attuned to the global village (Kgaphola 1999:63).

Therefore, in order to address the weaknesses identified by the post-apartheid government, the Draft White Paper on Higher education (RSA DoE 1997:1) specifically outlines the purposes of the transformed higher education system. Such a system would have to meet the learning needs and aspirations of individuals through the development of their intellectual abilities and aptitudes throughout their lives with the concept of lifelong learning forming the cornerstone of this philosophy. The new system would also seek to address the developmental needs of society and provide the labour market with high-level competencies and expertise necessary for the growth and prosperity of a modern economy.

Excellence in research would fundamentally aid this process and further contribute to the creation, sharing and evaluation of knowledge, which would enhance the entire education system. Finally, the transformed education system would contribute to the socialisation of enlightened, responsible and constructively critical citizens of the nation. The pillars of the higher education system can then be summarised in terms of the following criteria (RSA DoE 1997:1):

- Equity and redress.
- Democratisation.
- Development.
- Quality.
- Effectiveness and efficiency.
- Academic freedom.
- Institutional autonomy.
- Public accountability.

After determining the overall philosophy of the new education system, it was necessary for the DoE to evaluate the framework for qualifications in higher education. If the philosophy of the system was to ensure equity and access and lifelong learning and recognition of prior learning, it would therefore need to provide mechanisms to enhance horizontal and vertical mobility through flexible entry and exit qualifications.

The Department of Education in its White Paper (RSA DoE 1997:11) articulates the principle of a single qualifications framework that would comprise of a ladder set of qualifications from certificate and diploma levels progressing through to Master's and Doctoral degrees. Such a framework would ideally ensure that learners could enter into the system; obtain qualifications at various levels; and then undertake further studies unhindered in terms of access, mobility and articulation. This is a very important aspect because this research ultimately intends to develop an educational programme for health care workers at post-graduate level that would provide access, mobility and articulation based on their prior learning.

Having established a framework for higher education, the various levels of study comprising the framework could then be identified. For each stage of the framework, the required higher levels of knowledge and skills are articulated and recorded in terms of level descriptors. It is important to give a brief overview and explanation of these level descriptors in order to provide an orientation and overview of the educational programme levels towards which this research is aimed.

2.2.1 Level descriptors in higher education

The NQF will have 10 levels of study (RSA MoE 2004:11) with the higher education sector occupying the six levels of the NQF from levels five to 10. Levels five to seven are undergraduate levels, whilst levels eight to 10 are post-graduate. Each qualification level has a level descriptor which serves to differentiate the varying levels of complexity of the qualifications on the framework. It is particularly important to note the level of the Post-graduate Diploma, for it is at this level at which the post-graduate diabetes education programme is likely to be developed.

The Draft Higher education Qualifications Framework document (RSA MoE 2004:11) states that the level descriptors may be considered to be the outermost layer of qualification specification. At each level they describe the generic nature of learning achievements and their complexity. Level descriptors may thus be considered to be broad qualitative statements against which more specific learning outcomes can be compared and located. The positioning of two or more qualifications on the same NQF level only indicates that the qualifications are broadly comparable in terms of the general levels of outcomes. It does not mean that they have the same purpose, content or outcomes, nor does it necessarily demonstrate equivalence of qualifications (RSA MoE 2004:12).

2.2.2 Articulation principles, recognition of prior learning and lifelong learning in higher education

In order to develop a post-graduate education programme for health care workers, cognisance must be taken of the principles of lifelong learning in South African Higher education. The Draft White Paper on Higher education (RSA DoE 1997:5) refers to the key feature of the single co-ordinated higher education system being the broadening of the social base of the education system in terms of race, class, gender and age. In terms of lifelong learning the system must open its doors to workers and professionals in pursuit of multiskilling and reskilling, and will provide access to adult learners whose access to higher education had been thwarted in the past.

A hugely significant conceptual change is that the transformed single co-ordinated system will be premised on a programme-based definition of higher education. Such a conceptual change recognises that higher education takes place in a multiplicity of institutions and sites of learning, using a variety of methods while attracting an increasingly diverse body of learners.

A key feature will be the development of programmes and transformation of programmes to articulate within the NQF. Historically, qualifications were rigidly structured with little flexibility in terms of access for the learners with differing undergraduate forms of education. The NQF now promotes diversification of the access routes and curriculum and qualification structures and places greater emphasis on programme articulation. It encourages an open and flexible system based on credit accumulation and multiple entry and exit points for the learners. The aim of such a system would therefore be to remove obstacles which unnecessarily limit learners' access to programmes of study and to enable proper academic recognition to be given to prior learning achieved. This would then

permit greater horizontal and vertical mobility by learners in the higher education system and would also aim to break the grip of the traditional pattern of qualification based on sequential, year-long courses in single disciplines.

The South African Qualifications Authority in its NQF and Curriculum Development Policy Document (SAQA 2000:23) suggests that RPL has essentially two aspects. The first is the ability for learners through RPL to be credited with certain learning achievements. The second is the assessment of learners through RPL in order to gauge their potential for entry to a specific learning programme. If the objectives of facilitating access to, and mobility and progression within education, training and career paths are to be met, then exploring ways in which these aspects can be addressed in programme design, especially in respect of assessment, is critical. The same would also be true for accelerating the redress of past unfair discrimination in education, training and employment opportunities.

The RPL is defined in the National Standards Bodies Regulations (RSA NSB 1998) as “the giving of credit to what learners already know and can do regardless of whether this learning was achieved formally, informally or non-formally”. It is clearly important to recognise the aspect of prior learning when considering access to higher education. Prior learning may be considered to be both in terms of prior learning in formal academic programmes, which may or may not result in formal qualifications, as well as prior learning in a semi- or non-structured learning environment. This would include learning taking place through work and self-study.

The philosophy of the higher education system in South African now seeks to recognise the importance of prior learning and that credit should be given to learners for this. However, these credits should be provided through a formal

process which may comprise testing the learners' prior knowledge, requesting portfolios of work or learning previously undertaken or by providing for equivalent status of informal learning satisfactorily completed. This feature is supported by The Draft Higher Education Qualifications Framework Policy (RSA MoE 2004:15) which specifically states that "...with due regard to the policies, guides and recommended good practice of the Higher education Quality Committee (HEQC), institutions may recognise other forms of prior learning and achievement, in addition to qualifications, to determine the equivalence of admission requirements."

2.3 OUTCOMES-BASED EDUCATION (OBE)

Spady (1994a:18) believes that "reformers from coast to coast agree that measures other than student grades and Carnegie units must be used for determining student achievement", but disputes arise when attempting to explain exactly what outcomes are and what kinds of outcomes should be expected of learners. Furthermore, Spady (1994a:18) believes that the overriding issue affecting the development and implementation of outcomes today is that of *significance*. What this means in the evolution of outcomes-based education, is that in its simplest form, there has been a shift away from small relatively simple curriculum-focused segments of learning to much more complex and comprehensive learning experiences focused on life roles or role performances (Spady 1994a:18).

2.3.1 The principles of outcomes-based education

To understand the principles of OBE it is necessary to establish what exactly an outcome is. Spady (1994a:18) explains that "outcomes are high quality, culminating demonstrations of significant learning in context. *Demonstration* is

the key word: an outcome is not a score or a grade, but the end product of a clearly defined process that students carry out."

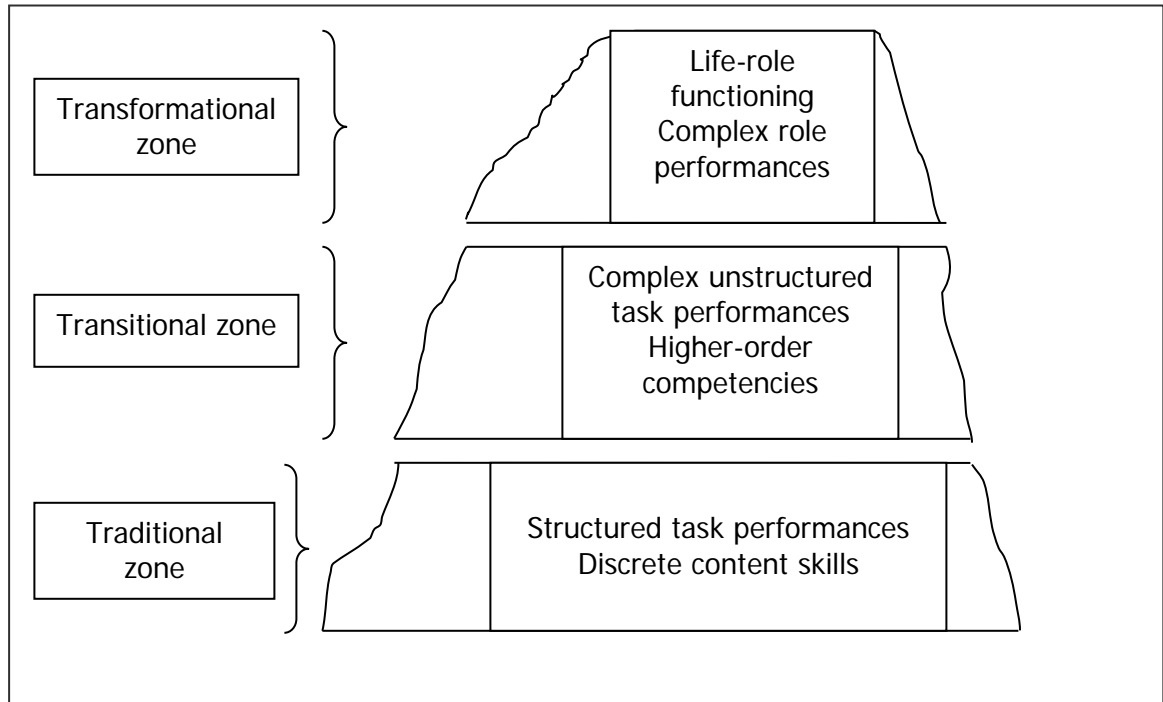
There are four critical aspects pertaining to the process of demonstration in an outcomes-based education system. First, according to Spady (1994a:18), "the demonstration must be high quality, which, at a minimum, means thorough and complete." Second, the demonstration should occur at the culminating or end point of the student's learning experiences, and this would be considered to be an exit-level outcome. Third, the demonstration must show evidence of significant learning that would result from the completion of significant subject content, and manifested through a demonstration process. Finally, according to Spady (1994a:18) "all demonstrations of learning [must] occur in some context or performance setting."

Spady and Marshall (1991:70) believe that adherents of outcomes-based education seek to apply four key principles to the design, delivery, documentation and decision-making work of schooling. The first principle is to *Ensure clarity of focus on outcomes of significance*. This means that culminating demonstrations become the starting point, focal point, and ultimate goal of curriculum design and instruction. Second, curriculum and instructional design should carefully proceed backward from the culminating demonstrations (outcomes) on which everything ultimately focuses and rests, thereby ensuring that all components of a successful culminating demonstration are in place. This is known as *Design down from ultimate outcomes*. Killen and Hattingh (2004:72) refer to this principle as designing back and explain that once the required learning has been defined, important instructional decisions can be made by tracing back from the desired end result and, in the process, identifying enabling outcomes that will assist learners to achieve the broader long-term outcomes.

Third, to *Emphasise high expectations for all to succeed* means that outcomes should represent a high level of challenge for students and all students should be expected to accomplish them and be given credit for their performance at a high level when it occurs. Finally, time should be used as a flexible resource rather than a predefined absolute in both instructional design and delivery, in order to facilitate differences in student learning rates and aptitudes. This last principle aims to *Provide expanded opportunity and support for learning success* (Spady & Marshall 1991:70).

It is important to acknowledge that there are ascending pedagogical levels of outcomes-based education and that these may be likened to a mountain whereby the higher the elevation, the higher the level of complexity of the educational outcomes and demonstrations. Such a mountain is described by Spady (1994a:19) in what he calls "The Demonstration Mountain" (cf. Figure 2.1).

Spady (1994a:19) describes the Demonstration Mountain as representing the act of "climbing from basic demonstrations of classroom learning up to demonstrations that involve living effectively in the face of real-world challenges at home, at work and in the community." The mountain consists of three major zones within which are incorporated the six different forms of learning demonstrations. The complexity and significance of demonstration increases the higher up one climbs the mountain and so, too, the ownership, self-direction and self-assessment that students must apply to a demonstration.

FIGURE 2.1: The Demonstration Mountain

Source: Spady (1994a:20)

According to Spady (1994a:19), the least complex forms of demonstrations fall in the Traditional Zone. They are grounded primarily in subject matter content and are relatively simple and limited to traditional subject categories. Owing to their strong content focus, they are not usually generalisable across other areas of the curriculum or other performance contexts. Whilst some of these Discrete content skills do eventually serve as enabling outcomes for demonstrations higher up the mountain, most of them are discrete objectives – small and detailed pieces of learning that constitute components in a larger block of curriculum content. The structured task performances in the Traditional Zone represent most day-to-day classroom activities and they typically involve completing a series of steps that the teacher or educator has defined.

Midway up the mountain lies the Transitional Zone, where we encounter higher-order competencies. According to Spady (1994a:20), these would include analysing concepts and their interrelations; proposing solutions to multifaceted problems; using complex arrays of data and information to make decisions; planning complex structures, processes or events; and communicating effectively with public audiences. Although they are more generalisable across different kinds of subject areas, they do still rely on some content skills and structured tasks as enablers. Above this, in the level of complex unstructured task performances, is where students create their own projects, defining the parameters, criteria, standards, and modes of execution and evaluation. These would then constitute the broad, complex demonstrations inherent in independent research and high-level applied projects (Spady 1994a:20). These tasks would also require the integration of knowledge from many different sources and disciplines.

The Demonstration Mountain then culminates in the Transformational Zone where one enters the realm of role performances (Spady 1994a:20). It is at this level that students or learners demonstrate what real people do in order to be successful on a continuing basis in their career, family, and community, operating with authentic life contexts as the backdrop. Grounded in these real-world contexts are complex role performances which occur and recur as people carry out their responsibilities. They involve a high degree of generalisability across time and situations; and they demand a high degree of ownership, self-direction and self-assessment on the part of their practitioners.

It can therefore be assumed that successful Complex Role Performers have the motivation and commitment to continually carry out their role responsibilities and

not just perform isolated tasks on demand. Such performances would be required by the health care workers for which this research is aimed, in order to ensure that a highly complex and integrated approach to health care provision occurs as a result of the outcomes-based learning process.

In terms of life-role functioning, Spady (1994a:21) identified 10 clusters of fundamental life performance roles which according to Spady, may also serve as a template for implementing transformational outcomes-based education (OBE). It is proposed that at this level, learners can be prepared to be the following:

- Implementers and performers.
- Problem finders and solvers.
- Planners and designers.
- Creators and producers.
- Learners and thinkers.
- Listeners and communicators.
- Teachers and mentors.
- Supporters and contributors.
- Team members and partners.
- Leaders and organisers (Spady 1994a:21-22).

The paradigm of transformational OBE can then be considered to represent the highest evolution of the OBE concept and it contrasts sharply with traditional OBE (Spady & Marshall 1991:70). It fully embraces and embodies the spirit of the four previously discussed OBE principles. It is grounded on the premise that transformational OBE aims to “equip all students with the knowledge, competence, and orientations needed for success after they have left

school/university". Its guiding vision of the graduate is therefore that of a competent future citizen (Spady & Marshall 1991:70).

Furthermore, Spady and Marshall (1991:67) believe that OBE is founded on three basic premises, namely that all students can learn and succeed (but not on the same day in the same way); that success breeds success; and that schools control the conditions of success. It could then be considered that OBE focuses on the philosophy of success for all learners and staff with learners exiting successfully from the educational system (Spady 1994b:9).

2.3.2 Outcomes-based education in academic programmes

When considering OBE, Diamond (1989:125) acknowledges that, in order to determine whether or not academic programmes are successful, we must initially determine the goals of academic programmes, courses and curricula. This is an important consideration in this research, since the ultimate aim of the research would be to develop a successful post-graduate academic programme. It is necessary to state in specific terms what we expect the students to be able to do and then to determine whether or not, at the completion of the instructional process, they can reach these predetermined goals.

This standard requires that we describe goals or objectives in performance terms and that evaluation instruments and procedures adequately assess the abilities of students to meet specific criteria (Diamond 1989:126). This philosophy may be considered to be the foundation of outcomes-based education and according to Diamond (1989:126), such a system that provides clearly stated objectives offers significant advantages at the course and programme level. Such an outcomes-based system would aim to ensure that the following:

- Fairness of both testing and grading is facilitated.

- Goals of the course, content and evaluation procedures are both consistent and interrelated.
- Course and materials evaluation identify what is effective and working and also what is not.¹
- Orientation from “what I (as a lecturer) must cover” is changed to what a student should be able to do as a consequence of instruction.
- Self-evaluation by the students is encouraged since they know what is expected of them.
- Efficient student learning is facilitated, and anxiety is reduced by providing direction and identifying instructional priorities (Diamond 1989:126).

Spady (1994b:1) states that “...outcomes-based education means clearly focusing and organising everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organising curriculum, instruction, and assessment to make sure this learning ultimately happens.”

In order to satisfy an outcomes-based system, the student would then be expected to undergo an evaluation and assessment process that would aim to determine the student’s proficiency in achieving the stated outcomes. It would also be expected that this assessment process would have clearly defined and measurable outcomes that the learner was prepared for prior to undergoing the required assessment. According to Spady (1994b:9), OBE focuses on the philosophy of success for all learners and staff and it is expected that learners will exit successfully from the educational system. This means, however, that

¹ Evaluation in these and other models may be considered similar to assessment in the South African OBE context. That is assessment refers to learners’ knowledge whilst evaluation refers to complete programmes.

conditions and opportunities must be created within the education system to encourage and enable learners to attain the stated outcomes (Spady 1994b:97). In addition it also means that a clear and focused set of learning outcomes must be developed and written as part of the curriculum development process for the academic programme.

Although the writing of aims and objectives has always been a part of quality instructional programmes in South Africa, there was previously an emphasis on writing such aims and objectives in terms of syllabus content, with little regard for what was to be expected of the student in performance terms upon completion of the work. The emphasis has now shifted completely away from the input or content aspect of programmes towards the objective assessment of the performance of learners in terms of clearly stated outcomes. It is important to emphasise that the earlier use of objectives in educational models should in no way be equated with outcomes in an OBE system. There is a fundamental shift in emphasis with a clear focus on end-point outcomes and the design-down formulation of such outcomes. This complete shift in educational philosophy and curriculum design then formed the background for the introduction of OBE in South Africa.

2.3.3 The rationale for outcomes-based education in South Africa

Steyn and Wilkinson (1998:203) explain that during the 1980s and early 1990s education in South Africa experienced a crisis. This crisis was characterised by major inequalities in the education system, high drop-out and failure rates, poorly qualified teachers, rote learning and unimaginative teaching methods (Steyn & Wilkinson 1998:203). According to these authors (Steyn & Wilkinson 1998:203) the new democratic government of South Africa has been striving to root out apartheid education and to produce a new vision of empowered citizens for the

future. So, as part of the transformation of the South African higher education system and structures, the change to a more objective, outcomes-based form of education had to be implemented.

Malan (1997:1) explains that trends from the international community in terms of education were considered and debated in South Africa and many educators and legislators felt that it was important to shift the emphasis in education from purely teaching and learning, based on content, towards learning focused on achieving clearly stated outcomes. The debate on the desirability and especially the feasibility of this shift continues, and as Malan (1997:1) observes, "...many questions remain unanswered and even unexplored; nevertheless, South Africa has committed itself to making this shift". Steyn and Wilkinson (1998:203) explain the reasoning behind the selection of OBE as a model for South Africa. Such a model would strive to guarantee success for all; it would devolve ownership by means of decentralised curriculum development; it would empower learners in a learner-centred ethos; and it would make schools more accountable and responsible for learner success.

A brief overview of the apartheid education system in South Africa reflects glaring disparities between the educational systems for the various classified racial groups. Malan (1997:3) explains that for each racial group and province of the country there was a different education system. Provincial education departments developed their own subject curricula, while education and training were regarded as separate and irreconcilable types of schooling. There was therefore a strong need for integration politically, administratively and educationally, as well as to develop and maintain a national, outcomes-based qualifications framework. The emphasis on outcomes demonstrated the thought that even though there may be various different forms of teaching and education, reflecting the rich

diversity of the country, the ultimate outcome for each and every person learning in a particular programme should be equivalent, clearly stated and that the assessment process should be objective and verifiable.

New terminology was also necessary when implementing OBE in South Africa and when it was introduced, the designers of the new system believed that some of the old teaching terms should be replaced by new terms more in line with an outcomes-based curriculum (Jacobs, Vakalisa and Gawe 2004:59). Specifically, the terminology relating to aims and objectives was replaced with outcomes and evaluation was replaced with assessment. Pupils and students were replaced with learners, subjects were replaced with learning areas, and a syllabus was replaced with a learning programme.

According to Jacobs *et al.* (2004:60) a number of fundamental principles were identified that had to be ingrained in OBE learning programmes. In addition to the programme being directed at achieving definite learning outcomes, the learning should be value-oriented and learner-centred. The learning areas must be relevant and integrated and the individual difference of learners must be recognised. Assessment in the programme should be criterion-referenced and include performance assessment, assessment of complex skills and should take place on a continuous or an ongoing basis. Above all, the learning programme should be non-discriminatory and encourage the development of mutual respect for diverse religions and value systems (Jacobs *et al.* 2004:61).

2.3.4 Theoretical philosophies underpinning outcomes-based education in South Africa

Steyn and Wilkinson (1998:203) are of the opinion that every education model has a theoretical basis and suggest that in South Africa there are four main theoretical philosophies upon which OBE is based.

The first philosophy suggested by Steyn and Wilkinson (1998:203) is behaviourism. Steyn and Wilkinson (1998:203) consider behaviourism to be a "strong psychological inclination which focuses on the external human behaviour which can be observed. It is a philosophy which deliberately breaks away from previous interpretations which explain human behaviour as driven by deep-seated internal motives." Evidence of this philosophy in South African OBE is apparent when considering the activity verbs relating to facets of observable behaviour such as "collect", "identify", "analyse", "demonstrate" etc. Outcomes in South Africa are rarely written in terms of concepts such as "wonder", "aspire", "visualise", "reflect", "imagine" etc., because such concepts indicate invisible and inherent learning behaviour, which the philosophy of behaviourism does not provide for (Steyn & Wilkinson 1998:204).

The second philosophy underpinning OBE in South Africa may be considered to be social reconstructivism. According to Steyn and Wilkinson (1998:204), social reconstructivism is a philosophy which is strongly oriented towards social transformation. It operates from the assumption that the existing social structures strive to maintain the present position of power or the *status quo*. Such a philosophy would require a shift in emphasis whereby teachers are perceived as facilitators and not as authoritarian sources of knowledge and power. Steyn and Wilkinson (1998:204) therefore argue that OBE in South Africa is also based on the philosophy of social reconstructivism.

The third philosophy suggested by Steyn and Wilkinson (1998:204) involves the concept of "critical theory". According to the authors (1998:204), the key focus

areas of this philosophy are the change and emancipation of societies and individuals from being regulated and indoctrinated towards being critical and questioning. The discussion documents on OBE in South Africa stress the critical attitudes and skills that should be acquired by learners, and include the concept that learning programmes should promote the learners' ability to think critically (Steyn & Wilkinson 1998:204).

The fourth philosophy underpinning OBE in South Africa may be considered to be pragmatism. Pragmatism is a philosophy which emphasises usefulness with the effect of underplaying the value of the principle (Steyn & Wilkinson 1998:205). Whatever works in practice as well as what is useful, is of the utmost importance. According to Steyn and Wilkinson (1998:205), this approach came into being as a reaction against ideals and idealism which cannot be implemented practically.

Having suggested the philosophies underpinning OBE, Steyn and Wilkinson (1998:205) further consider the reinforcements and tensions within the theoretical bases of OBE. Some of the strengthening roles of the underlying theories would include a united front against content-based approaches to learning as well as a theoretical power-base against the central position of teachers (Steyn & Wilkinson 1998:205). These theories would also present a front reaction against an evaluation system based mainly on written and memory-based work and a mutual affirmation against universal content and values (Steyn & Wilkinson 1998:205).

Another aspect which has to be considered, is that there may also be tensions between the underlying theories. One such tension would be between the product-oriented approach underpinned by behaviourism and pragmatism, as well as the process-oriented approach of social reconstructivism and critical theory.

Other tensions as suggested by Steyn and Wilkinson (1998:205) would include tension between control and consultation, between external and internal abilities, as well as between competition and co-operation in the learning environment (Steyn & Wilkinson 1998:205).

2.3.5 Guiding principles for the implementation of outcomes-based education in South Africa

Mason (1999:137) contextualises the shift to an OBE system by drawing on Ryle's distinction between propositional and procedural knowledge. According to Mason (1999:141), propositional knowledge may be considered to be knowledge associated with facts or content, whereas procedural knowledge is knowledge associated with skills. Defenders of OBE would therefore emphasise procedural knowledge, stressing the acquisition of demonstrable skills, but detractors of OBE point out that procedural knowledge without propositional knowledge potentially treats learners as uncritical members of the workforce (Mason 1999:141).

It is true that propositional knowledge is not much good in and of itself and, likewise, procedural knowledge on its own makes one little more than functionaries mindlessly executing tasks required of one (Mason 1999:142). However, it is important to consider how curriculum planners specify the learning outcomes that are deemed to be worthwhile. Steyn and Wilkinson (1998:206) acknowledge the obsolescence of the content-based educational model and reflect that many people all over the world believe that the content-based education model has served its purpose. Furthermore, this belief is central to all of the four philosophies underpinning OBE, which means that all stakeholders acknowledge that new demands in a new century require a totally different educational approach (Steyn & Wilkinson 1998:206).

As Steyn and Wilkinson (1998:207) point out, such a new educational approach would have to include a number of fundamental changes, for example a shift of emphasis away from the teaching of work to learners to the learning and permanent acquisition of educational outcomes. Inherent in this shift would require a total re-orientation of the entire process, purpose, methods and criteria for evaluation. A reflection on the place and role of values in education would also have to be included considering that, although the OBE model allows for a spectrum of values, it does not allow room for many moral or religious values (Steyn & Wilkinson 1998:207).

The OBE model suggested also expects learners to demonstrate inherent values such as awareness and sensitivity in an observable way (Steyn & Wilkinson 1998:207). However, not all educational aspects can be demonstrated immediately. Effective attitudes can be modified by involving the cognitive aspect, but this can only come to fruition on the affective terrain after some years (Steyn & Wilkinson 1998:207).

Perhaps one of the most critical aspects of the OBE model is the principle whereby learners are expected to acquire outcomes at their own pace and at the same time, co-construct meaning and acquire shared understanding (Steyn & Wilkinson 1998:207). This requires a balance between individual and group activities, thereby allowing the learners time to progress at their own speed. It would be imperative then that learning facilitators would have to be specially trained for this type of classroom situation.

Having established the guiding principles for the implementation in South Africa, we can consider the benefits of such a model. Malan (1997:3) outlines the

benefits of such a system according to those involved in its development as being able to achieve the following:

- Creating opportunities for all South Africans to be lifelong learners.
- Removing artificial boundaries between education and training by integrating theoretical and practical learning and teaching.
- Making education and training relevant to the needs of individual learners and of the country as a whole.
- Establishing credible standards and qualifications which would be recognised and accepted nationally and internationally.
- Making education and training accessible to all those who wished to learn.
- Establishing a flexible education and training system which would offer different routes, or learning pathways, by means of which learners could accumulate credits and gain qualifications (Malan 1997:3).

An overview of the phases leading up to the implementation of OBE in South Africa is outlined by Malan (1997:18) as follows:

First, the government - through a ministerial task team - prepared a discussion document on the development and implementation of a national qualifications framework in South Africa. This led to the appointment of SAQA and the development of the NQF for South Africa.

Second, as Malan (1997:18) explains, SAQA developed critical cross-field outcomes which refer to adult life roles and which would best meet the needs of the country. Spady (1994a:21) in his Demonstration Mountain considers the peak of the mountain to be the Transformational Zone where learners enter the realm of Role Performances or Fundamental Life Performance Roles. Spady (1994a:21)

suggests that almost all real-life role performances require complex applications of many kinds of knowledge and all kinds of competence as people confront the challenges surrounding them in their social systems.

In Spady's (1994a:21) cluster of life performance roles, he suggests that these would be essential to almost all the major life roles students will face once they leave school, such as being a citizen, an employer, a worker, a parent and/or a civic leader. It is perhaps this essential identification of life roles by Spady which underpins the critical outcomes developed for the education system in South Africa. These critical outcomes should therefore direct teaching and learning in all grades and in all subjects or courses in South Africa and are stated as follows (SAQA 1998:15):

- The ability to identify and solve problems with responsible decisions shown to be the result of critical and creative thinking.
- The ability to work effectively with others as a member of a team, a group, an organisation and a community.
- The ability to organise and manage oneself and one's activities responsibly and effectively.
- The ability to collect, analyse, organise and critically evaluate information.
- The ability to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation.
- The ability to use science and technology effectively and critically, showing responsibility towards the environments and health of others.
- The ability to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

It is of utmost importance that these critical outcomes are embedded in every aspect of the diabetes education programme that this research aims to develop.

The ability to identify and solve problems in the education programme must be applicable to the learners' life role performances in the clinics with the diabetic patients. Similarly, the ability to work effectively with others would be an outcome necessary for the learner both while completing the education programme as well as in a clinical situation. Other critical outcomes such as the ability to analyse information, communicate effectively and understand problem-solving in the context of a world of related systems, would also be integral aspects of the learners' experience in the learning programme and in their occupational environment.

Furthermore, according to SAQA (1998:15) in order to contribute to the full personal development of each learner and the social and economic development of the society at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of:

- reflecting on and exploring a variety of strategies to learn more effectively;
- participating as responsible citizens in the life of local, national and global communities;
- being culturally and aesthetically sensitive across a range of social contexts;
- exploring education and career opportunities;
- developing entrepreneurial opportunities (SAQA 1998:15).

Malan (1997:18) then continues to outline the steps leading to the implementation of OBE in South Africa. Fields of learning are then identified, within which the necessary knowledge, skills and attitudes have to be developed or acquired in the higher education and training band. Subject disciplines and career fields are then developed to contextualise the required outcomes.

According to Malan (1997:18) the identification and formulation of specific outcomes for each learning area was thereafter completed. These specific outcomes describe the contextually demonstrated knowledge, skills and attitudes which will have to be assessed whenever a learner's competence in a particular area of learning is to be determined. The use of Standards Generating Bodies (SGBs) was instrumental in the development of these specific outcomes, particularly for highly career-oriented programmes and those registerable with professional bodies or councils such as the Health Professions Council of South Africa (HPCSA) or the South African Nursing Council (SANC).

Finally, the last step involved the formulation of assessment criteria, range statements and performance indicators which would guarantee the objective evaluation of the work that had been completed according to the specific outcomes (Malan 1997:19). The importance of an understanding of these processes is that any new learning programme to be developed should follow the criteria and procedures that have been implemented through the processes outlined above. It is the responsibility of curriculum developers to determine learning programmes and programme/course content based on the specific outcomes necessary for that field and which would also reflect the critical outcomes and the underpinning intentions identified by SAQA.

2.3.6 The rationale and support for outcomes-based education

A major rationale for implementing outcomes-based education, which is supported by educators and learners alike, is that well-written and clearly stated outcomes ensure clear focused teaching and learning with a fair and transparent assessment process known to all.

A critical aspect of education is the assessment methodology. This is perhaps where learners may obtain the greatest benefit from the system, for in an outcomes-based learning system, learners are made aware of what is expected of them in terms of skills and competencies throughout their learning process. This aspect is reflected in the writing of learner outcomes in South Africa, where frequently the outcome will be written in a format such as "...upon completion of this work, the learner will be able to demonstrate...". In order to ensure, however, that the assessment of the learners will be fair and equitable, Malan (1997:31) states that educators in an outcomes-based system of education "...will have to identify, formulate and make known the criteria which they intend using during the assessment process". This means that these outcomes must be determined and clearly articulated to the learner prior to assessment taking place and, ideally, prior to commencing studies.

Killen (2002:5) agrees that there is indeed "merit in specifying what we want students to learn, merit in directing our teaching towards helping students learn those things, and merit in attempting to determine whether they have learned it." So in teaching through outcomes, it recognises the importance of addressing questions such as "What students should learn at university" and "What is the purpose of higher education?" Therefore it would be educationally desirable and prudent to teach in such a way that learners undergo learning in order to achieve predetermined goals and that there is merit in specifying just what those learning goals or objectives are.

Killen (2002:5) continues to state that "...outcomes are really no more than statements of intention, written in terms of student learning." In attempting to evaluate the benefits of outcomes-based education, then, we could rather consider the type of education that does not have clearly stated outcomes in

some form or other. In such a situation, little regard would be paid to the students' ability to perform. Subsequently, quality in the process and product would be based purely on subject content and not on learner performance. Therefore the greatest benefit in developing programmes according to an outcomes-based philosophy is that both learners and developers have a very clear idea of what work will comprise the course, what the learners will be expected to know upon completion of the course and, finally, what they will be able to do at the end of the learning programme.

According to Malan (1997:22), in the South African context, OBE "offers an alternative to current, at times highly fragmented, educational practices while at the same time making education more relevant to the world in which learners will probably find themselves in the future."

2.3.7 Concerns and criticisms of outcomes-based education

Jansen (1998:1) acknowledges that, at first glance, there appears to be sound reasons for a curriculum policy modelled on OBE. However, he continues to raise certain questions regarding the OBE experience in several First-world countries. Such questions are, for example: Do outcomes in fact deliver what they claim? How do outcomes play out in a resource-poor context? Can outcomes survive their psychological roots in behaviourism? Do outcomes in different contexts mean the same thing?

A further consideration, particularly in the South African context where higher education programmes had to transform their educational philosophy extremely quickly, was that these changes to OBE in such programmes were frequently characterised by cosmetic changes. This would include simply renaming objectives in student or learner guides as outcomes with little or no thought on

the true philosophy around OBE or the actual education development of well-thought and carefully considered outcomes. Similarly, assessment would continue along the same methodology as previously with little or no regard to the true value of demonstration in terms of attainment of the knowledge and outcomes specified.

Both Malan (1997:22) and Jansen (1998:2) suggest that there are a number of concerns regarding outcomes-based education. Jansen (1998:2) outlines 10 major reasons why OBE will have a negative impact upon South African schools, but his main argument for this failing is that the OBE policy is driven in the first instance by political imperatives which have little to do with the realities of classroom life or educational principles. Instead of spawning innovation, Jansen (1998:2) believes that OBE will in fact undermine the already fragile learning environment in schools and classrooms in South Africa. The failings of OBE in South Africa as outlined by Jansen (1998:2-7) may specifically be summarised as follows:

1. The language of innovation associated with OBE is too complex, confusing and at times contradictory.
2. OBE as a curriculum policy is implicated in problematic claims and assumptions about the relationship between curriculum and society.
3. OBE is destined to fail in the South African education system because it is based on flawed assumptions about what happens inside schools; how classrooms are organised; and what kinds of teachers exist within the system.
4. There are strong philosophical reasons for questioning the desirability of OBE in democratic school systems and that the OBE policy offers an instrumentalist view of knowledge.

5. There are important political and epistemological objections to OBE as curriculum policy. Teachers ultimately continue to be defined as “implementers” and even in this marginal role, official support is uneven, fragmented and, for many teachers, non-existent.
6. OBE, with its focus on instrumentalism – what a student can demonstrate given a particular set of outcomes – sidesteps the important issue of values in the curriculum.
7. The management of OBE will multiply the administrative burdens placed on teachers.
8. OBE trivialises curriculum content even as it claims to be a potential leverage away from the content coverage which besets the current education system. This means that outcomes are not learnt in a vacuum and that curriculum content is a critical vehicle for giving meaning to a particular set of outcomes.
9. A number of interdependent innovations must strike the new education system simultaneously. This includes retraining teachers, radically new forms of assessment, classroom organisation which facilitates monitoring and assessment, additional time for managing this complex process, as well as a number of other substantial changes to the processes and management of the learning experience.
10. Finally, OBE in South Africa requires a radical revision of the most potent mechanism in schools militating against curriculum innovation, namely the system of assessment.

These sentiments and concerns about OBE in South Africa are echoed by Malan (1997:22) who considers that a major concern of OBE is that it places more responsibility on both curriculum developers and teachers to be more aware of the needs and abilities of the consumer groupings, as well as to accept

responsibility for the decisions they make (Malan 1997:22). This is not necessarily a negative aspect of the philosophy of OBE in itself, but rather a concern as to how it may be implemented. It follows then that this process would require a higher degree of responsibility, accountability and professionalism from all involved with the development and implementation of the learning programme.

Another criticism of OBE is that the knowledge acquired may be regarded as negotiable and changeable (Malan 1997:11). She explains further that the study of these bodies of knowledge might no longer sufficiently equip learners with the knowledge and skills required to cope with a rapidly changing technological world (Malan 1997:11). This is one of the areas of importance referred to in the Draft White Paper on Higher education (RSA DoE 1997:1).

Killen (2002:5) too acknowledges that not all educators are in favour of OBE. He suggests that some educators may disagree with the actual outcomes that have been mandated, but more often it is because they disagree with the basic idea of pre-specifying the outcomes of education in relation to what is taught. Yet another criticism of OBE comes from the perspective of whether it is appropriate to mandate compulsory outcomes for students rather than to give them some freedom of choice. This may have certain legitimacy in some educational programmes, but in a health-related learning programme, such as that which this research aims to develop, the learning areas and outcomes are most certainly required to be compulsory as they are developed in order to fulfil a very clear role of the health care worker managing a specific type of disease.

Killen (2002:6) cites other concerns that may be raised in relation to outcomes-based education including:

- The notion that OBE is too behaviourist.
- Outcomes that may be too trivial to be of value.
- That the introduction of OBE on a large scale is too difficult resulting in confusion and concern in learners and educators.
- Some learning experiences are valuable in their own right and some of these learning experiences cannot be specified in advance.
- The question of what exactly should be incorporated as outcomes into the overall curriculum.
- The specific OBE training of educators that needs to take place prior to the re-qualification and teaching practice involved with this system (Killen 2002:6).

It should be noted, however, that criticisms against OBE were primarily directed at the implementation of Curriculum 2005 in schools. Recognition of some of the criticisms of OBE have been included in the Revised National Curriculum Statement published by the DoE (RSA DoE 2002) where a more pragmatic approach to OBE is outlined by the Department. The Department specifically acknowledges that “we must be realistic about what a curriculum can and cannot achieve ... and ... the curriculum is, and will be, differently interpreted and enacted in diverse contexts” (RSA DoE 2002:1).

In recognising these challenges, the revised curriculum would therefore have to deal in clear and simple language with what the curriculum requirements are and the statement would have to address the concerns around curriculum overload and the learner knowledge, skills, values and attitudes expected at the end of the General Education and Training band (RSA DoE 2002:6).

Furthermore, much of the criticisms directed at OBE also apply equally to the higher education sector as well, as this sector has also accepted the OBE

approach as part of the SAQA NQF objectives. These refer to the “underlying commitment to a system of education and training that is organised around the notion of learning outcomes.” (SAQA 2000:10).

During the 1990s all programmes converted to the OBE format as part of their interim registration on the NQF. Thus enormous challenges have been set, to new programmes as well, in order to make the real advantages of the OBE approach in higher education become a reality. This would in addition also specifically include health-related programmes, where not only do the learning processes need to take place through an outcomes-based methodology, but also within the context and confines of preparing learners to deal with the unique real life challenges and problems facing health care professionals in South Africa.

2.3.8 Outcomes-based education in health programmes

Smith and Dollase (1999:21) believe that competency-based education represents the model for medical education in the 21st century. They reflect that the current model of medical education served medicine well by building the education of medical students on a firm scientific foundation. But they believe that a new model of medical education is currently needed to prepare today’s medical graduates to face the challenges ahead. Although these statements refer specifically to education for medical practitioners, they could be applied equally well to nurses and other health care professionals at whom this research is aimed.

Harden, Crosby and Davis (1999:7) believe that OBE, which is a performance-based approach at the cutting edge of curriculum development, offers a powerful and appealing way of reforming and managing medical education. They suggest that the emphasis is on the product, in other words what sort of doctor or health

care worker will be produced, rather than on the educational process. They also perceptively suggest that a doctor or any other health care worker for that matter is a unique combination of three different kinds of abilities. These skills would include the tasks to be performed by the practitioner; the approaches used in the performance of the tasks; and the growth of the individuals in their roles in the practice of medicine (Harden *et al.* 1999:7).

In designing a curriculum for health care workers, it would be useful to note the thoughts of Spady (1988:4) on OBE. Spady (1988:4) suggests that OBE is “a way of designing, developing, delivering and documenting instruction in terms of its intended goals and outcomes.” What is particularly useful in terms of health education is Spady’s observation (1988:4) that “exit outcomes are a critical factor in designing the curriculum ... you develop the curriculum from the outcomes you want students to demonstrate, rather than writing objectives for the curriculum you already have”. This is the fundamental shift in curriculum planning that will be of significant benefit to any health education programme. Programming for outcomes means organising teaching to achieve predetermined results. This is particularly true in the South African context, where most programmes were previously formulated according to a particular syllabus or curriculum, while the aims and objectives merely stated according to the pre-existing curriculum.

2.3.8.1 *Advantages of outcomes-based education in health programmes*

Considering that the very nature of the work of a medical practitioner or health care worker relies heavily on taking certain actions based on predetermined criteria, the use of an outcomes-based form of education lends itself to the training of such professionals. Indeed, Harden *et al.* (1999:9) outline a number of advantages in adopting an outcomes-based model for medical education. There

may be advantages, for example, where an aspect such as relevance helps to focus discussion on the relationship between the curriculum and the practice of medicine or health care (Harden *et al.* 1999:9). The fact that OBE is frequently considered to be controversial may also be beneficial in a health-related programme where questions need to be asked as to what is the purpose of the programme; what sort of health care worker are we training; and what are the fundamentals that need to be taught (Harden *et al.* 1999:9).

Another advantage would be acceptability of the philosophy of OBE (Harden *et al.* 1999:9). Although the implementation of OBE is sometimes considered to be controversial, few educators could argue that educational programmes should not be based on some sort of idea of what we want students to know or be able to do. Furthermore, clarity of OBE could be considered an advantage where, according to Harden *et al.* (1999:9), the concept of OBE is easily understandable. It is not constrained by educational jargon and is a relatively simple and unambiguous concept.

A major benefit of OBE is that it provides a powerful and robust framework for the curriculum. By specifying courses in terms of their outcomes, educators can review what they contribute to the curriculum as a whole and thereby help to integrate the learning experiences, the teaching methods, and the assessment processes (Harden *et al.* 1999:9). This form of education also encourages learners to take more responsibility for their own learning. It provides the learners with a clear framework which allows them to plan their studies and to gauge their progress through the curriculum (Harden *et al.* 1999:9).

Harden *et al.* (1999:9) explain that a great benefit of OBE is its potential flexibility. It does not dictate the form of course delivery or the educational

strategy. Adjustments can be made at any time to the educational process provided that the changes proposed can be justified in terms of the specific learning outcomes. This is also beneficial in a South African context where different educational institutions may have differing educational mission statements and philosophies. This allows the institutions to retain autonomy over their own unique educational processes, provided that the overall outcomes are satisfactorily reached.

Harden *et al.* (1999:9) note that OBE is consistent with the move to a more performance-based form of assessment. Importantly, it reflects an approach where what matters more is the standards that students achieve and not the time that they take to achieve this. Therefore by specifying the intended learning outcomes, this then would guide the pathway for the planning and implementing of learner assessment. Finally, OBE provides significant advantages by making explicit the outcomes for each of the phases or stages of education, which helps to encourage continuity between basic or undergraduate education, post-graduate or vocational training, as well as continuing education (Harden *et al.* 1999:10).

2.3.8.2 *Deriving outcomes for health programmes*

The specification of outcomes for a programme based on OBE is not as easy an option as Harden *et al.* (1999:12) suggest. They warn that anyone adopting an outcomes-based approach will find themselves struggling with difficult challenges and issues. Furthermore, a measure of support and acceptance, by the profession and stakeholders, of the outcomes specified is required if OBE is to be implemented successfully. Therefore it is of the utmost importance that various stakeholders are identified and then contribute to the development of the education programme. According to Dunn, Hamilton and Harden (1985:16), the

Delphi technique, which was utilised in this research, is one of the approaches that may be developed to identify educational needs and thereafter applied to the identification of outcomes. The correct composition of the Delphi panel can then also satisfy the criteria regarding the inclusion of stakeholders and experts in the profession in the development of the programme.

Learning outcomes can be presented in a number of ways, but the distinguishing feature of the outcomes is their action or ability for what the learner is expected to do upon completion of the course of study. An example of such learning outcomes that is of particular relevance to this research, is reflected in Table 2.2 which provides the 10 key characteristics identified by the English National Board for Nursing, Midwifery and Health Visiting (1991) as the basis for the learning outcomes for the Higher Award. Although these learning outcomes were established specifically for nursing, they can equally be applied to other health care professionals.

TABLE 2.2: Outcomes identified by the English National Board for Nursing, Midwifery and Health Visiting

No	Learning Outcome
1	Ability to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations.
2	Specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs, within the context of changing health care provision.
3	Ability to use research to plan, implement and evaluate concepts and strategies leading to improvements in care.
4	Team working, including multi-professional team working in which the leadership role changes in response to changing client needs, team leadership and team-building skills to organise the delivery of care.
5	Ability to develop and use flexible and innovative approaches to practice appropriate to the needs of the client/patient or group in line with the goals of the health service and the employing authority.
6	Understanding and use of health promotion and preventative policies and strategies.
7	Ability to facilitate and assess the professional and other development of all for whom responsible, including where appropriate learners, and to act as a role model of professional practice.
8	Ability to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.
9	Ability to evaluate quality of care delivered as an ongoing and cumulative process.
10	Ability to facilitate, initiate, manage and evaluate change in practice to improve quality of care.

Source: English National Board for Nursing, Midwifery and Health Visiting (1991).

2.3.8.3 The role of assessment in outcomes-based education health programmes

According to Smith and Dollase (1999:19), the goal of teaching is to help the student to learn. In order to do so, the educator and the learner must know how well the learner is doing in reaching the educational outcome desired. Assessment is therefore the process by which the educator and the learner gain knowledge of the learner's progress. In a competency-based curriculum, we want to create assessments that reflect as closely as possible the actual tasks that the learners will face as health care practitioners. These assessments need to be authentic and direct, in what is termed performance-based assessment.

Performance-based assessment in a health curriculum requires the learner to use knowledge in a particular way to satisfactorily complete the task assigned. Learners will not be able to perform satisfactorily if they lack either the knowledge or the ability in the specific area of assessment. For example, according to Smith and Dollase (1999:19), the learner who is unable to integrate knowledge to evaluate a patient's problems will not perform satisfactorily when confronted with a patient with a complicated history or vague physical findings. Nor will the student who has excellent communication skills do any better if he or she does not know what to look for in the patient case history. Competence in this field thus requires the simultaneous application of knowledge and ability, which is exactly the competence we should expect from health care professionals.

Furthermore, in order to implement assessment programmes in outcomes-based health programmes, Ben-David (1999:24) lists important aspects of assessment programme development and implementation. These would include:

- Outlining the assessment premises and the educational philosophy of the institution and defining the responsibilities learners are expected to assume to monitor their own learning.
- Establishing outcome behaviour principles, which will consider consumer groups or stakeholders, short- vs. long-term abilities, the link between education and practice, and the institutional goals.
- Defining and selecting the methods by which outcome behaviours are defined, such as critical incidence techniques, job analysis, educators and other expert judgements and - of special relevance to this research - the Delphi technique.
- The development of assessment criteria for each of the abilities that has been defined. These criteria should include a description of the educational methods employed for this ability and the setting or educational environment in which this behaviour should be demonstrated.
- The establishment of an assessment taskforce, which will include an assessment expert. This taskforce will coordinate the development of assessment materials and recruit faculty and educators for the various tasks. This will also allow for educators from different disciplines to work together in order to allow for integration of abilities across disciplines.
- The establishment of an assessment programme by establishing assessment-oriented educators. This programme will thus aim to reach all institutional aspects, administrative as well as educational.
- The further establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all programmes.
- Indicating the flow of assessment information, lines of communication, promotion and exclusion processes of students, and how such decisions and remediation are reflected and passed on to the student (Ben-David 1999:24).

According to Ben-David (1999:24), institutions need to define their education and assessment premises prior to the design of assessment material. This is further supported by Loaker (1993) in a paper entitled *Performance assessment in undergraduate education* when giving the following examples of assessment premises: assessment is integral to learning; abilities must be assessed in multiple modes and contexts; content is the stimulus for learning and it also provides a context to demonstrate one's ability; performance assessment implies explicit criteria, feedback and self-assessment; core abilities must be assessed repeatedly over time to measure growth; and, finally, assessment should be cumulative and comprehensive, while deficiencies should be remediated.

2.3.9 Using outcomes to guide instructional planning in South Africa

According to Killen (2002:7), there are three major steps involved in instructional planning in an OBE system. These are:

- Deciding on the outcomes that students are required to achieve.
- Deciding how to assist students to achieve those outcomes, which would also involve deciding on subject content and teaching strategies.
- Deciding how to determine when students have achieved the stated outcomes, in other words deciding on assessment and reporting procedures.

The most important feature of OBE according to Killen (2002:9) is that "all students are expected to be successful". Although this may seem a controversial statement to many educators, the statement is defended by the notion that "it is this desire to have students succeed, that determines what content is presented to the students, what learning experiences are made available to them, how they are tested, how long they engage in learning particular knowledge or skills, and, above all, what is valued in the educational process. The traditional concern for

instructional time or programme duration is replaced with a concern for student learning” explains Killen (2002:9). Although the issue of time-based instruction has been the foundation for most academic programmes in South Africa, the educational justification for completing traditional academic programmes in a standard period of time (for example, three years for a National Diploma or four years for a Bachelor’s degree) appears to be one rather of administrative convenience, rather than from any sound educational philosophy.

In an OBE programme, the emphasis shifts from time-based learning, to a mastery of skills and knowledge and the programme attempts to focus clearly and deliberately on student learning. Curriculum developers, educators and administrators cannot ignore time when determining the structure of an academic programme, but the emphasis shifts to where “time is seen as a flexible resource rather than the principal factor that controls access to learning” (Killen 2002:8). What is critical to recognise in an outcomes-based programme, is that not all students are capable of learning the same things in the same time period, particularly if they are all taught in the same way. This has been recognised in South Africa, where instructional programmes are now being required to reflect notional learning hours in addition to required credits. The concept of notional learning hours acknowledges that students learn and progress at different rates and thereby provides the educational basis to recognise this aspect.

Killen (2002:7) furthermore explains the restrictions of time-based learning when reflecting that many programmes suggest lecturers should teach a predetermined amount of content in each time period (such as a term or a semester). This approach gives little consideration to how much individual students will learn in the available time and is a major failing in the South African higher education system. Learners frequently enter the system from vastly different educational

backgrounds, cultures and learning experiences, with even greater variation in their preparation for tertiary education. The use of outcomes-based programmes recognises these differences in students' ability, motivation and learning styles and rather than ignoring them, aims to provide additional learning opportunities for those students who need additional aid in mastering areas of study.

There are a number of general principles, therefore, that may be used to guide the development of an instructional programme (Killen 2002:7). To begin with, each programme would have a rationale (or mission statement) to explain why the programme exists together with clearly stated aims in order to explain what the programme will achieve. Outcome statements would indicate what students are to learn, and content statements would indicate what areas of work would comprise the student learning. Teaching strategy statements would be included to indicate how the learning activities will be organised, while assessment guidelines would be provided to indicate how student learning would be assessed and reported (Killen 2002:7).

Once all the objectives of the programme have been defined, these would then influence all other components of the curriculum. Killen (2002:9) identifies the following five ways in which outcomes would influence the curriculum and these should therefore be borne in mind when developing any instructional programme:

- By defining the scope and structure of the programme content.
- By focusing the instructional methods so that each learning activity has a specific purpose.
- By determining the way in which student placement and advancement will be organised.
- By determining how student learning will be assessed.

- By focusing attention on the learning environment that will be necessary in order for the stated outcomes to be achieved (Killen 2002:9).

Most importantly, outcomes-based programming has some useful side benefits for students, particularly when a mastery approach to learning is emphasised (Killen 2002:9). Aims and Archer (in Killen 2002:9) found that in teaching that emphasised mastery of learning outcomes, students were more likely to use effective learning strategies and to attribute their success to the effort that they had put into their work. The mastery approach also reduced the students' concerns about their ability and encouraged them to attempt challenging tasks. This directly supports the philosophy of using OBE in programme and instructional planning.

2.3.10 Implications of outcomes-based education

The current experience by South African educators in shifting towards an outcomes-based model of education is that there are a number of challenges and implications. As Harden *et al.* (1999:13) state, "...there are implications for all concerned with the educational process ... this includes faculties, curriculum committees, course planning groups, individual teachers (lecturers), assessment committees and students."

Harden *et al.* (1999:13) outline a number of implications for each group involved with the educational process in a medical programme. Although the implications refer to a medical school programme, they could very well apply to this or any other form of research which is also in the fields of health, health promotion and disease prevention. The areas in which OBE will have implications include the Faculty or School of Medicine (offering the health programme), the curriculum

planning committees and course committees, the lecturers and educators, as well as the students/learners in the programme (Harden *et al.* 1999:13).

It is clearly imperative that not only should the outcomes for any programme be specified in advance, but that these should be communicated to the students or learners at the beginning of the course and also referred to continuously through the duration of the learning programme. Most academic programmes in South Africa provide study or learner guides to the students and these would be the ideal vehicle for the students to familiarise themselves with the outcomes to which they will be required to attain. The students or learners must be made aware of the criteria used to assess whether they have achieved the required outcomes and the assessment methods by which they will be evaluated must be clearly stated. They should also be able to gauge their own progress in achieving the outcomes as they progress through the programme.

In a democratic and transparent educational environment towards which the higher education sector in South Africa aspires, it is equally important that students or learners are also involved with the compilation and development of the stated outcomes. They should find that the outcomes stated are helpful guides to their learning and they should recognise that the learning experience provided, as well as the assessment procedures involved, adequately reflects the desired outcomes. The very nature of health programmes requires that learners must achieve predetermined levels of knowledge, skill, competence and professionalism and, despite the implications for all involved with such programmes, there is little doubt that outcomes-based instruction could go a long way towards achieving those particular skills and competencies in the learners.

2.4 CURRICULUM DEVELOPMENT

In order to review the process of curriculum development, a good starting point would be to begin by defining what exactly "curriculum" means. According to Pratt (1994:5), the original derivation of the word "curriculum" is from the Latin verb *currere*, which means to run. *Curriculum*, the diminutive form, came to mean a "racing chariot" or "race track". Tom (1984:89) defines curriculum simply as "a plan for teaching or instruction." Pratt (1994:5) further modifies this description when explaining that "curriculum ... means a plan for a sustained process of teaching and learning". Included in the general understanding of curriculum would be the terms "programme", "course of study", "course description", "course outline" and "syllabus".

Rowntree (1982:20) provides a broad definition of "curriculum" which may include "anything from a four-year programme of studies down to a forty-minute lesson or an even briefer episode of planned teaching." Perhaps a more focused definition of "curriculum" would be that proposed by Marsh (1997:5) who defines curriculum as an "interrelated set of plans and experiences which a learner completes under the guidance of the school or learning institution".

The problem in attempting to define curriculum is that it means different things to different people and there is often great confusion when discussions about the curriculum take place (SAQA 2000:5). SAQA takes an all-encompassing view of what "curriculum" means. According to the SAQA NQF and Curriculum Development Policy (2000:6), the curriculum is more than the syllabus documentation, but refers to all the teaching and learning opportunities that take place in learning institutions. This would include the aims and objectives of the education system, what is taught and the underlying values, the strategies of teaching and learning, the forms of assessment and evaluation, how the

curriculum is serviced and - perhaps most importantly - how the curriculum reflects the needs and interests of those it serves. Therefore we can conceive that definitions of curriculum may range from rather narrow interpretations to broad, all-encompassing interpretations which include virtually every aspect of the full education system. It may be easiest, however, then to consider curriculum simply as "a blueprint for instruction" (Pratt 1994:5).

Having considered the various definitions of curriculum as cited in the literature, the researcher proposes the following possible working definition of curriculum:

The curriculum of a programme involves the plans and processes for sustained learning as well as the learner experiences, together with the supporting academic and administrative mechanisms leading to the successful completion of the required programme goals and outcomes.

2.4.1 Theories of curriculum

Steyn and Wilkinson (1998:203) suggest that every educational model has a theoretical basis. In South African it appears that there are four main theoretical philosophies upon which the outcomes-based curriculum is based, as previously discussed (cf. section 2.3.4). Curriculum theories that gained prominence during the 20th century can be divided into two broad categories according to Jacobs *et al.* (2004:39). These two categories of curriculum theory may be considered to be the *traditional* paradigm and the *inquiry* paradigm. The curriculum paradigm is explained by Jacobs *et al.* (2004:39) as "a representative set of curriculum theories which are characterised by one particular view of, and approach to, curriculum problems".

The traditional curriculum paradigm is characterised by theories that tend to be prescriptive and exclusive in the sense that each one resembles a definite package (Jacobs *et al.* 2004:39). The three most deeply embedded paradigms in curriculum thinking are the liberal theory, the experiential theory, and the behaviourist theory.

Jacobs *et al.* (2004:39) suggest that, according to the liberal theory, the main purpose of the curriculum should be to develop students' minds in such a way that they gain substantial insight into the great ideals of life and that the content of the curriculum should consist of the great works produced through the ages. In terms of this theory, the "curriculum" is seen as being synonymous with "content" and that the teacher is the chief policy-maker in the system. Liberalists are against detailed planning of the curriculum and against being prescribed to on what and how they should teach (Jacobs *et al.* 2004:39).

In the experiential theory, Jacobs *et al.* (2004:40) explain that, according to the original theory proposed by John Dewey, students can only acquire knowledge through personal experiences. The purpose of the curriculum is therefore to facilitate personal growth by exposing learners to as many real-life experiences as possible. Jacobs *et al.* (2004:41) suggest that, in the experiential theory, students and teachers learn from each other and furthermore, that one cannot place curriculum into neat little boxes. Rather, the curriculum should be interwoven with strong focus on the students' interests and not necessarily on material prescribed by the state. The major advantage of this theory is that the learners are likely to be highly motivated and the meaningful work is likely to make a positive impact on the learner.

Jacobs *et al.* (2004:42) believe that the third theory of the traditional paradigm, being a behaviourist theory, is the most popular and influential of the 20th century. According to behaviourist theories, each lesson in the curriculum should result in a desirable change in the behaviour of the student. The curriculum would then have to be divided into definite components and sections as determined by state policy, while teachers would then proceed to implement this prescribed curriculum in a systematic, logical and value-neutral fashion (Jacobs *et al.* 2004:42).

This theory closely resembles that of the OBE model for South Africa, where learning objectives become the outcome standards that teachers use to select classroom activities. The curriculum can then be seen to be an agglomeration of operationally designed skills, curriculum packages, instructional techniques and scientific evaluation procedures (Jacobs *et al.* 2004:42). Some of the drawbacks of this type of teaching include the teacher being so task-oriented that he/she may tend to be abrupt and aloof from the learners; the atmosphere in the class may be competitive and tense; slow learners may be left behind; and creative children may feel out of place.

In contrast to this, Jacobs *et al.* (2004:42) believe that there are a number of strong points of this behaviourist system. The learning material chosen is likely to be important and useful to the country; most learners in this system would be task-oriented and productive; the well-prepared lessons create respect for the teacher; and learner motivation is average with excellent discipline among the learners.

The second broad category of curriculum theory belongs to the inquiry paradigm. These inquiry theories tend to be more open, descriptive, critical and eclectic.

Instead of being focused on how things *should* be done, their point of departure, according to Jacobs *et al.* (2004:43), is how things *are* being done. Inquiry analysts may be seen to cut across all traditional theories and question many current practices, political motives and ideologies and often use the results of their inquiries to propose new theories. Three of the most important inquiry curriculum theories are the naturalistic, critical inquiry and constructivist theories.

Walker (in Jacobs *et al.* 2004:44) is credited with the naturalistic curriculum theory. This theory may be considered to be more socialistic than naturalistic and consists of a three-step sequence of curriculum reform. This includes:

- The *formation of a platform* consisting of members of the school community who agree on beliefs, theories, aims and procedures on which the curriculum at their school rests.
- The *deliberation* stage involving the assessment of actual states of affairs, problems and alternative solutions.
- The *design* stage during which the school community decides how each problem will be addressed.

Jacobs *et al.* (2004:45) consider the weak points of such a philosophy to cause the teaching style to be cramped because the school governing body determines how the subject should be taught. Furthermore, consultation between the teacher and the community would be time-consuming and learners may learn outdated material. The strong points of the teacher in such a system would, however, demonstrate that he/she is a living example of community spiritedness. The learners would learn to be obedient and they would be cooperative and be responsive to other people's needs.

The second theory of the inquiry paradigm would be the critical inquiry theory. According to Jacobs *et al.* (2004:45), the critical inquiry theory revolves around the need for all people to acquire and use critical thinking abilities. Four variables form the cornerstones of the critical inquiry theory and these include the teachers, the subject matter, the students/learners, and the milieu or culture of the school or department.

The weak points of the critical inquiry model might include that some learners overdevelop the critical inquiry mindset and become radical and militant. Class discipline is difficult to maintain, learners lack general knowledge and basic competencies, while the no-examinations policy causes the learners to live in an idealistic vacuum (Jacobs *et al.* 2004:46). As might be expected, the strengths of such a system would result in learners with good critical thinking skills. They would be likely to be sensitive and tolerant to less-privileged people and they would not suffer from examination stress.

The third and last of the inquiry paradigm theories according to Jacobs *et al.* (2004:46), is the constructivist theory, sometimes referred to as socio-constructivism. Constructivist teaching practices help learners to internalise and reshape, or transform, new information. This theory is based on the belief that learners should be helped to construct knowledge that is meaningful and useful in their own lives. What is important is not so much *what* learners learn, but *how* they learn (Jacobs *et al.* 2004:46). Once these learners have acquired effective learning skills such as research, excursions, interviews and group work, they can use these skills to learn whatever they wish to learn.

The weakness of the constructivist theory in the classroom is noticeable in the assessment of learners, where the assessment is likely to be vague and

insubstantial, causing fast learners to underachieve and slow learners to make unrealistic assumptions about themselves. The teaching methods in this system would also be demanding and stressful (Jacobs *et al.* 2004:48). There are, however, a number of strengths in the constructivist theory. Learners in such a system are likely to develop real and lasting insight into the learning material. They would acquire useful skills that prepare them for future jobs and slow learners perform better than usual due to their personal development in the acquisition of knowledge. There is also likely to be good teamwork between teachers in this model (Jacobs *et al.* 2004:46).

Pratt (1994:8) considers that few curriculum theorists have discussed curriculum directly in terms of well-being and happiness. More commonly curriculum is viewed as a vehicle for helping people construct meaning in their lives, since, according to Pratt, human beings are “first and foremost, meaning makers, and a sense of meaning is a critical component in human happiness.”

Curriculum theorists have written diversely and at length about the classification of different schools of curriculum thought. In order to simplify curriculum theory Pratt (1994:9) identified four orientations of curriculum theory which represent differences in focus but with strong interconnections. Although neither is exclusive nor exhaustive, they do illustrate the range of views that different curriculum scholars bring to their subjects. In order to give a final overview of curriculum theory, these orientations of curriculum theory may be summarised according to the following divisions:

1. Cultural transmission, which emphasises the traditional academic disciplines.

2. Social transformation, emphasising political and social change. This would be particularly relevant to the South African higher education environment.
3. Individual fulfilment, emphasising personal growth, relationships and self-actualisation.
4. Feminist pedagogy, emphasising a more equitable balance among gender-related characteristics and interests. This orientation is also applicable to the South African context (Pratt 1994:9).

2.4.2 Designing and developing the curriculum

When approaching curriculum development, it becomes apparent that a person's view of curriculum and how he/she views curriculum development will determine what the curriculum will look like in practice (Carl 2002:55). Views and assumptions would influence the construction of the curriculum and the various approaches to curriculum development may serve as the theoretical foundations for the curriculum (Carl 2002:55).

However, Pratt (1994:66) reflects that the process of developing a curriculum is not linear and is not a matter of simply moving from one phase to another in strict sequence. In designing a curriculum, developers need to shuttle back and forth from one activity to another, creating, correcting, reconsidering and adjusting. This would best be described as weaving the curriculum. There is also no fixed sequence for planning the elements of curriculum (Pratt 1994:65), but at some point planners do need to clarify the intentions they hold for student learning. This could be considered to be the curriculum rationale.

Killen and Hattingh (2004:72) refer to the *designing back* principle of OBE curriculum design. This means that the starting point for curriculum design must be a clear definition of the significant learning that students are to achieve. Once

this required learning has been defined, important instructional decisions can be made by tracing back from this desired end-result. Through this process enabling outcomes would be identified to assist learners to achieve the broader long-term outcomes. In this case the curriculum design and implementation is not necessarily a simple linear process, but it does mean that there should be direct and explicit links between all planning, teaching and assessment decisions and the significant outcomes that learners must ultimately achieve (Killen & Hattingh 2004:72).

Spady and Marshall (1991:70) place emphasis on “success for all” when considering curriculum design in an outcomes-based model. They refer to the concept of *Design Down from Ultimate Outcomes* where curriculum and instructional design should proceed backwards from the culminating demonstrations or outcomes, for these are what everything ultimately focuses and rests. In this way Spady and Marshall (1991:70) believe that all components of a successful culminating demonstration will be in place for the curriculum.

Carl (2002:55-62) reflects on four different approaches to curriculum development. According to Carl (2002:62), in the academic approach to curriculum development the curriculum development is a systematic process guided by academic rationality and theoretical logic in education decision-making. In the experiential approach, however, this process would be subjective and activity-orientated. This approach emphasises teachers and learners and their co-operative decisions on the curriculum. Personal feelings, dispositions, values and experiences are regarded as essential curriculum aspects. Moreover, according to Carl (2002:62), aims are merely meant to provide directions and are not final objectives. In the technological approach, curriculum development is highly analytical and emphasises educational planning in terms of systems management

and production. Scientific management and production principles from industry are applied to teaching and education. Learning is then considered to be a system that can be reduced to its component parts of steps that can occur in a systematic and predictable way (Carl 2002:55-62).

The last approach to curriculum development suggested by Carl (2002:55-62) is that of the pragmatic approach. The curriculum development process is the outcome of a long and interactive process of involvement and interaction. This approach may be considered to contain elements of all the other approaches.

Of the utmost importance to the curriculum development process is the purpose or justification of the curriculum. Pratt (1994:71) suggests that the rationale for the curriculum should be found early in any curriculum document but the final draft of a curriculum rationale cannot be written until the curriculum is completely developed and the developers know exactly what it is they are rationalising. The purpose of the curriculum rationale is not to restate the aim and state what the curriculum is intended to achieve, but rather to say why the aim is worth achieving. The rationale is therefore a brief essay that endeavours to persuade the reader of the significance and importance of the curriculum. It should be eloquent but without exaggeration and should be written for an audience that ranges from unmotivated students to sceptical parents, as well as sympathetic colleagues (Pratt 1991:70).

It is clear that curriculum developers may approach the process of curriculum development from a particular orientation which Carl (2002:74) believes gives direction and sense to the relevant process. Certain principles may be considered to be important to be adhered to when developing a new dispensation or curriculum. Carl (2002:74) believes that the purpose of the curriculum is an

important principle and that the curriculum rationale must be clear and communicable. The actual curriculum development must be based on sound accountable curriculum theory and the method of this is equally important. Effective and ongoing evaluation from the design phase to the evaluation phase is essential and this aspect is dealt with further when considering models for curriculum development (cf. section 2.5).

Carl (2002:76) considers that a particular level of curriculum ability is necessary for all those involved with the process together with effective time utilisation. Of particular importance is the feature that adequate and meaningful (significant) learning must be an important point of departure which is echoed by other researchers including Steyn and Wilkinson (1998:207) and Spady (1994a:18). According to Carl (2002:76), a further principle in curriculum development is that relevance of content or outcomes and the connection between the various elements are essential throughout the process. Furthermore, applicable educational principles for learning are considered to be an essential foundation applicable to the development process.

One aspect of the curriculum development process in South Africa that requires specific attention is the requirement that the curriculum be developed along outcomes-based principles. Previous systems of education in South Africa articulated curriculum aims and objectives. Aims were considered to be general statements of intent for a curriculum and objectives often reflected specific intents derived from the aims. With the transformation of the general education sector in South Africa and the higher education sector in particular, educators would now no longer consider and refer to curriculum aims and objectives but rather the curriculum outcomes. These outcomes may be the exit level outcomes which would reflect the general skills, knowledge and competencies that the

learners would possess and demonstrate upon completion of the curriculum, or the outcomes may be more specific to a particular phase of study during the curriculum programme.

These specific outcomes may be likened to objectives but, most importantly, these outcomes are derived as a result of careful consideration of what the learner should be able to do upon completion of the curriculum. This is the fundamental difference to the use of “objectives” in previous curriculum planning, where the objectives were tailored to curricula that had been formulated in isolation and not to any required competencies of learners.

We could, however, summarise the key components that must be adhered to when developing any curriculum programme. Three criteria must be considered when writing and developing outcomes during the curriculum planning process (Pratt 1994:69). The outcomes must be significant; they must be clear; and they must be concise. Of these three criteria, Pratt (1994:69) believes significance is the most important and this is true considering that in OBE, outcomes should not be developed if they are regarded to be too trivial or inconsequential. In educational terms, these outcomes should be meaningful.

Curriculum development may then be considered to be the umbrella concept for the process which is characterised by the phases of curriculum design, dissemination, implementation and evaluation Carl (2002:80). It is an ongoing and dynamic process involving a variety of role-players, stake-holders and educational experts. The development of the curriculum, however, must be approached in a logical and systematic way to ensure that the processes involved are educationally sound. In this way the curriculum and outcomes developed can

be considered to be meaningful, significant and verifiable and that the programme adds value to all who would complete it.

2.4.3 Benefits of a systematic approach to course and curriculum development

Diamond (1989:2) captures the intricacies of curriculum development exceptionally well when acknowledging that since educators and administrators in higher education are working with limited resources, it is imperative that they are used well. Furthermore, the processes involved with curriculum development must be effective, efficient and politically sensitive. Curriculum developers need to not only concern themselves with the design and development of new programmes, but with their implementation as well. Such a way of doing this should be approached in a systematic way.

In order for programmes to be developed and implemented, a model of curriculum development should be used which provides the academic staff involved with a form of ownership of the programme, and the institutional administration with guidelines leading towards maximum benefit for the institution (Diamond 1989:4).

Diamond (1989:4) considers that the following of a systematic or model approach to curriculum development and design has significant benefits to all those involved with the process. These advantages would include:

- It identifies the key factors that should be considered in sequential order.
- It serves as a procedural guide for those directing the project.
- It allows those involved to understand where they are in the process and their role in it.

- It improves efficiency by reducing duplication of effort and ensuring that critical questions are asked and alternative solutions explored (Diamond 1989:4).

Diamond (1989:5) cautions that, before considering which models may be used for curriculum and programme development, we should first acknowledge that the process of designing and implementing a course or curriculum is particularly complex. The process requires sensitivity to the academic setting of the project as well as an awareness of the capabilities, interests and priorities of the students for whom the programme is designed to serve. It requires a knowledge and an appreciation of the discipline, as well as an understanding of the resources and options available to the faculty and educators involved. But with these considerations in mind, the development of a programme through a systematic approach may become significantly easier and more efficient (Diamond 1989:5).

2.5 MODELS OF CURRICULUM DEVELOPMENT

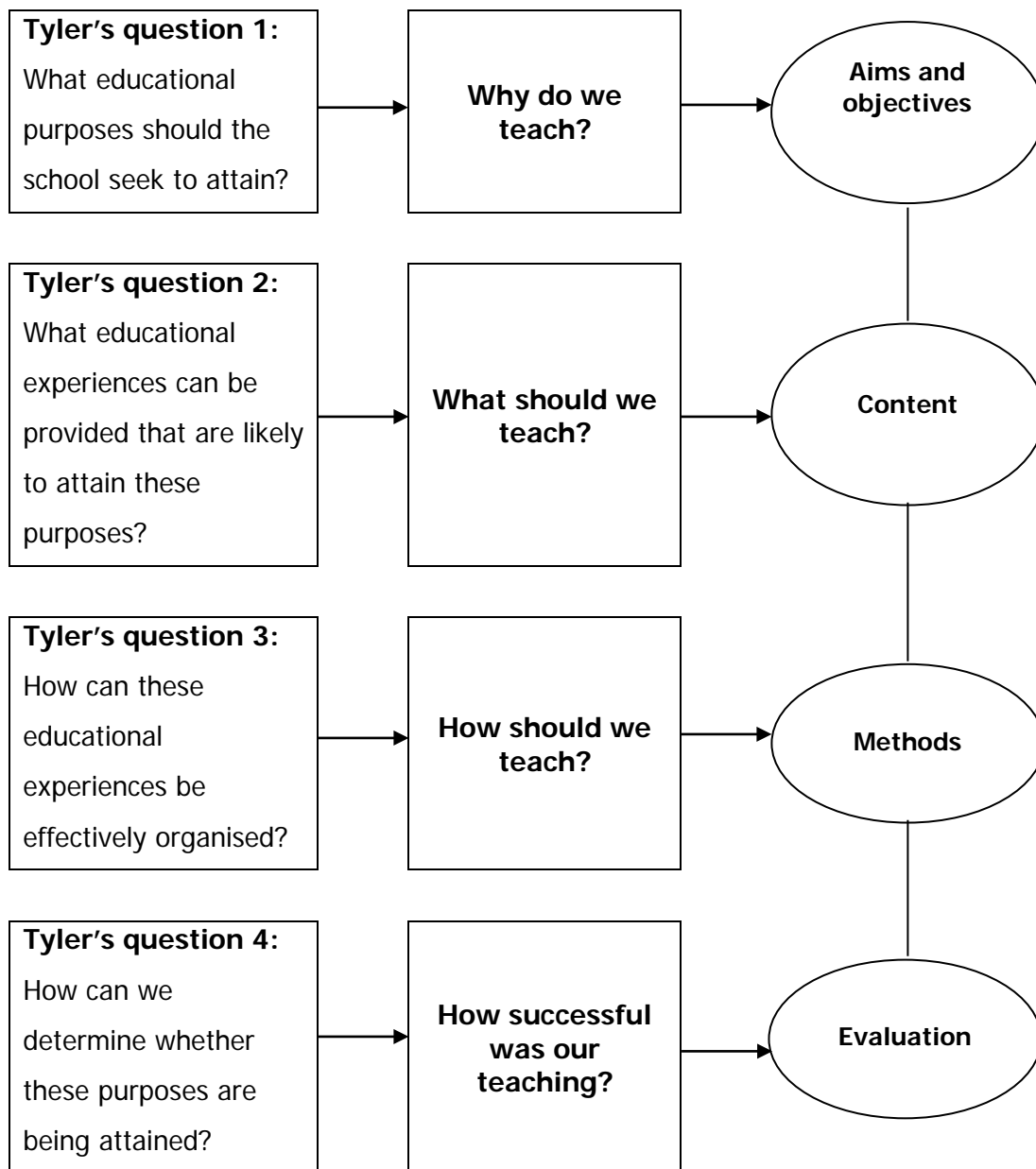
Before discussing specific models of curriculum development we can first consider the general characteristics of a curriculum model. According to Jacobs *et al.* (2004:48), curriculum models are simplified descriptions of theories, whilst theories are logical sets of ideas that explain a scientific phenomenon. The model therefore highlights important features and principles of curriculum theory and it guides the process of decision-making when learning programmes are designed.

Jacobs *et al.* (2004:48) cite the models of curriculum development by curriculum theorists such as Tyler, Taba, Walker and Marsh, but explains that - when all these models are compared - it becomes apparent that almost all curriculum development models are based on four concepts. These four concepts include the programme aims and objectives; its content; the methods involved with the

teaching, learning and delivery of the programme; and, finally, the evaluation of the learning. These four concepts together have become known as the perennial curriculum model which is meant to indicate a model that is unchanging, recurrent, timeless and long-lasting (Jacobs *et al.* 2004:48). A simplified version of the developmental process from Tyler's rationale to the perennial curriculum model is depicted in Figure 2.2.

Curriculum development may therefore be seen as the process for making programmatic decisions and for revising the products of those decisions on the basis of continuous and subsequent evaluation (Oliva 1997:144). A model can therefore give order to the process. Taba (1962:11) states that: "If one conceives of curriculum development as a task requiring orderly thinking, one needs to examine both the order in which decisions are made and the way in which they are made to make sure that all relevant considerations are brought to bear on these decisions."

FIGURE 2.2: Developmental process from Tyler's rationale to the Perennial Curriculum Model



Source: Jacobs *et al.* (2004:50)

Before reviewing specific models of curriculum development we can consider some of the common characteristics of curriculum models or instructional system designs cited by other curriculum designers. Hannum and Briggs (in Diamond 1989:4) found seven common elements among instructional systems designs:

1. Planning, development, delivery and evaluation of instruction were based on systems theory.
2. Goals were based on an analysis of the environment of the system. For example, a two-year Diploma programme at a Technical College must have different goals from those of a Bachelor's Degree at a University.
3. Instructional objectives were stated in terms of performance. These would be stated as outcomes in the South African context.
4. The design of the programme was sensitive to the entering competencies of the students and of their short- and long-term academic goals.
5. Considerable attention was paid to planning instructional strategies and selecting media.
6. Evaluation was part of the design and revision process.
7. Students were measured and graded by their ability to achieve desired standards and criteria rather than comparing one student with another.

Based on these common elements of instructional systems designs, we can further attempt to outline the criteria or characteristics inherent in a model for curriculum development. The model to be developed could then be expected to show various aspects as outlined by Oliva (1997:154). These would include the major components of the process, including stages of planning, implementation and evaluation, together with customary, but not inflexible beginning and end points.

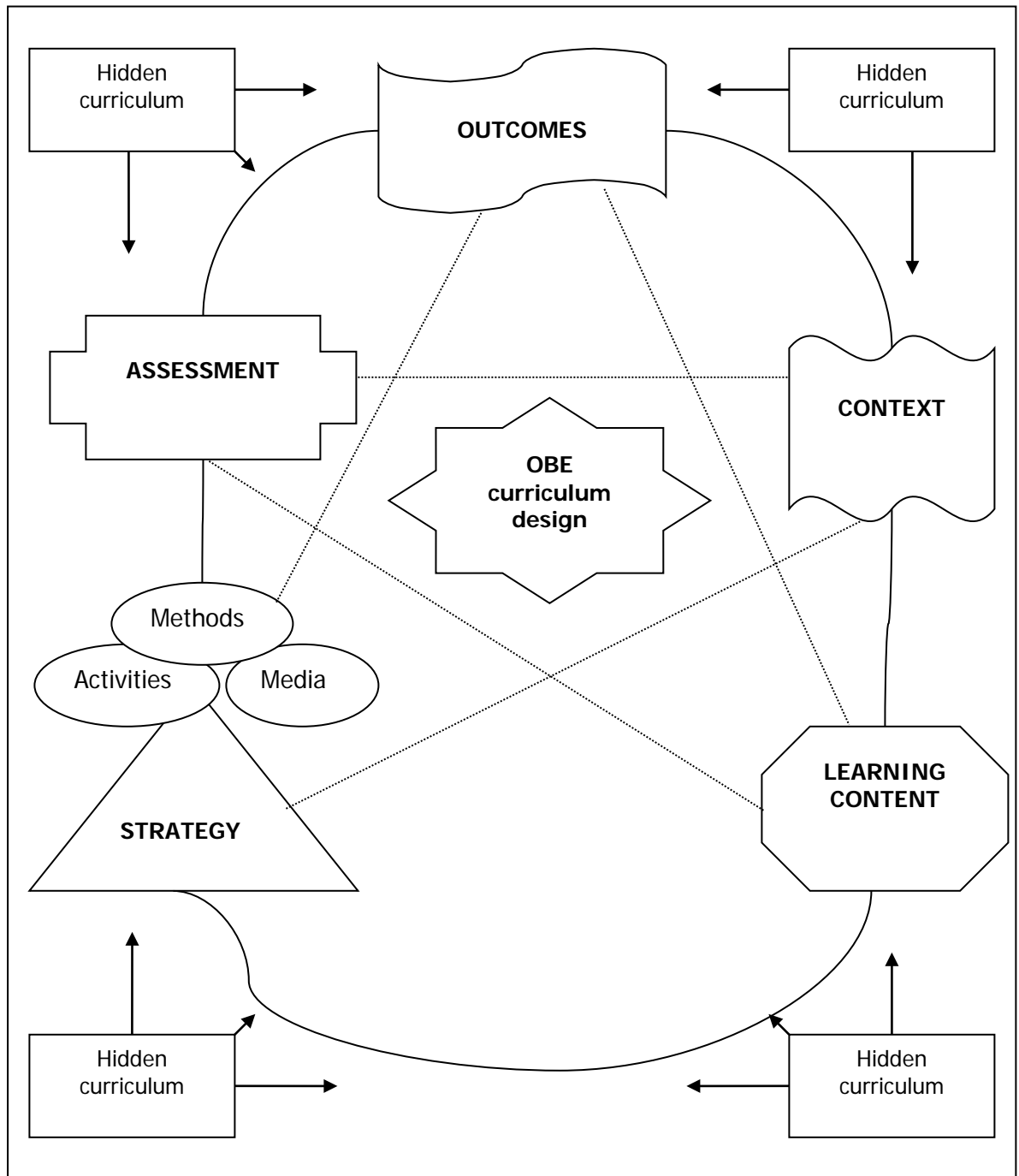
The relationship between curriculum and instruction would also be shown together with distinctions between curriculum and instructional goals and objectives (also known as exit level and specific outcomes in a South African context). The model could be expected to show reciprocal relationships among components and a cyclical rather than a linear pattern of development with feedback lines and the possibility of entry at any point in the cycle. It would have to demonstrate an internal consistency and logic, enough simplicity to be intelligible and feasible and, finally, the components of the system could be presented in the form of a diagram or a chart (Oliva 1997:154).

2.5.1 The OBE curriculum model in South Africa

When reviewing models of curriculum development, it would be useful to begin by considering the OBE curriculum model as it relates to curriculum development in South Africa. Jacobs *et al.* (2004:63) note that on close analysis, it becomes apparent that there is not much difference between the perennial curriculum model and the OBE curriculum model. The main differences between the perennial model and the OBE model are that the components have been changed to reflect OBE terminology, an extra component, context, has also been added to the model and the hidden curriculum is incorporated into the model (cf. Figure 2.3).

From the OBE model it can be seen that, in designing a curriculum, decisions have to be made about each of the five components of the programme design, namely outcomes, context, learning content, strategy and assessment. For the purposes of this research, during the development of a post-graduate education programme for the ocular complications of diabetes, careful attention will be paid to these various components and they will be dealt with in detail by the Delphi panel.

FIGURE 2.3: A model for OBE curriculum design in South Africa



Source: Jacobs *et al.* (2004:62)

In the OBE model, OBE places the focus on clearly defined outcomes which the learners are expected to demonstrate when they complete the programme. They therefore direct the selection and organisation of the learning content; the selection and preparation of learning programmes; the determination of a teaching strategy; and the assessment of learning programmes (Jacobs *et al.* 2004:63). The context and the outcomes for the OBE curriculum are then tightly linked. Although all learners have to achieve the prescribed outcomes, the ways in which the learners are taught or source the learning material may vary. The specific methods in which different learners obtain information and the various ways in which they assimilate the work will be expected to vary according to the context of the learning experience. This will then be an important consideration in the curriculum model.

The learning content of the programme is an essential consideration in an OBE curriculum (Jacobs *et al.* 2004:64). With the advent of the internet and the vast areas of information available to learners, it is important that curriculum developers pay careful attention to the selection of the learning content. The selection of the content is, however, often guided by decisions on how the learning fields should be divided; what should constitute the learning programmes or modules; and how these individual programmes/modules should be designed and implemented.

The strategy taken for the learners to achieve the desired learning elements or outcomes is a further component of the OBE model. According to Jacobs *et al.* (2004:71) it can be assumed that strategy includes learning content, teaching methods, learner activities and media. Finally, assessment forms the fifth component of curriculum design in OBE. It is important that the assessment has

to be valid and reliable in order to show the rate and extent of progress achieved by each learner, but flexible enough to reflect empathy with learners. It is important that a variety of different assessment methods be used to assess learners and that assessment should be seen as an integral part of every teaching-learning activity. In order to effectively and fairly assess learners, it would also be necessary to have assessment standards that inform educators of the type of evidence that is required to decide whether a learner has made the required progress towards a prescribed learning outcome.

Finally, in the OBE curriculum model, it is important to be aware of what may be considered to be the *hidden curriculum*. Jacobs *et al.* (2004:53) define the hidden curriculum as “the wide variety of planned as well as unplanned experiences which learners and teachers have but which are not stipulated in the departmental rules and regulations.” Those experiences that form the hidden curriculum can have both positive and negative effects on the learners, and the influence of the hidden curriculum on the learning experience should not be underestimated. It can therefore be said that the hidden curriculum is neither good nor bad, but is a reality that curriculum developers and educators have to bear in mind when developing academic programmes (Jacobs *et al.* 2004:53).

Having discussed the OBE curriculum model in South Africa, we can then consider specific models for curriculum development that may be useful in the development of a post-graduate education programme.

2.5.2 The Tyler model for curriculum development

Oliva (1997:145) suggests that the Tyler model is perhaps the best or one of the best models for curriculum development, particularly in terms of the planning phases. Although Tyler proposed a comprehensive model for curriculum

development, it is the first part of his model that has received the greatest attention from other educators.

Tyler (in Oliva 1997:145) recommends that curriculum planners identify general objectives by gathering data from three sources comprising of the learners, contemporary life outside the school, and the subject matter itself. After identifying numerous general objectives, the planners refine them by filtering them through two screens, these being first through the educational and social philosophy of the school and, second, through the psychology of learning. The general objectives that successfully pass through the two screens then become the specific instructional objectives. When searching for the sources for educational objectives, Oliva (1997:145) considered there to be three sources of information, namely the student as the source of information, society as the source of information, and subject matter as the source of information.

From these three sources of information, the curriculum planners may then derive general or broad objectives that may lack precision but would appear to be general instructional goals. These goals may be pertinent to specific disciplines but may also cut across disciplines. Once this large array of goals has been established, Tyler's model requires them to be screened through a philosophical screen. Finally, a psychological screen is applied in order to clarify the principles of learning that must be inherent in the curriculum. After the curriculum planner has applied this second screen, the list of objectives will be substantially reduced, leaving only those that are most significant and feasible (Oliva 1997:146). These objectives may then be considered to be exit level outcomes, from where instructional or behavioural objectives (specific outcomes) could then be developed.

2.5.3 The Taba model for curriculum development

Taba (quoted in Oliva 1997:148) took what is known as a grass-roots approach to curriculum development and, according to Oliva (1997:148), Taba believed that the curriculum should be designed by the educators rather than handed down by a higher authority. The Taba model therefore advocated an inductive approach to curriculum development, starting with the specifics of the programme and building up to a more general design. This is in contrast to the more traditional deductive approach of starting first with the general design and working down to the specifics.

Taba (1962:456-459) listed a five-step sequence for establishing a curriculum or curriculum change:

1. *Producing pilot unit's representative of the subject area.* This would link the theory to the practice in which the following steps would be required for curriculum developers to produce the pilot units:
 - diagnosis of needs;
 - formulation of objectives;
 - selection of content;
 - organisation of content;
 - selection of learning experiences;
 - organisation of learning activities;
 - determination of what to evaluate and of the ways and means of doing it;
 - and
 - checking for balance and sequence.

2. *Testing for experimental units.* In this phase, the units developed must now be tested to establish their validity and teachability and to set their upper and lower limits of required abilities.
3. *Revising and consolidating.* The units are now modified to conform to variations in student needs and abilities, available resources, and different styles of teaching so that the curriculum may suit all types of classrooms.
4. *Developing a framework.* After a number of units have been constructed the curriculum planners must examine them as to adequacy of scope and appropriateness of sequence. The curriculum specialist would assume the responsibility of drafting a rationale for the curriculum that has been developed through this process.
5. *Installing and disseminating new units.* Finally, in this phase, the administrators become involved in order to arrange appropriate in-service training so that educators may effectively put the teaching units into operation in their classes.

Oliva (1997:151) suggests that Taba's inductive model may not appeal to curriculum developers who prefer to consider the more global aspects of the curriculum before proceeding to the specifics. Some curriculum planners might wish to see a model that includes steps both in diagnosing the needs of society and in deriving needs from the subject matter. These philosophies should therefore be carefully considered when deciding on any particular model to pursue in the process of curriculum development.

2.5.4 The Saylor, Alexander and Lewis model for curriculum development

Saylor, Alexander and Lewis (1981:30) conceptualised the curriculum planning process in their model for better teaching and learning. There are three broad phases comprising their model.

Goals, objectives and domains

Their model begins by specifying the major educational goals and specific objectives that they wish to accomplish. Broad goals were then classified into four domains under which many learning experiences take place, namely personal development, social competence, continued learning skills, and specialisation. Once the goals, objectives and domains have been established, the planners move into the process of designing the curriculum. The curriculum workers decide on the appropriate learning opportunities for each domain and how and when these opportunities will be provided.

Instructional modes

After the designs have been created, all educators affected by a particular part of the curriculum plan must create the instructional plans. The educators select the methods through which the curriculum will be related to the learners and the educators are also involved in specifying the instructional objectives (specific outcomes). These would usually be developed prior to selecting the strategies or mode of presentation of the coursework.

Evaluation

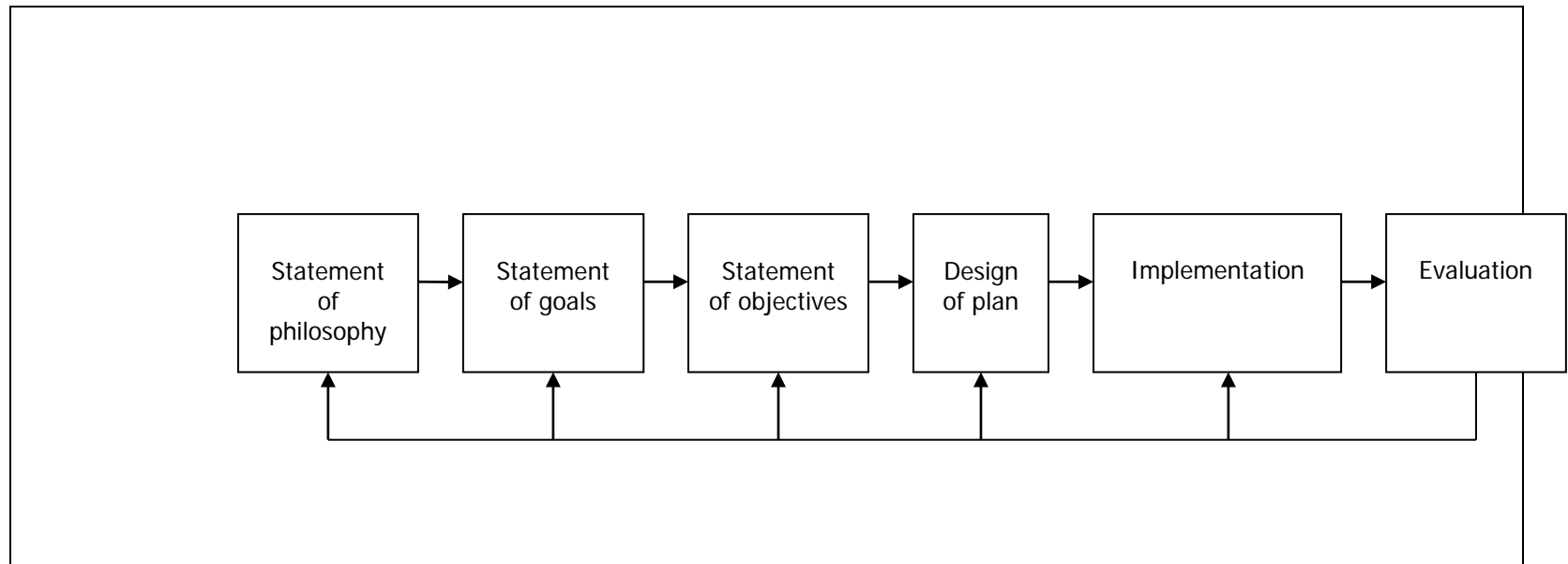
The final phase of the Saylor, Alexander and Lewis model (Saylor *et al.* 1981:30) involves evaluation in order to determine whether or not the goals of the institution and the objectives of the instruction have been met. In addition to this,

their model permits evaluation of the total educational programme as well as an evaluation of the evaluation programme itself.

2.5.5 The Oliva model for curriculum development

Oliva (1976:232) charted a very simple yet effective model for curriculum development that met three important criteria. The model had to be simple, it had to be comprehensive, and it had to be systematic. Although the model represents the most essential components, it can be expanded into an extended model that provides additional detail. The model is reflected in Figure 2.4.

Oliva (1997:155-158) further expanded on his earlier model to develop a more comprehensive step-by-step process that takes the curriculum planner from the sources of the curriculum to the evaluation. The great benefit of this model is that it can be used in a variety of ways. First, the model offers a process for a complete development of a programme's curriculum. The educators of each special area can plan for the curriculum in that particular area or they may develop interdisciplinary outcomes that cut across the areas of specialisation. Second, the educators and developers may also focus on the curricular component of the model in order to make programmatic decisions, or, third, the developers may concentrate on the instructional components.

FIGURE 2.4: The Oliva model for curriculum development

Source: Oliva (1976:232)

Although Oliva's final model involves a diagrammatic representation through squares and circles of planning and operational phases, it may be easier to consider it in terms of the steps involved. The following lists the phases for the Oliva model for curriculum development (Oliva 1997:158):

1. Specify the needs of students in general.
2. Specify the needs of society.
3. Write a statement of philosophy and aims of education.
4. Specify the needs of students in your school or programme.
5. Specify the needs of the particular community.
6. Specify the needs of the subject matter.
7. Specify the curriculum goals of your school or programme.
8. Specify the curriculum objectives of your school or programme.
9. Organise and implement the curriculum.
10. Specify instructional goals (exit level outcomes).
11. Specify instructional objectives (specific/learning outcomes).
12. Select instructional strategies.
13. Begin selection of evaluation techniques.
14. Implement instructional strategies.
15. Make final selection of evaluation techniques.
16. Evaluate instruction and modify instructional components.
17. Evaluate the curriculum and modify curricula components (Oliva 1997:158).

The use of models of curriculum development can help to conceptualise a process by showing certain principles and procedures (Oliva 1997:158). Whereas some models are in the form of diagrams, others are lists of steps or a combination of the two. Some models are linear or step-by-step in

approach, while others are more flexible in design. Some models are inductive, others deductive in philosophy, whilst others still are prescriptive or descriptive. It is important that those who take leadership in curriculum development become familiar with various models and, most importantly, to select the model that is most understandable and feasible to them and to the persons with whom they are working (Oliva 1997:159). This important philosophy is supported by the researcher and will be taken into account with the education programme that this research study aims to develop.

2.6 DESIGNING AND IMPLEMENTING THE CURRICULUM

Once the decision has been made to begin a specific project or programme, Diamond (1989:47) emphasises that basic data must be collected in five broad areas as the developer begins to work on the actual design of the programme. These areas defined by Diamond (1989:47) include “the characteristics of the students, including their backgrounds, abilities and priorities; the desires and needs of the society; the educational priorities of the institution, school, or department; the domain of knowledge that is appropriate to the scope of the project; and related research.” As Diamond (1989:47) further elucidates, “the data collected ... in these five areas are extremely important since they help to define required and optional elements of the programme, determine if remedial units or exemptions are appropriate, and form the basis for selecting basic content and determining instructional objectives (outcomes).”

2.6.1 The role of needs assessment in curriculum design

Suarez (in Pratt 1994:37) defines needs assessment as “an information-gathering and analysis process which results in the identification of the needs of individuals, groups, institutions, communities, or societies.” According to

Pratt (1994:38) there are four main information sources that are of great interest when considering needs assessment in curriculum development - these being opinion surveys, task analyses, social indicators, and test and research data.

Oliva (1997:201) recognises that statements of aims and statements of philosophy point to common needs of students and society and these set a general framework within which a school or department will function. In formulating curriculum goals and objective for a particular programme, curriculum developers must give their attention to five sources of needs. Oliva (1997:201) summarises these as the needs of students/learners in general, the needs of society, the needs of the particular students/learners, the needs of the particular community, and the needs derived from the subject matter.

Oliva (1997:222) defines a curriculum needs assessment as "...a process for identifying programmatic needs that must be addressed by curriculum planners". Oliva (1997:224) then continues to summarise the objectives of a needs assessment as first, to identify the needs of the learners not being met by the existing curriculum and, second, to form a basis for revising the curriculum in such a way as to fulfil as many unmet needs as possible.

It is also useful to recognise that the conduct of a needs assessment should not be seen as a single once-off operation but rather as a continuing and periodic activity. The needs assessment plan of English and Kaufman (as cited by Oliva 1997:227) is the most detailed plan available for conducting a needs assessment. The plan includes 14 generic steps of needs assessment and seven post-needs assessment steps. The steps are listed as follows:

Generic steps of needs assessment

According to Oliva (1997:228), these would include:

1. Planning to plan: Charting means and ends, which includes the preparation for the needs assessment.
2. Goal derivation where knowledgeable persons are asked to state outcomes of education that they feel to be desirable.
3. Goal validation, involving validation by asking educators and non-educators whether the goals are appropriate.
4. Goal prioritisation, where students, educators and a large sample of citizens are asked to rank the goals in order of importance.
5. Goal translation, where the statements of goals are converted into measurable performance standards.
6. Validation of performance objectives, where the groups that validated the goals now validate the performance standards (objectives or outcomes).
7. Goal reprioritisation, where the goals are reconsidered in light of a second sampling by educators, learners and the community.
8. Futuristic input in goal ranking, and in this step such methods as the Delphi technique may be used to predict future directions for the programme.
9. Re-rank goals, whereby the goals are re-ranked using research and predictive studies such as the Delphi technique.
10. Selecting the testing instrument or evaluative strategies for assessing the current state, where the test instruments are selected and administered to ascertain levels of student performance where appropriate.

11. Collate the data gathered, which would include all relevant data related to the intended curriculum or programme to be developed.
12. Develop an initial gap or “need statements”, and compile a list of needs based on the gaps in student performance between what is desired and what is performed (in terms of their current levels of knowledge and/or skills).
13. Prioritise gap statements according to step 4.
14. Publish a list of gap statements, which would then complete the needs assessment process.

Post-needs assessment steps

According to Oliva (1997:229), the steps to be taken following the needs assessment analysis would include:

1. Interpolate gaps by programme and level.
2. Conduct diagnostic/planning sessions to develop implementation strategies to meet identified needs.
3. Budget for implementation strategies.
4. Fund strategies.
5. Implement strategies.
6. Reassess gap via feedback.
7. Repeat the steps of the needs assessment process – whereby the generic steps 1 through 9 should be repeated periodically and generic steps 10 through 14 should be repeated continually (from Oliva 1997:229).

Thus having firmly established the process of identifying the needs that would guide the curriculum design process, curriculum developers would then

need to consider the critical aspects relating to the decision of implementing the programme.

2.6.2 Decision-making for implementing the curriculum

Perhaps the most important aspect of curriculum development is the actual decision of whether or not to proceed with the development and implementation of the curriculum programme. Whilst there may be a desire from the developer/s to introduce a programme and a need based on sound academic research, there are many other factors which may still determine the overall success or failure of a newly introduced programme. While the conditions that threaten the success of a project cannot always be avoided, Diamond (1989:37) suggests a number of conditions that must be kept in mind throughout the decision-making process of programme implementation. These include periods:

- when the academic expertise is lacking;
- when departments or faculties are in the process of changing administrators;
- when projects involve only one faculty member;
- when projects do not have a strong support base in the department in which they are being undertaken; and
- when projects may be unrealistic in terms of time and existing resources Diamond (1989:37).

Bearing these factors in mind, the curriculum developer and faculty management should then consider the following questions before finally deciding upon the approval of a new curriculum programme (Diamond 1989:37):

- **Is the programme needed?**

Evidence to support this will include statements of need from both formal and informal sources, including statements of students' failure and attrition rate, particularly in undergraduate programmes leading to the newly suggested programme. The South African DoE would specifically consider learner throughput rates in the undergraduate education programme when reviewing applications for the offering of a post-graduate programme. Additional evidence of support may be from the relevant industry as well as from Professional Bodies or Associations.

- **Is the academic area stable?**

Evidence supporting programme stability includes assessing whether any key administrative or faculty changes are in progress; determining whether curriculum changes are under way; and if there is potential for long-term growth in the programme area. National needs and national trends and governmental directions are essential areas that must also be considered, particularly in the South African context. With the changes in the higher education landscape further considerations of stability may include whether the academic institution has recently undergone a merger process and how the merger process has impacted on individual programme offerings.

- **What is the potential for success?**

Full support must be provided from all management officers of the faculty and institution in addition to the availability of departmental staff and resources. The project should be implemented at the beginning of the curriculum sequence and the time frame projected must be realistic to reach the stated goals.

- **Does the department have the necessary resources available?**

An essential assessment would include that of commitment in terms of staff, production, budget, and all physical and human resources. The staff available must be considered as well as times frames for both implementation and duration of the project/programme.

- **Are there political factors that should be considered?**

This refers to both internal politics of the institution as well as to political philosophies and transformations occurring in the Republic of South Africa. There may be times when even though a programme may be considered to be at high risk for failure, or potentially modest returns, there may be moral or other reasons justifying its implementation anyway. Perhaps the project represents a breakthrough for the department or institution or even its potential learners, or there may be a very real need for the programme in the community. There may also be very specific developmental needs or factors such as equity and affirmative action required in the community. Such needs would have to be considered in respect of the standing of the institution in the community (Diamond 1989:37).

2.6.3 Selecting the curriculum design and implementation team

Diamond (1989:41) emphasises that, while a number of interactions must take place prior to the start of a project, the first formal meeting of those who will actively participate in the project is extremely important. At this meeting the overall goals of the project are established, the development procedures are described, the roles of all the participants are defined and the fundamental groundwork for the project is laid. The institutional procedures and guidelines are reviewed at this meeting and, in particular, the

requirements and programme submission format as required by the South African DoE, the CHE and SAQA should be considered.

Diamond (1989:45) recognises the importance of the curriculum design team when cautioning that “care must be taken in identifying individuals who must be involved from the beginning of a programme and in establishing the committees and task forces that will be responsible for the project”. The purpose of the initial design meeting is to help all members involved to understand the overall nature of the programme to be developed as well as each team member’s role in the development of the programme. The members should also be informed of what would be expected of them in terms of expertise and the suggested timeframes for the development and implementation of the programme.

Having established the task team and terms of reference for the development of the programme curriculum, the participants can then proceed with their delegated tasks and report back at future meetings as scheduled by the chair. Their progress and feedback would then form part of the overall design of the curriculum, particularly in terms of any particular curriculum model that may have been followed by the developers. It should be noted that the use of a Delphi panel could form a part of this process and could function as the curriculum design team, provided that the experts selected as members of the team to participate on the panel have the required skills and expertise in both the subject area, as well as in programme and curriculum development in higher education.

2.6.4 Implementing the curriculum – adjusting the ideal to the real

At some point in the curriculum development process, the preliminary or ideal instructional design phase is completed, and modifications begin to meet the practical limitations of the real world (Diamond 1989:102). In moving from the ideal curriculum to the real curriculum to be implemented, several major factors need to be taken into consideration. These factors are often controlled by forces outside the control of the developer, but being aware of such factors in advance can prepare the developer for the challenges that they may pose as the curriculum is implemented. These factors as expressed by Diamond (1989:102), can be put into practice in the South African context as follows:

- **Accreditation requirements**

Attention should be paid to whether the proposed curriculum includes those academic areas, credits and courses that are required to be accredited and registered by the institution or by external professional associations and boards such as the HPCSA, the DoE, the CHE and SAQA.

- **Credit restrictions**

Does the proposed programme fit within the number of credit hours required for the qualification involved? There may be minimum or maximum credits specified for the programme or course and these standards may pose a restriction on the proposed curriculum. These restrictions should therefore be factored into the curriculum developed. In terms of this research, the proposed programme at the post-graduate Diploma level would be expected to have a minimum of 120 credits at the current NQF level 7.

- **Fiscal and staff constraints**

Factors to be considered under this aspect would include whether the proposed curriculum was feasible in terms of staffing, facilities and other fiscal resources. Other factors such as the provision of equipment, buildings and laboratory space and media facilities would all need to be considered. Furthermore, this could be affected in terms of whether the necessary equipment is already available in an undergraduate programme or whether new additional equipment would have to be sourced specifically for the new programme.

- **Effectiveness of existing courses and programmes**

If some elements of an existing curriculum or course are to be used, are they effective and up to date, and do they currently meet the needs for which they have been selected? Frequently changes and modifications would need to be made to adapt any existing courses to the specific requirements of the learners in the new curriculum programme.

In terms of the course projects to be implemented in the new curriculum, Diamond (1989:121) lists various factors that would need to be addressed when moving from the ideal to the real curriculum. These would include the programme goals, the time and staff availability for instruction, as well as other course-related activities. Attention would have to be given to the resources such as people, materials, facilities and fiscal resources, as well as the students in terms of numbers, backgrounds, goals and location. An additional factor would be in the area of research, including the instructional tools and techniques. Finally, the grading and scheduling options including continuous registrations, semester or year format, and whether flexible credit systems would be utilised would have to be addressed.

2.7 EVALUATING THE CURRICULUM

Pratt (1994:297) explains that before the curriculum is ready even to be tested, it needs to be “debugged” and that this is the purpose of curriculum evaluation. According to Worthen (in Pratt 1994:297), evaluation can be defined as “the determination of the worth of a thing”. Curriculum evaluation therefore involves determining the worth of a document, as compared with programme evaluation, which involves evaluating the activities that occur when a curriculum is implemented in the class or lecture theatre.

The first step might be called internal evaluation whereby an interval is allowed to elapse, of perhaps two to three weeks after the curriculum has been completed before the developer returns to reread it carefully (Pratt 1994:298). Inevitably, after this time period, certain changes will be made to the document and out of this process would emerge the revised draft. This revised draft should then be submitted to experts in curriculum development as well as one or more persons who are subject specialists or experts.

Table 2.3 provides an example of a checklist with criteria that may be used to evaluate a curriculum. Although the guide is not written in terms of OBE, the principles could still be applied to any programme curriculum. It is also important to understand that once the programme has been granted approval to be offered by a higher education institution, it would still have to undergo evaluation processes in terms of the regulations of the HEQC.

TABLE 2.3: The curriculum evaluation guide

The curriculum evaluation guide
<p>1. Needs assessment</p> <ul style="list-style-type: none"> • Was a needs assessment conducted? • Is the methodology as well as the results described? • Are the results used appropriately in the design of the curriculum?
<p>2. Aim</p> <ul style="list-style-type: none"> • Is the aim of the curriculum stated? • Does it express the overall intent of the curriculum? • Does it match the objective and the curriculum content? • Is it clear and concise? • Is it worthwhile? • Would it be meaningful and significant to the learners?
<p>3. Rationale</p> <ul style="list-style-type: none"> • Is the justification for the programme given? • Are all the important arguments for the programme included? • Is the rationale eloquently written and convincing? • Are the main objectives anticipated and dealt with? • Does the rationale deal appropriately with the social and personal significance of the curriculum?
<p>4. Objectives</p> <ul style="list-style-type: none"> • Are all the main objectives of the curriculum identified? • Do the objectives reflect student needs? • Do the objectives go beyond the cognitive? • Are social and personal objectives included? • Are priorities, particularly the critical objectives identified? • Are the objectives written in a clear and consistent style? • Are the objectives relevant to the aim? • Do the objectives collectively exhaust the meaning of the aim? • If all the objectives were achieved, would the aim be realised?

5. Assessment

- Are appropriate means suggested to assess the attainment of each objective?
- Are measures valid, reliable and efficient?
- Are measures low in anxiety for less able learners?
- Are assessment measures intrinsic to the curriculum, rather than formal or artificial?
- Is there adequate diagnostic formative assessment?
- Where appropriate, are standards of mastery clearly indicated?
- Do mastery standards set high expectations?
- Could students make valid judgements about their own proficiency?
- Is the grading system clearly described?
- Is the grading system aligned with the objectives?
- Does the grading system ensure that critical objectives are mastered?

6. Context

- Are the social, community and instructional contexts described?
- Is it clear how this curriculum fits with other programmes?
- Is linkage clear with preceding and following courses or units?
- Is the relationship of the curriculum to national guidelines shown?

7. Entry characteristics

- Are the learners adequately described?
- Is the cultural background of the students acknowledged and respected?
- Is the selection process clear?
- Are the necessary prerequisites identified?
- Is provision made for students who lack prerequisites?
- Is provision made for students who have already mastered the objectives?
- Is there guidance for design and use of pre-assessment?

8. Instruction

- Does the instruction match student needs?
- Does the instruction match the curriculum objectives?
- Is instructional content appropriate and interesting?
- Does the instruction ensure early significant success?
- Is the sequence and pacing of instruction appropriate?
- Are teaching strategies varied, interesting and challenging?
- Are there appropriate strategies for students with different learning styles?
- Do strategies involve active and co-operative learning?

9. Individual differences

- Is there provision for identifying individual differences in aptitude and motivation?
- Are there plans for effective remediation?
- Is there appropriate use of tutoring and peer tutoring?
- Is there adequate provision for faster and more motivated learners?
- Is there provision for cultural differences?
- Is there provision for students with special needs?

10. Resources

- Are consumables and communication materials described?
- Are high-quality materials included in the curriculum or readily available to educators?
- Is relevant instructional software listed?
- Is the required equipment described?
- Are there recommendations for lecture room layout?
- Are uses of facilities outside the lecture room suggested?
- Are instructor qualities and responsibilities defined?
- Are the roles of parents, guests, and administrators indicated?
- Is total time consumption calculated?
- Is the budget complete?

<p>11. Tryout</p> <ul style="list-style-type: none"> • Is there provision for pilot and field testing? • Are the results of pilot and field tests described?
<p>12. Programme evaluation</p> <ul style="list-style-type: none"> • Are criteria suggested for evaluation of all aspects of the programme? • Are multiple measures and data sources suggested? • Is there provision for feedback on the curriculum from users? • Is there provision for ongoing revision of the curriculum?
<p>13. Implementation</p> <ul style="list-style-type: none"> • Were significant groups involved throughout development of the curriculum? • Are the names and affiliations of the curriculum planners shown? • Are they credible? • Do they include people other than educators? • Is there a realistic adoption and implementation plan? • Is there sufficient provision for in-service training (experiential learning)?
<p>14. Production qualities</p> <ul style="list-style-type: none"> • Is the curriculum professional in appearance? • Is it printed and illustrated? • Are the binding and cover attractive and of high quality? • Is it well written and easy to follow and read? • Is it free of jargon, vagueness and pretentiousness?

Source: Pratt (1994:298-300)

According to the regulations, provisional approval for the offering of the programme would have been given by the CHE's HEQC during the programme's candidacy phase and thereafter a process of self-evaluation would have to be undergone in order to successfully complete the accreditation phase. It would also have to satisfy the criteria stipulated by the HEQC as well as any professional minimum standards required by associated professional council boards. This aspect will be discussed in more detail under section 2.9.3, which deals with post-graduate programme development criteria.

2.8 CURRICULUM DEVELOPMENT IN SOUTH AFRICA

In attempting to review curriculum development in higher education in South Africa we could begin by surmising that there is no one specific mechanism or curriculum model that can be considered absolutely correct in terms of curriculum development and delivery. However, we can highlight some of the guiding principles as well as the problem areas involved in curriculum development and delivery within the NQF in South Africa.

It is important to explore the links that exist between qualifications and the curriculum and it would also be useful to consider the relationship between qualifications and the learning programme. A study of the NQF and Curriculum Development policy document (SAQA 2000:4) provides the following definitions for the terminology that relates specifically to curriculum development in South Africa:

Qualification: This means a planned combination of learning outcomes which has a defined purpose or purposes, and which is intended to provide qualifying learners with applied competence and a basis for further learning;

and it means the formal recognition of the achievement of the required number and range of credits and such other requirements at specific levels of the NQF as may be determined by the relevant bodies registered for such purpose by SAQA (SAQA 2000:4).

Standard: This means registered statements of desired education and training outcomes and their associated assessment criteria according to SAQA (SAQA 2000:4).

Unit standard: This means registered statements of desired education and training outcomes and their associated assessment criteria together with administrative and other information as specified in NSB regulations (SAQA 2000:4).

Learning programme: This means the sequential learning activities associated with curriculum implementation, leading to the achievement of a particular qualification or part qualification. A learning programme can be identified with a cluster of qualifications, a single qualification or a part qualification (SAQA 2000:5).

Programme, curriculum or course: By programme we mean a coherent set of courses, leading to a certain degree. In a programme we can distinguish between a core curriculum and optional courses, together making up the various different ways by which a student can choose to arrive at the degree. (Vroeijenstein in SAQA 2000:5)

SAQA in its National Qualifications Framework and Curriculum Development Policy Document (2000:6) refers to the fact that "...in the South African

context, curriculum is a very broad concept which includes aspects such as standards setting, learning programme development and delivery and quality assurance of the delivery process." A particular concern raised by SAQA (2000:6), however, is that frequently the creators and guardians of knowledge have tended to be the same people. Those responsible for deciding on what learners should learn have in most instances been the same people responsible for learning programme development and delivery as well as those responsible for deciding whether that delivery process is of quality. It is therefore important that when developing future programmes in higher education, there is broad consultation and representation by the stakeholders in order to ensure that the curriculum that has been developed is accessible, relevant and appropriate and of benefit to both the learners and the community interests to which the institution serves.

2.8.1 The National Qualifications Framework and curriculum development

When developing academic programmes in higher education we need to consider the role of the NQF. Although the NQF may have been perceived as being simply about change in learning programme development and delivery, the NQF is primarily about systemic change (SAQA 2000:7). The role of the NQF is therefore about how a system is put in place that allows for adaptability, flexibility, responsiveness and accountability in setting of standards. It aims to ensure relevance, quality, creativity and accountability in the design and implementation of learning programmes, and seeks to ensure that the qualifications and standards and their delivery are of the degree of excellence that is specified.

SAQA (2000:7) proposes that the NQF should ensure that its processes focus on the setting of standards and the assurance of the quality of learner achievements. It sets in place standards and qualifications which become the starting point for learning programme design, development, and delivery. The most critical aspect and change to previous aspects of curriculum development, however, is not in terms of what should be included in a learning programme and how it should be taught and assessed, but in terms of *who* is included in the decision-making. Furthermore, the participatory nature of the NQF processes of standard-setting and quality assurance suggests that the responsibility for the success at each stage of the education and training process does not rest solely with those responsible for delivery, but is the responsibility of all who participate in the system (SAQA 2000:8).

Traditionally, the concept of curriculum development in the South African context has comprised three aspects. These included the setting of the standards; the design, delivery and assessment thereof; and the quality assurance processes in the programme (SAQA 2000:7). Although the NQF challenges this traditional concept of curriculum development, there is a recognition that the three parts are linked and hence the concept of a quality cycle.

According to SAQA (2000:7), the standards developed through the participatory and representative structures and processes of the NSBs and the SGBs and being registered on the Framework, will have their delivery and achievement quality assured for all users of the learning system, through the ETQA system. This system, in turn, reflects participatory and representative structures and processes and it is in assuring the quality of both the standards and learner achievements that the quality cycle of the Framework

is closed. It is through closing the cycle that the system allows ongoing improvements, both in the construction of standards and qualifications and in the delivery and assessment of these standards and qualifications by the users of those standards and qualifications.

Another important feature of the NQF is its requirement for articulation in nationally-registered qualifications and standards (SAQA 2000:9). The purpose of this is to directly challenge the previous social use of qualifications to exclude certain individuals. SAQA (2000:9), however, acknowledges that any one qualification can be achieved through different learning programmes and that it may even be beneficial to allow various training institutions to retain their niche areas and differing perspectives when providing the same qualification. The role of the providers of education in the standards-setting process as well as in the evaluation of the delivery process is achieved by the participatory process of the NQF and it is through the emphasis of self-evaluation as a means of ensuring real awareness of quality assurance that this is realised.

According to SAQA (2000:13), the NQF also emphasises a philosophy of OBE at the systems organisational level. This reflects the concept that the NQF is about systemic change that allows for greater access and transformation. The NQF has been created to address specific systemic features, namely a system that created and perpetuated inequity through inappropriate social uses of qualifications. This system permitted the delivery of education and training that lacked quality and prevented adequate participation in education and training decision-making by important stakeholders (SAQA 2000:13).

The NQF is not a curriculum framework and hence its primary focus is not how the outcomes are achieved. Its primary focus, however, does include what it is that curricula or, more specifically, learning programmes should aim to achieve. Furthermore the focus aims to provide the assurance that learners accredited with particular standards and qualifications have demonstrated their ability as specified in the standards and qualifications registered on the framework.

In order to develop a programme and/or qualification that satisfies the requirements of SAQA and the NQF, it is important to consider the description of a qualification according to the regulations of the NSB (RSA NSB 1998). According to these regulations, a qualification shall:

- represent a planned combination of learning outcomes which has a defined purpose or purposes, and which is intended to provide qualifying learners with applied competence and a basis for further learning;
- add value to qualifying learner in terms of enrichment of the person through provision of status, recognition, credentials and licensing, marketability and employability; as well as opening-up of access routes to additional education and training;
- provide benefits to society and the economy through enhancing citizenship, increasing social and economic productivity, providing specifically skilled/professional people and transforming and redressing legacies of inequity;
- comply with objectives of the NQF contained in Section 2 of the SAQA Act.
- have both specific and critical cross-field outcomes that promote lifelong learning;
- where applicable, be internationally comparable;

- incorporate integrated assessment appropriately to ensure that the purpose of the qualification is achieved, and such assessment shall use a range of formative and summative assessment techniques such as portfolios, simulations, workplace assessments and also written and oral examinations; and
- indicate in the rules governing the award of the qualification that the qualification may be achieved in whole or in part through the recognition of prior learning, which concept includes but is not limited to learning outcomes achieved through formal, informal and non-formal learning and work experience Body (RSA NSB 1998).

It is then recommended that curriculum developers should make every effort to ensure that these requirements are considered in any learning programme development, delivery and assessment process. Furthermore, these requirements will have to be adhered to in the development of the proposed diabetes education programme.

2.8.2 Processes for post-graduate programme approval in South Africa

Once curriculum developers have finalised the development of an academic programme, a formal process of approval takes place for the submission of the details of the programme with the relevant authorities prior to the offering of the programme. The procedures for submission of new programmes for accreditation and approval have been amended during 2003 and are outlined as follows (RSA DoE 2003a):

- The application must be approved in advance by the Institution's Council and/or Senate and signed by the Vice-Chancellor or designate and then submitted to the DoE on the prescribed form.
- Institutions are allowed to submit applications twice a year.
- The DoE will analyse and evaluate applications in terms of the criteria as set out in Part 2 of the Appendix to the attached application form. The decisions of the DoE in this regard will be conveyed to institutions no later than one month after receipt of the application.
- In the event of an application being approved, the DoE will communicate such outcomes to the HEQC and SAQA.
- If the DoE decides that it cannot support an application, the process ends for that particular application. The HEQC and SAQA will only consider those programmes or parts of programmes which have been certified as acceptable by the DoE.
- If the DoE decides that all or part of an institution's application is acceptable, then that institution must submit an application for accreditation to the HEQC and at the same time apply to SAQA for the registration of the new qualification on the NQF.
- Only those programmes which are accredited and registered, will then be submitted to the Minister of Education for formal approval.
- Institutions will not be permitted to introduce any new or reconfigured programmes until it has been (a) accepted as part of the institutions programme and qualifications mix by the DoE; (b) accredited by the HEQC; (c) registered on the NQF by SAQA; and (d) approved by the Minister of Education.
- Applications that are incomplete or do not comply with any of the conditions will not be screened or evaluated.

In terms of the requirements and criteria for the submission for recognition of whole qualifications according to SAQA, those qualifications forwarded for recognition and registration as *whole qualifications* must include the following information (SAQA 1998:14):

1. A statement of the purpose of the qualification.
2. Learning assumed to be in place.
3. Exit level outcomes and their associated assessment criteria.
4. Total credits required (including maximum and minimum credits as specified in the Regulations).
5. An integrated assessment that is appropriately incorporated into the qualification achievement requirement and that demonstrates that the purpose of the qualification has been achieved.
6. A statement of the articulation possibilities with other and related qualifications, together with a statement of arrangements (implicit or specific) for such articulation.
7. Criteria for the registration of assessors (SAQA 2001:8-10).
8. Options for moderation, including the recommendation of moderator/s and/or moderating bodies (SAQA 1998:14).

There are also additional criteria for the assessment of qualifications that have been submitted to the DoE for approval (RSA DoE 2003a). First, all applications must be consistent with the set of national academic policies approved by the Minister of Education. If an application is not consistent with these policies, then it will not be considered further by the Department.

Further criteria for the approval of programmes by the DoE include the following (RSA DoE 2003a):

- Account will be taken of the fit between the institution's mission, including national or regional needs and the proposed additions and/or changes to its approved programme and qualification mix.
- Institutional capacity in terms of qualified academic staff and student to academic staff ratios.
- Overall graduation rates and the graduation rates in the proposed programme area.
- Past enrolment trends, particularly if the application is for a new qualification which builds on a lower level qualification.
- The programme and qualification mix of neighbouring institutions.
- Proposed programmes either (a) in new Classification of Educational Study Matter (CESM) categories or (b) at new qualification levels will be approved in exceptional circumstances only.
- New distance education programmes to be offered by contact institutions will be permitted in exceptional circumstances only.
- If a new programme area is approved, either in a new CESM category or in a new cell in an existing category, then, unless further exceptional circumstances exist, the institution will be permitted to introduce only the appropriate first level qualification.
- A qualification (undergraduate or post-graduate), which builds on an existing lower-level qualification, will be considered for approval only if the enrolment and graduation trends of the lower-level qualification show that there is likely to be an adequate flow of students into the new qualification (RSA DoE 2003a).

It should also be noted that as from July 2005 all applications for new programmes to the HEQC must be submitted to the CHE online in an electronic format. According to the HEQC (RSA HEQC 2004:4), "in its

submission for candidacy status for a new programme, an institution has to demonstrate, firstly, that it meets the HEQC's criteria for the candidacy phase (the input criteria), or, alternatively, that it has the potential or capability to meet these criteria in a stipulated period of time.

The institution's application for candidacy status should be based on a critical self evaluation of the new programme measured against the requirements of the HEQC's programme input criteria." In addition to this requirement, the institution has to submit a plan for the implementation of the new programme which would include aspects such as time frames, budgetary allocations and human resources planning. Midway through the programme, the institution will be required to submit a progress report for evaluation by the HEQC. The HEQC on receipt of this report may also wish to conduct a site visit if circumstances warrant such.

The input criteria for a new programme indicate the minimum standards for activities which should take place and resources and conditions which should be available or present in order to offer the programme (RSA HEQC 2004:5). In addition, proper conceptualisation and design of a programme are important first steps towards achieving high quality educational provision. Therefore, in order for a programme to receive the necessary approval from the HEQC to offer the programme, it must demonstrate its ability to satisfy the stated criteria for programme input.

Following on from the candidacy phase would be the accreditation phase in which the programme achieves full accreditation. According to the HEQC (RSA HEQC 2004:15), "within one year of the first cohort of students graduating from the new programme, the institution must demonstrate that it

has met the conditions set by the HEQC during the candidacy phase ... and ... the institution is also required to conduct a self-evaluation of the programme, using the HEQC's criteria for the accreditation phase." Thereafter if the institution's submission is approved by the HEQC, the programme obtains accreditation status.

There are nine accreditation criteria stipulated by the HEQC in terms of programme input and these relate to the areas as reflected in Table 2.4 as follows:

TABLE 2.4: HEQC criteria for programme input

	Areas	Criteria
1.	Programme design	Criterion 1
2.	Student recruitment, admission and selection	Criterion 2
3.	Staffing	Criteria 3 and 4
4.	Teaching and learning strategy	Criterion 5
5.	Student assessment policies and procedures	Criterion 6
6.	Infrastructure and library resources	Criterion 7
7.	Programme administrative sources	Criterion 8
8.	Post-graduate policies, regulations and procedures	Criterion 9

Source: RSA HEQC (2004:6-7)

2.9 TOWARDS EXCELLENCE IN PROGRAMME AND CURRICULUM DEVELOPMENT

The transformation of the education system in South Africa in general and the higher education system in particular, has provided educators with the opportunity to revise or develop programmes that are exciting, innovative and of high quality. The challenge for educators and curriculum developers is

to ensure that programmes that have been developed are of world-class quality and excellence. The other challenge is that new qualifications may either be programme-based or discipline-based, and that a balance for this needs to be found for the Institution (UFS 2004). In order to ensure that programmes are of high quality, we can review the principles underlying good academic programmes.

2.9.1 Principles underlying the development of quality academic programmes and qualifications

A number of characteristics of good quality academic programmes have been articulated by the UFS (2004:15) in its position paper "What is a good programme?" These state the following aspects:

- Ideally an interdisciplinary focus implies that preferably two or more disciplines are combined.
- Its coherent nature implies a certain focus, which should probably be interpreted neither too widely, nor too narrowly.
- A purpose-driven focus implies that a programme is planned consciously and cannot be implemented in an unplanned way.
- "Structured" points to the fact that a programme should be structured thoroughly before implementation and during the planning phase.
- Relevance indicates that a programme should prepare a learner for the world in which he/she is going to find him-/herself on completion of his/her studies.
- Mobility implies that a learner must be able to switch between programmes and institutions within the NQF without difficulty.
- Equivalence signifies comparable standards within and among institutions.

- Sequencing of learning activities implies that a programme includes more than one qualification.
- A programme may serve a generally formative purpose or be career-focused, with a likely emphasis on the latter.
- The integrative adding on of skills and the requisite values to the knowledge base.

The engagement model for top-quality programmes developed by the UFS (2004:14) suggests that central to each programme there are people and people-driven structures which would include lecturers, students, leaders and managers, administrative and other support staff, alumni, society and the state. All of these are connected in some way or another to the programmes that are offered by the institution. Thus the good programme is founded on an emphasis on the particular mutual engagements among people and people-structures. It takes into account the specific engagements of each of the role-players in the programme, and it is expected that in the good programme, all the participants should exhibit characteristics such as dedication, vision, adaptability, a willingness to learn, and - above all - an emphasis for the welfare of others.

The model of the UFS for quality academic programmes (UFS 2004:14) proposes six areas of excellence in a programme and these would include the following aspects; The academic programme would be expected to have diverse, dedicated role players and it would include a variety of contributing cultures. The programme would have a participative programme design with adequate infrastructure and resources and contain a formative, interactive teaching and learning culture. Above all, the programme would have to make a commitment to quality assurance.

2.9.2 Steps to achieving quality academic programmes

The UFS (2004:15) provides guidelines for what may be considered to be a good programme. Two broad overarching areas of preference are identified in realising the goals of a good programme. These aspects can be described in terms of, first, knowledge-building (capacity-building) and second, sensitising. When describing knowledge building, the policy proposes very definite plans to empower both directors (Heads of Departments/Programmes) and lecturers so that they may gain the knowledge and skills that are required to plan, implement, evaluate and extend a good programme or module.

When considering sensitisation in programme context, plans are proposed to guide all role-players to mutual commitments and better relationships and co-operations. This would also include important aspects such as improved student support, cultivating cultural sensitivity, as well as acknowledging and dealing with specific national priorities, taking into consideration the context of the region and the institution.

2.9.2.1 Knowledge building in the programme context

The UFS (2004:16) proposes a number of aspects which would contribute to knowledge-building in the good academic programme. Such aspects should be considered by curriculum developers and would include:

Programme planning:

This is an aspect whereby the programme directors are supported and guided in all facets of programme planning. Specific guidelines and work sessions should be provided, while programme developers and directors should become fully conversant in national policies and regulations, including SAQA

regulations and National Academic Policy regulations, including OBE and modularisation (UFS 2004:16).

Module planning:

In this regard, lecturers are supported in their modular planning as well as in the requirements of OBE. They are also guided in terms of SAQA requirements for learning programmes or models (UFS 2004:16).

Programme delivery:

Capacity-building needs to take place to ensure that lecturers are given the opportunity to extend their knowledge in all aspects of programme or module delivery. This may be facilitated through the use of self-help materials, workshops and departmental group discussions or meetings (UFS 2004:16).

Composition of module files and module records:

For best practice in a good academic programme, all lecturing staff, as part of their teaching task, should compile module files or records in terms of faculty/departmental guidelines. These records, in addition to supporting the administrative requirements of a good programme, will play an important role in self-evaluation actions for the programme itself (UFS 2004:16).

Compiling lecturers' teaching files and records:

Educators and lecturing staff should be encouraged to compile teaching files which would include all aspects of the lecturers' teaching activities, including research and publications. The Cape Peninsula University of Technology requires all staff to complete performance evaluation contracts for the key performance areas in their academic position. Such lecturer teaching files and records would therefore provide supporting documentation when undergoing

performance management review sessions and thereby further contributing to the quality assurance of a good programme.

Meaningful quality assurance and renewal:

Quality assurance should be considered to be an ongoing exercise and not an occasional process for programme accreditation. The production and ongoing maintenance of manuals and guidelines aims to ensure that quality assurance and programme renewal are pursued successfully and in an integrated way. Self-evaluation then is also an ongoing process whereby areas of a programme requiring attention are identified early in an attempt to ensure best practice for all aspects of academic delivery (UFS 2004:16).

Establishing a challenging learning environment:

The way in which a challenging (and formative) learning environment is created may lead to stimulating debates (UFS 2004:17). The good programme should offer opportunities to the learner to test the boundaries of his/her potential. A challenging learning environment should ideally develop critical thinking, problem-solving thinking, a culture of life-long learning and self-confidence. It is proposed that all role-players be involved in discussions on how a challenging learning environment can be established so that growth may be promoted.

2.9.2.2 *Sensitisation in the programme context*

According to the UFS (2004:17), sensitisation refers to the ways in which role-players can be sensitised to extend the spirit of contributing and participating cultures and diverse role-players. The various ways in which sensitisation may occur include the following aspects (UFS 2004:17):

Extending commitments and relationships among all role-players:

Usually management staff such as vice-rectors, deans, heads of departments and programme directors takes the lead in this respect. These commitments may be achieved in the following ways:

- Management supporting the actions of staff in programmes and in programme development.
- Clarifying the tasks expected of heads of departments and programme directors.
- Improving communication among lecturing staff.
- Acknowledging the roles and importance of the student in the institution.
- Establishing a less hierarchical relationship between lecturers and students.
- Acknowledging the role of alumni in programmes and departments.
- Involving industry and employers meaningfully in terms of evaluation and renewing programmes.
- Extending the role of the wider community in the programme and its commitment to community service and partnerships.

A commitment to supporting learners:

This would require all role-players to commit themselves to actively supporting the learners in every aspect.

Cultivating cultural sensitivity:

Acknowledging the multiculturalism of the role-players, learners and the learning environment is an important aspect in ensuring a good programme. This aspect aims to cultivate cultural sensitivity in all areas, including programme content, study material, assessment and commitment to learners.

The student profile should be consistently considered and any difficulties identified early in order to ensure that remediative action takes place timeously.

Addressing national priorities:

By the very nature of the transformation of the higher education sector, it is of great importance that, to ensure a good programme, account is taken of certain national priorities. These issues include access, equity, RPL, pass and throughput rates, and quality assurance. It is important that role-players are sensitised at all levels to such priorities and to ensure that these priorities are addressed responsibly in academic programmes (UFS 2004:17).

2.9.3 Post-graduate programme development criteria

In order for academic institutions to offer post-graduate education programmes, the CHE through its HEQC has specific requirements that must be met by the Institution. According to the HEQC's criteria for programme accreditation (RSA HEQC 2004:6), "post-graduate studies and research training in the context of these studies constitute a core academic activity ... and enabling policies and procedures must be in place in order to maintain and enhance the quality of post-graduate programmes." In order to ensure this aspect, the HEQC has additional criteria for the accreditation of post-graduate programmes (RSA HEQC 2004:15).

Criterion Nine of the CHE's HEQC policy for programme accreditation (RSA HEQC 2004:15) relates specifically to the offering of post-graduate programmes where the criterion requires that "post-graduate programmes have appropriate policies, procedures and regulations for the admission and selection of students, the selection and appointment of supervisors, and the

definition of the roles and responsibilities of supervisors and students". The policy states further that, in order to meet the above criterion the following is required at minimum (RSA HEQC 2004:15):

1. Appropriate policies, procedures and regulations are in place for student admission, selection and assessment. These are communicated to all post-graduate students, as well as academic and administrative staff, and implemented consistently across the institution and the programme.
2. The selection and appointment criteria in place for post-graduate supervisors are acceptable to the research community in the area of study.
3. Explicit guidelines exist on the roles and responsibilities of supervisors and students and other matters relevant to the performance of research.

In addition to the above academic criteria, there are administrative criteria related to the development and offering of new academic programmes. Once the CHE has approved the offering of a programme, this would be implemented under a candidacy process. Within one year of the first intake of students graduating from the new programme, the institution must demonstrate that it has met the conditions set by the HEQC during the candidacy phase, which includes conditions relating to the evaluation of the mid-term report from the institution (RSA HEQC 2004:16). Furthermore, the institution is required to conduct a self-evaluation of the programme using the HEQC's criteria for the accreditation phase which include those criteria related to programme input, process, output and impact and review. Only

once the institution's submission is approved by the HEQC does the programme obtain full accreditation status.

In addition to the above specific criterion related to post-graduate programme approval, there are additional criteria applicable to any new programme. According to the HEQC (RSA HEQC 2004:ii), during the candidacy phase of a new programme, the requirements for the following aspects would need to be addressed satisfactorily in terms of criteria for programme input:

- Programme design.
- Student recruitment, admission and selection.
- Staffing.
- Teaching and learning strategy.
- Student assessment policies and procedures.
- Infrastructure and library resources.
- Programme administrative services.

During the accreditation phase, the following would need to be articulated in terms of criteria for programme process, including programme coordination, academic development for student success and teaching and learning interactions. This would include learner/student assessment practices and the coordination of work-based learning in the delivery of the post-graduate programme. Finally, the last phase would require that criteria for programme output and impact and criteria for programme review would also need to be articulated.

2.10 DIABETES EDUCATION

The preface to the International Curriculum for Diabetes Health Professional Education Document (IDF 2002) states that “The lack of trained health professionals and lack of programmes to train health professionals have been cited by many member organisations of the International Diabetes Federation (IDF) as the most critical issue impeding the delivery of high-quality diabetes education and care.”

The Declaration of the Americas on Diabetes (2001) in their *DOTA Bulletin on Diabetes* emphasises the importance of diabetes education in the promotion of better health for people with diabetes in the Americas. This is evidenced in the Declaration of the Americas (1998) Position Statement on Education where the Declaration of the Americas on Diabetes seeks as an ultimate goal: “to ensure that people affected by diabetes are able to acquire knowledge and skills to enable and empower them to provide self-care for their chronic disease ... and to ensure that the health care team has the specific knowledge and skills necessary to care for people with diabetes”. The position statement also recognises that diabetes education is one of the essential components in achieving the goal of reducing the burden of diabetes.

The Declaration of the Americas (1998) Position Statement on Education states that: “it is essential that all concerned are aware of the importance of diabetes education in achieving effective results from every diabetes care programme. Diabetes education is multifaceted; it should help patients acquire the necessary skills to manage their disease, and also provide appropriate training of health care professionals, so that they can provide optimal care.” The statement also asserts that effective educational

programmes should assess the needs of the recipients and include mechanisms for evaluation.

The Declaration of the Americas Education Task Group (1999) explains that, in order to be effective, the education programme requires a series of planned events including individual assessment of knowledge and skills, educational interventions based on this assessment and adult learning principles and an evaluation of learning and behaviour change. The Declaration of the Americas Education Task Group (1999) also assumes that "...health professionals are competent in the care and treatment of persons ... and possess advanced training in patient counselling and education." This means that, in order to assure the best outcome from an educational programme, it is necessary for those who carry it out to have adequate training and experience.

Having established the importance and value of diabetes education in public health, we can now evaluate current diabetes education programmes, both internationally and in South Africa.

2.11 A CRITICAL ANALYSIS OF DIABETES EDUCATION PROGRAMMES

A review of the literature suggests a large variation in the ways in which diabetes education programmes may be offered. These offerings range from short courses, modules or certificate programmes through to post-graduate diplomas and Master's degrees. This section will attempt to review international standards and norms for the curriculum of diabetes education programmes and will then investigate the various forms of diabetes education programmes that are currently available internationally and in South Africa.

2.11.1 Standards and norms for diabetes education programmes

When considering the standards and norms for diabetes education programmes, it would be useful to review the guiding principles outlined in the *International Curriculum for Diabetes Health Professional Education* (IDF 2002). These guiding principles state that the curriculum for diabetes education will need to demonstrate that it:

- supports students to gain knowledge, and develop skills and competence to deliver diabetes education;
- has processes in place to recognise prior diabetes learning;
- has processes for collaboration with relevant organisations, associations and other bodies where appropriate, for example, by providing clinical experience;
- integrates theory, research and clinical practice;
- uses reflective practice, problem-solving and decision-making skills.
- is standard and competency-based;
- has appropriate resources required to deliver the curriculum, including the quantity and quality of clinical experience and supervision;
- is delivered by a teacher and faculty with the appropriate education and qualifications to teach the subjects allocated to them;
- has appropriate procedures in place to approve and monitor facilities where clinical experience is undertaken;
- will lead to a qualification in diabetes education upon successful completion of the course;
- equips the students to deal with professional issues, role conflict and the delivery of diabetes education according to the roles they are expected to perform; and

- is clearly defined in the context of the particular society and healthcare system in which the programme is to be delivered (IDF 2002).

Having established these principles, the Consultative Section on Diabetes Education of the International Diabetes Federation developed International Standards for Diabetes Education. These are summarised in Table 2.5 (IDF 2003). The standards in the table have been organised in terms of structure, process and outcome. Structure standards provide the framework for a diabetes service. They describe the personnel, resources and physical structure that should be in place in order to provide a diabetes education service. Process standards describe the process of diabetes education, the steps required in preparing for, implementing and evaluating diabetes education. Outcome standards describe the overall objective of diabetes education. If a service has been successful, it will be able to measure and meet the stated outcome standards.

Table 2.6 provides an overview of the standards and norms for diabetes education programmes that have been developed for people with diabetes in the Americas (Declaration of the Americas Education Task Group 1999). In order to facilitate the achievement of these objectives, the task group developed certain standards and conditions that should be strived for in an educational programme for people with diabetes. Although these standards refer to the programme that will be provided to patients, it nonetheless provides the standards for the educational organisations that would offer such training.

TABLE 2.5: International standards for diabetes education

Structure standards	Organisational support	There is documented evidence of organisational institutional support for education as an integral part of diabetes care.
	Co-ordination	One person will be responsible for the organisation and administration of the diabetes education service in such a way that the process and outcome standards can be met.
	Physical space and equipment	Physical space and education resources are conducive to learning and based on individual/community needs.
	Advisory committee/board	An advisory committee is established to ensure that the views and values of all stakeholders are represented in the ongoing planning and delivery of diabetes education.
	The team/teamwork	Teamwork and communication are evident between those providing diabetes education and management.
	Professional skill/continuing education	Personnel involved in diabetes education have a sound clinical understanding of diabetes, are knowledgeable about teaching and learning skills; and diabetes self-management practices.
	Curriculum	Diabetes education covers topics based on individual assessment and fosters acquisition of knowledge leading to self-management of diabetes.
	Community	Relationships are fostered with available community resources such as diabetes associations, the Society of the Blind, and social services.

TABLE 2.5: International standards for diabetes education (Continued)

Process standards	Assessment	Diabetes education is based on the ongoing learner-centred needs assessments of individuals and/or communities.
	Plan	Plans for individual diabetes education and diabetes education programmes are learner-centred and subject to ongoing review and modification.
	Implementation	Implementation of diabetes education is learner-centred and facilitates cognitive learning, behaviour change and self-management and is extended to families, caregivers and communities where appropriate.
	Access	The diabetes education service will be recognised by and accessible to the community.
	Evaluation	The effectiveness and quality of education will be annually assessed, linked to outcomes, and the services will be reviewed on the basis of the assessment.
	Research	Educational and clinical research are undertaken to provide an evidence base for practice.

TABLE 2.5: International standards for diabetes education (Continued)

Outcome standards	Community – primary prevention	Communities are aware of risk factors for the development of diabetes and actions that may delay the onset of diabetes mellitus and its potential complications.
	Community - support	Communities are aware of the different types of diabetes mellitus and the needs and support available for individuals living with diabetes.
	Knowledge	People with diabetes will understand, depending on their individual capabilities, how diabetes affects their bodies and the significance of maintaining a healthy lifestyle.
	Application of knowledge	Individuals with diabetes make informed decisions and take deliberate action towards healthy living with diabetes. These decisions occur in the context of their own spiritual and cultural values, socioeconomic needs and resources and desired quality of life.
	Clinical outcomes	The physical, psychological and emotional health of the individual will be improved.

Source: International Diabetes Federation (2003)

TABLE 2.6: Summary of the standards and norms for diabetes education programmes

Education Programme	Standards
I. Organisation	<ol style="list-style-type: none"> 1. Written objectives of the education programme. 2. Provision of necessary resources to achieve the proposed objectives. 3. Composition of the organisation to include the teaching team and its members, a coordinator and an advisory committee.
II. Teaching staff characteristics	<ol style="list-style-type: none"> 4. The personnel of the organisation should meet the following requirements: <ul style="list-style-type: none"> • Specialised knowledge of diagnosis, control and management of diabetes. • The core teaching team to include a physician and/or a nutritionist, a nurse, a diabetes educator or other appropriately trained health care professionals. • Regular meetings of the teaching team with the programme co-ordinator and submission of an annual report to the Advisory Committee.
The coordinator	<ol style="list-style-type: none"> 5. The coordinator will be responsible for overseeing the overall progress of the programme, the planning, implementation and evaluation.

Advisory committee	<p>6. The advisory committee should have the following characteristics and operational modalities:</p> <ul style="list-style-type: none"> • Interdisciplinary and intersectoral integration. • Current experience and understanding of diabetes management. • Regular meetings. • Planning and review of the programme on an annual basis. • Certifying the knowledge, skills, abilities and experience of the educators. • Approving new programmes where necessary.
III. Education programme	<p>7. The programme will aim to ensure accessibility to the overall population to whom it is directed.</p> <p>8. They should guarantee the development of the programme in a systematic and consistent fashion ensuring the continuing education of its participants (educators and learners).</p> <p>9. The target population should be defined with regard to its potential number of patients, type of diabetes, age, language, regional characteristics and special educational needs.</p> <p>10. The curriculum document of the programme should reflect the following:</p> <ul style="list-style-type: none"> • Objectives. • Contents. • Teaching methodology. • Education materials to be used. • Evaluation and assessment instruments.

III. Education Programme (Continued)	<p>11. The education programme should include the following outcomes:</p> <ul style="list-style-type: none"> • General aspects on diabetes. • Psychosocial factors and stress. • Social support and family participation. • Nutrition and exercise. • Diabetes-specific medication and administration and related risk factors. • Self-glucose monitoring. • Relationship between diet, exercise, medication and blood glucose levels. • Prevention, detection and treatment of acute and chronic complications. • Dental, skin and foot care. • Health care in pregnancy and gestational diabetes. • Use of health care system and community resources. • Overview of environmental, work and other activities that influence the management of diabetes.
	<p>12. The educational programme should use methods and materials that are appropriate regarding the characteristics of the target population.</p>
IV. Methodology of teaching	<p>13. The health care team will share the responsibility of the individual teaching of people with diabetes.</p> <p>14. Small group teaching should be encouraged in order to facilitate closer interaction between learner and educator.</p>

V. Evaluation	<p>15. The advisory committee should be responsible for the annual programme evaluation. This evaluation should take into account the following:</p> <ul style="list-style-type: none"> • Programme objectives. • Curriculum, methods and materials. • Composition of the teaching team. • Programme resources and budget. • Marketing strategies. • Effectiveness of the programme based on objective patient/participant outcomes.
	<p>16. Patient outcomes should be assessed according to programme objectives,</p>

Source: Declaration of the Americas Education Task Group (1999)

2.11.2 An overview of international diabetes education programmes

A review of the internet and available literature reveals an abundance of academic programmes that have been developed for the purposes of diabetes education. These education programmes range from short courses or certificate programmes through to post-graduate diplomas and Master's degrees. The institutions offering such programmes also vary from private colleges, associations and diabetes support groups to research institutes and established universities. Some institutions offer the programmes as part of a nursing curriculum or programme, whilst others offer diabetes education programmes as a separate entity in a Health or Health Sciences Faculty.

Diabetes education programmes can be found almost universally, with well-established programmes being offering in countries such as Australia, the United Kingdom, and the United States of America. In Australia, three

Universities offer courses in diabetes education (Western Australia Department of Health 2005). The School of Nursing and Midwifery at Curtin University of Technology offers both a Graduate Certificate in Diabetes Education as well as a Graduate Diploma in Health Sciences specialising in Diabetes Education. The Schools of Nursing and Health Sciences at Deakin University also offer a Graduate Certificate in Diabetes Education, whilst the Sydney University of Technology offers a Graduate Certificate in Diabetes Education and Management in its Faculty of Nursing, Midwifery and Health Sciences.

Although each university has its own curriculum for each qualification, most programmes include the following general areas of study:

- The clinical management of diabetes.
- Diabetes as part of primary health care.
- Programming for diabetes education.
- Teaching and learning in diabetes education.

Each programme also offers some level of research/research methodology, either as a separate subject or as an integrated component depending on the level of the coursework. In the United Kingdom, courses in diabetes education range from part-time short courses as offered by Buckingham Chilterns University College (2005) to full research and coursework Master's degrees.

At the certificate level, the Faculty of Health at the University of Central Lancashire (2003) in the United Kingdom offers a University Advanced Certificate in Practice of Diabetes Management. This part-time programme

covers the development and administrative management of diabetes care programmes, the professional's role in managing drug treatments, the needs of specialist patient groups, as well as educational approaches to diabetes care and standards, quality and guidelines in diabetes care.

The University of Warwick in Coventry (2004a), the United Kingdom, offers the Post-graduate Diploma in Diabetes Care, the successful completion of which could lead to further study to obtain a Master's degree in Applied Health Studies in Diabetes Care (2004b). Both the Post-graduate diploma as well as the Master's degree programme has core modules comprising principles of diabetes care, organisation and delivery of diabetes care, as well as research in primary health care. Two optional modules are then required in order to obtain the post-graduate diploma, whilst the Master's degree requires four to five additional modules as well as a research dissertation.

Other institutions in the United Kingdom offering post-graduate diplomas and Master's degree in diabetes education include Roehampton University, which offers a certificate, a post-graduate diploma and an M.Sc. degree. Learning outcomes are clearly stated for each level of study with the required research components forming the basis of the M.Sc. level qualification.

There are also a number of institutions in other locations offering similar programmes. The University College Dublin, Ireland (2001) offers a Higher Diploma in Nursing Studies (Diabetes Nursing) where modules reflect learning outcomes in the areas of diabetes nursing, nursing research, biological sciences, health promotion, and health education.

In Singapore, the School of Health Sciences at Nanyang Polytechnic offers a Post-graduate Diploma Certificate in Nursing – Diabetes Nurse Educator (Nanyang Polytechnic 2004). This part-time course for registered nurses which lasts 10 months aims to develop competencies for nurses to enhance their career development within the health care industries. Modules for the course include biological sciences, medications for diabetes mellitus, aspects of diabetes management, case management, as well as nursing education and research.

The Chinese University of Hong Kong (2004) also offers both a Certificate Course as well as a Professional Diploma Programme in Diabetes Management and Education. Module one of the certificate course comprises an overview of the diagnosis and management of diabetes mellitus with particular emphasis on application of knowledge and the acquisition of practical skills. Module Two consists of case studies, interactive discussions and practicals in order to demonstrate the principles of diabetes management. The Professional Diploma thereafter continues with a series of clinical attachments for students to gain in-depth understanding of the complexity and multi-disciplinary nature of diabetes management and education and finally concludes with a module on diabetes research and its relevance to clinical management

Finally, the United States of America has a multiplicity of programmes for diabetes education also ranging from short courses and modules to formal diplomas and degrees. These courses are provided by private training institutions, research institutes, colleges and universities. It is beyond the scope of this research to review every programme offered, but it would be sufficient to note that the review of programmes and qualifications conducted

so far would be representative of and similar to those programmes offered in the United States.

2.11.3 South African diabetes education programmes

A review of the literature and a comprehensive search through the database of the South African NQF does not reveal the existence of any post-graduate programmes aimed specifically at training health care workers in diabetes education or for the management of the ocular complications of diabetes in South Africa. There is, however, a Further National Certificate in Diabetes Nursing available from the Rand Afrikaans University (2003). This 120-credit programme at NQF Level 5 aims to provide qualifying learners with the competencies required to function as a clinical diabetes mellitus nurse practitioner. The core modules of the curriculum include:

- National health profile, prevention and diagnosis.
- Monitoring and management procedures and treatment modalities.
- Lifestyle modifications and complications of diabetes mellitus.
- Clinical practice.

Exit level outcomes for this qualification are reflected in Table 2.7 as registered with SAQA (SAQA 2003). The outcomes describe what the learners should be able to do upon successful completion of the National Certificate in Diabetes Nursing and are indicated as follows:

**TABLE 2.7: Exit level outcomes for the National Certificate in
Diabetes Nursing**

EXIT LEVEL OUTCOMES	
1.	Effectively assess, analyse, interpret, diagnose, prioritise, solve, reflectively evaluate and report clinical/health problems based on relevant frameworks/standards (knowledge, skills and attitudes/values).
2.	Effectively practice, in accordance with the professional and legal framework (knowledge, skills and attitudes/values) as a member of the health team.
3.	Participate as a competent, responsible, professionally accountable and reflective member of the clinical health team.
4.	Participate as a member of the research team within the clinical environment, based on the knowledge, professional and legal frameworks.
5.	Demonstrate interpersonal communication skills, attitudes/values and communicate effectively in verbal and written format as a member of the health team.
6.	Effectively utilise technology in the design, implementation and reflective evaluation of clinical programme.
7.	Address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration.
8.	Explore and reflect on a variety of learning and problem-solving strategies in relation to clinical advancement as a lifelong professional learner.
9.	Participate as a responsible, professionally accountable and reflective member of the clinical team in empowering the community.
10.	Demonstrate cultural and aesthetic sensitivity in the design, implementation and reflective evaluation of clinical programme.
11.	Explore clinical, managerial and educational career opportunities as a reflective leader.
12.	Identify, explore and evaluate reflectively new options for clinical advancement in the interest of health care.

Source: SAQA (2003)

A different form of education programme which does not lead to a formal qualification is the in-service training programme in diabetes education, provided by three full-time specialist diabetes education nursing Sisters at the Groote Schuur Hospital in Cape Town, South Africa (Groote Schuur Hospital 2000). This programme aims to provide efficient instructions to thousands of patients regarding self-care management of diabetes as well as formal instruction to junior and senior nursing staff as part of the in-service training programme.

What is evident, based on a thorough literature review both internationally and in South Africa, is that although there may be a number of diabetes education programmes for health care workers, there are no programmes currently available for health care workers that have been specifically developed for the prevention and management of the ocular complications of diabetes. The final section of this chapter will therefore deal with the need for a comprehensive education programme for health care workers to prevent and manage the ocular complications of diabetes.

2.12 THE NEED FOR AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This chapter has provided an overview of the various educational programmes that deal with the training of nurses and health care workers in diabetes education. Some of these programmes also deal with patient education in diabetes where patients are educated and counselled on the effects of diabetes and how to deal with this medical condition for the rest of their lives. What is evident from the literature review is that, although there are a great number and variety of diabetes education programmes, there is

very limited information available on the existence of education programmes that deal specifically with the ocular complications of diabetes.

One of the few initiatives reviewed in the literature study is the diabetic retinopathy education project developed by the Lions Club International (2002). This education and prevention programme focuses on the Latino population of Southern California and features free educational material and free eye screenings conducted by health care professionals. Further details and information on the programme and its outcomes achieved so far have not yet been published.

In reviewing the literature it has become apparent that there is a great need, particularly in South Africa, for an educational programme that will train nurses and other health care workers not only in diabetes education, but - more specifically - in the ocular complications that may arise in diabetic patients. This is substantiated by the fact that the epidemiological statistics for the prevalence of diabetes (RSA DoH 1999) demonstrates that this disease is on the rise in South Africa and affects significant numbers of the South African population.

The development and provision of such an education programme for the prevention and management of the ocular complications in diabetic patients will constitute a fundamental shift in the way diabetic patients are managed and treated and will expand the skills and expertise of health care workers treating such patients. Ultimately the lives of the patients, as well as those of their families and support systems, will be significantly improved by the initiatives of this programme that will aim to prevent devastating sight loss, which is frequently an inevitable consequence of poorly managed diabetes.

2.13 CONCLUSION

This chapter has provided a review of the literature consulted for this study. All aspects of curriculum and programme development were discussed in this chapter together with a review of the types of diabetes education programmes currently available. The processes for developing academic programmes in South Africa together with a review of the higher education landscape were also reviewed.

The following chapter, Chapter 3, will deal with the medical condition of diabetes, including the ocular conditions arising from diabetes, which is the primary focus of this study. The Chapter will outline the prevalence of diabetes both locally and internationally, as well as the management and treatment options for the disease. A full description of the socio-economic consequences of this disease and its ocular complications will also be provided.

CHAPTER 3

DIABETES AND DIABETIC EYE DISEASE

3.1 INTRODUCTION

This chapter will aim to comprehensively review the medical condition of diabetes, including its causes and systemic effects, as well as the effects of this condition on the human eye. The chapter will also attempt to demonstrate the multitude of effects that diabetes has both medically, as well as socio-economically, on the patient. It will therefore serve to emphasise the need for an extensive education programme, about the disease and its ocular effects, for diabetic patients and healthcare workers.

3.2 OVERVIEW OF DIABETES MELLITUS

According to Feman (1992:53), diabetes mellitus is a chronic disorder that is characterised by hyperglycemia, associated with major abnormalities of carbohydrate, fat and protein metabolism, and is accompanied by a marked propensity to develop relatively specific forms of renal, ocular, neurological and premature cardiovascular diseases.

Waugh and Grant (2001:234) simply refer to diabetes mellitus as being "...due to a deficiency or absence of insulin activity (insulin resistance) causing varying degrees of disruption of carbohydrate and fat metabolism." Dobbins (1999:2) similarly defines diabetes as "a chronic disorder characterised by a deficiency of insulin secretion and/or insulin effect, which causes hyperglycemia, disturbances of carbohydrate, fat and protein metabolism, and a constellation of chronic complications." It is this inability to

metabolise carbohydrates, fats and proteins that leads to the multitude of both chronic and acute complications associated with the disease.

Having thus established the basic description of diabetes, we can also classify individuals with diabetes as having one of two clinically and pathogenetically different types. These are Type I or insulin-dependent diabetes mellitus (IDDM) or Type II, non-insulin-dependent diabetes mellitus (NIDDM).

3.2.1 Classification of diabetes

Diabetes mellitus can be classified according to two main categories, namely non-pregnant adults and children. This classification is also indicative of the pathophysiological development of the disease.

3.2.1.1 *Type I, insulin-dependent diabetes mellitus*

This occurs mainly in children and young adults and the onset is usually sudden (Waugh & Grant 2001:234). The deficiency or absence of insulin is due to the destruction of β -islet cells, and although the causes for Type I diabetes are unknown, there is frequently a familial tendency which suggests that there is a genetic involvement. According to Waugh and Grant (2001:234) an autoimmune reaction occurs in many cases in which autoantibodies to β -islet cells are present. Antibodies to viruses are also present in some cases and these may destroy the β -islet cells directly or by means of an autoimmune mechanism.

3.2.1.2 *Type II, non-insulin-dependent diabetes mellitus*

Type II diabetes is the most common form of diabetes and, according to Waugh and Grant (2001:235), accounts for about 90% of all cases. Most patients who develop this form of diabetes are either overweight or obese

and it tends to develop in women over 75 years of age and men over 65 years. Insulin secretion may be below or above normal and the deficiency of glucose inside body cells may occur when there is hyperglycaemia and a high insulin level. This may be due to changes in cell membranes, which subsequently block the insulin-assisted movement of glucose into the cell, commonly referred to as insulin resistance.

Although diabetes has thus far been classified according to Type I or Type II, a further additional category of diabetes can be suggested and this would be termed secondary diabetes, since it usually occurs as a result or complication of a prior condition. Secondary diabetes may develop as a complication of acute and chronic pancreatitis or even through the effects of certain drugs, such as corticosteroids. Other hormonal disturbances involving hypersecretion of growth hormone, thyroid hormones, cortisol or adrenaline may give rise to the disease and pregnancy, also known as gestational diabetes is known to be a contributing factor (Waugh & Grant 2001:235).

The latest criteria for the diagnosis of diabetes mellitus are described in Table 3.1. The criteria for the diagnosis of gestational diabetes mellitus (GDM) are also presented in Table 3.2 as follows:

TABLE 3.1: Criteria for the diagnosis of diabetes mellitus

CRITERIA FOR DIABETES MELLITUS
<ul style="list-style-type: none"> • Symptoms of diabetes plus casual plasma glucose concentration ≥ 200 mg/dl (11.1 mmol/l). Casual is defined as any time of day without regard to time since last meal. The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss; <li style="text-align: center;">or • Fasting plasma glucose ≥ 126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h; <li style="text-align: center;">or • 2-h postload glucose ≥ 200 mg/dl (11.1 mmol/l) during an Oral Glucose Tolerance Test. The test should be performed as described by WHO, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.

Source: American Diabetes Association (2005:S41)

TABLE 3.2: Criteria for the diagnosis of gestational diabetes mellitus

Diagnosis of GDM with a 100-g or 75-g glucose load		
100-g Glucose load	mg/dl	mmol/l
Fasting	95	5.3
1-h	180	10.0
2-h	155	8.6
3-h	140	7.8
75-g Glucose load		
Fasting	95	5.3
1-h	180	10.0
2-h	155	8.6

Source: American Diabetes Association (2005:S42)

Dobbins (1999:2) had a more simplified classification of diabetes and diagnosed diabetes according to the following criteria which refer only to glucose levels:

Fasting Plasma Glucose Level: 126 mg/dL (7.0mM) or greater

Random Plasma Glucose Level: 200 mg/dL (11.1mM) or greater

Oral Glucose Tolerance Test: Greater than 200 mg/dL (11.1mM).

Of greater relevance perhaps would be the diagnostic criteria for diabetes that are applied in South Africa. The South African Department of Health (RSA DoH 1998) as part of its National Programme for Control and Management of Diabetes Type II at Primary Level has the following criteria for the diagnosis of diabetes, namely either, symptoms of diabetes plus random glucose level greater than 11.1 mMol/l, or symptoms of diabetes plus fasting glucose greater than 7.1 mMol/l (plasma) or greater than 6.1 mMol/l (whole or capillary blood).

Of interest is the recent yet very stringent classification of diabetes by McClatchey (2002:339) when he describes "...a fasting blood sugar greater than 125mg/dL (5.0 mMol/l) on two occasions is diagnostic of diabetes mellitus". He substantiates these new stringent criteria by explaining that the revision of the diagnostic criteria was prompted by the findings of the presence of significant macrovascular and microvascular complications at the time of diagnosis when using previous less stringent criteria. Normal fasting blood sugar is now considered to be less than 110 mg/dL, and diabetes diagnosed if levels are more than 126 mg/dL.

3.2.2 Causes, features and pathophysiology of diabetes

3.2.2.1 *Type I, insulin-dependent diabetes mellitus*

Dobbins (1999:2) states that 80% of Type I diabetes occurs before age 20, although it may occur at any age and that insulin deficiency may be of autoimmune pathogenesis, although less commonly, non-immune mediated cases may occur.

Feman (1992:56) supports the cause that Type I diabetes is an autoimmune process initiated by an unknown trigger in genetically susceptible individuals which destroys insulin-secreting β -cells of the pancreatic islets. This process generally requires months to years to destroy sufficient β -cells so that the remaining insulin is inadequate to maintain normal glucose levels. The result is that insulin-dependent diabetes mellitus may be considered to be a disease of absolute insulin deficiency. According to Feman (1992:56) the primary actions of insulin are considered to be to stimulate the uptake and utilisation of glucose by insulin-sensitive tissues, to suppress lipolysis in adipose tissue, to promote protein synthesis, and to suppress glucose production and ketogenesis by the liver.

It is therefore evident from the above actions that insulin deficiency may lead to hyperglycaemia from both inadequate glucose utilisation as well as from excessive hepatic glucose production.

3.2.2.2 *Type II, non-insulin-dependent diabetes mellitus*

Type II diabetes is different from Type I Diabetes in that it is not the result of absolute insulin deficiency, but it may rather be considered to be as a result of insulin resistance (Feman 1992:63; and Dobbins 1999:6).

Three factors appear to be important for the development of Type II diabetes mellitus, these being genetic susceptibility, ageing, and obesity. Of these three factors, genetic susceptibility appears to be the most essential component, as evidenced by studies which show that the majority of the elder obese population does not develop Type II diabetes mellitus (Feman 1992:64).

Almost all Type II diabetic patients have a strong family history of the disease consistent with autosomal dominant inheritance. However, the association between ageing, obesity and Type II diabetes may also be interrelated. Obesity exacerbates insulin resistance in susceptible individuals, whereas weight loss can improve glucose tolerance in these same patients. Glucose tolerance deteriorates with ageing, at the same time as the proportion of body fat is increasing, even if body weight remains constant. According to Dobbins (1999:6), other important factors associated with Type II diabetes are hypertension and atherosclerosis.

3.2.3 The effects of diabetes mellitus on the human body

Waugh and Grant (2001:235) describe four main effects that uncontrolled diabetes mellitus has on the body, namely raised blood glucose levels, glycosuria and polyuria, weight loss, and ketoacidosis. These are described in further detail as follows by Waugh and Grant (2001:235):

- Raised blood glucose level

After the intake and consumption of carbohydrates, the blood glucose levels remain high because the glucose uptake and its use by body cells is defective. In addition, the conversion of glucose to glycogen in the liver and

muscles is diminished and there is gluconeogenesis (biosynthesis of new glucose) from protein in response to the deficiency of intracellular glucose.

- Glycosuria and polyuria

During the process of filtration in the kidneys, not all of the glucose is reabsorbed by the tubules and the remaining glucose in the filtrate causes the water reabsorption to be reduced and the volume of urine that is produced to increase. This causes an electrolyte imbalance and the resulting polyuria (excessive formation and passing of urine) leads to hypovolaemia and polydipsia (extreme thirst).

- Weight loss

In diabetes, the cells fail to metabolise glucose in the normal manner, resulting in weight loss due to gluconeogenesis from amino acids and body protein. This causes tissue wasting and tissue breakdown in the body and a further increase in blood glucose.

- Ketoacidosis

The consequence of this in the body is hyperventilation and the secretion of excess bicarbonate. The acidification of urine leads to excessive loss of water, ammonia, sodium and potassium. The resulting low blood pH or acidosis, electrolyte imbalance and high plasma osmotic pressure, can then ultimately lead to coma (Waugh & Grant 2001:235).

3.3 THE EPIDEMIOLOGY OF DIABETES

3.3.1 Global epidemiology of diabetes

According to the International Diabetes Federation (IDF) (2001:7), globally an estimated 151 million people between the ages of 20-79 have diabetes

and this figure is on the increase. The following Table 3.3 reflects the prevalence of diabetes globally, as well as in Africa, and classifies the prevalence of diabetes by age group, type and location. It appears that the current prevalence of diabetes in Africa is lower than the global average. However, in Africa and, in particular South Africa, the prevalence of diabetes is on the rise (RSA DoH 2002:12).

TABLE 3.3: The epidemiology of diabetes mellitus

DIABETES MELLITUS (DM) FOR THE 20-79 YEAR AGE GROUP		
REGION	NO. OF PEOPLE WITH DM (000's)	PREVALENCE %
GLOBAL	150,916.3	4.6
AFRICA	2,532.9	1.2
TYPE 1 DIABETES MELLITUS (DM) FOR ALL AGE GROUPS		
GLOBAL	4867.04	0.09
AFRICA	101.57	0.02

Source: International Diabetes Federation (2001:11)

3.3.2 Epidemiology of diabetes in South Africa

The Western Cape population comprises approximately 10% of the total South African population, with a recorded population of 4 187 035 in 1999 according to Statistics South Africa Online (RSA 1996). The provincial profile by race group, however, is notably different in the Western Cape Province from that of the country as a whole. People identified as African, form only 21% of the population compared to the national average of 77%. Yet those identified as Coloured form 54% of the provincial population compared to the national average of 7%.

This is an important factor to consider when reviewing the prevalence of diabetes in the South African and in the Western Cape population. Other important considerations are also the socio-economic profile of the population of the Western Cape, including its education levels and income generating ability. The Western Cape Province is divided into four health regions, namely Cape Metropole (comprising 65% of the Western Cape Population), West Coast/Winelands (13%), Southern Cape/Karoo (11%) and the Boland/Overberg (11%) (RSA 1996).

Table 3.4 demonstrates the prevalence of non-communicable diseases in the Western Cape and South Africa, as well as other factors which may contribute to such diseases. Significantly, those factors affecting diabetes and diseases of lifestyle, notably smoking, hypertension and obesity are more prevalent in the Western Cape than they are in the rest of South Africa.

Although the figures quoted in Table 3.4 do not distinguish between Type I and Type II diabetes, the stated prevalence of 3.2% and 2.4% for the Western Cape and South Africa respectively, are nevertheless indicative of a very serious public health issue. The figures are also much higher than the average prevalence values for Africa as a whole, which reflects the belief that diabetes, and particularly Type II diabetes, is largely a disease of lifestyle both in terms of poor dietary habits and insufficient exercise.

TABLE 3.4: The prevalence of non-communicable diseases in the Western Cape and in South Africa

VARIABLES	WESTERN CAPE	SOUTH AFRICA
	%	%
SMOKING IN ADULTS		
Men	49	42
Women	29	11
DISEASE		
Ischaemic Heart Disease	2.8	2.9
Hypertension	9.2	7.9
Diabetes	3.2	2.4
OBESITY		
Men	12.8	9.1
Women	30.8	29.4

Source: RSA DoH (1999)

In 1996 research was conducted in order to investigate the prevalence of Type II diabetes mellitus and its risk factors in a working class peri-urban community in the Western Cape province of South Africa (Levitt, Steyn, Lambert, Reagon, Lombard, Fourie, Rossouw & Hoffman 1999:946-950). A cross-sectional study was conducted on persons aged 15 years and older, who were resident in randomly selected houses in Mamre, 55km from Cape Town. The subjects underwent a 75g oral glucose tolerance test, and then the World Health Organization's criteria were used to diagnose whether the subjects were diabetic or not.

The data obtained showed that the crude prevalence of Type II diabetes was 7.1%; that the impaired glucose tolerance test was 8.0%; and that the age-

adjusted prevalence of Type II diabetes was 10.8% (Levitt *et al.* 1999:948). This indicated a disturbing trend of an increasing prevalence of diabetes and, furthermore, that it affects a significantly large proportion of the population to constitute a serious public health issue for all the people in the Western Cape and in South Africa.

This is supported by a more recent publication, namely *The National Guidelines for the Prevention of Blindness in South Africa* (RSA DoH 2002:12) which quotes a much higher prevalence of diabetes in South Africa. The stated prevalence of diabetes in South Africa among Indians is believed to be 11-13%, while among Africans it is 5% and increasing. Significantly, 90% of diabetes that occurs in South Africa is Type II according to *The National Guidelines* (RSA DoH 2002:12).

3.3.3 Global epidemiology of diabetic retinopathy

Exact figures for the prevalence and epidemiology of diabetic retinopathy vary greatly, not least of all because of the various ways of classifying the extent of the retinopathy, but also due to the variety of different population groups that it occurs in. However, the overall prevalence of diabetic retinopathy in the widely quoted Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR) during 1980 to 1982 was estimated to be 50.1% (Klein, Klein, Moss, Davis & DeMets, 1984a:520-526). Their studies demonstrated that younger-onset diabetic people had the highest frequency of retinopathy whilst older-onset people not taking insulin had the lowest frequencies, which would suggest that the occurrence of retinopathy has a direct correlation with the duration of the diabetes.

Further examination of the data by Klein, Klein and Moss *et al.* (1984b:527-532) revealed the frequency of any retinopathy at about 19% after three to four years among people with Type I diabetes, and at about 24% among those with Type II diabetes.

Similar prevalence rates have been established more recently in Australia by Tapp, Shaw, Harper, De Courten, Balkau, McCarty, Taylor, Welborn and Zimmet (2003:1731-1737). Their study determined that the overall prevalence of diabetic retinopathy in diabetic patients was 15.3%. The prevalence of retinopathy was 21.9% in those with known Type II diabetes and 6.2% in those newly diagnosed. The prevalence of proliferative diabetic retinopathy was 2.1% in those with known Type II diabetes and no cases of proliferative diabetic retinopathy was found in newly diagnosed patients. Tapp *et al.* (2003:1737) therefore concluded that their study had found that the prevalence of retinopathy was similar to that in other population-based studies and was significant in that it was one of the first national studies of diabetic retinopathy in a developed country.

3.3.4 Epidemiology of diabetic retinopathy in South Africa

According to *The National Guidelines for the Prevention of Blindness in South Africa* (RSA DoH 2002:12), approximately 90% of diabetes that occurs in South Africa is Type II, and in these cases retinopathy may well be established before the diabetes is eventually diagnosed. In South Africa, diabetic retinopathy accounts for 8% of blindness, which is a figure that is also on the increase. The prevalence of blindness due to diabetic retinopathy in any particular health region may, however, vary, and would also possibly depend on the demography of the region. Large-scale studies on the

prevalence rates of diabetic retinopathy in the Western Cape or in South Africa have as yet not been conducted.

What is certain, however, is that - due to the lack of access to comprehensive eye care and the great prevalence of diabetes in the South African population - a great deal of sight-threatening diabetic retinopathy is likely to develop in large numbers of the population.

3.4 RISK FACTORS FOR DEVELOPING DIABETES MELLITUS

3.4.1 Risk factors for developing Type I diabetes

Fantus, Delovitch and Dupré (1997:184) state that no known modifiable risk factors exist for acquiring Type I diabetes in children and the youth. Non-modifiable risk factors for developing Type I diabetes include race and ethnic background, age and genetic susceptibility.

3.4.2 Risk factors for developing Type II diabetes

Non-modifiable risk factors for Type II diabetes are similar to Type I, that being age and family history (Levitt *et al.* 1999:949). Potentially modifiable risk factors include upper-segment body fat distribution and physical inactivity. Studies by Levitt (1999:946-950) further concluded that waist circumference for visceral fat was a more important determinant of Type II diabetes than obesity *per se*. The Mamre study by Levitt *et al.* (1999:950) supports this with their study indicating that age, waist circumference, low total energy expenditure, as well as family history of diabetes were independent risk factors for Type II diabetes, whilst sex (gender), obesity and regular alcohol consumption were not.

3.4.3 Risk factors for developing diabetic retinopathy

The following risk factors have been identified as having an influence on the incidence and progression of diabetic retinopathy:

- **Sex**

Klein *et al.* (1984a:520) in the Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR) found that younger-onset males had a higher frequency of proliferative retinopathy than younger onset females. However, there were no significant differences in the four-year progression of diabetic retinopathy between the sexes (Klein, Klein, Moss, Davis & DeMets 1989a: 237-243) and (Klein *et al.* 1989b:244-249). A study over six years from diagnosis by Stratton, Kohner, Aldington, Turner, Holman, Manley and Matthews (2001:163), however, found that diabetic retinopathy in Type II diabetes was also associated with male sex.

- **Race**

Race has been identified as being a non-modifiable risk factor in the incidence of diabetes (Fantus *et al.* 1997:206). Evidence of this was reported in South Africa by Motala, Pirie, Gouws, Amod and Omar (2003:23-30) who determined that South African Indians have a high prevalence of Type II diabetes. Although, as previously stated, no large-scale studies have been conducted in South Africa on the risk factors predisposing to diabetic retinopathy, the fact that race is a non-modifiable risk factor for diabetes indicates that it would consequently be an indirect risk factor for diabetic retinopathy.

- **Genetic factors**

The relationship between genetic factors and the prevalence and severity of diabetic retinopathy is controversial. However, evidence supporting such a link is the observation that retinopathy occurs more frequently in identical twins having diabetes (Feman 1992:17). The severity and onset time of retinopathy among identical twins is similar, thus suggesting that genetic factors do in fact influence the development of retinopathy.

- **Duration of diabetes**

Studies from the Wisconsin Epidemiologic Study of Diabetic Retinopathy (Klein *et al.* 1984:523) demonstrate that the duration of diabetes has a definite influence on the frequencies of any retinopathy, proliferative retinopathy and macula oedema, and that these relationships are almost universally found. Feman (1992:18) and Kanski (1999:465) both cite the duration of diabetes as being the most important risk factor for the development of retinopathy. Statistics by Feman (1992:18) show that, for people who have had diabetes for over 20 years, 99% had retinopathy, and after 30 years of diabetes, 56% had proliferative retinopathy.

Kanski (2003:439) also concludes that the duration of diabetes is the most important factor in the prevalence and epidemiology of diabetic retinopathy. His rates of prevalence are similar when suggesting that in patients diagnosed with diabetes before the age of 30 years, about 50% of people have retinopathy after 10 years of diabetes, while after 30 years this figure rises to a critical 90%. He also confirms that retinopathy rarely develops within five years of the onset of diabetes, but about 5% of Type II diabetics have retinopathy when they present for examination. According to Mitchell and Moffit (1990:17), the rate of proliferative disease in Type I diabetics rises

from approximately 0% - 4% after 10 years to 27% - 50% after 20 years duration. Maculopathy also increases with duration of diabetes, from an approximate prevalence of 12% after 10-14 years to 26% after 30 years.

In Type II diabetic patients, there is also a rise in the prevalence of retinopathy with increasing duration (Mitchell and Moffit 1990:17). With less than five years of diabetes, there is an 18% prevalence rate of retinopathy, which rises to 76% after 30 or more years of diabetes. Interestingly, in this group of Type II diabetic patients, the authors of this study found 13% of patients to have retinopathy at first diagnosis of diabetes, and 3% of patients had clinically significant macula oedema or high-risk proliferative retinopathy at first diagnosis. It is important to note that, according to Mitchell and Moffit (1990:17), maculopathy occurs frequently with increasing duration in Type II diabetic patients; the presence of maculopathy in such patients was found to be twice as frequent as in Type I patients according to them.

- **Age**

Feman (1992:22) suggests that diabetic retinopathy is rare in children prior to puberty, regardless of the duration of diabetes. There is, however, a higher incidence of diabetic retinopathy after puberty. This may be as a result of hormonal changes, secondary growth factors, elevations in sex hormones, or due to poor glycaemic control that occurs around the time of puberty (Feman 1992: 24-25). This has also been confirmed in Type II diabetes by a study by Stratton *et al.* (2001:156-163), which likewise found that diabetic retinopathy was associated with older age.

- **Age at diagnosis**

There are conflicting reports regarding the effect of age at diagnosis on the occurrence of diabetic retinopathy. Klein *et al.* (1984a:526) in the Wisconsin Epidemiologic Study of Diabetic Retinopathy found that younger age at diagnosis was not found to increase the incidence or progression of diabetic retinopathy. However, a study of risk factors for diabetic retinopathy in Minnesota, USA by Ballard, Melton, Dwyer, Trautmann, Chu, O'Fallon and Palumbo (1986:342), found that age at diagnosis was significantly and inversely related to the development of retinopathy.

It is an important consideration that, since Type I diabetes is usually diagnosed soon after onset, there is less chance of diabetic retinopathy developing in these patients in the first few years, whereas - since Type II diabetes has a more insidious onset - one can have the condition for a prolonged period of time before the diabetes is diagnosed. This would then allow diabetic retinopathy to develop over that prolonged time period in Type II patients.

- **Hyperglycaemia**

A number of epidemiological studies cited by Feman (1992:25-28) suggest a causal relationship between glycemic control and retinopathy, but do not necessarily prove the relationship. This relationship may be due to the parallel effects of more severe diabetes and therefore further randomised clinical trials would be necessary to prove this relationship. Clinical trials by the Kroc Collaborative Study Group (1984:365-372) have failed to demonstrate that control of blood sugar prevents the occurrence or progression of retinopathy.

A study by the Diabetes Control and Complications Trial (DCCT) Research Group was published in 1993 and established that optimal blood glucose levels or good diabetic control can in fact reduce the development and progression of retinopathy (DCCT Research Group 1993:977-986). Among people with pre-existing retinopathy, the progression of retinopathy and the development of severe non-proliferative or proliferative retinopathy were approximately halved over the time of the study by intensive treatment and control of the diabetes. Estimates of the long-term efficacy of intensive therapy suggested a risk reduction for the progression of retinopathy of 80% or more (DCCT Research Group 1993:986).

Further research from the Diabetes Trials Unit, UK (Stratton *et al.* 2001:156-63), supported the concept that the need for good glycaemic control should be emphasised to diabetic patients. Interestingly, a study by Zhang, Krzentowski, Albert and Lefebvre (2001:1279) found that diabetic retinopathy develops in approximately 10% of patients with Type I diabetes under good metabolic control, whereas more than 40% of patients with Type I diabetes remain free of retinopathy despite poor control.

A possible explanation was therefore hypothesised that previous glycaemic exposure as well as body mass index may provide an explanation for this paradoxical situation. Although there may be debatable and inconclusive research on the effects of blood sugar levels on the actual progression of retinopathy, there does appear to be broad consensus, however, that diabetic patients should, as far as possible, try to maintain good control of their blood sugar levels.

This aspect is echoed by Stratton *et al.* (2001:163) who investigated the risk factors relating to the incidence and progression of diabetic retinopathy in Type II diabetic patients. Their results (Stratton *et al.* 2001:163) concluded that the development of retinopathy (incidence) was strongly associated with baseline glycaemia and glycaemic exposure over six years, thereby re-emphasising the need for good glycaemic control.

- **Blood pressure**

The Wisconsin Epidemiologic Study of Diabetic Retinopathy, (Klein *et al.* 1984a:522), found that blood pressure may not be causally related to retinopathy. They suggested that the finding of a relationship in younger-onset but not in older-onset diabetic groups could be explained by differences in the causes of hypertension in these groups. According to Simonson (1988:827), higher blood pressure in younger-onset people may occur as a result of diabetic nephropathy, while in older-onset diabetic patients it is usually as a result of atherosclerotic vascular disease. Significantly, however, Bakris, Sowers, Epstein and Williams (2000:64) suggest that hypertension increases the risk of glaucoma and ischaemic optic glaucoma in diabetics, while controlling blood pressure also significantly reduces progression of diabetic retinopathy.

- **Smoking**

Feman (1992:34) suggests that smoking, by inducing tissue hypoxia and platelet adhesiveness, might be expected to increase the risk of diabetic retinopathy. However, results from clinical trials demonstrate conflicting results and are therefore ongoing and inconclusive. A study by Moss, Klein and Klein (1991:119-126) found that smoking was not a predictor of the incidence or progression of retinopathy in either younger-onset or older-onset

diabetic groups. This has been confirmed by Stratton *et al.* (2001:158) whose clinical trials found that retinopathy progression was associated with not smoking.

- **Proteinuria and renal disease**

Studies cited by Feman (1992:35) suggest that diabetic nephropathy has been strongly associated with diabetic retinopathy. Diabetic nephropathy may lead to rheological, lipid and platelet abnormalities, which have been hypothesised to be pathogenetic factors for the development of diabetic retinopathy (Borch-Johnsen & Kreiner 1987:1651).

- **Pregnancy**

In terms of the effects of pregnancy on diabetic retinopathy, a study by Klein, Moss and Klein (1990:34) showed that pregnancy itself was a strong independent predictor of the risk of progression of diabetic retinopathy. After controlling for other risk factors, those who were pregnant had 2.3 times the odds of progression of retinopathy compared to similar women who were not pregnant. Feman (1992:36) supports this finding and suggests that pregnant women should be examined by an ophthalmologist each trimester and seen more frequently if they develop complications that may exacerbate the retinopathy.

- **Body weight**

The effects of body weight on the presence, progression or severity of diabetic retinopathy has not been conclusively linked. However, studies by Levitt *et al.* (1999:946) have shown a link between visceral fat and the propensity towards developing non-insulin dependent diabetes mellitus.

- **Other factors**

There are a number of other factors that have been cited by Feman (1992:36-37) as being considered as risk factors for the development of diabetic retinopathy. Factors such as alcohol consumption and serum lipid levels are still being investigated for their possible effects on the progression of diabetic retinopathy. Other factors that may have an influence include the following:

- **Socio-economic status**

In the South African context, the lack of funding and financial resources to pay for optometric and/or ophthalmological examination may be considered to be a socio-economic risk factor for the development of retinopathy. Diabetic patients should have their eyes examined at least annually in order to exclude the possibility of retinopathy occurring, therefore those patients unable to afford such examinations will be at risk. The geographical location will also contribute to this problem in that patients from rural communities will, in addition, need financial help in order to travel to more urban areas where more comprehensive eye care is available. Furthermore, the mere provision and availability of optometric eye examinations are lacking or non-existent in these areas.

- **Anticoagulant and aspirin use**

Studies by Klein, Klein and Moss (1987:495) found that aspirin usage was not related to diabetic retinopathy and that it also did not increase the risk of vitreous haemorrhage in people with proliferative disease. The study then suggested that there is no contraindication for the use of aspirin in patients with diabetic retinopathy when it is required for other medical conditions.

The Australian Diabetes Society Retinopathy Sub-committee (1996:6) in its position statement on Diabetes and the Eye states that anticoagulant agents such as Warfarin and Streptokinase are not contraindicated for use in diabetic patients. They warn, however, that they should be used in caution with patients having untreated hi-risk proliferative retinopathy because of the risk of vitreous and preretinal haemorrhage. They recommend that all efforts should be made to treat proliferative retinopathy prior to the use of anticoagulants.

- **Cataract surgery**

Studies by Pollack, Doton and Oliver (1991:758) found that there was an increased risk of visual loss from diabetic retinopathy following uncomplicated cataract surgery. They recommended that any retinopathy should be completely assessed prior to surgery, and that fluorescein angiography should be undertaken to evaluate the retina if the cataract was so advanced as to make clinical assessment difficult.

- **Carotid artery disease**

The Australian Diabetes Society Retinopathy Sub-committee (1996:7) also notes that there is an increased likelihood that patients with diabetes will have carotid artery disease and ischaemic heart disease. A significant unilateral carotid artery obstruction may produce marked asymmetry of diabetic retinopathy, while generalised ocular ischaemia may develop in cases of severe carotid artery obstruction.

3.5 SYSTEMIC COMPLICATIONS OF DIABETES MELLITUS

According to Dobbins (1999:17-19), microvascular complications of diabetes mellitus include diabetic retinopathy, diabetic nephropathy, and diabetic

neuropathy. Macrovascular complications include coronary heart disease, cerebrovascular disease, and peripheral vascular disease. The magnitude of the problem is reflected in statistics from Dobbins (1999:20) when it is recognised that diabetic retinopathy is the most common cause of blindness before the age of 65; nephropathy is the most common cause of end stage renal disease (ESRD); neuropathy is the most common cause of non-traumatic amputations; and there is a two to threefold increase in cardiovascular disease in diabetic patients. The systemic complications of diabetes mellitus can thus be divided into two broad groups, that being the acute or short-term complications and, secondly, the group of long-term complications of diabetes.

3.5.1 Acute complications of diabetes mellitus

Waugh and Grant (2001:236) explain that the two main acute complications of diabetes mellitus are diabetic ketoacidosis (commonly referred to as diabetic coma or hyperglycaemic coma) and hypoglycaemic coma. The main factors that predispose to the development of hyperglycaemic coma include hypovolaemia and severe dehydration due to persistent polyuria, electrolyte imbalance, and acidosis due to accumulation of ketoacids.

Hypoglycaemic coma occurs when the insulin administered is in excess of what is needed to balance the food intake and expenditure of energy. The resulting glucose deprivation causes disturbed neural function leading to coma. Waugh and Grant (2001:236) then surmise that the condition of hypoglycaemia may therefore be the result of such conditions as:

- accidental overdose of insulin;
- delay in eating after insulin injection;

- vomiting and diarrhoea causing gastrointestinal disturbances;
- increased metabolic rate such as that which occurs during unexpected exercise; or
- an insulin-secreting tumour.

3.5.2 Long-term complications of diabetes mellitus

Rippey (1994:306-309) outlines the morphological long-term complications of diabetes and states that these complications are so widespread as to occur in the pancreas, the vascular system (with microangiopathy and atheroma), the kidney, the eyes, the skin, the nervous system and in the liver. In fact there is hardly an organ in the body that is not affected by long-term diabetes and, according to Waugh and Grant (2001:236), even when the disease is well controlled by insulin and/or diet, changes in blood will still occur.

Waugh and Grant (2001:236) cautions that, in addition to the various types of infection that may occur, as well as the possibility of kidney failure, a large number of cardiovascular disturbances are also likely to occur as a result of long-standing diabetes. Diabetic microangiopathy sequelae are serious and often fatal and these include peripheral vascular disease, myocardial infarction, as well as cerebral ischaemia and infarction. Diabetic microangiopathy changes, which occur as a thickening of the epithelial basement membrane of arterioles, capillaries and venules, may often lead to peripheral vascular disease such as gangrene, ocular retinopathy (the major focus of this research), renal failure, and peripheral neuropathy (Waugh & Grant 2001:236).

3.6 OCULAR COMPLICATIONS OF DIABETES MELLITUS

3.6.1 General ocular complications of diabetes

The general ocular changes that may arise due to diabetes mellitus include the following as outlined by Naidoo (1998:427) and Kanski (2003:14):

- **Refractive changes:** Myopic shifts are seen with elevated blood glucose. A hyperopic shift may be seen when sugar level is placed under control.
- **Visual performance:** These may include reduced acuity, blue-yellow colour defects, abnormal contrast sensitivity and field loss.
- **Nerve palsies:** The third nerve is the most common nerve affected and is usually characterised by sparing of the pupillary fibres.
- **Cornea:** There is a decreased sensitivity of the cornea as well as an alteration in the basement membrane, which retards healing.
- **Cataracts:** Age-related cataractogenesis begins at an earlier age and progresses faster than in non-diabetic patients.
- **Rubeosis irides:** This is a neovascular response to ocular ischaemia secondary to the diabetes and consists of the growth of new blood vessels in and around the iris. This can be responsible for open and closed angle glaucoma.
- **Ocular hypertension and glaucoma:** Even after removing rubeosis irides as a cause of glaucoma, the frequency of glaucoma has been found to be significantly higher in both younger and older diabetic people.
- **Neuro-ophthalmic disorders:** This would include non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders.
- **Skin and eyelid disorders:**
Infections may frequently occur around the skin of the eyelids and xanthelasma may also occur in this region. Xanthelasma are yellow

tumour-like nodules or subcutaneous plaques, usually containing cholesterol and lipids and are located on the medial aspect of the superior and inferior eyelids.

- **Ocular retinopathy:** This is as detailed in the following description of diabetic retinopathy.

3.6.2 Diabetic retinopathy

Rippey (1994:309) summarises the effects of diabetic retinopathy to include the thickening of retinal vessel basement membranes and the narrowing of the vessels themselves. Other features of retinopathy would include exudates and haemorrhages, focal dilatation of small vessels and micro-aneurysms, as well as new vessel formation, which would then be termed proliferative retinopathy.

3.6.3 Pathogenesis of ocular retinopathy

According to Kanski (1999:465-466), diabetic retinopathy is a microangiopathy affecting the precapillary arterioles, capillaries and venules of the eye. Larger vessels of the eye may also be involved and retinopathy has features of both microvascular occlusion and leakage.

According to Kanski (1999:466), microvascular occlusion comprises the following aspects: The pathogenesis is due to capillary changes, including thickening of the basement membrane, endothelial cell damage and proliferation of new blood vessels. This is followed by deformation of red blood cells, leading to decreased oxygen transport, and thereafter changes in platelets occur leading to increased stickiness and aggregation.

Kanski (1999:466) further explains that the main effects and consequences of retinal hypoxia include arteriovenous shunts often referred to as intra-retinal microvascular abnormalities (IRMA), as well as neovascularisation which is thought to be caused by growth factors such as the vascular endothelial growth factor (VEGF). This occurs due to an attempt by the blood vessels to revascularise hypoxic areas of the retina.

In terms of the macrovascular leakage, Kanski (1999:466) outlines the pathogenesis as being due to a reduction in pericytes, which are responsible for the distension of capillary walls and the breakdown of the blood-retinal barrier. This then leads to the leakage of plasma constituents into the retina. As a consequence, this increased vascular permeability results in intraretinal haemorrhage and oedema. Initially there is diffuse retinal oedema, which is caused by extensive capillary dilation and leakage, and thereafter localised retinal oedema occurs caused by focal leakage from microaneurysms and dilated capillary segments. Over time this leads to the deposition of hard exudates (Kanski 1999:466).

3.6.4 Classification of diabetic retinopathy

Various authors and organisations have attempted to classify diabetic retinopathy. Originally diabetic retinopathy was classified according to whether it was background retinopathy, preproliferative retinopathy or in the proliferative stage (Kanski 2003:441).

3.6.4.1 *Background diabetic retinopathy*

The clinical features of background diabetic retinopathy as outlined by Kanski (2003:441-452) include the following:

i. Microaneurysms

These are located in the inner nuclear layer of the retina, are the earliest clinically detectable lesions of retinopathy, and appear as tiny round red dots often appearing temporal to the fovea.

ii. Hard exudates

These lie within the outer plexiform layer of the retina and appear as waxy yellow lesions with relatively distinct margins, often arranged in clumps or rings, and often exhibiting microaneurysms in its centre.

iii. Retinal oedema

This is initially located between the outer plexiform and inner nuclear layers, but later involves the inner plexiform and nerve fibre layers until eventually the entire thickness of the retina becomes oedematous. With further accumulation of fluid, the fovea appears cystoid and is then termed cystoid macular oedema (CMO).

iv. Haemorrhages

These arise from the venous end of capillaries and are located higher in the compact middle layers of the retina. They give rise to a larger red dot and blot appearance than with microaneurysms (Kanski 2003:441-452).

3.6.4.2 *Preproliferative diabetic retinopathy*

Kanski (2003:441-452) summarises the clinical features of preproliferative diabetic retinopathy to include the following:

i. Cotton wool spots

These appear as small whitish fluffy superficial lesions, which obscure underlying blood vessels. They represent focal infarcts or ischaemic areas of the retinal nerve fibre layer due to occlusion of pre-capillary arterioles.

ii. Intraretinal microvascular abnormalities (IRMA)

These appear as very fine red lines that run from retinal arterioles to venules and represent focal areas of flat retinal new vessels. The main features of IRMA are their intraretinal location, their failure to cross major retinal blood vessels, and the absence of leakage on fluorescein angiography.

iii. Venous and arterial changes

This involves the dilatation, looping, beading and sausage-like segmentation in the veins of the retina and the narrowing, silver wiring and obliteration of the arteries.

iv. Dark blot haemorrhages

These represent haemorrhagic retinal infarcts and are located in the middle retinal layers thus giving rise to the dark colour of the haemorrhage (Kanski 2003:441-452).

3.6.4.3 Proliferative diabetic retinopathy

In addition to all the signs and features of background and preproliferative diabetic retinopathy, the hallmark of proliferative diabetic retinopathy is neovascularisation. According to Kanski (2003:447), it is estimated that about one-quarter of the retina has to be non-perfused before proliferative diabetic retinopathy develops. The clinical assessment involves determining whether the proliferation of neovascularisation is at the disk (NVD) or whether the

neovascularisation is elsewhere on the retina (NVE). Another particularly important feature of proliferative diabetic retinopathy is the occurrence of fibrosis associated with neovascularisation. This is due to the fact that this fibrosis can contribute to tractional retinal detachment.

Kanski (2003:447) suggests that other complications of proliferative diabetic retinopathy may include the growth of opaque membranes that may grow across the macula and obscure vision as well as the growth of new vessels in the iris. This condition, termed rubeosis irides, is particularly dangerous because it may lead to neovascular glaucoma by reducing and blocking the anterior chamber angle where the aqueous drainage of the eye takes place.

3.6.4.4 *Diabetic maculopathy*

Involvement of the fovea by oedema and hard exudates or ischaemia (diabetic maculopathy) are the most common causes of visual impairment in diabetic patients, particularly those with Type II diabetes (Kanski 2003:445). Kanski (2003:445) explains that clinically significant macular oedema (CSMO) has the following characteristics:

- Retinal oedema within 500 μm of the centre of the fovea.
- Hard exudates within 500 μm of the centre of the fovea if associated with adjacent retinal thickening.
- Retinal oedema one disc area (1500 μm) or larger, any part of which is within one disc diameter of the centre of the fovea.

A summary of the classical or original classification of diabetic retinopathy is listed in Table 3.5.

TABLE 3.5: The original classification of diabetic retinopathy

CLASSIFICATION OF DIABETIC RETINOPATHY	CLINICAL FEATURES
Simple background diabetic retinopathy	<ol style="list-style-type: none"> 1. Microaneurysms 2. Intraretinal haemorrhages 3. Hard exudates 4. Retinal oedema
Preproliferative diabetic retinopathy	<ol style="list-style-type: none"> 1. Vascular changes 2. Cotton wool spots 3. Dark blot haemorrhages 4. Intraretinal microvascular abnormalities (IRMA)
Proliferative diabetic retinopathy	<ol style="list-style-type: none"> 1. Neovascularisation 2. Vitreous detachment 3. Haemorrhages (into the vitreous or retrohyaloid space)
Diabetic maculopathy	<ol style="list-style-type: none"> 1. Focal maculopathy 2. Diffuse maculopathy 3. Ischaemic maculopathy 4. Mixed maculopathy 5. Clinically significant macula oedema
Clinically significant macula oedema	<ol style="list-style-type: none"> 1. Retinal oedema within 500µm of the centre of the fovea 2. Hard exudates within 500µm of the fovea if associated with adjacent retinal thickening 3. Retinal oedema that is one disc area (1500µm) or larger, any part of which is within one disc diameter of the centre of the fovea

Source: Kanski (1999:467-475)

More recently, the International Council of Ophthalmology (2002) published an International Diabetic Retinopathy Grading Scale consisting of five levels for Diabetic Retinopathy (DR), namely none, mild, moderate, severe and proliferative (cf. Table 3.6).

TABLE 3.6: Clinical diabetic retinopathy disease severity scale

DISEASE SEVERITY SCALE	FINDINGS OBSERVABLE UPON DILATED OPHTHALMOSCOPY
No diabetic retinopathy	No abnormalities
Mild non-proliferative diabetic retinopathy	Microaneurysms only
Moderate non-proliferative diabetic retinopathy	More than just microaneurysms but less than severe NPDR
Severe non-proliferative diabetic retinopathy	Any of the following: Extensive (>20) intraretinal haemorrhages in each of 4 quadrants Definite venous beading in 2+ quadrants Prominent IRMA in 1+ quadrant No signs of proliferative retinopathy (PDR)
Proliferative diabetic retinopathy	One or more of the following: Neovascularisation Vitreous/ preretinal haemorrhage

Source: International Council of Ophthalmology (2002)

The purpose of this grading scale was to develop consensus regarding clinical disease severity classification systems for diabetic retinopathy and diabetic macular oedema that can be used around the world, and to improve communication and coordination of care among physicians who care for patients with diabetes (Wilkinson, Ferris, Klein *et al.* 2003:1677).

Diabetic retinopathy is therefore classified simply as nonproliferative diabetic retinopathy (NPDR) or proliferative diabetic retinopathy (PDR). It must be noted that, according to this scale, macular oedema can be present at any level of retinopathy.

The classification of diabetic retinopathy in the position statement of the Australian Diabetes Society (1996) is very similar to the classification of the International Council of Ophthalmology. The Australian classification also classifies diabetic retinopathy either as non-proliferative or proliferative and they too note that macular oedema can be present at any level of retinopathy. They describe each component as follows in Table 3.7.

According to the statement of the Australian Diabetes Society's Retinopathy Sub-committee (1996), high-risk proliferative diabetic retinopathy would include one or more of the following features, namely NVD of greater than one-third of the disc area; NVD with vitreous or preretinal haemorrhage; and/or NVE greater than one disc area with vitreous or preretinal haemorrhage.

Furthermore, advanced proliferative diabetic retinopathy would occur when there is high-risk proliferative diabetic retinopathy with tractional detachment involving macula or vitreous haemorrhage obscuring the ability to grade NVD or NVE.

TABLE 3.7: Australian classification of diabetic retinopathy

DISEASE SEVERITY SCALE	OBSERVABLE FINDINGS
Minimal non-proliferative diabetic retinopathy	In this stage only microaneurysms are present
Mild non-proliferative diabetic retinopathy	Microaneurysms are present with any one or more of the following: <ul style="list-style-type: none"> • Retinal haemorrhage • Hard exudates • Nerve fibre layer infarcts
Moderate non-proliferative diabetic retinopathy	Haemorrhages and microaneurysms occur in at least one quadrant of the retina, with one or more of the following: <ul style="list-style-type: none"> • Nerve fibre layer infarct • Venous beading • Intraretinal microvascular abnormalities (IRMA)
Severe non-proliferative diabetic retinopathy	This would include one of the following: <ul style="list-style-type: none"> • Haemorrhages in all four quadrants of the retina • IRMA in at least one quadrant • Venous beading in at least two quadrants
Proliferative diabetic retinopathy	Any one or more of the following: <ul style="list-style-type: none"> • Neovascularisation elsewhere (NVE) • Neovascularisation at the disc (NVD) • Neovascularisation elsewhere less than one disc area without neovascularisation at the disc or vitreous/preretinal haemorrhage

Source: Australian Diabetes Society Retinopathy Sub-committee (1996)

3.7 DIABETIC RETINOPATHY AS AN INDICATOR OF SYSTEMIC DISEASE AND MORTALITY

A critical aspect and major reason for this research is supported by the evidence that proliferative diabetic retinopathy is an accurate indicator for the patient's systemic disease risk and mortality. Statistics by Klein, Moss, Klein and DeMets (in Feman 1992:38) indicate that younger-onset diabetic patients with proliferative retinopathy were found to have a poorer six year survival (66.2%) compared with those with moderately severe (82.5%), mild (91.4%) or no retinopathy (95.9%). Similarly, older-onset patients with proliferative retinopathy were found to have a poorer survival rate (31.8%) compared with those with moderately severe non-proliferative (41.4%), mild non-proliferative (52.2%), or no retinopathy at all (61.3%).

Due to the fact that proliferative retinopathy is a significant predictor of poorer survival because of its strong association with risk factors for systemic conditions, it is therefore imperative that screening for retinopathy takes places as early as possible and in a proper systematic way as part of the overall National Health and Prevention of Blindness Policies. Diabetic patients with proliferative retinopathy should therefore be referred for further comprehensive examination to detect early renal disease, elevated blood pressure and/or cardiovascular effect, so as to intervene and minimise their progress and effects.

3.8 MANAGEMENT OF DIABETIC EYE DISEASE

The management of diabetic eye disease would depend first on the classification of the diabetes, and, second, on the severity of the pathology manifesting in the various parts of the eye. The emphasis of any diabetic eye disease management programme should, however, focus on the prevention

of vision loss and this may be achieved by reviewing the main ways in which vision loss can occur. Thereafter management methods can be individually applied to address each particular problem manifesting as a result of the diabetic eye disease.

3.8.1 The role of prevention in the management of diabetic eye disease

In order to understand the role that prevention may play in the management of diabetic eye disease, it is important to understand the major causes of vision loss in diabetes. These causes would generally include maculopathy, proliferative retinopathy, generalised ocular ischaemia, lens opacities (such as cataract) and diabetic papillopathy which affects the optic nerve.

Results from the DCCT Research Group (1993: 977-986) demonstrate that monitoring and management of the risk factors for diabetic retinopathy will help reduce both the incidence of developing diabetic retinopathy as well as the rate of progression of existing changes. As a result of this, we can conclude that the following simple key measures outlined by the Australian Diabetes Society Retinopathy Sub-committee (1996) may be employed to prevent visual loss:

- The early detection of retinopathy and monitoring of existing retinopathy with regular and appropriately timed fundus examinations; together with
- effective appropriately timed laser treatment; and
- the effective education of patients, the public and health care professionals.

3.8.2 The treatment and management of diabetic eye disease

Kanski (2003:443) emphasises that the form of treatment of diabetic eye disease should begin with the early detection and monitoring of any diabetic retinopathy. Patients with mild background diabetic retinopathy require no treatment, but should be reviewed annually. Apart from the optimal control of diabetes, associated factors such as hypertension, anaemia or renal failure should also be addressed (Kanski 2003:443).

Kanski (2003:443) continues to explain that, when the background diabetic retinopathy exhibits signs of imminent proliferative disease, it must be monitored very carefully for any signs of such changes. Treatment by laser photocoagulation at this stage is usually not necessary unless regular follow-up visits are not possible or if vision in the fellow eye has already been lost due to proliferative disease.

Clinically significant macular oedema (CSMO) must be treated as soon as possible irrespective of the level of visual acuity because treatment reduces the risk of vision loss by 50% (Kanski 2003:447). Because laser photocoagulation treatment for CSMO is essentially prophylactic, it must be performed as soon as CSMO is detected, which makes early recognition and diagnosis an important factor in preserving vision. A pars plana vitrectomy may also be an indicated form of treatment for CSMO when it is associated with traction from a posterior hyaloid membrane growing across the macula area of the retina. This is an important procedure in reducing the risk of a tractional retinal detachment by the membrane adherence to the retina.

When proliferative retinopathy occurs in diabetes, the main form of treatment and management is with panretinal laser photocoagulation (Kanski

2003:447). This form of laser treatment aims to prevent, reduce or retard the growth of new blood vessels in the retina of the eye and, in doing so, reduces the risk of vision loss from vitreous haemorrhage and tractional retinal detachment. The extent of treatment would depend on the severity of the proliferative diabetic retinopathy. This form of treatment involves laser burns on the retina, the spacing of such burns becoming closer together and with greater intensity, the more severe or recurrent the retinopathy.

3.9 INTERNATIONAL STANDARDS FOR THE SCREENING OF DIABETIC RETINOPATHY

As one of the most sight-threatening complications of diabetic disease is diabetic retinopathy, the screening and detection of diabetic retinopathy is an essential component of any public or private health care system. The benefits of early screening for the detection and treatment of diabetic retinopathy are well recognised and screening for diabetic retinopathy fulfils the World Health Organization's requirements for a screening programme (Tomlinson 2002:70). Visual screening for diabetic retinopathy and appropriate referral is an essential aspect of any public health programme designed to eliminate preventative blindness. Furthermore, research by Verma, Prakash, Tewari, Gupta, Murthy and Sharma (2003:373) supports the view that diabetic retinopathy screening by non-ophthalmologists is also a reliable and effective means of determining the presence of sight-threatening diabetic eye disease.

The mechanisms of screening for retinopathy have evolved considerably and, more recently, digital electronic photographic screening has been researched and implemented to varying degrees in a number of countries. Research into screening methods and the prevalence of retinopathy has been undertaken in such diverse locations as the United Kingdom (Younis, Broadbent, James,

Harding & Vora 2002:44-49); Canada (Maberly, Cruess, Barile & Slakter 2002:169-178); Kuwait (Al Sabti, Raizada, Wani, Al Ajmi, Gayed & Sugathan 2003:229); Australia (Tapp *et al.* 2003:1731-1737); India (Namperumalsamy, Nirmalan & Ramasamy 2003:1831-1835); and Spain (Lopez, Diez, Velilla, Rueda, Alvarez & Pastor 2002:205-214). All these studies in such diverse locations have supported and verified the usefulness, reliability and importance of screening for diabetic retinopathy in diabetic patients.

The seriousness of diabetic eye disease and the importance of screening for it is illustrated by the research conducted by Tomlinson (2002:70) who established that diabetic retinopathy is the leading cause of blindness in the United Kingdom's working population. Furthermore, Tomlinson (2002:70) established that at the time of diagnosis, 39 percent of patients with Type II diabetes already had diabetic retinopathy. This finding was rare at diagnosis of Type I diabetes, but 20 years after diagnosis, 60 percent of patients with Type II diabetes and 90 percent of Type I diabetes had developed retinopathy. Therefore screening is critical to the early identification, treatment and prevention of blindness arising from the complications of diabetic eye disease. Screening programmes should also seek to identify the individual risk factors and, in particular, the modifiable risk factors that contribute to diabetic eye disease in order that the patient becomes better educated in order to minimise the risks contributing to the disease.

Guidelines have been established by the American Diabetes Association (1994:616-623) for the recommended screening interval of Type I diabetics. These guidelines suggest that a comprehensive eye examination should take place within three to five years of diagnosis and then annually thereafter. Controversy exists regarding the frequency of retinal exams for Type II

diabetics, but a dilated retinal examination at diagnosis, followed by annual examinations are recommended by the American Diabetes Association (1994:616) and other eye care organisations (Mallone, Morrison, Pavan & Cuthbertson 2001:522; Javitt, Aiello, Chiang, Ferris, Canner & Greenfield 1994:917). This is due to the fact that delayed screening postpones the application of medical and ophthalmological therapies that would be more effective if applied at an early and appropriate stage of the disease (Jackson 2002:1477). Jackson (2002:1477) warns that treating end-stage diabetic eye complications is very frustrating to the physician and the patient, and can be expensive, technically challenging and disappointing in prognosis.

3.9.1 General screening and referral protocols for diabetic retinopathy

Kanski (2003:455) suggests that all diabetics over the age of 12 years should be screened and those with risk factors for visual loss should be referred to an ophthalmologist. His recommended screening and referral protocols involve the following as detailed in Table 3.8:

TABLE 3.8: General screening and referral protocols for diabetic retinopathy

REFERRAL CRITERIA	CLINICAL FEATURES
Annual review but no referral when:	<ul style="list-style-type: none"> • The fundus is normal • There is mild background diabetic retinopathy with small haemorrhages and/or small hard exudates, which are more than one disc diameter from the fovea
Routine referral to an ophthalmologist when:	<ul style="list-style-type: none"> • There is background diabetic retinopathy with large exudates within the major temporal arcades but not threatening the fovea • There is background diabetic retinopathy without maculopathy but with reduced visual acuity in order to determine the cause of visual impairment
Early referral to an ophthalmologist when:	<ul style="list-style-type: none"> • There is background diabetic retinopathy with hard exudates and/or haemorrhages within one disc diameter of the fovea • There is maculopathy • There are signs of preproliferative diabetic retinopathy
Urgent referral to an ophthalmologist when:	<ul style="list-style-type: none"> • There is any proliferative diabetic retinopathy • There is preretinal or vitreous haemorrhage • There is rubeosis irides • There is a retinal detachment

Source: Kanski (2003:455)

3.9.2 Screening and referral protocols for diabetic retinopathy in South Africa

Currently there is a lack of a comprehensive and well-integrated framework for the screening of diabetic retinopathy and other ocular manifestations of diabetic disease in the Western Cape region of South Africa. The Western Cape Department of Health for Chronic diseases is organising the training of ophthalmic nurses at community level with specific reference to the identification of diabetic retinopathy (Bonnici 2003), but the roll out of this initiative has yet to be realised on a broad scale. Therefore the results of this study will contribute to the understanding of the effects of this disease on patients in this community, as well as for the development of the educational programme for both health care workers and diabetic patients.

National Guidelines for the Prevention of Blindness in South Africa (RSA DoH 2002:14) have recently been established for the referral of diabetic patients. However, these guidelines have yet to be translated into action at the primary health care level, while training of nurses and health care workers in the detection and referral criteria for diabetic retinopathy still needs to take place. Only ophthalmic nurses currently have the skills and expertise required to adequately screen and detect diabetic retinopathy at the primary care level in the public health sector. However, very few ophthalmic nurses are currently employed in such positions, thereby necessitating the urgent training of health care workers currently managing and treating diabetic patients in the community clinics and in the public sector. The following referral criteria from primary level to secondary level health care facilities has been proposed as outlined in Table 3.9 according to the *National Guidelines for the Prevention of Blindness in South Africa* (RSA DoH 2002:14):

TABLE 3.9: Urgency of referral for diabetic retinopathy

URGENCY OF REFERRAL	CRITERIA
REFERRAL FROM PRIMARY LEVEL TO SECONDARY LEVEL	If the health care worker is unable to visualise the fundus:
Urgent referral for:	<ul style="list-style-type: none"> • all patients with new vessels at the disk (NVD) or new vessels elsewhere (NVE) • all patients with a decrease in visual acuity that is moderate to severe
Routine referral for:	<ul style="list-style-type: none"> • any signs of preproliferative retinopathy • any signs of macula oedema
Refer for screening when:	<ul style="list-style-type: none"> • there is no retinopathy: screen in one year • there is low risk: for example, patients over age 70 years at diagnosis or children younger than 12 years, screen in two years • there is high risk: for example, pregnant patients, screen in three months
	If the health care worker is unable to visualise the fundus:
Urgent referral:	<ul style="list-style-type: none"> • all diabetics with a decrease in visual acuity
Routine referral:	<ul style="list-style-type: none"> • all new diabetics

Source: RSA DoH (2002:14).

3.9.3 Recommended instrumentation for diabetic retinopathy screening

Various studies have been conducted to test the effectiveness and reliability of screening for diabetic retinopathy by digital camera, both with the pupil in dilated and undilated situations. Results from a study by Massin, Erginay, Ben Mehidi, Vicaut, Quentel, Victor, Marre, Guillausseau and Gaudric (2003:635) showed that fundus photographs taken with a non-mydratic camera without pupillary dilation are suitable for screening for diabetic retinopathy. A similar study by Al Sabti *et al.* (2003:229) concluded that digital images provide an efficient method for diagnosing and classifying sight-threatening diabetic retinopathy, particularly proliferative diabetic retinopathy. However, the detection of diabetic maculopathy was not very satisfactory.

Recommended digital imaging specifications have been proposed by the National Screening Committee for the National Health Service in the United Kingdom (NHS UK 2003:1-3). The main outcome measures for any screening programme were considered to be the detection of sight-threatening diabetic retinopathy; the detection of as many microaneurysms as possible through the highest resolution cameras as was reasonably possible; and the use of cameras meeting the required resolutions in order to detect sight-threatening features. The working group that compiled these screening guidelines considered that non-mydratic digital cameras were the preferred cameras to use in a diabetic retinopathy screening programme.

The reasons for this decision were that, according to the National Screening Committee (NHS UK 2003:3) diabetic subjects tend to dilate poorly and information is lost if the pupil diameter is below a critical level. In non-mydratic cameras this is nominally four mm. An advantage of non-mydratic

cameras is that they tend to be lighter and more easily transportable. Non-mydriatic cameras also tend to be easier to use than mydriatic cameras, so it would be much quicker to teach a new screener or health care worker to take good quality images with the former. The recommended specifications for the camera to be used for DR screening according to the guidelines from the National Screening Committee (NHS UK 2003:3) are described in Table 3.10 as follows:

TABLE 3.10: Recommended camera specifications for diabetic retinopathy screening

CRITERIA	DESCRIPTION
Image file formats	Image file storage formats should not result in the loss of any clinically significant information
Camera resolution	The original images, as output by the camera, should be a minimum of 20 pixels per degree of retinal image, both horizontally and vertically. Available cameras with a resolution of 1360x1024 use around 90% of the vertical frame size for the retinal image, that is about 900 pixels
Field of view	The field of view, as permanently recorded, should be a minimum of 45° horizontally and 40° vertically.
Viewing images for grading purposes	Pictures should be viewed in a manner that minimises the chance of missing any clinically significant detail.
CE or equivalent quality standard marking	All retinal cameras should be CE (Conformité Européene) marked or verified as being of equal quality and standard

Source: NHS UK (2003:3)

3.10 SOCIO-ECONOMIC ASPECTS OF DIABETES

A study published by Wändell and Gåfvels (2004:195-203) found a definite association between lower educational levels and higher diabetes morbidity. They concluded that socio-economic factors affect both the prevalence of known diabetes and its complications among middle-aged patients with Type II diabetes. And, because of this association, they suggested that more effort should be made at the regional and national level in countries in order to prevent obesity and diabetes development, especially among socially deprived populations.

In terms of the costs and financial burden of diabetes to the health system of a country, a study in the United Kingdom by Currie, Morgan, Dixon, McEwan, Marchant, Bearne, Sharplin and Peters (2004:273) found that the cost of inpatient care for all diabetic patients increases markedly in the final year of life and that people with diabetes were found to be more financially costly, even in this stage of their care, than were people who did not have diabetes.

Research by Björk (2001:17) attempted to estimate the cost of diabetes and diabetes care. He suggested that diabetes ought to be one of the major concerns of Ministers of Health especially in developing countries. He reiterated that the most important socio-economic aspect of dealing with diabetes relates to introducing and improving treatment if the costs to the patients, their families and their country's health system are to be reduced. Such an initiative would then lead to increased health status and quality of life among the population, which would ultimately aim to optimise the usage of resources in the national health care budgets.

In addition to the direct costs of treating diabetic patients to the patient and close family, there are also indirect costs. This aspect of diabetes was investigated by Leese (1992:1303) when she noted that "...most studies on the costs of diabetes tended to focus on direct costs, for example, the costs of hospital care, consultations and drugs, because they are the easiest to measure". She identifies other indirect costs, such as the effect of time lost from work, early retirement and premature death. She points out that these are less easily analysed because of the difficulties in assigning monetary values to these factors. Still, it is important to recognise these aspects, as they would certainly have a major influence on the diabetic patient's quality of life.

3.11 SOCIO-ECONOMIC ASPECTS OF DIABETIC EYE DISEASE

The ocular problems of diabetes can lead to severe visual impairment and blindness. Blind persons, as well as their immediate family, are likely to face both social and financial constraints, and employment opportunities for the visually disabled are limited as is their participation in leisure activities. According to the World Health Organization's fact sheet on blindness and visual disability (WHO 1997:1), cataracts are the most common cause of avoidable blindness. Furthermore, diabetic retinopathy is cited by the WHO (1997:3) as the most common cause of vision loss in the working population. Sight-threatening retinal complications can be effectively prevented by adequate control of diabetes and thorough ophthalmoscopic examination and treatment when required. It was demonstrated by the World Health Organization (1997:3) that health programmes aimed at motivating diabetic patients to undergo periodic eye examinations have proven to be cost-effective, not only financially, but as a health investment to society as well.

3.12 EDUCATION CONCERNING DIABETES AND ITS OCULAR COMPLICATIONS

The importance of patient education, and health care worker education on diabetes, and its potential ocular complications form the fundamental cornerstone of this research. The IDF in its International Curriculum for Diabetes Health Professional Education (IDF 2004:1) states that "...diabetes educators are an integral part of the diabetes management team. The role of the educator is to enable people with diabetes to manage their diabetes-related health to the best of their abilities, to allow them to make choices and take actions based on informed judgment, and to enhance the quality of life of the person with diabetes".

The importance of education is also reflected in the Position Statements of the Australian Diabetes Society Retinopathy Sub-committee (1996:9) when it states that "...it is recognised that visual loss from retinopathy can be reduced further by education of the professional, the patient and the public". The Society suggests that all educational messages should convey the following points (Australian Diabetes Society Retinopathy Sub-committee 1996:9):

- That people can develop vision-threatening diabetic retinopathy even in the absence of eye symptoms.
- That severe eye disease may occur in all diabetic patients, even those controlled on diet alone.
- That the duration of diabetes in all age groups is the single most important risk factor for the development of diabetic retinopathy.
- That regular and repeated examinations for diabetic eye disease are essential for early detection and referral.

- That prompt referral and appropriate treatment can prevent almost all severe visual loss due to diabetes.

3.13 CONCLUSION

This chapter has provided a comprehensive review of the scientific literature dealing with the clinical aspects of diabetes and its ocular complications. All relevant aspects of the medical condition of diabetes were discussed together with a detailed review of its sight-threatening complications, including its treatment and management. An overview of the classification of diabetes and its ocular complications was also described together with details of current guidelines for diabetic retinopathy screening procedures.

The following chapter, Chapter 4, will deal with the theoretical perspectives of the research methods used for the research and will also be followed by a detailed discussion of how the methods were used by the researcher.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter will deal with the research methodology involved in the study. To begin with, the theoretical perspectives for each of the various research techniques employed will be explained. This will be followed by a detailed explanation of the process of each technique. The research process consisted of an extensive literature review which underpinned the development of the questionnaires used for the diabetic patients and the health care workers. The Delphi technique was thereafter used to develop the proposed education programme. This chapter will then detail how the researcher in the process of undertaking the research used these specific methods and procedures.

4.2 THE ASSESSMENT OF HEALTH NEEDS

The fundamental reason for this research was to develop an appropriate educational intervention that was designed to improve the general and ocular health of diabetic patients. In order to reach this educational intervention, an assessment of the health needs of the patients, in one form or another, had to be undertaken. Data from health surveys, mortality and morbidity statistics, and other information on the need for health do not indicate for health planners what can be done to improve health (Bowling 2002:57). Thus health planners prefer to base health need on a disease model and define it in relation to the need for effective health care and preventative services. Bowling (2002:57), however, further modifies this definition of health need to include "...taking the views of interested parties into account in order to

develop an overall understanding of need, and to be responsive to the views of local people about the patterns and delivery of services". This is important in the context of this research in South Africa, due to the many difficulties and complexities of providing adequate health care to the population in the public health system.

An important observation and one that is particularly relevant to this research, was made by Fitzpatrick (1990:19) who argued that the epidemiological techniques of documenting incidence and prevalence of illnesses and chronic conditions are not the same as identifying needs for health care. This supports the methodology used in this research, which uses information from epidemiology as well as other information gained from the health care workers and patients themselves in order to identify the needs and to thereafter develop the educational interventions to satisfy those needs.

4.2.1 Methods of assessing health needs

There are certain difficulties and drawbacks inherent in assessing the health needs of any particular community. Epidemiological surveys can contribute greatly to the understanding of the prevalence of a certain disease in any particular community, but they can be expensive and time-consuming. Using existing prevalence and incidence rates and applying this to different communities may be inaccurate and so other methods of assessing health needs of communities should then be utilised. It is possible to use action research to determine the health needs of a community and it is this approach that was followed in this research. Bowling (2002:60) suggests a collaborative, empowering, bottom-up approach to researching health needs, and describes the use of triangulated research methods for this type of study.

This would involve community meetings, interviews with key people, postal surveys (such as the Delphi method), and the feedback of findings to key people and community members, as well as the joint development of a plan of action.

4.2.2 The role of epidemiological research

Bowling (2002:63) states that: "...traditionally, epidemiology has been concerned with the distribution of, specific causes of, and risk factors for diseases in populations." Epidemiology is also concerned with the broader causes of disease, and this aspect is particularly relevant to this study, which examines the educational perspectives of diabetic patients and health care workers in this field.

There are a number of methods that may be used in epidemiological research but, according to Bowling (2002:66-73), they may be broadly listed as follows:

- Case series and case studies. This involves the observation of a number of cases often using methods such as questionnaires, data from records and personal observations. The observations can be made retrospectively or prospectively and this is a relatively economical method in terms of time and resources. This method was used for the patient questionnaire and patient examinations in the research.
- Surveys. This involves surveys such as descriptive cross-sectional surveys as well as screening surveys and case findings.
- Other forms of research. This would include research using documents, prospective longitudinal cohort surveys, randomised controlled trials, natural and field experiments, and community intervention experiments.

4.3 THEORETICAL PERSPECTIVES ON THE RESEARCH DESIGN

Goddard and Melville (2001:1) state that "research is not just a process of gathering information, as is sometimes suggested. Rather, it is about answering unanswered questions or creating that which does not currently exist." A more detailed description of research, provided by Leedy (1989:5), is that it is "a procedure by which we attempt to find systematically, and with the support of demonstrable fact, the answer to a question or the resolution of a problem."

These two descriptions of research describe exactly the purpose of the study undertaken by the researcher. Part of the research involved a number of carefully selected questions being asked of the patients and health care workers involved with the study in order to obtain some level of understanding of the complex issues surrounding diabetes and diabetes education. The other aspect of the research involved the creation of something new, something that did not exist, and something that would be useful and make a significant difference and improvement to people's lives.

4.3.1 Methods of sampling

Sampling methods for research may be broadly divided into two groups, namely for quantitative research and for qualitative research. For each of these research processes, the methods can be further divided into random or non-random sampling, depending upon the purpose of the research. Bowling (2002:187) explains that random sampling would include such methods as unrestricted random sampling, simple random sampling, systematic random sampling, stratified random sampling, cluster sampling, as well as other techniques with slight variations to the sampling methods. The results of

random sampling are often used to draw conclusions on how the research would apply to the wider population.

According to Bowling (2002:187), non-random sampling is usually conducted for the purposes of understanding complex phenomena and to generate hypotheses, rather than to apply the findings to a wider population. Sampling methods for qualitative research often involve methods such as convenience sampling, purposive sampling, snowballing and theoretical sampling. While these methods are non-random, they may be specifically used to determine a particular understanding of a condition or problem in a select community in the population. Purposive sampling was a method used in this research and its features are described as follows:

4.3.2 Purposive sampling for qualitative research

Bowling (2002:187) describes purposive sampling as a deliberately non-random method of sampling which aims to sample a group of people or settings with a particular characteristic. In this research, the specific group of people would be the diabetic patients, the health care workers, and the Delphi panel. This form of sampling is also used to pilot the research questionnaires, which was also done in this study. A further aspect of purposive sampling is that it is often referred to as judgement sampling; that is where respondents are selected because they have knowledge that is valuable to the research process. Again, in this study, the judgement sampling would refer to the participation by the health care workers as well as by the Delphi panel.

4.3.3 Triangulated methods for quantitative research

Denzin (1989:236) defines triangulation or the use of multiple methods as “a plan of action that will raise sociologists above the personal biases that stem from single methodologies.” Bowling (2002:201) describes triangulated research methods and surveys as the most common quantitative descriptive method. According to Bowling (2002:201), “No research method is without bias, therefore interviews and questionnaires should be supplemented by methods testing the same social variables but having different methodological weaknesses.” Furthermore, Denzin (1989:236) argues that: “by combining methods and investigators in the same study observers can partially overcome the deficiencies that flow from one investigator or one method.” It therefore follows that once a proposition has been confirmed by more than one independent measurement process, the level of uncertainty surrounding it is reduced, and thus this triangulation of research processes should achieve the least level of uncertainty and error. This would be the purpose of using triangulation for quantitative research.

Denzin (1989:92) supports the use of multiple (triangulated) research methods when he explains that “triangulation directs the observer to combine multiple data sources, research methods, theoretical perspectives, and observers in the collection, inspection, and analysis of behaviour specimens.” Denzin (1989:93) further explains that “triangulating data sources forces [sic] the researcher to go to as many concrete situations as possible in forming the observational base” and that “the use of multiple methods means that the naturalist will use any and all research techniques that better unravel the processes under study.” These multiple methods or basic types of triangulation would then include data triangulation, investigator triangulation, theory triangulation and methodological triangulation (Denzin 1989:237).

It will be evident from this research that a triangulation of methods was used in order to obtain the data to be analysed. The methods used in this research included a comprehensive literature review; developing and piloting the questionnaire for use by the diabetic patients as well as the health care workers; the completion of the questionnaires by the diabetic patients and the health care workers; and, finally, the use of the Delphi panel in order to compile the education and training programme.

4.3.4 Theoretical and methodological bases for the use of questionnaires

A questionnaire may be considered to be a printed list of questions that respondents are asked to answer (Goddard & Melville 2001:47). The effectiveness of the questionnaire, however, depends upon the careful prior planning of the questionnaire, particularly in terms of how objectively it can be analysed afterwards. Questionnaires may include open and closed questions; typically the closed questions are answered by means of ranking or scoring. Usually four-point scales are used for such questions and the respondent chooses the most appropriate answer. Four-point scales in questionnaires usually force the patient/respondent to choose a particular response, whilst five-point scales may have the option to provide a neutral answer.

Goddard and Mellville (2001:48) suggest the following criteria for a good questionnaire:

- The questionnaire is complete, in other words it gets all the data needed.

- It is short and therefore does not abuse the respondents' time or concentration.
- It asks only relevant questions.
- It gives clear instructions.
- It has precise, unambiguous and understandable questions.
- It has objective questions and does not suggest answers.
- It starts with general questions.
- It has appropriate questions.
- It puts sensitive questions at the end.
- It uses mostly closed questions, often with a four-point scale.

In designing an appropriate research instrument, the researcher needs to carefully assess what type of information is being attempted to obtain. The instrument used also needs to be reliable, while the information obtained must be valid. These concepts are addressed further in this chapter under section 4.7, which deals with "reliability", "validity" and "trustworthiness".

Questionnaires may also be structured or semi-structured, whereas unstructured schedules may include exploratory, in-depth or free-style interviews but would also form part of an overall questionnaire design. Structured questionnaires involve the use of fixed standardised questions and/or scales which are presented to the respondents in the same way, with no variation in question wording, and with mainly pre-coded response choices (Bowling 2002:258).

When questionnaires are used to obtain a general idea about a particular research subject or field, open and unstructured questions can be used. Respondents are free to answer the questions in their own words and to

provide their thoughts and opinions on the questions posed. When very specific information is required, however, closed or structured questions may be used; this type of questionnaire may also be used for large-scale data collection (Goddard & Mellville 2001:48).

The main advantage of the use of structured questionnaires is the ability to collect unambiguous and easy to count answers, leading to quantitative data for analysis (Bowling 2002:258). Because this method leads to greater ease of data collection and analysis, it is relatively economical and large scales of people can be included. The disadvantage of structured questionnaires is that the pre-coded response choices may not be sufficiently comprehensive and that not all answers may be easily accommodated. Some respondents may therefore be forced to choose inappropriate pre-coded answers that might not fully represent their views.

Another weakness of structured questionnaires is that it assumes that the questions will be understood by the respondents, whereas a further complication is that respondents may not all share the same perspectives and understanding of the terms and concepts used. There is also the potential for bias in that respondents' replies may be influenced by the design of the pre-coded questionnaires, and some questions may be leading in the sense that they may lead to potential social desirability bias (Bowling 2002:259).

Some of the other problems of the use of questionnaires are the rates of return and the process of selection of the participants. Volunteers may often be unrepresentative of the population and may have their own particular reasons for becoming involved with the research (Goddard & Melville 2001:48). This can create bias and statistically unreliable results. This study

attempts to ensure reliability and validity through appropriate and carefully constructed questionnaires, as well as through a random yet systematic selection of questionnaire participants.

In terms of scaling for questionnaires, Bowling (2002:287) notes that most scales for measuring health status, health-related quality of life, and patients' and professionals' evaluations of health care are based on the techniques for developing attitude scales.

The Likert scale is the most popular scaling method used by sociologists and psychologists in both scale development and their final scales (Bowling 2002:289). The method is relatively quick and most questionnaires and scales use this method of scaling within them. The Likert scale contains a series of opinion statements about an issue. The person's attitude is the extent to which he or she agrees or disagrees with each statement, usually on a five-point scale. Thus the responses from "never", through to "sometimes" through to "always" are divided into a series of responses such as from 1 to 5. It is the convention for high numbers to signify a favourable evaluation. The Likert scale can therefore indicate the ordering of different people's attitudes, but not precisely how far apart or close these attitudes are. The Likert scale was used in the questionnaires in this research with slight modifications necessary in response to the pilot study.

The questionnaires used for the purposes of this research were developed as far as possible in accordance with the previously discussed guidelines for a good questionnaire in order to ensure that the most accurate, reliable and valid responses were obtained for the study. The Likert scale was the method of scaling for most questions but, as a result of the pilot study, the response

scale for the diabetic patient questionnaires was reduced from a five-point to a four-point scale. This was mainly due to the Xhosa language not differentiating between a “very important” and an “extremely important” response. The other reason for the choice of the four-point response was to eliminate the respondents from simply choosing a middle response. This forced the respondents to make a decision and not choose the neutral answer.

In this study, questionnaires were used for all three aspects of the research. These included the questionnaires that were completed by the diabetic patients, those completed by the health care workers, and the questionnaires completed by the experts on the Delphi panel.

4.3.5 Theoretical basis for the use of a pilot study

In order to streamline the research process, it is important to conduct a smaller version of the research study in order to identify possible problems and pitfalls in the proposed technique, as well as to ensure that the most efficient and appropriate research instrument is used. This process is generally referred to as a pilot study.

A pilot study is a small study that is often conducted to test the feasibility of a proposed study (University of Washington 2004). “Feasibility” refers to the ability of actually conducting the study as proposed. This involves checks of the instruments used for data collection and of the logistics of performing the study. A further important reason for the pilot study in this research was to improve the internal validity of the questionnaires used.

Baker (in Van Teijlingen and Hundley 2001:1) suggests that the reason for conducting a pilot study could be for pre-testing or “trying out” a particular research instrument. One of the advantages of conducting a pilot study is that it might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated.

Van Teijlingen and Hundley (2001:1) also consider that pilot studies refer to mini-versions of a full-scale study (also called “feasibility” studies), as well as the specific pre-testing of a particular research instrument such as a questionnaire or an interview schedule. They suggest that the benefits of performing a pilot study do not guarantee success in the main study - but it does at least increase the likelihood of it - and that pilot studies fulfil a range of important functions and can provide valuable insights for other researchers. According to van Teijlingen and Hundley (2001:1-2), the reasons for conducting a pilot study may include the following aspects:

- Developing and testing adequacy of research instruments.
- Assessing the feasibility of a (full-scale) study/survey.
- Designing a research protocol.
- Assessing whether the research protocol is realistic and workable.
- Establishing whether the sampling frame and technique are effective.
- Assessing the likely success of proposed recruitment approaches.
- Identifying logistical problems which might occur using proposed methods.
- Estimating variability in outcomes to help in determining sample size,
- Collecting preliminary data.
- Determining what resources (finance, staff) are needed for a planned study.

- Assessing the proposed data analysis techniques to uncover potential problems.
- Developing a research question and research plan.
- Training a researcher in as many elements of the research process as possible.
- Convincing funding bodies that the research team is competent and knowledgeable.
- Convincing funding bodies that the main study is feasible and worth funding.
- Convincing other stakeholders that the main study is worth supporting.

It must, however, be remembered that there are also certain limitations and problems inherent in conducting pilot studies. These include the possibility of presupposing the research by making inaccurate predictions or assumptions and by including the data from the pilot study in the main results. These possible problems were therefore considered and kept in mind throughout the research process.

Peat, Mellis, Williams and Xuan (2002:123) list a number of aspects of a pilot study that may improve the proposed questionnaire and these would aim to:

- administer the questionnaire to pilot participants in exactly the same way as it will be administered in the main study;
- ask the participants for feedback to identify ambiguities and difficult questions;
- record the time taken to complete the questionnaire and decide whether it is reasonable;
- discard all unnecessary, difficult or ambiguous questions;
- assess whether each question gives an adequate range of responses;

- establish that replies can be interpreted in terms of the information that is required;
- check that all questions are answered;
- re-word or re-scale any questions that are not answered as expected;
- shorten, revise and, if possible, pilot again.

4.3.6 Philosophical and methodological foundations of the Delphi technique

The Delphi research technique may be considered to be a phenomenological approach whereby phenomenology may be considered to be “a research method that attempts to understand participants’ perspectives and views of social realities” (Leedy 1997:161). When researchers attempt to analyse the information that can play a part in the decision-making process, there are approximately three types of data that may be used (Dalkey 1969:2). The first type of data would be assertions, highly confirmed and with a great deal of evidence supporting them. This kind of information can be called knowledge. Dalkey (1969:2) also suggests that “at the other end of the scale is material that has little or no evidential backing.” Such material could then be assumed to be speculation. In between these two areas would be what Dalkey (1969:2) calls opinion. What would then constitute opinion would be the products of opinion such as judgement, wisdom, insight and similar intellectual processes.

With this in mind, Dalkey (1969:iii) undertook research with the Rand Corporation in Santa Monica, California, in order to continue studying methods that would result in improved decision-making. The experiments were concerned with evaluating the effectiveness of the Delphi procedures for formulating group judgements. Dalkey (1969:v) summarises the Delphi technique as a “method of eliciting and refining group judgements.” He

continues to explain that the rationale for the procedures is based on the age-old adage that two heads are better than one. The procedures have three features according to Dalkey (1969:v):

1. Anonymous response: Opinions of the members are obtained by formal questionnaire.
2. Iteration and controlled feedback: Interaction is effected by a systematic exercise conducted in several iterations, with carefully controlled feedback during rounds.
3. Statistical group response: The group opinion is defined as an appropriate aggregate of individual opinions on the final round.

The Delphi technique is summarised slightly differently by Linstone and Turoff (2002:3) when they consider Delphi to be "...more of an art than a science". With that in mind, they suggest that Delphi may be characterised as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. They explain further that, in order to accomplish this structured communication, there is provided some feedback of individual contributions of information and knowledge; some assessment of the group judgement or view; some opportunity for individuals to revise views; and some degree of anonymity for the individual responses.

Bowling (2002:407) also classifies the Delphi technique as a consensus method for both qualitative and quantitative research and suggests further that consensus methods are increasingly being used to establish the extent of consensus and, in some cases, to develop it. In particular, consensus methods may be used in areas of uncertainty in clinical medicine and health

policy, where there is a lack of definitive evidence about the effectiveness and appropriateness of health care interventions. The use of the Delphi technique for the development of health-related education programmes in particular is well established (Jones & Hunter 1995:376). For qualitative (and quantitative) research studies, such as this where opinions are being sought, the Delphi approach may also be particularly useful when considering the development of the diabetes education programme.

One of the advantages of the Delphi technique is that the responses of the group are anonymous. Dalkey (1969:14) explains that studies by psychologists have demonstrated some serious difficulties with using face-to-face methods of pooling individual opinions. Some of the problems of such techniques include:

- The influence of dominant individuals.
- Noise – whereby much of the discussion of the group has to do with individual and group interests and not with problem-solving.
- Group pressure for conformity, in which distortions of individual judgement can occur due to group pressure.

Originally the Delphi technique was classified as a postal questionnaire method using open-ended questions in order to obtain the ideas or attitudes of a number of people anonymously, without the necessity of organising a meeting. The advantage of the Delphi method is that it preserves individuals' identities and is an economical method of contacting large numbers of people. In the process, experts may be sent questionnaires to complete and their responses would be compiled into the questionnaire and then recycled back to the experts, asking them to rank their level of agreement with the

statements. This process usually involves at least two cycles of re-ranking and feedback until consensus and stability have finally been reached.

A critical component of the Delphi process includes the selection of a panel of experts to participate in the formulation of the outcomes of the research. Critcher and Gladstone (1998:435) place great importance on the selection of the correct panel of experts, and that these experts function as referees and advocates for a specific issue or field of interest. The preparatory phase or groundwork for the panel is most important in order to ensure a successful process. Part of this preparatory process would also include the careful construction of the Delphi questionnaire, with particular attention paid to the fact that the questions should be in the form of clear statements, as well as for there to include provision for feedback, comments and recommendations by the panel.

It can therefore be inferred that the main aim and purpose of the Delphi process is to reach consensus and stability among a panel of experts for a specific statement provided and proposed by the researcher. In order to facilitate this process, the researcher provides feedback to each member of the panel of the previous rating of the panel as a whole and of the individual as well. There is then the opportunity to undergo a second and even a third round of questions in order to obtain the consensus.

In order to summarise the Delphi technique, the following advantages and disadvantages as listed by the Michigan State University Extension Programme (1994:1-3) will next be explicated:

4.3.6.1 *Advantages of the Delphi technique*

The advantages of the Delphi technique can be listed as follows:

- It allows participants to remain anonymous.
- It is inexpensive.
- It is free of social pressure, personality influence and individual dominance.
- A reliable judgement or forecast of results is likely.
- It allows sharing of information and reasoning among participants.
- It is conducive to independent thinking and gradual formulation.
- It consists of a well-selected respondent panel.
- It can provide a broad analytical perspective on potential growth impacts.
- It can be used to reach consensus among groups hostile to one another.

4.3.6.2 *Disadvantages of the Delphi technique*

The disadvantages of the Delphi technique can be listed as follows:

- The judgements are those of a selected group of people and may not be representative.
- There may be a tendency to eliminate extreme positions and force a middle-of-the-road consensus.
- It is more time-consuming than the group process method.
- It should not be viewed as a total solution to forecasting.
- It requires skill in written communication.
- It requires adequate time and participant commitment (about 30-45 days)

4.3.7 Implications for the use of the Delphi technique as a research method

The previously discussed advantages and disadvantages of the Delphi technique were kept in mind when formulating the research design. Furthermore, an attempt was made to overcome some of the disadvantages of this process by ensuring a representative panel, taking into account any extreme positions that emerged during the consensus-building process and by using the results of the patient and health care worker questionnaires when formulating the Delphi questionnaire.

Mitroff and Turoff (2002:17) emphasise that "... there is more than one fundamental basis which can underlie any technique, or in other words, that there is no one 'best' or even 'unique' philosophical basis which underlies any scientific procedure or theory." They continue to expand on this thought through their reasoning that "...depending upon the basis which is presumed, there results a radically different developmental and application history of a technique. Thus in this sense, the particular basis upon which a scientific procedure depends is of fundamental practical importance and not just of philosophical interest." What this means is that often the reason why a particular technique is chosen for a specific area of research, is not only as a result of its appropriateness, reliability and validity, but also as a result of its practicality of implementation.

The key element of the Delphi technique, therefore, is the overall aim of reaching consensus and stability. Mitroff and Turoff (2002:22) reflect this in their statement that "... the validity of the resulting judgment of the entire group is typically measured in terms of the explicit 'degree of consensus' among the experts." Some of the criticisms and drawbacks of this technique, however, centre on the fact that some of the judgements that emanate from

the Delphi process may be considered to be a compromise judgement, rather than the best objective statement. However, this may be partially negated by a suitably sized Delphi Panel. It may therefore be hypothesised that the truth content of the Delphi process (often measured as the error) increases as the size of the Delphi group increases (Mitroff & Turoff 2002:24) and that the results of the technique should nevertheless form an important and valid part of the research process.

Dalkey (1969:12) analysed the relationship between reliability and the Delphi group size. His research demonstrated a definite increase in the reliability of the group responses with increasing group size. There was also an approximately linear relationship in reliability when there were between three and 11 members of the group. It was found that there was a large increase in reliability when group size increased from one to 11 members, but after this point, there was a lesser degree of increased reliability. This implies that, ideally, the Delphi group size should have at least 11 members in order to increase its reliability.

The validity of and justification for the use of the Delphi technique as a method for this research is an important consideration. According to De Meyrick (2003:14), the Delphi method has a long tradition as a valid research technique, especially in medical and health-related fields. Furthermore, in many health-related issues, there is a relevant body of expert knowledge held by a group of recognised experts, and it is this expert knowledge that must be identified, not the estimates of respondents without the necessary expertise (De Meyrick 2003:14). This aspect therefore justifies the fact that the Delphi panel consists of members or experts who are usually carefully selected by the researcher and not randomly selected without considering their unique skills and expertise.

4.4 METHODS AND PROCEDURES

The methods and procedures comprising the research process are described in the following sections. The methods are described according to the way that the research process evolved. The preparation for the research involved a literature review which enabled the following rounds of questionnaires to be developed. The empirical phase involved the use of those questionnaires to determine the diabetes-specific knowledge of the diabetic patients as well as that of the nurses and health care workers. The responses and results of this phase of this research then framed the development of the Delphi questionnaire.

The documentation used for each stage of the research, such as the letters requesting permission to conduct the research, the letters of invitation and letters of information to the participants, as well as the questionnaires are reflected in Appendices A – Y.

An overview of the overall research process is illustrated in Figure 4.1 as follows:

FIGURE 4.1: A schematic overview of the research process

4.4.1 The literature review

The research was initially conducted by means of a comprehensive literature review of educational programme development, particularly in the South African context, as well as of diabetes and its ocular complications.

The purpose of the literature study was to frame and establish the background for the research, and thereafter to form the basis for the development of the questionnaires for the diabetic patients and the health care workers. The review focused initially on the development of educational programmes in general, as well as on education programmes in particular that have been developed for diabetes educators and diabetic patients. Various sources of information were consulted, including books and journal articles, as well as relevant publications on the Internet. The focus of the review was, however, in the context of the higher education system of South Africa and consequently the policies from the South African DoE, SAQA and the NQF were reviewed for the purposes of this research.

Thereafter, a thorough literature study on diabetes and the ocular problems and complications of diabetes was undertaken. It was important that a very detailed review of diabetes and its ocular complications had to be undertaken to ensure that the researcher was fully informed about the extent to which diabetes can affect the eyes. It was also important that the most recent journal findings and medical literature was reviewed so that any proposed education programme that was to be developed, would be based on the latest medical evidence and suggested management/treatment options currently available. The development of the questionnaires was also structured in such a way as to provide both qualitative and quantitative responses from the diabetic patients and the health care workers.

4.4.2 The measuring instruments

Prior to the commencement of the research, permission and consent had to be obtained from the participants. A letter of request was provided to the health care workers (cf. Appendix A) as well as a form of consent to participate in the research study (cf. Appendix B). The diabetic patients were also provided with a letter of request (cf. Appendix C) followed by a form of consent (cf. Appendix D). A letter of permission to conduct the research was also obtained from the Chief Director: District Health Services in the Western Cape Department of Health (cf. Appendix E).

4.4.2.1 *The diabetic patient questionnaire*

The diabetic patient record card and education questionnaires (cf. Appendices F - H) were developed first by formulating a patient history/record card. Thereafter four broad areas of investigation were identified based on information obtained through the comprehensive literature review. Considering that the aim of the questionnaire was to determine the diabetic patients' knowledge about their condition and its effect on the eyes, questions were developed to determine the patients' knowledge in the areas of diabetes, the ocular complications of diabetes, the management and treatment options of diabetes, and any additional information relating to diabetes.

The diabetic patients' questionnaires were available in the three most commonly-spoken languages of the patients attending the community health clinics, namely Afrikaans, isiXhosa and English. The questionnaires were also specifically coded during their development to ensure that upon completion, the data could be analysed in terms of both qualitative and quantitative statistics (cf. Appendix F. Diabetic patient record card and Education

Questionnaire in English; Appendix G. Diabetic patient record card and Education Questionnaire in Xhosa; and Appendix H. Diabetic patient record card and Education Questionnaire in Afrikaans).

The format of the diabetic patient education questionnaire will be discussed per section. The questionnaire consisted of four sections which dealt with the various areas of diabetes knowledge of the patient. The questionnaire began with a comprehensive patient history record card detailing all aspects of the patient's personal and medical history. The consent form to be completed by the patient was also included with these details.

SECTION 1 of the Diabetic patient record card and Education Questionnaire (cf. Appendices F, G and H, pp. 1-2) dealt with the various issues pertaining to the patient's **Knowledge of diabetes**. The section contained various statements or questions (n=6) aimed at determining the patient's knowledge of diabetes. The questions required the patient to choose only from the closed-response options provided. The sixth question required the patient to rate the relative importance of six statements on a scale from 1 (Not important) to 4 (Very important).

SECTION 2 of the Diabetic patient record card and Education Questionnaire (cf. Appendices F, G and H, p. 3) dealt with the areas pertaining to the patient's **Knowledge of the ocular complications of diabetes**. The section contained various statements (n=8) that the patient was required to rate according to how he/she felt about each statement. The questions were definitive and required the patient to rate the relative importance of the statements on a scale from 1 (Strongly disagree) to 4 (Strongly agree).

SECTION 3 of the Diabetic patient record card and Education Questionnaire (cf. Appendices F, G and H, pp. 4-5) dealt with aspects pertaining to the patient's **Knowledge of the management and treatment options** of diabetes. The section contained two subsections. The first subsection contained various statements (n=7) pertaining to the control of diabetes that the patient was required to rate according to how he/she felt about each statement on a scale from 1 (Not important) to 4 (Very important). The following subsection contained questions (n=8) relating to how the management and treatment of diabetes was carried out specifically by the patient. The patient was required to choose from a "Yes" or "No" option.

SECTION 4 of the Diabetic patient record card and Education Questionnaire (cf. Appendices F, G and H, pp. 5-6) dealt with any **Additional information** related to the patient's knowledge of diabetes. The section contained various statements (n=9) that the patient was required to answer according to a scale of 1 (True), 2 (False) or 3 (Do not know). The questionnaire concluded by thanking the patient for participating in the study.

The questionnaire survey with the diabetic patients was preceded by a pilot study that was initially conducted with a small group of diabetic patients in order to best develop and finalise the diabetic patient questionnaire. After the first draft of the diabetic patient questionnaire had been produced, it was given to 10 patients to complete. After completion of this questionnaire by the patients a further revision/modification of the questionnaire was necessary. This was again completed by a further 10 patients whereupon the understanding and ease of completion of the questionnaire by the patients indicated that it was ready for use in the main research process.

4.4.2.2 *The health care worker questionnaire*

The health care worker questionnaire was used to assess the knowledge, education and training of health care workers, specifically in terms of diabetic eye disease. The development of the questions for the health care worker questionnaire was established after considering the information gained thorough the literature review. In order to determine the knowledge, education and training of the health care workers, four broad areas of questioning were identified. The questionnaire consisted of these four sections which dealt with the health care workers' education and training in terms of assessing the risk factors for diabetes; the ocular complications of diabetes; the screening and management of diabetes; and patient counselling for diabetes. The questionnaire began with a consent form to be completed by the health care worker prior to participating in the study. The format of the health care worker education questionnaire will be discussed per section.

SECTION 1 of the Health care worker Diabetes Education Questionnaire (cf. Appendices I and J, pp. 1-2) dealt with the various issues pertaining to the health care worker's **Education and training for the assessment of diabetes risk factors**. The section contained various statements or questions (n=6) which included both closed and open-ended questions. The questions also aimed to determine the health care workers' knowledge of the risk factors influencing the development of diabetes. The first and third questions required the health care worker to rate the relative importance of the risk factors associated with the development of Type I and Type II Diabetes respectively on a scale from 1 (Not important) to 4 (Very important).

SECTION 2 of the Health care worker Diabetes Education Questionnaire (cf. Appendices I and J, p. 3) dealt with aspects pertaining to the health care worker's **Education and training for the assessment of the ocular complications of diabetes**. The section contained statements or questions (n=2) which included both a closed and an open-ended question. The first question aimed to determine the health care worker's knowledge of the risk factors contributing to the development of diabetic eye disease on a scale from 1 (Not important) to 4 (Very important). The second question was open-ended, requiring the participant to list any other factors that they felt might contribute to diabetic eye disease.

SECTION 3 of the Health care worker Diabetes Education Questionnaire (cf. Appendices I and J, p. 4) dealt with aspects pertaining to the health care worker's **Education and training for screening and managing diabetic patients' eye disease**. The section contained statements or questions (n=2) which included both a closed and an open-ended question. The first question aimed to determine how well the health care workers felt that their education and training had prepared them to screen and manage the various ocular complications that might occur in diabetic patients. They were required to indicate their opinion on a scale from 1 (Not at all) to 4 (Well). The second question was open-ended, requiring the participant to list any areas of education or training that he/she felt would help him/her to screen and manage diabetic eye disease.

SECTION 4 of the Health care worker Diabetes Education Questionnaire (cf. Appendices I and J, p. 5-6) dealt with aspects pertaining to the health care worker's **Education and training for diabetic patient counselling**. The section contained statements or questions (n=6) which included both closed

and open-ended questions. The first four questions aimed to establish the level of training that the participant had received specifically for diabetes counselling and how well he/she felt they were prepared for this task.

Question five required the participants to rate the relative importance of various education components that might form part of a patient education and counselling programme on a scale from 1 (Not important) to 4 (Very important). The final question was open-ended, requiring the participant to list any other aspects that could form part of a diabetes education programme. The questionnaire concluded by thanking the patient for participating in the study.

The health care workers' diabetes education questionnaires were specifically coded during their development to ensure that upon completion, the data could be analysed in terms of both qualitative and quantitative statistics. The health care worker questionnaire survey was also preceded by a pilot study that was initially conducted with a small group of health care workers in order to best develop and finalise the health care worker questionnaires.

Again, for the questionnaires that were completed by the health care workers, a similar process in terms of the pilot study was conducted. The draft questionnaire was produced and five health care workers were requested to complete the questionnaire. Their comments and suggestions were incorporated into the second draft of the questionnaire and the process was repeated. At this stage the comments from the participants suggested that the questionnaire was ready to be used in the main research process.

4.4.2.3 *The Delphi study first round*

The last phase of the research process for the development of the diabetes education programme made use of the Delphi technique. The advantages of the Delphi technique were discussed (cf. section 4.3.6), but in this research the technique was particularly useful in ensuring that participants in the research were anonymous; that they were free of social pressure, personality influence and individual dominance; and it allowed for the sharing of information and reasoning among participants from a variety of professions. In this study, a panel of experts in the fields of diabetes, nursing, ophthalmology, optometry and education were selected.

The first round Delphi questionnaire for the proposed curriculum and outcomes of the post-graduate training programme was then developed, based on the educational needs analysis identified by the patient and health care worker questionnaires and the extensive literature review. The questionnaire developed was both qualitative and quantitative in nature and the reliability of the questionnaire was ensured by conducting a pilot study prior to submitting to the Delphi panel of experts.

With regard to the piloting for the Delphi process, the compilation of the Delphi questionnaire required the input and insight of experts in optometry, health care and higher education. The participants who contributed to the original pilot study of the Delphi were in no way associated with the actual Delphi panel, but provided input to ensure that the questionnaire was appropriately structured and developed prior to its being considered by the Delphi panel.

The pilot study consisted of submitting the questionnaire to two members of the academic staff in the Department of Ophthalmic and Wellness Sciences at the Cape Peninsula University of Technology who had experience in higher education, optometry and diabetic eye disease. They were requested to complete the questionnaire, taking note of the time being taken to complete the questionnaire and to take note of any questions that were ambiguous or unclear. They were also requested to specify any errors in grammar, spelling or formatting. One member of the pilot study completed the questionnaire electronically whilst the other completed the hard copy to ensure that it was equally clear to the Delphi panel if they preferred to complete either format of the questionnaire.

Prior to commencing the research study, letters of invitation were sent to the expert panel members to request their participation in the research (cf. Appendix K, Letter of invitation and request to Delphi panellists). This was accompanied by a consent form for the participants to complete should they accede to the request (cf. Appendix L, Form of consent for Delphi panellists). A letter of instruction was thereafter sent to each participant (cf. Appendix M, Accompanying letter to Delphi panel Round One) together with the questionnaire for the first round (cf. Appendix N, Questionnaire for Delphi panel Round One). A list of references consulted during the development of the Delphi questionnaire was also made available on request (cf. Appendix O, References for Delphi questionnaire Round One).

In the letter, the researcher thanked the participants for agreeing to take part in the Delphi study and gave further information about the research process. Information on the structure of the questionnaire was provided as well as a detailed explanation of the procedure of the Delphi technique. Instructions on

how to complete the questionnaire were also included. For the purposes of this study, the letters, forms of consent and Delphi questionnaires were available in English.

It was clearly stated that the participants in the study had to rate the relative importance of the various aspects of the proposed diabetes education programme on a three-point Likert scale. This scale ranged from “essential” to “useful” or “unnecessary”. These points were defined as follows:

- 1 = Essential (this criterion/statement must **DEFINITELY BE INCLUDED** in the programme)
- 2 = Useful (it **DOES NOT MATTER** whether this criterion/statement is included in the programme)
- 3 = Unnecessary (this criterion/statement must **DEFINITELY BE EXCLUDED** from the programme)

The layout of the Delphi questionnaire will be discussed per section and will be done once in the following paragraphs, as the basic structure of the questionnaire remained the same through all the rounds. The questionnaire consisted of seven sections which dealt with the various educational and clinical aspects of diabetes and the proposed education programme.

SECTION A of the Delphi questionnaire (cf. Appendix N) dealt with the various issues pertaining to curriculum development in higher education and the heading read as follows: **This section deals with curriculum and programme development in the higher education sector**. The section was divided into five subsections containing various statements (n=62) included under each subsection. Place was allocated after each statement for

the participants to give their comments. The sixth subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N).

SECTION B of the Delphi questionnaire (cf. Appendix N) dealt with patient diabetes education and the heading read as follows: **This section deals with the education of diabetes patients.** This section was divided into three subsections containing various statements (n=26) included under each subsection. Place was allocated after each statement for the participants to give their comments. The fourth subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N).

SECTION C of the Delphi questionnaire (cf. Appendix N) dealt with public health in South Africa and the heading read as follows: **This section deals with issues related to the provision of public health in South Africa.** This section was divided into two subsections containing various statements (n=18) included under each subsection. Place was allocated after each statement for the participants to give their comments. The third subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N).

SECTION D of the Delphi questionnaire (cf. Appendix N) dealt with the academic and administrative aspects of the programme and the heading read as follows: **This section deals with issues related to the academic and administrative aspects of a diabetes education programme.** This section was divided into 11 subsections containing various statements (n=53) included under each subsection. Place was allocated after each statement for

the participants to give their comments. The 12th subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N).

SECTION E of the Delphi questionnaire (cf. Appendix N) dealt with the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes and the heading read as follows: **This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes.** This section was divided into 10 subsections containing various statements (n=78) included under each subsection. Place was allocated after each statement for the participants to give their comments. The 11th subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N).

SECTION F of the Delphi questionnaire (cf. Appendix N) dealt with the benefits of an education programme and the heading read as follows: **This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes.** This section was divided into three subsections containing various (n=18) statements included under each subsection. Place was allocated after each statement for the participants to give their comments. The fourth subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N).

SECTION G of the Delphi questionnaire (cf. Appendix N) dealt with the various aspects of the proposed education programme as a whole and the

heading read as follows: **This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes.** This section had one subsection containing various statements (n=7) included under the subsection. Place was allocated after each statement for the participants to give their comments. The second subsection was an open-ended section in which the participants could add other statements or write additional comments (cf. Appendix N). The sections A – G made up the seven sections which comprised the Delphi questionnaire for the three rounds. A total of 262 statements were presented in the questionnaire.

The questionnaires were sent electronically to each panel member individually and the participants were free to return the questionnaires electronically or by hard copy. A hard copy paper version of the questionnaire was also provided to each panel member. A deadline was given to the participants for completion of the questionnaires and follow-up reminders were sent to the panel members three days prior to the deadline. Responses from all the participants were received within a total of 34 days. Six participants returned their questionnaires electronically and six participants preferred to complete and return a hard copy paper version of the questionnaire. All members of the Delphi panel who had agreed to participate in the research process completed Round One.

4.4.2.4 *The Delphi study second round*

A letter of feedback for Round One (cf. Appendix P) and the complete results of the entire first-round questionnaire (cf. Appendix Q) were provided to the panel members two days prior to the commencement of the second round of the Delphi. These results included all the responses for each statement on

the questionnaire, as well as all the comments and opinions provided by the members of the panel. This feedback comprised the exact wording by the participants in an attempt to provide feedback that was as accurate as possible, but all comments were kept anonymous.

In this feedback questionnaire for the first round, a fourth column was included to the right of the three-point Likert scale containing the percentage responses of the panel members. This column contained the number of the Likert scale that corresponded to that participant's choice in the first round and was individualised for each Delphi participant. Each participant's specific response in Round One was indicated, as depicted for example, in Figure 4.2:

FIGURE 4.2: Example of feedback questionnaire for the Delphi study

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
i	demonstrations must show evidence of significant learning	92	8	0	1	

This was interpreted as follows: As far as that statement was concerned, 92% of the participants in Round One indicated *essential* as their preference; 8% indicated *useful* as their preference; and no-one indicated *unnecessary* as their choice. The respondent's choice in Round One was essential (=1). Each panel member received a personalised form that only indicated that specific participant's choice.

The second round questionnaire (cf. Appendix S) retained this fourth column so that each panel member could review his/her previous choice. This provided each participant with the opportunity of reconsidering their responses in relation to the responses of the other participants. The participants were again provided with a letter explaining exactly how the second round was to proceed, as well as with clear instructions on how to complete the questionnaire (cf. Appendix R, Accompanying letter to Delphi panel Round Two and Appendix S, Questionnaire for Delphi panel Round Two).

The panel members were then requested to indicate their choices for each item on the questionnaire by using an "X" again in the column of their choice on the three-point Likert scale. Where appropriate, various statements and items in the questionnaire were modified slightly in response to the comments and suggestions from the previous round. All statements on which consensus had been reached during the first round were subsequently excluded from the Round Two questionnaire.

The second-round questionnaires were then forwarded to all the panel members by e-mail. Again, the participants were free to return the questionnaires electronically or by hard copy. A hard-copy paper version of the questionnaire was also provided to any panel members who preferred to complete it by such method. A deadline of 14 days was given to the participants for completion of the questionnaires and again, follow-up reminders were sent to the panel members three days prior to the deadline.

Responses from all the participants were received within a total of 21 days. Eight participants returned their questionnaires electronically and four

participants preferred to complete and return a hard copy paper version of the questionnaire. All members of the Delphi panel who had agreed to participate in the research process completed Round Two.

4.4.2.5 *The Delphi study third round*

A letter of feedback for Round Two (cf. Appendix T) and the combined results of the first and the second round questionnaire (cf. Appendix U) were provided to the panel members two days prior to the commencement of the third round of the Delphi. Again, these results included all the responses for each statement on the questionnaire, as well as all the comments and opinions provided by the members of the panel.

The third round questionnaire (cf. Appendix W) once again retained the fourth column so that each panel member could review his/her previous choice. All statements on which consensus had been reached during the first and the second rounds were subsequently excluded from the questionnaire. As for the previous rounds, a letter of instruction (cf. Appendix V) accompanied the third and final round Delphi questionnaire. The panel members were once more requested to indicate their choices for each item on the questionnaire by using an "X" again in the column of their choice on the three-point Likert scale.

As per the previous two rounds, the third-round questionnaires were forwarded to all the panel members by e-mail. Again, the participants were free to return the questionnaires electronically or by hard copy. For this last round, a deadline of five days was given to the participants for completion of the questionnaires with follow-up reminders sent to the panel members three days prior to the deadline.

Responses from all the participants were received within a total of 15 days. Once again, eight participants returned their questionnaires electronically and four participants returned a hard copy paper version of the questionnaire. All members of the Delphi panel who agreed to participate in the research process completed Round Three.

4.5 SAMPLE SELECTION

4.5.1 The diabetic patients

4.5.1.1 *Target population*

The target population included diabetic patients in the Western Cape Province of South Africa. In particular, diabetic patients from the Cape Town metropolitan district as well as from those areas within 100km of Cape Town were targeted for the research.

4.5.1.2 *Survey population*

The survey population consisted of diabetic patients from community health centres and clinics who had been requested to participate in the research after signing the consent forms and who were willing to complete the diabetic patient questionnaires. Examples of the letter of request, form of consent, and diabetic patient questionnaires in English, isiXhosa and Afrikaans are attached (cf. Appendices C, D, F, G and H).

4.5.1.3 *Sample size*

The sample size consisted of the number of questionnaires which had been distributed to the diabetic patients. The sample size consisted of a total of 98 diabetic patients who had agreed to participate in the research. All the participants who agreed to participate in the research completed the questionnaire (100% response rate).

4.5.1.4 *Description of the sample*

The diabetic patients were selected by arrangement with the supervisor/coordinator of the health centres who was requested to identify diabetic patients who were willing to participate in the research process. These patients were then referred for optometric examination at the Cape Peninsula University of Technology Eye Care Clinic. Prior to these examinations at the clinic, the patients were requested to complete the form of consent and then continued to complete the diabetic patient education questionnaire that comprised the research instrument. In addition, any other diabetic patients attending the Peninsula University of Technology Eye Care Clinic were also requested to participate in the study.

The community health care centres and clinics from where the patients were referred were located in the Western Cape region as defined in the South African Census 2001 (RSA 2003). The diabetic patients were selected randomly in the sense that any diabetic patient attending the clinics was requested to participate in the research. Therefore there was an equal possibility for any diabetic patient to participate in the process and there were no inclusion or exclusion criteria other than that the patient should be diabetic and willing to participate in the study.

4.5.2 The health care workers

4.5.2.1 *Target population*

The target population consisted of nurses and health care workers employed by hospitals, clinics and community health centres in the Western Cape Province of South Africa.

4.5.2.2 *Survey population*

The survey population consisted of nurses and health care workers from community health centres, clinics and hospitals who were requested to

participate in the research after signing the consent forms and who were willing to complete the health care worker questionnaires. Examples of the letter of request, the form of consent and health care worker diabetes education questionnaires in English and isiXhosa are attached (cf. Appendices A, B, I, and J).

4.5.2.3 *Sample size*

The sample size consisted of the number of questionnaires which had been distributed to the nurses and health care workers from the community health care centres. The sample size consisted of a total of 52 nurses and health care workers. All health care workers who had agreed to participate in the research completed the questionnaire (100% response rate).

4.5.2.4 *Description of the sample*

The health care worker questionnaires were given to nurses/health care workers from the community health centres to complete, as well as to qualified nurses studying for the programme Bachelor Technologiae: Community Health Nursing at the Cape Peninsula University of Technology. Some of the nurses and health care workers were sourced and invited to participate in the research through the assistance of the Head of the Programme for Community Health Nursing at the Cape Peninsula University of Technology.

The socio-economic profile of the community health care centres, clinics and hospitals from which the nurses and health care workers were sourced varied. However, they could be classified as providing services to the mid- and lower-level income tier patients as the majority of these were state-subsidised community health centres, clinics and hospitals. The community

health care centres and clinic from where the nurses and health care workers were employed, were located in the Western Cape region as defined in the South African Census 2001 (RSA 2003). Table 4.1 provides a detailed listing of the hospitals, clinics and health care centres where the participating nurses and health care workers were employed.

TABLE 4.1: List of hospitals, clinics and community health centres for participating health care workers

	NAME OF HOSPITAL, CLINIC OR HEALTH CARE CENTRE
1.	Western Cape Rehabilitation Centre
2.	Delft Community Health Centre
3.	St Lukes Hospice
4.	Desmond Tutu HIV Research Centre
5.	2 Military Hospital
6.	Mathew Goniwe Clinic
7.	Red Cross Children's Hospital
8.	Denovo Rehabilitation Centre
9.	Valkenberg Hospital
10.	Groote Schuur Hospital
11.	Milnerton Medi-Clinic
12.	Gugulethu Community Health Centre No. 3
13.	Mowbray Maternity Hospital
14.	G.F. Jooste Hospital
15.	Brown's Farm Community Health Centre
16.	Good Hope Community Health Clinic
17.	Nolungile Clinic
18.	Vanguard Community Health Centre
19.	Boland-Strand Community Health Centre
20.	CPUT community health nursing students from Cape Town and Bellville

In addition to forms of consent being signed by the participating nurses and health care workers, ethical clearance for the conduct of the research was also obtained from the Chief Director: District Health Services, Provincial Administration of the Western Cape (cf. Appendix E).

4.5.3 The Delphi panel

4.5.3.1 *Target population*

The target population for the Delphi panel included experts in education, diabetes and the ocular complications of diabetes.

4.5.3.2 *Survey population*

The survey population consisted of experts in optometry, nursing, ophthalmology, public health, medical research and diabetes, as well as experts with experience and qualifications in higher education and curriculum/programme development. The panel of experts were requested to participate in the research after signing the consent forms and were requested to complete the various rounds of the Delphi questionnaire. Examples of the letter of invitation and request, the form of consent, the accompanying letter, the Delphi questionnaire and the letter of feedback for Round One are attached (cf. Appendices K, L, M, N, and P).

4.5.3.3 *Sample size*

The sample size for the expert Delphi panel was established at 12 members.

4.5.3.4 *Description of the sample*

Fifteen experts in the field of study were originally selected to participate in the research study. The panel were selected according to predetermined criteria to ensure representivity in all the areas of the research field. The experts were selected and invited based on their proven expertise and their

reputation among colleagues and professionals in the optometric/medical and higher education professions. As the field of study was interdisciplinary ranging from optometry to nursing, ophthalmology and higher education, the criteria for selection were developed with this aspect in mind. The following criteria and areas of specialisation were then formulated in order to provide a benchmark for the selection of experts to serve on the Delphi panel:

- Specialised knowledge and experience with programme development in higher education.
- Specialised knowledge and experience with statute/policy formulation through the relevant Professional Board of HPCSA.
- Experience and post-graduate qualifications in both optometry and education.
- Specialised knowledge and experience in ophthalmology, specifically in vitreo-retinal surgery and diabetic retinopathy.
- Specialised knowledge and experience in nursing and community/public health.
- Specialised knowledge and experience in world health and the epidemiology of public health problems.
- Specialised knowledge and experience in medical research.
- Specialised knowledge and experience with diabetes and its effects in the public health context.
- Specialised knowledge and experience of chronic diseases in terms of policy-making for the DoH of South Africa, and representation of organisations specifically dealing with the effects of diabetes and the eyes.

Of the 15 panellists originally selected and invited to participate in the study, one panellist did not respond to the invitation letter. One panellist indicated that she was unable to participate due to work scheduling and one other panel member did not complete the first round, as his medical/surgical commitments did not allow for the time required to participate in the Delphi. This drop-out rate was taken into consideration when the panel was first selected and the resulting panel of 12 members were considered broadly representative of the required expertise.

The sample was therefore not considered to be randomly chosen. However, this was justified considering that for the Delphi process, the selection of the correct panel of experts is critical (Critcher & Gladstone 1998:435). Of the panel of 12 experts, three had specialised qualifications in optometry and four members were qualified in both optometry and dispensing optics. Of these seven optometrists, three were in private practice dealing with patients from the public sector as well as a substantial number of diabetic patients. One optometrist had been involved with teaching at a higher education institution for 10 years and had a post-graduate qualification in higher education.

One optometrist was involved with teaching in the field of optometry at a higher education institution and was also the Chairperson of the Professional Board for Optometry and Dispensing Opticians, and as such was closely involved with policy formulation in terms of the provision of eye care in the public health sector. This panel member had over 15 years of experience in higher education and held post-graduate qualifications in optometry and, in particular, had a special interest in the provision of eye care to the public health sector. She was also involved with programme development at her University of employment.

Another optometrist was the supervisor of a community eye care clinic which had a large patient base of diabetic patients and was also affiliated with a higher education institution. One other optometrist was also a Professor at a University and had strong ties to the World Council of Optometry, the WHO, and held post-graduate qualifications in both optometry and public health. This panellist had been involved with teaching and research, nationally and internationally, in optometry and public health for more than 15 years and was also involved with the development of eye care programmes for optometrists and nurses dealing with patients in the public health sector. This panellist also specialised in ocular pathology and diabetic retinopathy in particular.

Another member of the panel was a nurse, held post-graduate qualifications at the level of Doctorate, and was the Head of the Programme for Community Health Nursing at a higher education institution. She also had a great deal of experience in developing health programmes for patients from the public health sector as well as in curriculum development of nursing programmes at University level. Another participant was from the National Government's DoH, who dealt with chronic disease and eye care in the public health sector and was also a member of the Professional Board for Optometry and Dispensing Opticians. Still another member was a Professor in Biomedical Technology at a University of Technology with specific expertise and more than 20 years of experience in the medical aspects of diabetes as well as in programme development in higher education. The last two members of the panel were ophthalmologists.

One of these ophthalmologists was further specialised in vitreo-retinal surgery and had vast experience surgically treating diabetic complications

both in private practice as well as in a tertiary academic hospital. His experience at the academic hospital was also in terms of educating and training medical practitioners specialising in ophthalmology. The last member of the panel was also a medical practitioner specialising in ophthalmology and was currently senior registrar at a tertiary academic hospital who was dealing with screening and surgically treating the complications of diabetic patients on a full-time basis.

The panel members were from various geographical areas of South Africa, including Tshwane, Kwa-Zulu Natal, the Eastern Cape and the Western Cape provinces. The profile of the panel was also mixed being comprised of eight male and four female members. The participants were originally contacted by telephone or by e-mail to determine whether they would be prepared to serve on the panel. Thereafter they were formally invited via e-mail letters. The letter of invitation and request gave a full description of the research and the Delphi process (cf. Appendix K). The participants were also requested to indicate whether they preferred to complete the questionnaire electronically or on hard copy and, in such cases, hard copies were hand-delivered or posted to those participants.

The members of the panel were requested to maintain full confidentiality about their participation on the panel as well as with regard to the questionnaire itself. This was to prevent any form of contamination of the results of the questionnaire research process. The participants were anonymous to one another and all correspondence to each separate participant was dealt with separately.

Three rounds were necessary before the Delphi process could be concluded. These rounds are discussed in Chapter 5, entitled Results and Findings of the Research, under the section dealing with the Delphi study.

4.6 DATA ANALYSIS

4.6.1 The diabetic patient and health care worker questionnaires

The data obtained from the questionnaires that had been completed by the diabetic patients and the health care workers was captured and analysed by the researcher, assisted where necessary by a statistician from the Cape Peninsula University of Technology. Each question was captured and analysed on Microsoft Excel according to the coding system set up for the questionnaire. The number of respondents, the frequency and the percentage of the respondents was calculated for each question or statement.

To ensure that the educational programme was specific and relevant to the needs of the health care workers and patients in the region, the results of the clinical examinations of the eyes of the diabetic patients were also recorded, but were kept separate from this study. A qualitative analysis of the diabetic patient and health care worker questionnaires was performed through prior coding of individual open-ended questions as well as both a quantitative and a qualitative analysis of the data derived from the closed-response questions in the questionnaires. The responses to the open-ended questions were analysed and the responses obtained were summarised in the results.

The responses to the questionnaires and data obtained were captured and analysed separately for the diabetic patients and the health care workers. This was done to ensure that the separate and substantial differences in

education required by the patients and by the health care workers could be analysed separately and then later integrated into the Delphi process.

4.6.2 The Delphi technique

4.6.2.1 *The first round*

The responses of the first round Delphi process were captured and analysed manually by the researcher while using Microsoft Excel. For each of the questionnaire questions or statements, the frequency and percentage responses for each point of the Likert scale was calculated. For the purposes of this research, consensus was reached when 80% of the respondents had chosen the same response to a particular question or statement. This meant that 10 out of the 12 panel members in the first round had to choose the same response in order to achieve consensus. This resulted in an effective consensus value of 83.3%.

The open-ended questions were also processed and interpreted by the researcher and the opinions and ideas of the expert respondents were used to adapt the formulated set of criteria for each subsequent round of Delphi. All comments and suggestions by the participants were included in the feedback reports after this round. Those opinions that were not necessarily used to reformulate the statements in the following rounds were nonetheless still taken into consideration for the development of the education programme. Once the data had been captured and analysed, those questions or statements upon which consensus had been achieved were removed from the questionnaire so that the second round Delphi process considered only those items upon which consensus had not been reached.

4.6.2.2 *The second round*

The responses from the second round Delphi process were captured and analysed as for the first round. Again, the frequency and percentage responses for each point of the Likert scale was calculated and all items on which consensus had been reached were again removed before continuing to the third round. Any comments and suggestions by the participants in this round were once again included in the feedback report to the panel. Where appropriate, recommendations and opinions expressed by the respondents were again incorporated and integrated into the questionnaire for the final round which aimed to achieve final consensus or stability.

4.6.2.3 *The third round*

The responses from the third round of the Delphi process were captured and analysed as for the two previous rounds. For those questions upon which consensus had not been reached, panel members were requested to state if they would remain with their choice from the second round. The expression by the panel members that they would remain with their choices meant that stability had been reached and it was then recorded as such.

4.7 RELIABILITY, VALIDITY AND TRUSTWORTHINESS

Psychometric validation is the process by which an instrument is assessed for reliability and validity through the mounting of a series of defined tests on the population group for whom the instrument is intended (Bowling 2002:147). Reliability therefore affects validity, and an unreliable scale would inevitably have low validity.

4.7.1 Reliability

Bowling (2002:147) defines reliability as "... the reproducibility and consistency of the instrument. It refers to the homogeneity of the instrument and the degree to which it is free from random error." Joppe (2000:1) defines reliability as "... the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable."

Denzin (1989:96) approaches reliability from an observation perspective when he suggests that "a reliable observation is one that is not biased by idiosyncrasies of the observer, a research instrument, or a subject, or by the constraints of time and place". In other words the observation would be considered to be reliable if any similarly situated observer observed and reported the same thing (Denzin 1989:96). Perhaps Babbie and Mouton (2001:1190) capture the essence of reliability best with their statement that "... reliability is a matter of whether a particular technique, applied repeatedly to the same object, would yield the same result each time".

It was important for this study that reliability was consistent in the research instrument, namely the questionnaire used, in order that the same results would be consistently obtained on repeated trials. The reliability in this research was therefore established by means of a well-constructed questionnaire, carefully piloted and reviewed by experts in this area of research. Further reliability of the study was ensured by a fully inclusive sample, both in the questionnaire and the Delphi process as well as the statistically high response rate in each phase of the use of the questionnaires.

The reliability of the research instruments (questionnaires) was also established in this study through triangulation of the processes of questionnaire development, the inclusiveness of the sample, and the response rate to the questionnaires and the Delphi technique.

4.7.2 Validity

The Writing Centre at the Colorado State University (2004) suggests that "... validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study's success at measuring what the researchers set out to measure."

Bowling (2002:147) defines validity simply as an assessment of whether an instrument measures what it aims to measure. An instrument would then be assigned validity after it has been satisfactorily tested repeatedly in the populations for which it was designed. This type of validity is known as internal validity, as compared to external validity, which refers to the generalisability of the research findings to the wider population of interest (Bowling 2002:150).

The validity of the findings of this research was maintained through the expertise of the participants in the Delphi panel, the broad collaboration by means of which the research instruments were designed, as well as by the supervisors and the supportive expertise provided to the researcher.

4.7.3 Trustworthiness

According to Seale (1999:466), to ensure reliability in qualitative research, the examination of trustworthiness is crucial. Babbie and Mouton (2001:277-278) believe that, since a quantitative study cannot be considered valid unless it is reliable, a qualitative study cannot be called transferable unless it is credible, and it cannot be deemed credible unless it is dependable.

The trustworthiness of this study is therefore evidenced through the reliability and the validity of the quantitative research instrument - in this case, the questionnaires, as well as the credibility of the qualitative instrument, the Delphi method of research, as well as the Delphi panel. Trustworthiness of the study was ensured through the selection of subject experts and specialists for the Delphi panel according to set criteria. Furthermore, trustworthiness of the Delphi process was ensured by providing the Delphi panel with individual and collective written feedback of the results after each and every round of the Delphi study.

4.8 ETHICAL CONSIDERATIONS

SA Healthinfo (2003:1) states that "the basic ethical assumption in health research is the autonomy of the individual within the broader context of human relations ... and that the social and cultural environment should be taken into consideration in all circumstances." Although this research did not involve any form of human clinical trials, it still did involve the questioning of both diabetic patients and health care workers, as well as involving other specialists in the Delphi process. Therefore it was of importance that the ethical guidelines stated by SA Healthinfo (2003:1) were adhered to; these required that research programmes should *inter alia* treat people as part of a community while simultaneously respecting their individual autonomy.

4.8.1 Health care workers and patients

All health care workers and patients agreed to participate in this research and gave informed consent to participation in the study, in addition to giving permission for their details and results to be used for the statistical analysis of the findings. Their own anonymity as well as that of their responses was ensured. All patient examinations conformed to the Ethical Regulations of the Cape Peninsula University of Technology, as well as to the Ethical Rules governing registered practitioners of the HPCSA. Written consent and permission for this research had also been obtained from the Chief Director: District Health Services, Dept. of Health, Provincial Administration of the Western Cape (cf. Appendix E).

4.8.2 The Delphi panel

The panel of Delphi experts had to provide personal information such as demographic details in order to enable a meaningful study to be conducted. They were, however, not permitted to obtain any information about the other members of the team. Their own anonymity as well as that of their responses was ensured. They furthermore completed informed consent forms for participation in the research. All information collected was dealt with in a strictly confidential manner and no names or personal information was made known.

4.9 CONCLUSION

This chapter has provided a detailed account of the methods used in this research. The methods of assessing health needs were explained and the theoretical perspectives on the various approaches used in the study were discussed. The specific methods, procedures and instruments involved with the research were comprehensively described together with an account of the

participating samples. An explanation was provided on how the data was analysed together with reliability, validity and trustworthiness considerations. Finally the ethical aspects of the research were addressed.

The following chapter, Chapter 5, will deal with the results obtained from the research and will also provide a statistical analysis of the data and a summative discussion of the findings.

CHAPTER 5

RESULTS AND DATA ANALYSIS

5.1 INTRODUCTION

This research was conducted in a number of phases beginning with a comprehensive literature review, followed by the use of questionnaires for diabetic patients and health care workers. Thereafter followed the Delphi process.

The literature study was used as a basis to develop the questionnaires for the diabetic patients and health care workers as well as to provide background for the Delphi process. The questionnaire survey was undertaken in order to obtain data concerning the status of the knowledge and education of diabetic patients about their condition and its possible complications. A similar process elicited the status of the knowledge and education of health care workers about diabetes and its complications. The information gained from these questionnaires then underpinned the basis for the development of the Delphi questionnaire. Thereafter the Delphi technique was utilised in order to develop the proposed programme for the prevention and management of the ocular complications of diabetes.

This chapter will deal with the results, the data analysis and a description of the findings, as well as a summative discussion thereof. It is important to consider the results of the diabetic patients' questionnaire survey, the health care workers' questionnaire survey, and the results and feedback from the Delphi panel.

After reporting the results, a discussion on the findings will follow. First, the questionnaire surveys will be discussed with reference to the diabetic patients as well as the health care workers. This will be followed by a discussion on the results of the Delphi process.

5.2 DEMOGRAPHIC INFORMATION

5.2.1 Demographic information of the diabetic patients

A total of 98 patients participated in the questionnaire survey (n=98). With regard to ethnicity, 7% (n=7) patients stated their racial classification was Black, 3% (n=3) stated their race was White and 90% (n=88) stated their race was Coloured. 28% (n=27) of the respondents were male and 72% (n=71) were female. The largest age group of respondents 39% (n=38) were in the 60-69-year age group. This was followed closely by 30% (n=29) of the respondents in the 50-59-year age group. 14% (n=14) of the respondents fell into the 40-49-year age group followed by 4% (n=4) in the 30-39-year age group. Only 2% (n=2) and 1% (n=1) of the respondents fell into the 20-29-and the 80-89-year age groups respectively.

As far as employment status was concerned, the largest group of 32% (n=31) of the respondents stated that they were pensioners. 23% (n=23) stated that they were housewives and 21% (n=21) indicated that they had some other type of employment. 11% (n=11) stated that they were unemployed and 9% (n=9) did not state their working/employment status. 2% (n=2) of the respondents stated that they were domestic workers and 1% (n=1) was retired.

The overwhelming majority 80% (n=78) of the diabetic patient respondents stated that they were Afrikaans-speaking, followed by English [13% (n=13)] and isiXhosa [7% (n=7)].

5.2.2 Demographic information of the health care workers

A total of 52 (n=52) health care workers participated in the questionnaire survey. With regard to ethnicity, 52% (n=27) stated their race was Coloured, 23% (n=12) of the health care workers stated that their racial classification was Black, 0% (n=0) stated their race was White, and 25% (n=13) did not state their ethnicity. 63% (n=33) of the respondents were female, 12% (n=6) of the respondents were male and 25% (n=13) did not state their gender. 25% (n=13) of the respondents fell into the 40-49-year age group, followed by 17% (n=9) of the respondents in the 30-39-year age group and 10% (n=5) in the 20-29-year age group. Only 4% (n=2) of the health care workers fell into the 50-59-year age group, while 44% (n=23) did not state their age.

In terms of language preference, 25% (n=13) were English-speaking, 25% (n=13) were Afrikaans-speaking, 21% (n=11) were isiXhosa-speaking and 29% (n=15) did not state their language preference.

5.2.3 Demographic information of the Delphi panel

A total of 12 members participated in the Delphi process (n=12). With regard to ethnicity, 17% (n=2) respondents were classified as Indian and 83% (n=10) were classified as White. 67% (n=8) of the respondents were male and 33% (n=4) were female. In terms of geographical location, 67% (n=8) of the respondents were from the Western Cape, 17% (n=2) were from Kwa-Zulu Natal, 8% (n=1) were from Tshwane and 8% (n=1) were from the Eastern Cape. [This analysis was done after strict criteria (on the expertise of the Delphi member) was used to identify/select the Delphi panel] (cf. section 4.5.3.4 detailing the selection criteria for the Delphi panel).

5.3 THE DIABETIC PATIENT QUESTIONNAIRE SURVEY

Section 1 of the Diabetic patient record card and Education Questionnaire (Appendices F, G and H) included questions with regard to the patients' knowledge of diabetes, whilst Section 2 considered the patients' knowledge of the ocular complications of diabetes. This was followed by Section 3, which dealt with the diabetic patients' knowledge of the management and treatment options for diabetes and - finally - other general information regarding the patients' general diabetes knowledge was dealt with in Section 4.

5.3.1 Descriptions of data and findings from the diabetic patients' questionnaire

The data obtained from the diabetic patient questionnaires is reported in this section together with a summative discussion of each subsection of the questionnaire. A total of 98 patients participated in the questionnaire survey and their responses are recorded as follows:

5.3.1.1 *Diabetic patients' knowledge of diabetes*

Table 5.1 indicates information with regard to the diabetic patients' knowledge of the various aspects pertaining to the disease of diabetes. The table also provides information about the participant's knowledge of their own diabetic condition.

TABLE 5.1: Diabetic patients' knowledge of diabetes

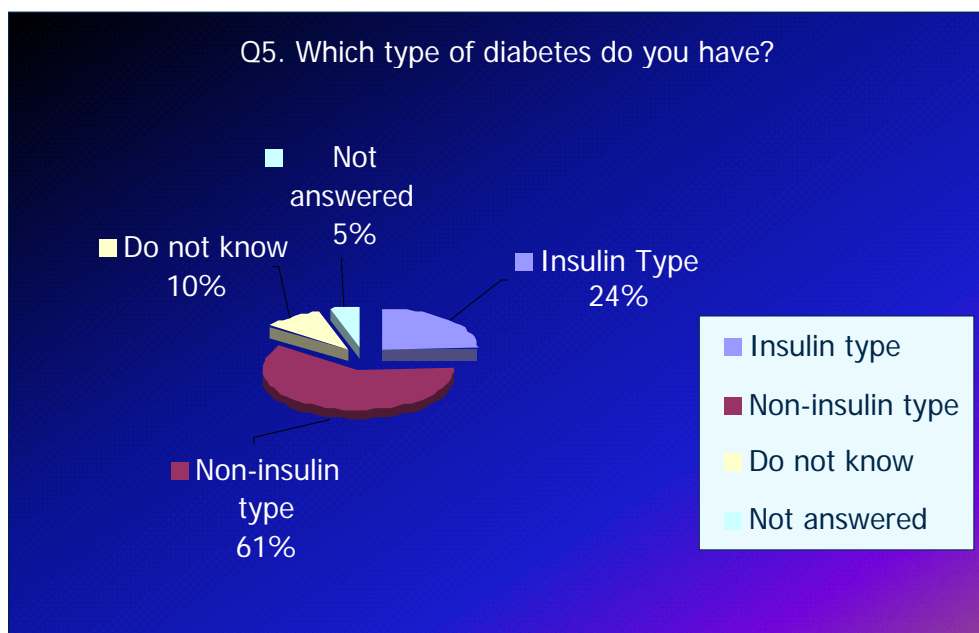
SECTION 1: KNOWLEDGE OF DIABETES	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
Q4. How many different types of diabetes do you know about?			
1 type	32	98	33%
2 types	41	98	42%
More than 2 types	5	98	5%
Don't know	16	98	16%
Not answered	4	98	4%
Q5. Which type of diabetes do you have?			
Insulin Type	24	98	24%
Non insulin type	59	98	60%
Don't know	10	98	10%
Not answered	5	98	5%
Q6. Do you think that your Diabetes is hereditary? (inherited from your parents)			
Yes	56	98	57%
No	27	98	28%
Don't know	13	98	13%
Not answered	2	98	2%
Q7. Do you think that your waist size may be used as a means to predict your risk of developing diabetes?			
Yes	24	98	24%
No	31	98	32%
Don't know	39	98	40%
Not answered	4	98	4%
Q8. Do you feel that pregnancy may affect diabetes and its complications			
Yes	48	98	49%
No	9	98	9%
Don't know	33	98	34%
Not answered	8	98	8%

In order for me to reduce the problems that may arise from diabetes I feel that ...	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
Q9. a healthy diet and lifestyle is ...			
Not important	3	98	3%
Slightly important	2	98	2%
Important	15	98	15%
Very important	77	98	79%
Not answered	1	98	1%
Q10. the age when I was diagnosed as a diabetic is ...			
Not important	8	98	8%
Slightly important	8	98	8%
Important	39	98	40%
Very important	39	98	40%
Not answered	4	98	4%
Q11. duration of your diabetes is ...			
Not important	4	98	4%
Slightly important	5	98	5%
Important	34	98	35%
Very important	40	98	41%
Not answered	15	98	15%
Q12. having good control of my blood sugar levels is ...			
Not important	2	98	2%
Slightly important	1	98	1%
Important	16	98	16%
Very important	78	98	80%
Not answered	1	98	1%
Q13. having my blood pressure checked and controlled is ...			
Not important	4	98	4%
Slightly important	2	98	2%
Important	19	98	19%
Very important	73	98	74%
Not answered	0	98	0%
Q14. not smoking is ...			
Not important	3	98	3%
Slightly important	2	98	2%
Important	12	98	12%
Very important	81	98	83%
Not answered	0	98	0%

5.3.1.2 *Summative discussion on the diabetic patients' knowledge of diabetes*

In Table 5.1 the diabetic patients' knowledge of diabetes is reported. As far as the patients' knowledge of the number of different types of diabetes is concerned, only 42% (n=41) stated that they knew about the existence of two types of diabetes. 24% (n=24) of the patients stated that they had insulin-type diabetes, 61% (n=60) stated that they had the non-insulin type of diabetes and a total of 15% (n=15) either did not know what type of diabetes they had or did not answer the question (cf. Figure 5.1).

FIGURE 5.1: Patient responses to their diabetes type



57% (n=56) believed that diabetes was hereditary, whilst 28% did not think it was hereditary. Interestingly, only 24% (n=24) of the diabetic patients believed that their waist size could be used as a means to predict their risk of developing diabetes, whilst 32% (n=31) did not believe this and a total of 44% (n=43) of the patients either did not know or did not answer the question. 49% (n=48) of the respondents also believed that pregnancy might affect diabetes and its complications, yet 34% (n=33) of the patients were unaware of this aspect.

When the patients were questioned on the ways that problems arising from diabetes may be reduced, 79% (n=77) of the patients felt that a healthy diet and lifestyle were very important. Only 3% (n=3) felt that this aspect was not important, and 2% (n=2) felt that this aspect was only slightly important. A total of 80% (n=78) of the respondents felt that the age of diagnosis was an important factor or a very important factor when considering the problems that might arise from diabetes. This aspect was supported by their choice of statements, as 35% (n=34) felt that the duration of diabetes was important and 41% (n=40) felt that the duration of diabetes was a very important factor when considering the problems that might arise.

16% (n=16) of the respondents felt that having good control of their blood sugar was important and 80% (n=78) believed that good blood sugar control was very important. A similar response was seen in relation to the patients' thoughts on having their blood pressure checked and controlled. 19% (n=19) thought that having their blood pressure checked and controlled was important and 74% (n=73) of the respondents believed that this aspect was very important. An additional lifestyle question asked the respondents about their thoughts on smoking: 12% (n=12) considered that it was important not

to smoke and 83% (n=81) believed that it was very important that they did not smoke.

These results complete the section of the questionnaire dealing with the patients' overall knowledge of diabetes. The following section, namely 5.3.1.3 deals with the diabetic patients' knowledge of the ocular complications of diabetes.

5.3.1.3 *Diabetic patients' knowledge of the ocular complications of diabetes*

Table 5.2 indicates information with regard to the diabetic patients' knowledge of the ocular complications of diabetes. The table also provides information about the participants' knowledge of how diabetes might affect their own eyes.

TABLE 5.2: Diabetic patients' knowledge of the ocular complications of diabetes

SECTION 2: KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
Q15. Do you think that diabetes may affect the way people see when looking far and/or near?			
Strongly Disagree	0	98	0%
Disagree	8	98	8%
Agree	28	98	29%
Strongly Agree	59	98	60%
Not answered	3	98	3%
Q16. Diabetes may affect the way I see colours?			
Strongly Disagree	9	98	9%
Disagree	19	98	19%
Agree	34	98	35%
Strongly Agree	32	98	33%
Not answered	4	98	4%

Q17. Diabetes may cause my eyes to become squint?			
Strongly Disagree	11	98	11%
Disagree	27	98	28%
Agree	32	98	33%
Strongly Agree	21	98	21%
Not answered	7	98	7%
Q18. Diabetes may affect the way my eyes heal if they become injured?	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
Strongly Disagree	6	98	6%
Disagree	9	98	9%
Agree	36	98	37%
Strongly Agree	42	98	43%
Not answered	5	98	5%
Q19. Diabetes may cause a cataract in my eyes making my vision clouding?			
Strongly Disagree	2	98	2%
Disagree	11	98	11%
Agree	40	98	41%
Strongly Agree	40	98	41%
Not answered	5	98	5%
Q20. Diabetes may increase the pressure in my eyes and lead to glaucoma?			
Strongly Disagree			
Disagree	5	98	5%
Agree	50	98	51%
Strongly Agree	36	98	37%
Not answered	6	98	6%
Q21. Diabetes may cause bleeding and damage inside the back of my eye?			
Strongly Disagree	3	98	3%
Disagree	14	98	14%
Agree	32	98	33%
Strongly Agree	42	98	43%
Not answered	7	98	7%
Q22. Diabetes will not affect my eyes.			
Strongly Disagree	44	98	45%
Disagree	25	98	26%
Agree	8	98	8%
Strongly Agree	18	98	18%
Not answered	3	98	3%

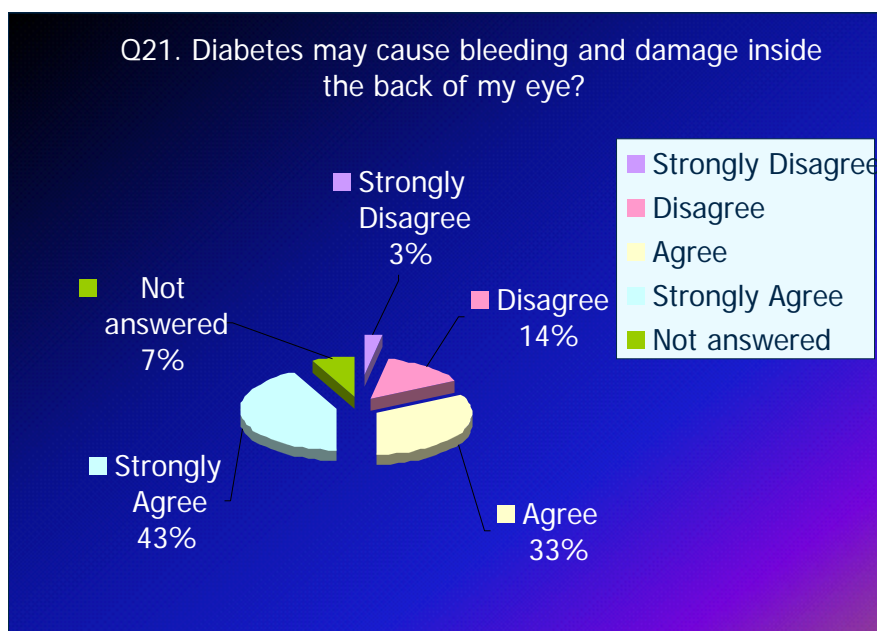
5.3.1.4 *Summative discussion on the diabetic patients' knowledge of the ocular complications of diabetes*

In Table 5.2 the diabetic patients' knowledge of the ocular complications of diabetes is reported. A total of 89% (n=87) of the patients agreed or strongly agreed that diabetes might affect the way that people may see when they look far and/or near. 28% (n=28) disagreed or strongly disagreed with the statement that diabetes may affect the way that they see colours, whilst 68% (n=66) agreed or strongly agreed with this statement. When considering whether diabetes could affect the way their eyes healed if they became injured, 37% (n=36) agreed with this statement and 43% (n=42) strongly agreed.

A particularly important question related to the patients' knowledge of whether diabetes could cause a cataract in their eyes. 13% (n=13) disagreed or strongly disagreed with this statement and 5% (n=5) did not know. 41% (n=40), however, agreed and 41% (n=40) strongly agreed with this statement. A total of 88% (n=86) agreed or strongly agreed with the statement that diabetes may cause pressure changes in the eyes leading to glaucoma, which is another particularly important area of knowledge for the diabetic patients.

Perhaps the most critical question of this section dealt with the patients' knowledge of whether diabetes causes bleeding and damage inside the eyes. 33% (n=32) agreed and 43% (n=42) strongly agreed that diabetes may cause bleeding and damage inside the eyes. However, a significant percentage of 24% (n=24) of the respondents either disagreed with this statement or did not answer the question (cf. Figure 5.2).

FIGURE 5.2: Patients' knowledge of the effects of diabetes inside the eye



The final question of this section asked the patients if they believed that diabetes will not affect their eyes. 45% (n=44) strongly disagreed with this statement and 26% (n=25) disagreed. However, a total of 29% either did not answer the question or felt that diabetes would not affect their eyes. Of this total 18% (n=18) strongly agreed that diabetes would not affect their eyes. This is a significant proportion of the patients sharing this view and indicates the need for further education of such patients about diabetes and its ocular complications.

These results complete the section of the questionnaire dealing with the patients' knowledge of the ocular complications of diabetes. The following section, namely 5.3.1.5 deals with the diabetic patients' knowledge of the management and treatment options for diabetes.

5.3.1.5 *Diabetic patients' knowledge of the management and treatment options for diabetes*

Table 5.3 indicates information with regard to the diabetic patients' knowledge of the management and treatment options for diabetes. The table provides information about the participants' knowledge of how diabetes should be managed and controlled and then requires respondents to state exactly how they managed their own condition. The section also requests respondents to state how often they felt that diabetic patients should go for medical check-ups and ocular examinations. It then asks the patients how often they themselves went for such checks.

TABLE 5.3: Diabetic patients' knowledge of the management and treatment options for diabetes

SECTION 3: KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OPTIONS FOR DIABETES	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
In order to best control my diabetes, I feel that			
Q23. ... following a healthy diet is ...			
Not important	0	98	0%
Slightly important	0	98	0%
Important	17	98	17%
Very important	79	98	81%
Not answered	2	98	2%
Q24. ... measuring my blood sugar is ...			
Not important	0	98	0%
Slightly important	0	98	0%
Important	22	98	22%

Very important	74	98	76%
Not answered	2	98	2%
Q25. ... regular exercise is ...			
Not important	0	98	0%
Slightly important	2	98	2%
Important	33	98	34%
Very important	61	98	62%
Not answered	2	98	2%
Q26. ... maintaining an ideal body weight is ...			
	RESPONSES	TOTAL	% OF
	QUESTION	PATIENTS	TOTAL
Not important	1	98	1%
Slightly important	2	98	2%
Important	31	98	32%
Very important	62	98	63%
Not answered	2	98	2%
Q27. ... taking my medication exactly as prescribed is ...			
Not important	0	98	0%
Slightly important	0	98	0%
Important	12	98	12%
Very important	85	98	87%
Not answered	1	98	1%
Q28. ... going for regular medical check-ups at the clinic/doctor is ...			
Not important	0	98	0%
Slightly important	0	98	0%
Important	18	98	18%
Very important	79	98	81%
Not answered	1	98	1%
Q29. ... going to have my eyes tested is ...			
Not important	0	98	0%
Slightly important	2	98	2%
Important	20	98	20%
Very important	74	98	76%
Not answered	2	98	2%
Q30. I follow a healthy diet specially designed for my diabetes.			
Yes	75	98	77%
No	18	98	18%
Not answered	5	98	5%
Q31. I measure my blood sugar on a daily basis.			
Yes	36	98	37%

No	59	98	60%
Not answered	3	98	3%
Q32. I exercise for at least an hour at least three times a week.			
Yes	46	98	47%
No	47	98	48%
Not answered	5	98	5%
Q33. I feel that my body weight is about right for me to help control my diabetes.			
	RESPONSES QUESTION	TOTAL PATIENTS	% OF TOTAL
Yes	56	98	57%
No	37	98	38%
Not answered	5	98	5%
Q34. I take my diabetes medication and exactly as prescribed.			
Yes	92	98	94%
No	1	98	1%
Not answered	5	98	5%
Q35. I go for medical check-ups at the clinic/doctor once a month.			
Yes	76	98	78%
No	20	98	20%
Not answered	2	98	2%
Q36. I feel that controlling my diabetes may help to prevent eye complications and vision problems.			
Yes	96	98	98%
No	0	98	0%
Not answered	2	98	2%
Q37. I have my eyes checked and tested every year.			
Yes	29	98	30%
No	65	98	66%
Not answered	4	98	4%

5.3.1.6 *Summative discussion on the diabetic patients' knowledge of the management and treatment options for diabetes*

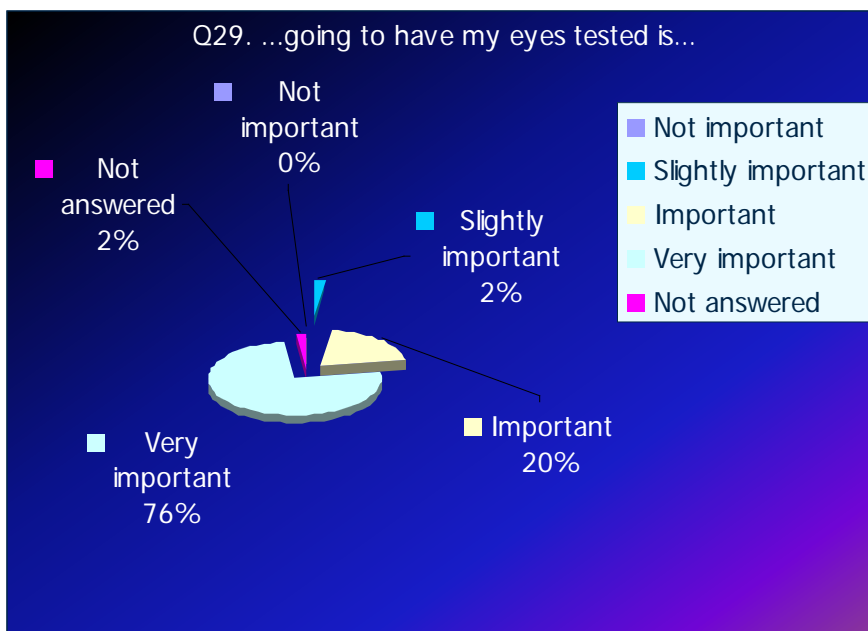
In Table 5.3 the diabetic patients' knowledge of the management and treatment options for diabetes is reported. The participants were asked to

rate the relative importance of various statements in relation to best controlling their diabetes. The first seven questions in the questionnaire dealt with how the participants *rated* the relative importance of the various statements. The following eight questions dealt with how the patients *actually followed* the various management and treatment regimens in their day-to-day activities.

With the exception of only 2% (n=2) of the respondents, all the other respondents felt that following a healthy diet was important in controlling diabetes. Of these respondents, 17% (n=17) felt that it was simply important, but the overwhelming majority 81% (n=79) felt that following a healthy diet was very important. None of the patients felt that measuring their blood sugar was unimportant, whilst 22% (n=22) and 76% (n=74) stated that measuring blood sugar was important and very important respectively. On the question of exercise, 34% (n=33) felt that regular exercise was important in controlling diabetes and 62% (n=61) felt that exercise was very important.

A similar statistic was found with the patients' responses in terms of maintaining an ideal body weight. 32% (n=31) believed that it was important to maintain an appropriate body weight and 63% (n=62) felt that this aspect was very important in order to control diabetes. 87% (n=85) of the respondents believed that taking their medication exactly as prescribed was very important and 81% (n=79) of the patients felt that it was very important to go for regular medical check-ups at the clinic or doctor. A similar response was obtained with regard to eye examinations, with 76% (n=74) of the respondents feeling that going to have their eyes tested was very important and 20% (n=20) considering this aspect to be simply important (cf. Figure

5.3). None of the patients felt that going for regular medical check-ups or eye tests was unimportant.

FIGURE 5.3: Importance of eye tests to patients

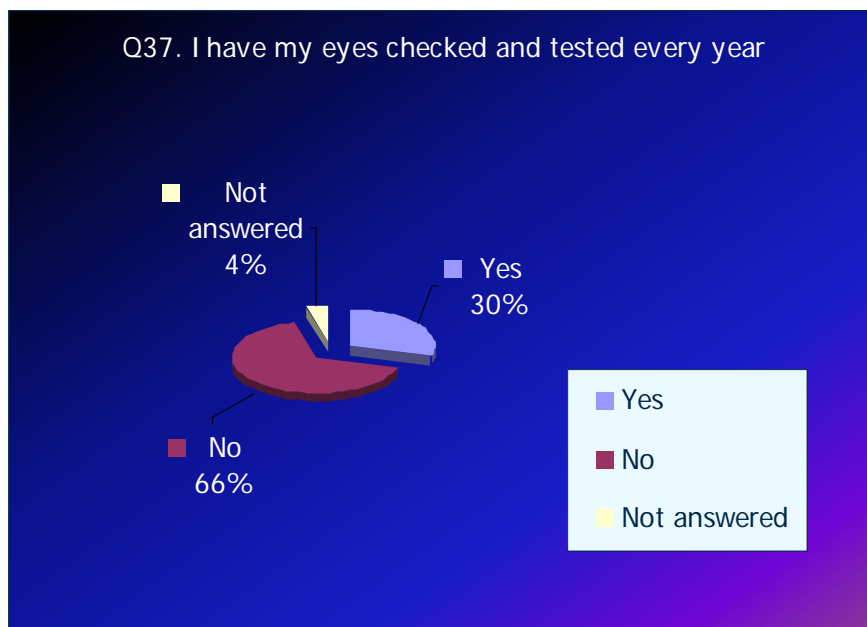
The following responses dealt with how the patients followed the various management and treatment regimens on a real-life day-to-day basis.

77% (n=75) of the patients stated that they followed a healthy diet specifically designed for diabetes, but 18% (n=18) stated that they did not follow such a diet. 5% (n=5) chose not to answer this question. Significantly, 60% (n=59) stated that they did not measure their blood sugar on a daily basis with only 37% (n=36) of the respondents stating that they did. This aspect does not correlate with the patients' rating of the importance of measuring their blood sugar, in which case a total of 98% (n=96) patients stated that measuring their blood sugar was important or very important. These two aspects of diet and blood sugar measurement are both particularly important aspects that need to be considered foremost in the management of diabetes.

On the question of exercise, an equal response was reflected with 47% (n=46) of the patients stating that they exercised for at least an hour three times a week and 48% (n=47) stating that they did not. 57% (n=56) of the respondents believed that their body weight was about right for them to control their diabetes effectively, but a significant 38% (n=37) did not feel their body weight was appropriate. Almost all the patients [94% (n=92)] stated that they took their diabetes medication exactly as prescribed. Only 5% (n=5) of the respondents chose not to answer the questions regarding exercise, body weight or the taking of their diabetes medication.

The majority of the patients [78% (n=76)] stated that they went for medical check-ups once a month, which correlates closely with the 81% (n=79) of patients' rated importance of going for regular check-ups. Although 98% (n=96) of the patients felt that controlling their diabetes would help to prevent eye complications, the majority of these patients [66% (n=65)] stated that they did not have their eyes checked every year.

Only 30% (n=29) of the respondents stated that they had actually had their eyes checked every year, compared to the 96% (n=94) of the respondents who had earlier stated that it was important to have their eyes checked regularly (cf. Figure 5.3 and Figure 5.4). This is a critical aspect to note in this research, as irreversible diabetic eye problems may occur without the patient being aware of them, thus emphasising the importance of having the eyes examined for the complications of diabetes.

FIGURE 5.4: Frequency of diabetic patients' eye examinations

These results complete the section of the questionnaire dealing with the patients' knowledge of the ocular complications of diabetes. The following section, namely 5.3.1.7 deals with other additional information from the diabetic patients not previously categorised.

5.3.1.7 *Additional information from diabetic patients*

Table 5.4 provides additional information from the diabetic patients in terms of common misconceptions with regard to diabetes and its management. The respondents were also requested to state their opinion on the various ways in which diabetes might affect their own eyes. Provision was also made in the table for the respondents to indicate if they did not actually know the answer to the question or statement provided.

TABLE 5.4: Additional information from diabetic patients

SECTION 4: ADDITIONAL INFORMATION FROM DIABETIC PATIENTS	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
Q38. About 40% of people with diabetes have diabetic retinopathy (complication of diabetes).			
True	67	98	68%
False	4	98	4%
Don't know	26	98	27%
Not answered	1	98	1%
Q39. "If you can see right, there's nothing wrong with your eyes".			
True	49	98	50%
False	26	98	27%
Don't know	22	98	22%
Not answered	1	98	1%
Q40. Diabetic eye disease can develop even if diabetes is under control.			
True	59	98	60%
False	12	98	12%
Don't know	26	98	27%
Not answered	1	98	1%
Q41. People with diabetes should have annual comprehensive eye examinations with dilated pupils.			
True	77	98	79%
False	4	98	4%
Don't know	16	98	16%
Not answered	1	98	1%
Q42. Diabetes affects everyone the same way.			
True	14	98	14%
False	58	98	59%
Don't know	25	98	26%
Not answered	1	98	1%
Q43. If detected early, diabetic eye disease may be well treated and vision preserved in most patients.			
True	87	98	89%
False	0	98	0%
Don't know	9	98	9%
Not answered	2	98	2%

	RESPONSES PER QUESTION	TOTAL NUMBER PATIENTS	% OF TOTAL
Q44. Eye examinations are needed only if there are symptoms present.			
True	36	98	37%
False	51	98	52%
Don't know	10	98	10%
Not answered	1	98	1%
Q45. Controlling blood sugar levels eliminates the risk of visual loss.			
True	73	98	74%
False	7	98	7%
Don't know	17	98	17%
Not answered	1	98	1%
Q46. Early diagnosis and prompt treatment can protect against vision loss.			
True	82	98	84%
False	1	98	1%
Don't know	14	98	14%
Not answered	1	98	1%

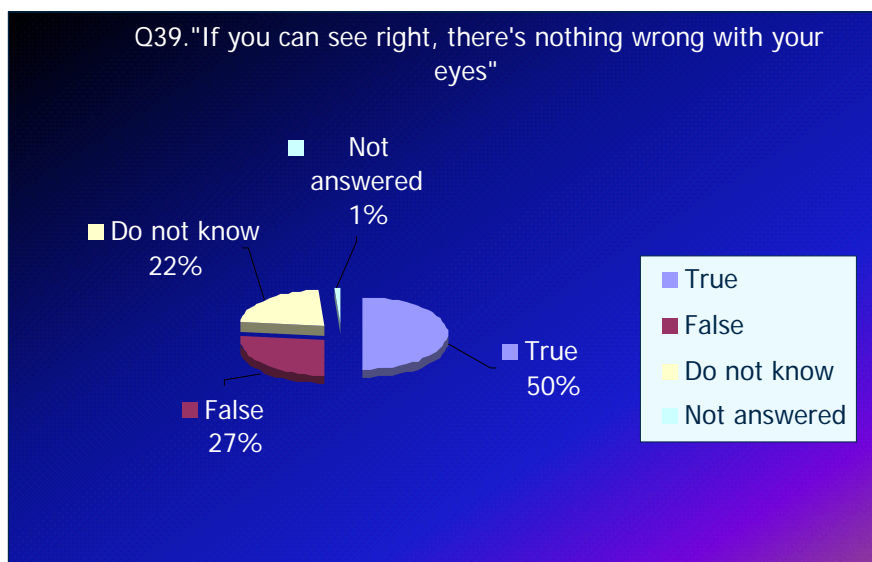
5.3.1.8 *Summative discussion on the additional information from the diabetic patients*

In Table 5.4 other additional information on the patients' knowledge about diabetes is reported. The participants were provided with various statements and asked to state whether they believed them to be true or false or to state if they did not know.

Regarding the prevalence of diabetic retinopathy, 68% (n=67) of the patients felt that the statement was true, whereas 27% (n=26) of the patients did not know if this statement was true or not. A common misconception among diabetic patients is that, if their vision is good and they can see clearly, then there is nothing wrong with their eyes. A substantial 50% (n=49) of the patients believed the statement that "If you can see right, there's nothing wrong with your eyes" to be true (cf. Figure 5.5). This is an important finding and one that should be addressed in the patient education programme. Only

27% (n=26) of the respondents felt that this statement was untrue and 22% (n=22) did not know if the statement was true or not.

FIGURE 5.5: Patient beliefs on vision and health of the eyes



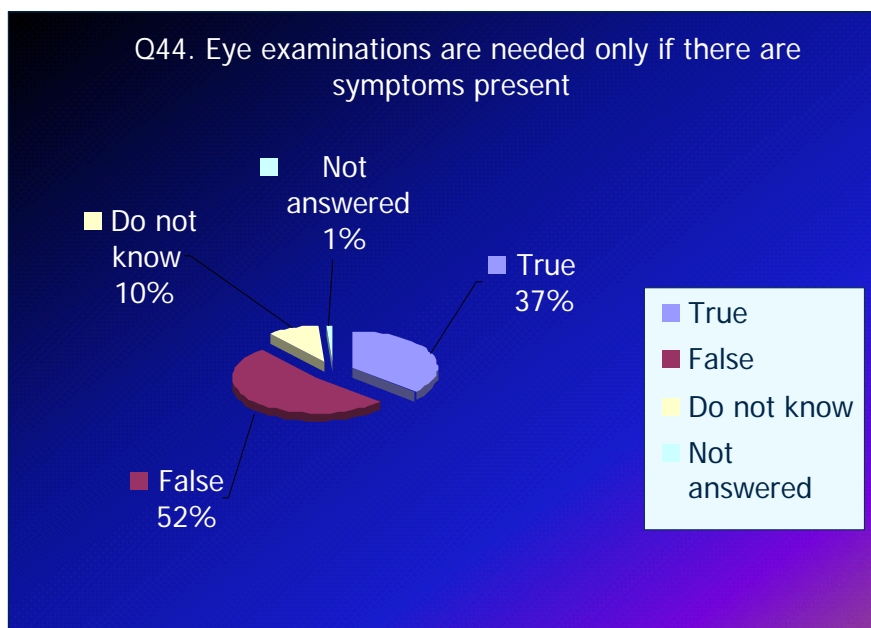
On the question of whether diabetic eye disease can develop even if the diabetes is under control, 60% (n=59) of the respondents felt that this was true. However, 27% (n=26) did not know if this statement was true or not and 12% (n=12) believed it to be false. With regard to the fact that diabetic patients should undergo annual comprehensive eye examinations with dilated pupils, 79% (n=77) of the patients thought this was true, yet 20% (n=20) of the patients either did not know or thought this to be false.

Although 59% (n=58) of the respondents recognised that the statement "Diabetes affects everyone the same" was false, 14% (n=14) thought this

was true and 26% (n=25) of the respondents did not know if this was true or not. An important finding was that 89% (n=87) of the patients believed that, if detected early, diabetic eye disease can be treated and vision preserved, yet in the previous section of the questionnaire (cf. Table 5.3, Q.37), only 30% (n=29) stated that they had their eyes checked and tested every year.

A further critical finding was that only 52% (n=51) of the patients felt that the statement "Eye examinations are needed only if there are symptoms present" was false (cf. Figure 5.6). 37% (n=36) of the patients thought this was in fact true and 10% (n=10) did not know if this was true or not. Again this was highlighted by the fact that only 30% (n=29) of the respondents stated that they had their eyes checked annually. It is essential that, in order to reduce the severity and prevalence of the ocular complications of diabetes, diabetic patients are informed about the need to undergo regular comprehensive eye examinations to detect whether there are any signs of diabetic retinopathy before vision is affected. The presence of symptoms of poor sight must not be used as criteria for when eye examinations should commence.

FIGURE 5.6: The need for eye examinations



A significant 74% (n=73) of the respondents believed that controlling blood sugar levels eliminates the risk of visual loss, with 17% (n=17) not knowing if this was in fact true.

Finally, 84% (n=82) of the patients felt that early diagnosis and prompt treatment could protect against vision loss, with 14% (n=14) not knowing if this was true. The results of these findings clearly indicate that, although the patients have a basic level of understanding of diabetes and its potential ocular complications, their daily management of the condition - both from a medical as well as from a holistic lifestyle point of view is - not adhered to. Furthermore, the essential need for undergoing comprehensive eye examinations is not understood nor acted upon by the patients and this is a

critical area that needs to be addressed if the sight-threatening complications of diabetes are to be reduced or eliminated in these patients.

5.3.2 Implications of the findings from the diabetic patients for the proposed education programme

The results and findings of the diabetic patients' questionnaires have implications for the Delphi study and the proposed diabetes education programme. The results reflect deficiencies in the patients' knowledge of the different types of diabetes and the type that they themselves suffered from. Aspects such as the importance of diet/nutrition, body weight, and blood pressure control as preventative measures will have to be included in the programme.

The patients' knowledge of the ocular complications of diabetes was also deficient, particularly in terms of the knowledge of the various types of complications that may arise from diabetes. The proposed diabetes education programme, through the Delphi process, will have to focus specifically on educating patients about the sight-threatening complications that may arise. Furthermore, the findings reflect the belief among a number of patients that diabetes will not affect their eyes and this misconception must also be addressed by the education programme.

In terms of the diabetic patients' knowledge of the management and treatment options, the research identified specific areas that need to be included in the proposed programme. These areas include the adherence to a healthy diet; the measuring of blood sugar; the taking of regular exercise; the maintenance of an appropriate body weight and the undergoing of regular eye and medical examinations. The most critical finding, and one that

must be addressed by the education programme, is that even though patients realise that vision can be preserved and diabetic eye disease can be well treated if it is detected early, this belief must be put into practice.

Therefore, to ensure that these findings were addressed, the substantive areas and sections comprising the diabetic patient questionnaire were also included in the Delphi questionnaire. They were then considered by the Delphi panel for inclusion in the proposed diabetes education programme.

5.4 THE HEALTH CARE WORKER QUESTIONNAIRE SURVEY

Section 1 of the Health care workers' Diabetes Education Questionnaire (Appendices I and J) included questions with regard to the health care workers' education and training for the assessment of the risk factors for diabetes, whilst Section 2 considered the health care workers' education and training for the ocular complications of diabetes. This was followed by Section 3, which dealt with the health care workers' education and training for screening and managing diabetic eye disease and, finally, Section 4 dealt with their education and training for diabetic patient counselling.

5.4.1 Descriptions of data and findings from the health care worker questionnaire

The data obtained from the health care worker questionnaires is reported in this section together with a summative discussion of each subsection of the questionnaire. A total of 52 health care workers participated in the questionnaire survey and their responses are recorded as follows:

5.4.1.1 *Health care workers' education and training for the assessment of diabetes risk factors*

Table 5.5 provides information with regard to the health care workers' education and training for the assessment of risk factors contributing to the development of Type I and Type II diabetes. Where the questionnaire had place for open-ended responses, these will be addressed in the summative discussion on the findings of the health care worker questionnaire.

TABLE 5.5: Health care workers' education and training for the assessment of diabetes risk factors

SECTION 1: EDUCATION AND TRAINING FOR THE ASSESSMENT OF DIABETES RISK FACTORS	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Rate the importance of the following diabetes risk factors having an effect on the development of Type 1 diabetes:			
Q3. Age of patient			
Not important	8	52	15%
Slightly important	11	52	21%
Important	16	52	31%
Very important	17	52	33%
Not answered	0	52	0%
Q4. Race/Ethnicity			
Not important	18	52	35%
Slightly important	10	52	19%
Important	19	52	37%
Very important	5	52	10%
Not answered	0	52	0%
Q5. Family history			
Not important	0	52	0%
Slightly important	0	52	0%
Important	11	52	23%
Very important	41	52	79%
Not answered	0	52	0%
Q6. Upper body fat distribution			
Not important	7	52	13%
Slightly important	2	52	4%
Important	18	52	35%
Very important	24	52	46%
Not answered	1	52	2%
Q7. Physical inactivity			
Not important	6	52	12%
Slightly important	4	52	8%
Important	16	52	31%
Very important	26	52	50%
Not answered	0	52	0%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q8. Poor diet			
Not important	2	52	4%
Slightly important	2	52	4%
Important	8	52	15%
Very important	40	52	77%
Not answered	0	52	0%
Rate the importance of the following diabetes risk factors on the development of Type 2 diabetes:			
Q10. Age of patient			
Not important	3	52	6%
Slightly important	8	52	15%
Important	16	52	31%
Very important	23	52	44%
Not answered	2	52	4%
Q11. Race/Ethnicity			
Not important	10	52	19%
Slightly important	16	52	31%
Important	13	52	25%
Very important	6	52	12%
Not answered	7	52	13%
Q12. Family history			
Not important	0	52	0%
Slightly important	2	52	4%
Important	14	52	27%
Very important	34	52	65%
Not answered	2	52	4%
Q13. Upper body fat distribution			
Not important	2	52	4%
Slightly important	8	52	15%
Important	20	52	38%
Very important	17	52	33%
Not answered	5	52	10%
Q14. Physical inactivity			
Not important	1	52	2%
Slightly important	8	52	15%
Important	18	52	35%
Very important	22	52	42%
Not answered	3	52	6%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q15. Poor diet			
Not important	2	52	4%
Slightly important	2	52	4%
Important	12	52	23%
Very important	35	52	67%
Not answered	1	52	2%
Q17. The risk factors for developing Type 1 diabetes are the same as the risk factors for developing Type 2 diabetes.			
Yes	24	52	46%
No	27	52	52%
Not answered	1	52	2%
Q18. How well have your education and training prepared you for assessing and managing diabetic patients' risk factors?			
Not at all	0	52	0%
Poorly	7	52	13%
Adequately	29	52	56%
Well	10	52	19%
Very well	5	52	10%
Not answered	1	52	2%

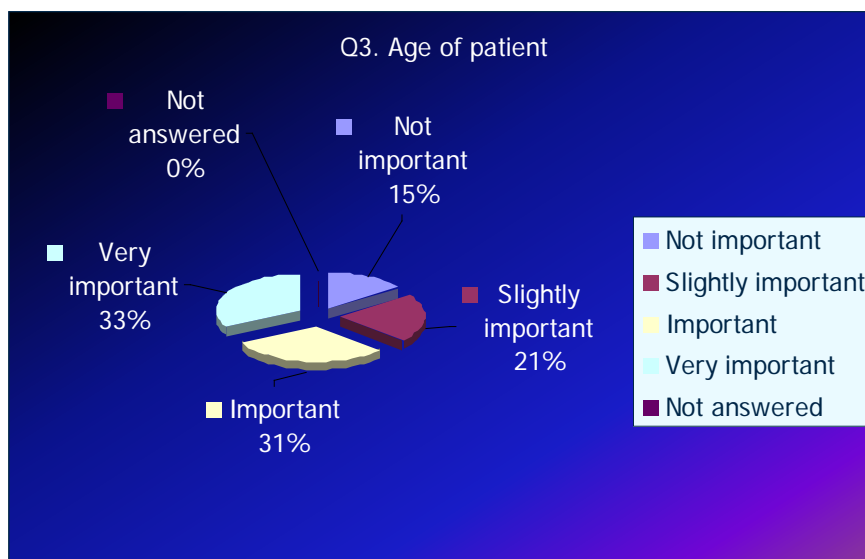
5.4.1.2 *Summative discussion on the health care workers' education and training for the assessment of diabetes risk factors*

In Table 5.5 the health care workers' education and training for the assessment of the risk factors contributing to the development of diabetes are reported. Fantus, Delovitch and Dupre' (1997:184-206) list the non-modifiable risk factors for Type I diabetes as being race/ethnic background, age and genetic susceptibility or family history.

In terms of the age of the patient, 33% (n=17) of the respondents felt that this factor was very important and 31% (n=16) considered it to be important.

However, a total of 36% (n=19) of the respondents considered this aspect to be only slightly important or not important at all (cf. Figure 5.7).

FIGURE 5.7: Age of the patient as a risk factor for diabetes



In terms of race/ethnicity as a factor contributing to Type I diabetes, 35% (n=18) of the respondents felt that this aspect was not important and 19% (n=10) felt it to be only slightly important. 37% (n=19) considered this factor to be important, but only 10% (n=5) felt that this factor was very important. An overwhelming majority 79% (n=41) of the respondents considered family history to be very important and 23% (n=12) considered this factor to be important.

Although there are no known modifiable risk factors for Type I diabetes, 81% (n=42) of the respondents believed that upper body fat distribution was either an important or very important factor contributing to the development of Type I diabetes. 81% (n=42) also believed that physical inactivity was an important or very important contributory factor to Type I diabetes. 92%

(n=48) of the respondents furthermore considered poor diet to be an important or very important factor contributing to the development of Type I diabetes.

The second half of this section deals with the factors that may contribute to the development of Type II diabetes. Non-modifiable risk factors for Type II diabetes once more include age and family history (Levitt *et al.* 1999:949). Potentially modifiable risk factors include upper segment body fat distribution, physical inactivity, waist circumference and poor diet leading to excessive visceral fat.

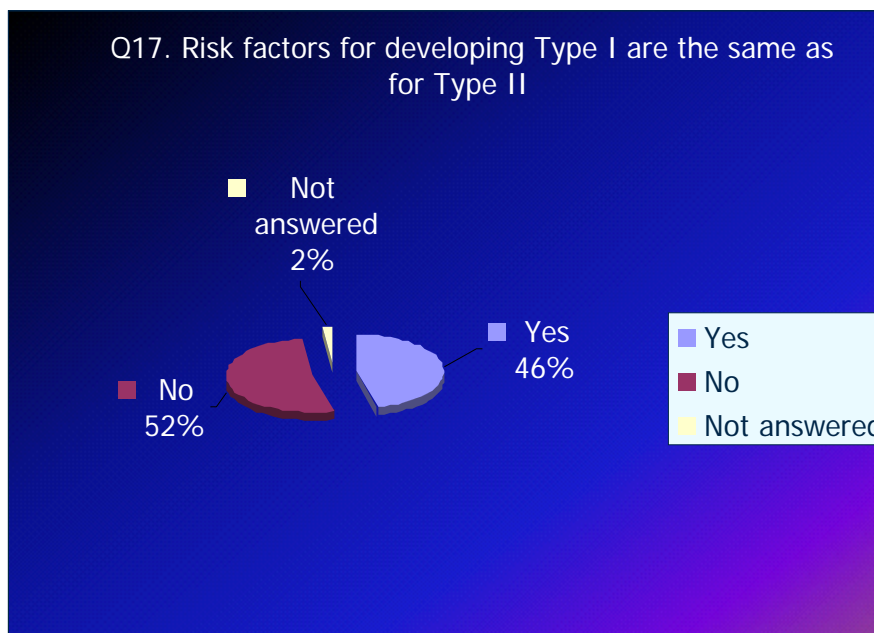
44% (n=23) of the respondents considered the age of the patient to be a very important factor contributing to the development of Type II diabetes, with 31% (n=16) rating this factor as important. 21% (n=11) felt that this factor was not important or only slightly important. 19% (n=10) believed that race/ethnicity was not an important contributory factor and 31% (n=16) considered this to be only slightly important. 37% (n=19) of the health care workers believed this factor to be either an important or very important factor contributing to the development of Type II diabetes, whilst 13% (n=7) chose not to answer this question.

In terms of family history, 65% (n=34) of the respondents believed that this was a very important factor and 27% (n=14) considered this factor to be important. Only 4% (n=2) felt that family history was only slightly important. For the modifiable risk factors, 33% (n=17) of the health care workers believed that upper body fat distribution was a very important factor contributing to Type II diabetes and 38% (n=20) felt it to be an important

factor. 19% (n=10), however, considered this factor not to be important or only slightly important.

For physical inactivity, 42% (n=22) of the respondents considered this to be a very important contributory factor with 35% (n=18) considering this aspect to be important. 17% (n=9) felt that physical inactivity was either not important or only a slightly important factor contributing to Type II diabetes. The next question considered poor diet, which may indirectly contribute to the development of Type II diabetes. A majority of 67% (n=35) of the respondents felt that this was a very important factor contributing to the development of Type II diabetes with 23% (n=12) rating this factor as important. A total of 8% (n=4) considered poor diet not to be important or only a slightly important contributory factor.

The risk factors for developing Type I diabetes are not necessarily the same as those contributing to the development of Type II diabetes, yet 46% (n=24) of the respondents considered that the risk factors were the same for each (cf. Figure 5.8). Interestingly, 56% (n=29) of the respondents felt that their education and training had prepared them adequately for assessing and managing the risk factors contributing to diabetes. 29% (n=15) believed that they were either well or very well prepared, but 13% (n=7) felt that they were poorly prepared to assess and manage the risk factors contributing to diabetes.

FIGURE 5.8: The risk factors for Type I and Type II diabetes

These results complete the section of the questionnaire dealing with the health care workers' education and training for the assessment of diabetes risk factors. The following section, namely 5.4.1.3 deals with the health care workers' education and training for the assessment of the ocular complications of diabetes.

5.4.1.3 *Health care workers' education and training for the assessment of the ocular complications of diabetes*

Table 5.6 provides information with regard to the health care workers' education and training for the assessment of the ocular complications of diabetes. Where the questionnaire had place for open-ended responses,

these will be addressed in the summative discussion on the findings of the health care worker questionnaire.

TABLE 5.6: Health care workers' education and training for the assessment of the ocular complications of diabetes

SECTION 2: EDUCATION AND TRAINING FOR THE ASSESSMENT OF THE OCULAR COMPLICATIONS OF DIABETES	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Rate the importance of each of the following factors which may contribute to diabetic eye disease:			
Q19. Genetic factors			
Not important	0	52	0%
Slightly important	7	52	13%
Important	27	52	52%
Very important	14	52	27%
Not answered	4	52	8%
Q20. Age of diagnosis of diabetes			
Not important	3	52	6%
Slightly important	8	52	15%
Important	13	52	25%
Very important	26	52	50%
Not answered	2	52	4%
Q21. Duration of diabetes			
Not important	3	52	6%
Slightly important	5	52	10%
Important	12	52	23%
Very important	22	52	42%
Not answered	10	52	19%
Q22. Race or ethnic background of patient			
Not important	17	52	33%
Slightly important	11	52	21%
Important	13	52	25%
Very important	7	52	13%
Not answered	4	52	8%
Q23. Poor control of blood sugar			
Not important	1	52	2%

Slightly important	0	52	0%
Important	5	52	10%
Very important	45	52	87%
Not answered	1	52	2%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q24. High blood pressure			
Not important	1	52	2%
Slightly important	8	52	15%
Important	10	52	19%
Very important	31	52	60%
Not answered	2	52	4%
Q25. Proteinuria and renal/ kidney disease			
Not important	2	52	4%
Slightly important	7	52	13%
Important	13	52	25%
Very important	29	52	56%
Not answered	1	52	2%
Q26. Pregnancy			
Not important	5	52	10%
Slightly important	11	52	21%
Important	18	52	35%
Very important	18	52	35%
Not answered	0	52	0%
Q27. Body weight			
Not important	5	52	10%
Slightly important	5	52	10%
Important	14	52	27%
Very important	27	52	52%
Not answered	1	52	2%
Q28. Socio-economic status			
Not important	7	52	13%
Slightly important	9	52	17%
Important	15	52	29%
Very important	21	52	40%
Not answered	0	52	0%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q29. Alcohol			
Not important	2	52	4%
Slightly important	7	52	13%
Important	12	52	23%
Very important	29	52	56%
Not answered	2	52	4%
Q30. Serum lipids/hypercholesterolemia			
Not important	1	52	2%
Slightly important	7	52	13%
Important	21	52	40%
Very important	23	52	44%
Not answered	0	52	0%

5.4.1.4 *Summative discussion on the health care workers' education and training for the assessment of the ocular complications of diabetes*

Table 5.6 provides information with regard to the health care workers' education and training for the assessment of the ocular complications of diabetes. In the first part of Table 5.6 the respondents were requested to rate the relative importance of the factors that may contribute to diabetic eye disease. 52% (n=27) of the respondents rated genetic factors as being important with 27% (n=14) rating this factor as very important. 13% (n=7) considered this aspect to be only slightly important.

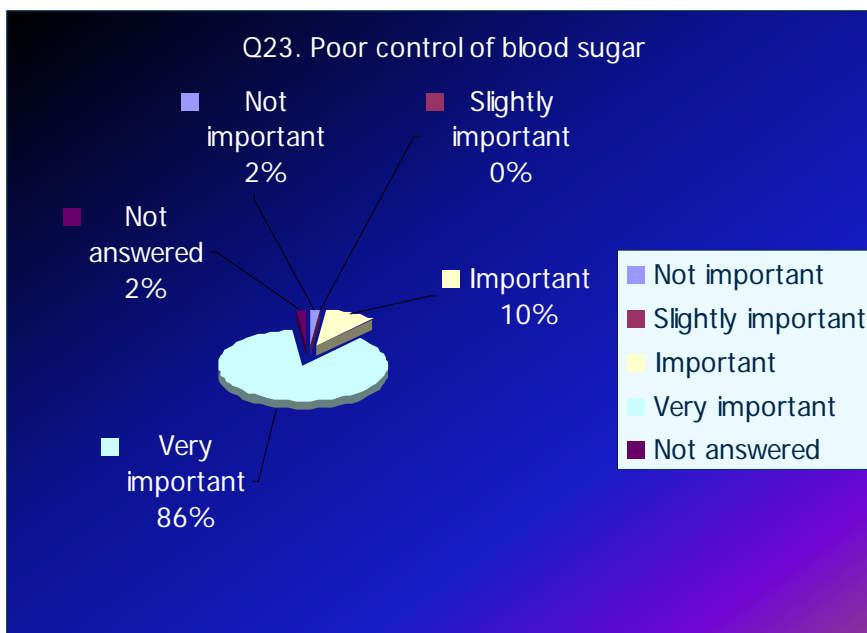
The age of diagnosis of diabetes was rated to be very important by 50% (n=26) of the health care workers with 25% (n=13) considering this to be important. 21% (n=11), however, felt that age was either not important or only a slightly important factor. Although the duration of diabetes has been cited in the literature (Kanski 2003:439) as the most important factor contributing to the development of the ocular complications of diabetes, this

aspect was only rated as very important by 42% (n=22) of the respondents. 23% (n=12), however, felt it was important, but 16% (n=8) of the respondents considered duration to be only slightly important or not important at all.

Although genetic factors and race may influence the development of diabetic eye disease, 33% (n=17) of the respondents felt that this factor was not an important contributory factor and 21% (n=11) felt it was only slightly important. 25% (n=13) rated this aspect as important and 13% (n=7) considered this aspect to be very important. 8% (n=4) declined to answer this question.

An especially important associative factor, being the control of blood sugar, was considered by the health care workers (cf. Figure 5.9). 86% (n=45) rated this factor as very important with 10% (n=5) considering this to be an important factor contributing to diabetic eye disease. Only one of the respondents felt that blood sugar control was not an important consideration.

FIGURE 5.9: The importance of blood sugar control

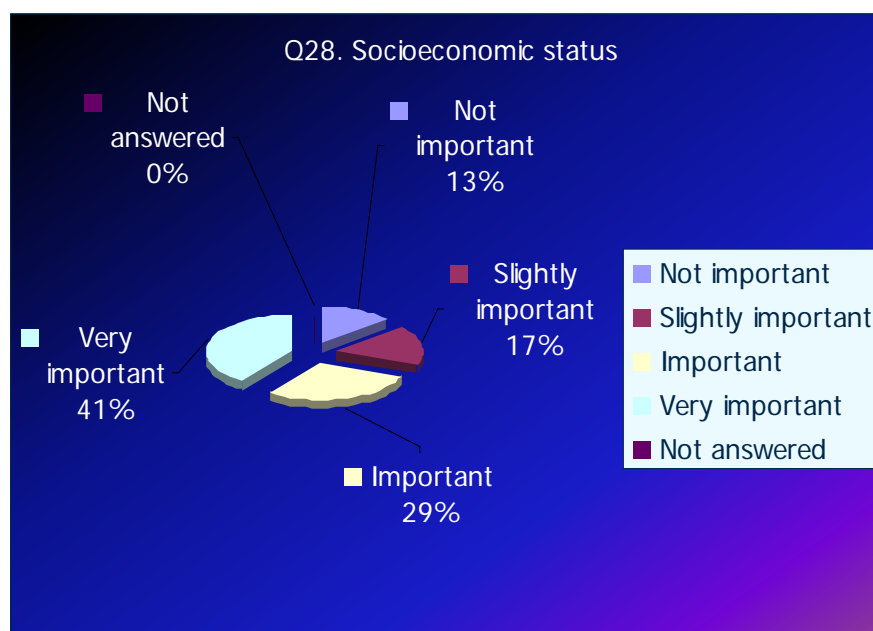


Although the influence of blood pressure on eye disease is still being studied, Bakris *et al.* (2000:64) believe that controlling blood pressure may reduce progression of diabetic retinopathy. 60% (n=31) of the health care workers believed that high blood pressure was a very important factor contributing to diabetic eye disease and 19% (n=10) felt it was simply important. However, 17% (n=9) rated this factor as either not important or only slightly important.

Pregnancy has been associated with an increased risk of diabetic retinopathy (Feman 1992:36) and the responses from the health care workers reflect this. 35% (n=18) of the respondents felt that pregnancy was an important factor, while a further 35% (n=18) rated pregnancy as a very important factor contributing to diabetic eye disease. A total of 31% (n=16), however, felt that pregnancy was either not important or only a slightly important risk factor.

One factor included in the questionnaire dealt with the aspect of socio-economic status in contributing to the ocular complications of diabetes. In the South African context access to affordable eye care is often restricted or even unavailable in the public health sector. 40% (n=21) of the respondents considered socio-economic status to be a very important factor contributing to diabetic eye disease with a further 29% (n=15) considering this aspect to be important. 17% (n=9) rated this aspect slightly important (cf. Figure 5.10).

FIGURE 5.10: The influence of socio-economic status on the development of the ocular complications of diabetes



These results complete the section of the questionnaire dealing with the health care workers' education and training for the assessment of the ocular complications of diabetes. The following section, namely 5.4.1.5 deals with the health care workers' education and training for screening and managing diabetic eye disease.

5.4.1.5 *Health care workers' education and training for screening and managing diabetic eye disease*

Table 5.7 provides information with regard to the health care workers' education and training for screening and managing diabetic eye disease. The questionnaire requested the respondents to state how well their training had prepared them to manage diabetic patients' eye disease in terms of the various ways in which this may occur. Once again, where the questionnaire had place for open ended responses, these will be addressed in the summative discussion on the findings of the health care worker questionnaire.

TABLE 5.7: Health care workers' education and training for screening and managing diabetic eye disease

SECTION 3: EDUCATION AND TRAINING FOR SCREENING AND MANAGING DIABETIC PATIENTS' EYE DISEASE	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
How well have your education and training prepared you to screen and manage the following ocular complication?			
Q32. ... fluctuations and changes in vision			
Not at all	14	52	27%
Poorly	17	52	33%
Adequately	15	52	29%
Well	5	52	10%
Not answered	1	52	2%
Q33. ... loss of areas of the visual field			
Not at all	11	52	21%
Poorly	15	52	29%
Adequately	17	52	33%
Well	7	52	13%
Not answered	2	52	4%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q34. ... changes in colour vision perception			
Not at all	12	52	23%
Poorly	21	52	40%
Adequately	11	52	21%
Well	7	52	13%
Not answered	1	52	2%
Q35. ... changes and damage to nerves affecting the eyes and the eye muscles			
Not at all	13	52	25%
Poorly	18	52	35%
Adequately	12	52	23%
Well	8	52	15%
Not answered	1	52	2%
Q36. ... squints of recent onset			
Not at all	13	52	25%
Poorly	20	52	38%
Adequately	11	52	21%
Well	7	52	13%
Not answered	1	52	2%
Q37. ... cataracts			
Not at all	11	52	21%
Poorly	19	52	37%
Adequately	14	52	27%
Well	8	52	15%
Not answered	0	52	0%
Q38. ... abnormal growth of new blood vessels in the eyes			
Not at all	15	52	29%
Poorly	16	52	31%
Adequately	11	52	21%
Well	6	52	12%
Not answered	4	52	8%
Q39. ... increased pressure in the eyes			
Not at all	10	52	19%
Poorly	16	52	31%
Adequately	14	52	27%
Well	7	52	13%
Not answered	5	52	10%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q40. ... glaucoma			
Not at all	7	52	13%
Poorly	18	52	35%
Adequately	18	52	35%
Well	7	52	13%
Not answered	2	52	4%
<hr/>			
Q41. ... diabetic changes to the retina such as diabetic retinopathy			
Not at all	11	52	21%
Poorly	15	52	29%
Adequately	18	52	35%
Well	7	52	13%
Not answered	1	52	2%
<hr/>			

5.4.1.6 *Summative discussion on the health care workers' education and training for screening and managing diabetic eye disease*

The responses from the health care workers regarding their education and training for screening and managing diabetic eye disease are reported in Table 5.7. The table provides information with regard to the health care workers' education and training for screening and managing diabetic eye disease. The questionnaire requested the respondents to state how well their training had prepared them to manage diabetic patients' eye disease in terms of the various ways in which this may occur. Once again, where the questionnaire had place for open-ended responses, these will be addressed in the summative discussion on the findings of the health care worker questionnaire.

The first question in Table 5.7 asked how their education and training had prepared the health care workers to screen and manage the ocular complications of diabetes. The most common ocular complications of diabetes

include refractive error changes and fluctuations in vision, loss of areas of the visual field, the occurrence of cataracts, the growth of new blood vessels in the eyes, diabetic retinopathy, as well as increased intra-ocular pressure leading to glaucoma. The health care workers' responses to these aspects will now be discussed.

A total of 60% (n=31) of the respondents felt that they were poorly or not at all trained to screen and manage the fluctuations that may occur in diabetic patients. 29% (n=15), however, felt that they had been adequately trained with only 10% (n=5) considering that they had been well trained in this respect. A similar finding was noticed in terms of their training to deal with loss of areas of the visual field with a total of 50% (n=25) of the respondents stating that they felt poorly or not at all trained to deal with this aspect. 33% (n=17) of the respondents stated that they had been adequately trained, however, and 13% (n=7) stated that they had been trained well.

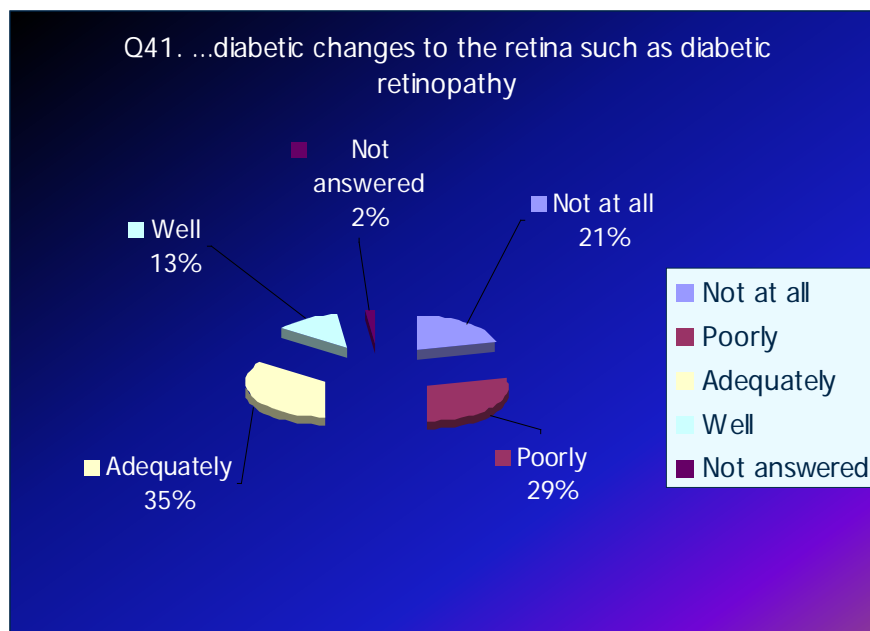
In terms of screening and managing cataracts, 58% (n=30) of the health care workers felt poorly or not at all equipped in this respect with 27% (n=14) stating that they had been adequately trained. Only 15% (n=8) of the respondents felt that they had been trained well to screen and manage for diabetic cataracts. Similarly 60% (n=31) of the respondents believed that they had been poorly or not at all trained to screen for the abnormal growth of new blood vessels in diabetic eyes with 21% (n=11) stating that they felt adequately trained to deal with this. Only 12% (n=6) considered themselves well trained to screen and manage the abnormal growth of blood vessels in diabetic eyes.

One of the consequences of the abnormal growth of new blood vessels in diabetic eyes is an increase in intra-ocular pressure which may then lead to glaucoma. 27% (n=14) of the respondents stated that they felt adequately trained to screen and manage the increased pressure in diabetic patients' eyes, but a total of 50% (n=26) of the respondents felt poorly or not at all trained in this aspect. Only 13% (n=7) of the health care workers stated that they were well trained for this and 10% (n=5) elected not to answer this question.

As a result of increased intra-ocular pressure, glaucoma may occur and a total of 48% (n=25) of the respondents stated that they felt poorly or not at all trained to screen or manage this aspect. However, 35% (n=18) stated that they had been adequately well trained to screen and manage for glaucoma with 13% (n=7) stating that they had been well trained in this respect.

Finally, and perhaps most importantly, the last question in this section of the questionnaire dealt with diabetic changes such as diabetic retinopathy, which may lead to diabetic blindness. Once more, 50% (n=26) of the respondents stated that they had been poorly, or not at all trained to screen for the diabetic changes such as diabetic retinopathy. 35% (n=18) stated that they had been adequately trained for this, but only 13% (n=7) felt that they had been well trained (cf. Figure 5.11). This is possibly the most important finding of this research, and, together with the responses from this section as a whole, lends strong support to the development of an education programme for the prevention and management of the ocular complications of diabetes.

FIGURE 5.11: Training for the screening of diabetic retinopathy



These results complete the section of the questionnaire dealing with the health care workers' education and training for screening and managing diabetic eye disease. The following section, namely 5.4.1.7 deals with the health care workers' education and training for the counselling of diabetic patients.

5.4.1.7 *Health care workers' education and training for the counselling of diabetic patients*

Table 5.8 provides information with regard to the health care workers' education and training for the counselling of diabetic patients. The questionnaire asked respondents to state the type of education and training they had received and then asked them to rate the importance of various components of a diabetes education programme. Once again, where the questionnaire had place for open-ended responses, these will be addressed in

the summative discussion on the findings of the health care worker questionnaire.

TABLE 5.8: Health care workers' education and training for the counselling of diabetic patients

SECTION 4: EDUCATION AND TRAINING FOR DIABETIC PATIENT COUNSELLING	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q43. Have you undergone education and training to educate & counsel diabetic patients?			
Yes	18	52	35%
No	34	52	65%
Not answered	0	52	0%
Q44. State the type of education and training you have undergone:			
Formal nursing programme	12	52	23%
Certified short courses	3	52	6%
Workshops	5	52	10%
Skills development training courses	0	52	0%
On the job experience	13	52	25%
Not answered	19	52	37%
Q46. Rate how well your education and training have prepared you to educate and counsel diabetic patients.			
Not at all	0	52	0%
Poorly	7	52	13%
Adequately	11	52	21%
Well	4	52	8%
Very well	2	52	4%
Not answered	28	52	54%
Q47. Based on your prior education and training, are you confident in your ability to effectively educate and counsel diabetic patients?			
Yes	25	52	48%
No	16	52	31%
Not answered	11	52	21%

Rate the importance of the following educational components	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q48. ... psychosocial factors and stress in diabetic patients are ...			
Not important	1	52	2%
Slightly important	3	52	6%
Important	17	52	33%
Very important	28	52	54%
Not answered	3	52	6%
Q49. ... nutrition is ...			
Not important	0	52	0%
Slightly important	0	52	0%
Important	12	52	23%
Very important	38	52	73%
Not answered	2	52	4%
Q50. ... exercise is ...			
Not important	1	52	2%
Slightly important	3	52	6%
Important	11	52	21%
Very important	35	52	67%
Not answered	2	52	4%
Q51. ... medication and treatment options are ...			
Not important	0	52	0%
Slightly important	0	52	0%
Important	6	52	12%
Very important	43	52	83%
Not answered	3	52	6%
Q52. ... glucose monitoring is			
Not important	0	52	0%
Slightly important	0	52	0%
Important	3	52	6%
Very important	47	52	90%
Not answered	2	52	4%
Q53. The relationships between diet, exercise and blood glucose levels are ...			
Not important	0	52	0%
Slightly important	1	52	2%
Important	6	52	12%
Very important	43	52	83%
Not answered	2	52	4%

	RESPONSES PER QUESTION	TOTAL H/C WORKERS	% OF TOTAL
Q54. ... prevention, detection & treatment of diabetic complications are ...			
Not important	0	52	0%
Slightly important	0	52	0%
Important	4	52	8%
Very important	46	52	88%
Not answered	2	52	4%
Q55. ... the ocular complications of diabetes are ...			
Not important	0	52	0%
Slightly important	1	52	2%
Important	11	52	21%
Very important	38	52	73%
Not answered	2	52	4%
Q56. ... referral and co-management with other health care services are ...			
Not important	0	52	0%
Slightly important	1	52	2%
Important	12	52	23%
Very important	37	52	71%
Not answered	2	52	4%

5.4.1.8 *Summative discussion on the health care workers' education and training for the counselling of diabetic patients*

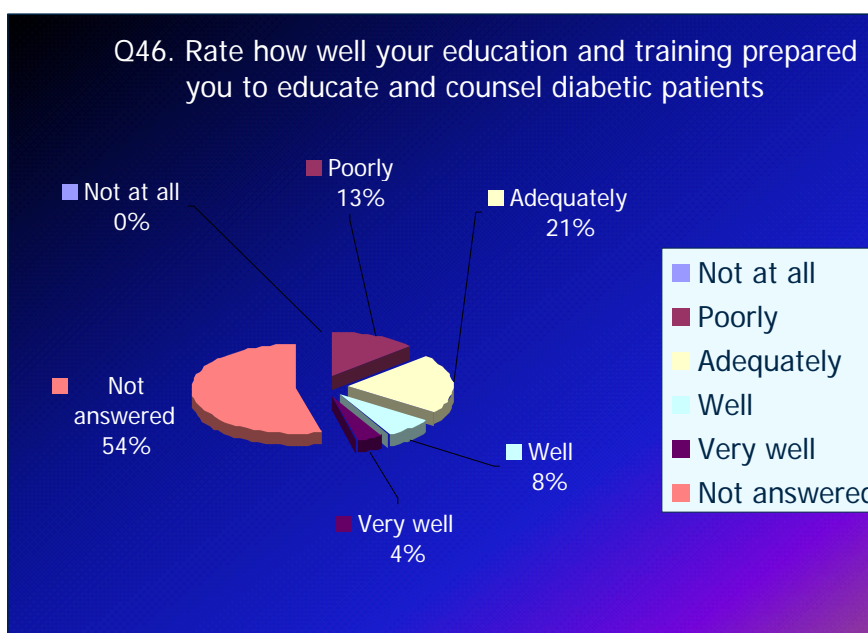
The final section of the health care workers' questionnaire dealt with their education and training, in terms of counselling diabetic patients. This is reported in Table 5.8. The section started by asking the respondents whether that had undergone any education and training for the purposes of educating and counselling diabetic patients. 65% (n=34) of the respondents stated that they had not, while only 35% (n=18) stated that they had.

Of those respondents who had received training, 25% (n=13) stated that this was through "on the job" experience and 10% (n=5) stated that they had undergone workshops for this. 23% (n=12) of the respondents stated that

they had received this training through a formal nursing programme with only 6% (n=3) having attending certified short courses for this.

When asked to comment on how well their education and training had prepared them to educate and counsel diabetic patients, 21% (n=11) of the respondents felt adequately prepared, but 13% (n=7) stated that they felt poorly prepared. Only 12% (n=6) felt well or very well prepared for this function (cf. Figure 5.12)

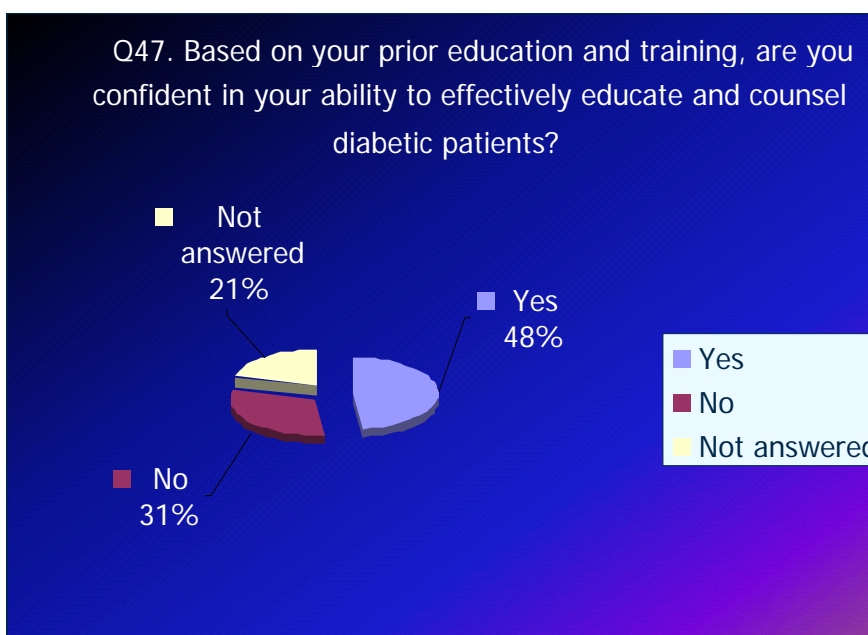
FIGURE 5.12: The preparation and training of health care workers for educating diabetic patients



In terms of the health care workers' ability, based on their prior education and training, 48% (n=25) of the health care workers felt confident in their ability to effectively educate and counsel diabetic patients, but 31% (n=16) were not confident about this (cf. Figure 5.13).

The remaining 21% (n=11) of the respondents did not answer these questions, as they had previously stated that they had not undergone any specific training for the educating and counselling diabetic patients. Once more these statistics support the need for a formal diabetes programme to be offered to health care workers managing such patients.

FIGURE 5.13: Health care workers' ability to educate and counsel diabetic patients



Finally, the last section of the questionnaire asked the health care workers to rate the relative importance of the various educational components that should be included in a training programme that would enable health care workers to better manage, educate and counsel diabetic patients.

A total of 87% (n=45) of the respondents felt it important or very important that the area of psychosocial factors and stress in diabetic patients should be included in the education programme. 23% (n=12) of the respondents rated

the subject of nutrition to be important and 73% (n=38) felt that this was a very important aspect of the diabetes education programme. A total of 88% (n=46) of the health care workers felt that the subject of exercise was either important or very important for the education programme.

In terms of the medication and treatment options, once again, the vast majority [95% (n=49)] of respondents rated the knowledge of this as important or very important for the education programme and a total of 90% (n=47) of the respondents felt that glucose monitoring was a very important educational component for the diabetic patients. 83% (n=43) of the health care workers rated the relationships between diet, exercise and blood glucose levels as very important in terms of the proposed education programme.

A total of 96% (n=50) of the respondents felt that the prevention, detection and treatment of diabetic complications were important or very important components of the education programme, while a total of 94% (n=49) of the respondents rating the ocular complications of diabetes as being important or very important for the programme. Finally, considering that the screening and management of diabetic patients involves a number of interdisciplinary members of the health professions team, this was reflected by 71% (n=37) of the health care workers stating that referral and co-management with other health care services are very important. 23% (n=12) of the respondents, however, stated that this aspect was simply important.

These results complete the section of the questionnaire dealing with the health care workers' education and training for the counselling of diabetic patients. The following section, namely 5.4.2 provides a summative discussion on the open responses of the health care worker questionnaires.

5.4.2 Summative discussion on the open responses of the health care worker questionnaires

The health care worker questionnaire contained six open-ended response type questions, usually at the end point of each subsection. Question 9 of the questionnaire requested participants to provide any additional factors that might contribute to Type I diabetes. A variety of additional factors were provided by the respondents, but most of these risk factors were for Type II diabetes and not Type I. Some responses indicated that a defective or surgically altered pancreas could contribute to diabetes, whilst other responses suggested that genetic factors could influence the disease. There were also suggestions that alcohol and drugs and a poor lifestyle, particularly in young adults, could cause damage to the pancreas.

Question 16 of the questionnaire requested participants to provide any additional factors that might lead to the development of Type II diabetes. A number of contributory factors were listed by the participants, ranging from socio-economic status to alcohol and drug abuse. A broad understanding of this disease (Type II diabetes) was demonstrated by the responses when indicating that poverty, associated diseases, lifestyle, family history and genetics all played a role in the development of Type II diabetes. An additional aspect suggested was the influence of patient ignorance and health education in terms of a healthy lifestyle as a contributory factor to the disease.

Question 31 asked the respondents to list any other factors that might contribute to diabetic eye disease. Once more, ignorance, "not knowing" and a lack of patient education were listed by a number of respondents as factors leading to diabetic eye disease. Together with the education aspects were

listed the issues of non-compliance and poor social support for the diabetic patient. Poor management - both in terms of the patient, as well as on the health care provider - was also listed as possible factors. In particular, the accessibility to eye and health care services and staff shortages were seen as critical factors possibly influencing this aspect. These comments suggested that the participants had a good understanding of the complexity of issues relating to the provision of eye and health care to diabetic patients in the public health sector.

Question 42 of the questionnaire requested the respondents to list any other areas of education and training that might help them to screen and manage ocular disease in diabetic patients. It was suggested that the specific examination of the diabetic eye be included, as well as the study of other immuno-compromised diseases that might affect the eye. The format (mode of delivery) of the training was also proposed by the respondents, with some respondents suggesting continuous professional development courses, ophthalmic nurses training workshops, and in-service short courses as possible modes of delivery. There was also a suggestion that the performance of tonometry for the assessment of intra-ocular pressure, for the detection of glaucoma, should also be considered part of these courses.

Question 45 simply asked the respondents to list any other forms of education that they had received in terms of diabetes education. The responses included reading the literature and other medical journals. One respondent stated "self-training", as that particular health care worker had a son who had Type I diabetes. The last open-ended response question asked respondents to list any other aspects that could form part of a diabetes patient education programme. Most of the suggestions with regard to the

clinical aspects of diabetes were already included in the questionnaire, such as the types of diabetes, signs and symptoms of abnormal blood-sugar levels, and the complications of the disease. A suggestion was also made with regard to educating the family of the diabetic patient, as well as for the patients themselves, on the effects of other medication on diabetes. This would also include how to administer the insulin injections to him-/herself.

With regard to the support services, a number of suggestions focused on the creation of diabetic workshops and clubs. It was felt that resources should be made available to the support groups and accessibility to service centres for diabetics should be facilitated. The emotional support of the patients, as well as the networking with other diabetics was considered an essential aspect of any diabetic education programme.

These results complete the findings from the health care workers' questionnaire. The areas and sections comprising this questionnaire were also included in the Delphi questionnaire for consideration by the Delphi panel for inclusion in the proposed diabetes education programme.

5.4.3 Implications of the findings from the health care workers for the proposed education programme

The results and findings of the health care workers' questionnaires have implications for the Delphi study and the proposed diabetes education programme. The results demonstrate that there are certain areas of skills and knowledge that, once acquired by the health care workers, may enhance their scope and role in the treatment and management of the diabetic patient. In particular, the knowledge of the health care workers in terms of the various risk factors pertaining to diabetes must be addressed by the

programme. Furthermore, the programme must specifically address the various risk factors for the development of Type I diabetes as well as Type II diabetes, as they are not the same.

The findings also indicate a need for the proposed diabetes programme to educate health care workers about the risk factors contributing to the development of diabetic eye disease. This would include an understanding of the importance of the age at which the diabetes was diagnosed; the duration of the diabetes; genetic factors contributing to diabetic eye disease; as well as the importance of the patient maintaining good control of blood sugar.

The proposed education programme also has to provide the means for the health care workers to be trained in order to screen and manage diabetic eye disease. Areas of training that must be addressed include screening for visual changes; screening and managing/referring for cataracts; screening and referring for diabetic retinopathy; and screening for raised intra-ocular pressure.

The findings also indicated that a number of health care workers felt inadequately trained to provide education and counselling to diabetic patients. They suggested that the proposed diabetes education programme should contain specific areas of training. These would include the understanding of psychosocial factors and stress in the diabetic patient; the subject of nutrition and exercise; medication and treatment modalities, including glucose monitoring; and, perhaps, most importantly, education around the prevention, detection and treatment of both systemic and ocular complications of diabetes. Once again, these specific areas and sections

comprising the health care worker questionnaire were included in the Delphi questionnaire for further consideration by the Delphi panel.

5.5 THE DELPHI STUDY

Three rounds of the Delphi study were necessary in order to obtain consensus or stability. A description of the measuring instrument as well as a discussion of the methodology was done previously in Chapter 4 (cf. section 4.4). First, a description of the questionnaire is presented, followed by an analysis of the responses. These will be followed by a short summative discussion of the findings of rounds one and two respectively. A summative discussion will then be provided on Round Three (the Final Round).

In the Delphi questionnaire (Appendix N), Section A referred to the process of curriculum development in higher education, whilst section B considered the outcomes relating to patient diabetes education. Section C outlined the public health issues in South Africa and Section D reviewed the academic and administrative aspects pertaining to the proposed diabetes education programme. Section E aimed to identify the required standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes, whilst Section F considered the benefits of such an education programme. Finally, Section G summarised the aspects that had to be addressed in an education programme for the prevention and management of the ocular complications of diabetes.

5.5.1 First round of the Delphi study

5.5.1.1 *Analysis of responses*

The responses from Round One of the Delphi study were analysed manually by indicating for each statement on the questionnaire the frequency of responses for each point on the Likert scale. The findings of the first round

are reported in Table 5.9. The table provides a summative analysis of the responses from the first round of the Delphi study. An indication of the responses of the panel members for Sections A through G is provided on the statements and items where consensus was reached. The table also provides the percentage of statements on which consensus was reached per section as a whole. Consensus was considered to be achieved when 10 of the 12 panel members (83.3%) chose the same item on the Likert scale. All items on which consensus had been reached during the first round were excluded from the questionnaire for Round Two.

TABLE 5.9: Analysis of responses from the Delphi Study Round One

DELPHI PANEL ROUND ONE CONSENSUS STATISTICS		% CONSENSUS PER SECTION OVERALL
SECTION A	CURRICULUM DEVELOPMENT IN HIGHER EDUCATION	
SECTION 1.	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL	20
SECTION 2.	OUTCOMES-BASED EDUCATION	45
SECTION 3.	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN	50
SECTION 4.	IMPLEMENTING AND EVALUATING THE CURRICULUM	59
SECTION 5.	LEARNER ASSESSMENT	42
SECTION 6.	ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?	OPEN RESPONSE
SECTION B	PATIENT DIABETES EDUCATION	
SECTION 7.	PATIENT'S KNOWLEDGE OF DIABETES	71
SECTION 8.	PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES	40

SECTION 9.	PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES	100
SECTION 10.	ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?	OPEN RESPONSE
SECTION C	PUBLIC HEALTH IN SOUTH AFRICA	
SECTION 11.	LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS	75
SECTION 12.	POLICIES OF THE SOUTH AFRICAN DEPARTMENT OF HEALTH	50
SECTION 13.	ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA?	OPEN RESPONSE
SECTION D	ACADEMIC AND ADMINISTRATIVE ASPECTS	
SECTION 14.	ORGANISATION OF THE PROGRAMME	67
SECTION 15.	PROGRAMME CO-ORDINATION	100
SECTION 16.	ADVISORY COMMITTEE	17
SECTION 17.	DIABETES EDUCATION PROGRAMME	25
SECTION 18.	MISSION AND PURPOSE	25
SECTION 19.	TEACHING PERSONNEL	67
SECTION 20.	EDUCATIONAL METHODOLOGIES	44
SECTION 21.	LEARNER ASSESSMENT	40
SECTION 22.	FORMAT OF PROGRAMME AND MODULES	20
SECTION 23.	ADMISSION REQUIREMENTS AND LEARNING ASSUMED TO BE IN PLACE	40
SECTION 24.	ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS	25

SECTION 25.	ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS?	OPEN RESPONSE
SECTION E	STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 26.	OVERVIEW AND CLASSIFICATION OF DIABETES	100
SECTION 27.	CRITICAL CROSS-FIELD OUTCOMES	25
SECTION 28.	CRITICAL OUTCOMES FOR HEALTH CARE WORKERS	19
SECTION 29.	DIABETES STANDARDS FOR EDUCATION PROGRAMMES	60
SECTION 30.	CRITERIA FOR DIAGNOSIS OF DIABETES	67
SECTION 31.	RISK FACTORS FOR DIABETES	67
SECTION 32.	SYSTEMIC COMPLICATIONS	100
SECTION 33.	OCULAR COMPLICATIONS	93
SECTION 34.	MANAGEMENT OF DIABETIC EYE DISEASE	100
SECTION 35.	SCREENING FOR DIABETIC EYE DISEASE	71
SECTION 36.	ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?	OPEN RESPONSE
SECTION F	BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 37.	BENEFITS TO THE PROFESSION	50
SECTION 38.	BENEFITS TO COMMUNITY AND SOCIETY	100

SECTION 39.	BENEFITS TO HEALTH CARE WORKERS	60
SECTION 40.	ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?	OPEN RESPONSE
SECTION G	AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 41.	ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	14
SECTION 42.	ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?	OPEN RESPONSE
TOTAL PERCENTAGE CONSENSUS FOR ENTIRE QUESTIONNAIRE		54

5.5.1.2 *Summative discussion of the findings of the first round of the Delphi study*

All 12 members of the panel responded to the Delphi questionnaire (100% response rate). After Round One, consensus was reached on 141 of the 262 statements in the questionnaire, giving 54% overall consensus.

An accompanying letter of feedback (Appendix P) as well as a feedback questionnaire sheet (Appendix Q) which contained the results of Round One was sent to the participants a week after Round One had been concluded. All the statements on which consensus had been reached were highlighted (54% of the statements). The participants' comments were listed as well (cf. Appendix Q). These comments were noted and either included in the following Round Two or kept for further consideration.

During the first round, no additional statements were added by the Delphi panel. Where questions were asked of the researcher in terms of clarification, these were provided to the panel member requesting such clarity. For the findings of Round One of the Delphi study, see Appendices R and R-2.

5.5.2 Second round of the Delphi study

5.5.2.1 *Analysis of responses*

The responses from Round Two of the Delphi study were analysed manually, by indicating for each statement in the questionnaire the frequency of responses for each point on the Likert scale. Table 5.10 provides a summative analysis of the responses from the second round of the Delphi study.

The table indicates the responses of the panel members for Sections A through G on the statements and items where consensus was reached. The table also provides the percentage of statements on which consensus was reached per section as a whole. Consensus was considered to be achieved when 10 of the 12 panel members (83.3%) chose the same item on the Likert scale. All items on which consensus had been reached during the second round were subsequently excluded from the questionnaire for Round Three.

TABLE 5.10: Analysis of responses from Delphi Study Round Two

DELPHI PANEL ROUND TWO CONSENSUS STATISTICS		SECOND ROUND % CONSENSUS PER SECTION OVERALL
SECTION A	CURRICULUM DEVELOPMENT IN HIGHER EDUCATION	
SECTION 1.	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL	40
SECTION 2.	OUTCOMES-BASED EDUCATION	82
SECTION 3.	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN	75
SECTION 4.	IMPLEMENTING AND EVALUATING THE CURRICULUM	76
SECTION 5.	LEARNER ASSESSMENT	58
SECTION 6.	ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?	OPEN RESPONSE
SECTION B	PATIENT DIABETES EDUCATION	
SECTION 7.	PATIENT'S KNOWLEDGE OF DIABETES	100
SECTION 8.	PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES	70
SECTION 9.	PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES	100
SECTION 10.	ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?	OPEN RESPONSE
SECTION C	PUBLIC HEALTH IN SOUTH AFRICA	
SECTION 11.	LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS	92
SECTION 12.	POLICIES OF THE SOUTH AFRICAN DEPARTMENT OF HEALTH	67

SECTION 13.	ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA?	OPEN RESPONSE
SECTION D	ACADEMIC AND ADMINISTRATIVE ASPECTS	
SECTION 14.	ORGANISATION OF THE PROGRAMME	100
SECTION 15.	PROGRAMME CO-ORDINATION	100 (ROUND ONE)
SECTION 16.	ADVISORY COMMITTEE	17
SECTION 17.	DIABETES EDUCATION PROGRAMME	63
SECTION 18.	MISSION AND PURPOSE	50
SECTION 19.	TEACHING PERSONNEL	67
SECTION 20.	EDUCATIONAL METHODOLOGIES	56
SECTION 21.	LEARNER ASSESSMENT	80
SECTION 22.	FORMAT OF PROGRAMME AND MODULES	60
SECTION 23.	ADMISSION REQUIREMENTS AND LEARNING ASSUMED TO BE IN PLACE	80
SECTION 24.	ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS	25
SECTION 25.	ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS?	OPEN RESPONSE
SECTION E	STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 26.	OVERVIEW AND CLASSIFICATION OF DIABETES	100 (ROUND ONE)
SECTION 27.	CRITICAL CROSS-FIELD OUTCOMES	63

SECTION 28.	CRITICAL OUTCOMES FOR HEALTH CARE WORKERS	44
SECTION 29.	DIABETES STANDARDS FOR EDUCATION PROGRAMMES	80
SECTION 30.	CRITERIA FOR DIAGNOSIS OF DIABETES	67
SECTION 31.	RISK FACTORS FOR DIABETES	100
SECTION 32.	SYSTEMIC COMPLICATIONS	100 (ROUND ONE)
SECTION 33.	OCULAR COMPLICATIONS	93
SECTION 34.	MANAGEMENT OF DIABETIC EYE DISEASE	100 (ROUND ONE)
SECTION 35.	SCREENING FOR DIABETIC EYE DISEASE	86
SECTION 36.	ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?	OPEN RESPONSE
SECTION F	BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 37.	BENEFITS TO THE PROFESSION	75
SECTION 38.	BENEFITS TO COMMUNITY AND SOCIETY	100 (ROUND ONE)
SECTION 39.	BENEFITS TO HEALTH CARE WORKERS	60
SECTION 40.	ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?	OPEN RESPONSE

SECTION G	AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 41.	ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	43
SECTION 42.	ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?	OPEN RESPONSE
TOTAL PERCENTAGE CONSENSUS FOR ENTIRE QUESTIONNAIRE		72

5.5.2.2 *Summative discussion of the findings of the second round of the Delphi study*

All 12 members of the panel responded to Round Two of the Delphi questionnaire (100% response rate). After Round Two, consensus was reached on 189 of the 262 statements in the questionnaire, giving 72% overall consensus.

An accompanying letter of feedback for Round Two (Appendix T), as well as a feedback questionnaire sheet which contained the combined results of Rounds One and Two (Appendix U) was sent to the participants a week after Round Two had been concluded. All the statements on which consensus had been reached (72% of the statements) were highlighted separately. (Round One consensus statements were highlighted in blue, whilst Round Two consensus statements were highlighted in yellow.) Again, all the participants' comments were included in the feedback (cf. Appendix U). These comments were noted and either included in the following Round Three or kept for further consideration.

5.5.3 Third round of the Delphi study

5.5.3.1 *Analysis of responses*

The findings of the third and final round of the Delphi process are reported in Table 5.11. Once more, the responses from Round Three of the Delphi study were analysed manually by indicating for each statement in the questionnaire the frequency of responses for each point on the Likert scale. Consensus was reached on the items indicated and stability was reached on all the remaining statements in Round Three.

Table 5.11 provides a summative analysis of the responses from the third round of the Delphi study. The table indicates the responses of the panel members for Sections A through G on the statements and items where consensus was reached. The table also provides the percentage of statements on which consensus was reached per section as a whole. Consensus was considered to be achieved when 10 of the 12 panel members (83.3%) chose the same item on the Likert scale.

Appendix Y provides a detailed analysis and complete summary of all three rounds of the Delphi process and contains the responses of the panel members for all Sections A through G on the statements and items where either consensus or stability was reached.

TABLE 5.11: Analysis of responses from Delphi Study Round Three

DELPHI PANEL ROUND THREE CONSENSUS STATISTICS		THIRD ROUND % CONSENSUS PER SECTION OVERALL
SECTION A	CURRICULUM DEVELOPMENT IN HIGHER EDUCATION	
SECTION 1.	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL	100
SECTION 2.	OUTCOMES-BASED EDUCATION	100
SECTION 3.	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN	100
SECTION 4.	IMPLEMENTING AND EVALUATING THE CURRICULUM	82
SECTION 5.	LEARNER ASSESSMENT	83
SECTION 6.	ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?	OPEN RESPONSE
SECTION B	PATIENT DIABETES EDUCATION	
SECTION 7.	PATIENT'S KNOWLEDGE OF DIABETES	100 (ROUND TWO)
SECTION 8.	PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES	100
SECTION 9.	PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES	100 (ROUND TWO)
SECTION 10.	ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?	OPEN RESPONSE
SECTION C	PUBLIC HEALTH IN SOUTH AFRICA	
SECTION 11.	LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS	100
SECTION 12.	POLICIES OF THE SOUTH AFRICAN DEPARTMENT OF HEALTH	83

SECTION 13.	ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA?	OPEN RESPONSE
SECTION D	ACADEMIC AND ADMINISTRATIVE ASPECTS	
SECTION 14.	ORGANISATION OF THE PROGRAMME	100 (ROUND TWO)
SECTION 15.	PROGRAMME CO-ORDINATION	100 (ROUND ONE)
SECTION 16.	ADVISORY COMMITTEE	50
SECTION 17.	DIABETES EDUCATION PROGRAMME	63
SECTION 18.	MISSION AND PURPOSE	100
SECTION 19.	TEACHING PERSONNEL	100
SECTION 20.	EDUCATIONAL METHODOLOGIES	56
SECTION 21.	LEARNER ASSESSMENT	100
SECTION 22.	FORMAT OF PROGRAMME AND MODULES	60
SECTION 23.	ADMISSION REQUIREMENTS AND LEARNING ASSUMED TO BE IN PLACE	100
SECTION 24.	ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS	50
SECTION 25.	ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS?	OPEN RESPONSE
SECTION E	STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 26.	OVERVIEW AND CLASSIFICATION OF DIABETES	100 (ROUND ONE)
SECTION 27.	CRITICAL CROSS-FIELD OUTCOMES	75

SECTION 28.	CRITICAL OUTCOMES FOR HEALTH CARE WORKERS	75
SECTION 29.	DIABETES STANDARDS FOR EDUCATION PROGRAMMES	100
SECTION 30.	CRITERIA FOR DIAGNOSIS OF DIABETES	100
SECTION 31.	RISK FACTORS FOR DIABETES	100 (ROUND TWO)
SECTION 32.	SYSTEMIC COMPLICATIONS	100 (ROUND ONE)
SECTION 33.	OCULAR COMPLICATIONS	100
SECTION 34.	MANAGEMENT OF DIABETIC EYE DISEASE	100 (ROUND ONE)
SECTION 35.	SCREENING FOR DIABETIC EYE DISEASE	86
SECTION 36.	ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?	OPEN RESPONSE
SECTION F	BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 37.	BENEFITS TO THE PROFESSION	100
SECTION 38.	BENEFITS TO COMMUNITY AND SOCIETY	100 (ROUND ONE)
SECTION 39.	BENEFITS TO HEALTH CARE WORKERS	67
SECTION 40.	ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?	OPEN RESPONSE

SECTION G	AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	
SECTION 41.	ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES	57
SECTION 42.	ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?	OPEN RESPONSE
TOTAL PERCENTAGE CONSENSUS FOR ENTIRE QUESTIONNAIRE		88

5.5.3.2 *Summative discussion on the findings of the third round (final round) Delphi study*

Once again, all 12 members of the panel responded to Round Three of the Delphi questionnaire (100% response rate). Consensus was reached on 54% of the statements after Round One and this increased to 72% after Round Two. After Round Three, consensus was reached on 230 of the 262 statements in the questionnaire, giving 88% overall consensus. Stability on the remaining 12% of the statements was reached after completion of Round Three. The consensus and stability results are reflected in the final results of the Delphi questionnaire Round Three (cf. Appendix Y). The number of participants voting on each item is also indicated.

The statements on which consensus was reached for essential items, means that they must be included in the post-graduate education programme for the prevention and management of the ocular complications of diabetes. Furthermore, on those items where consensus was reached on useful items, this would indicate that their inclusion in the programme could aid or enhance its effectiveness but were not essential. Those items on which consensus were reached for unnecessary items means that they would not need to be included in the education programme. (Refer to Appendix Y for

detailed analysis of consensus items for the education programme.) The statements on which stability was reached in the third round will be reflected in Table 5.12 in the following pages.

- **Findings on consensus statements**

The statements upon which consensus was reached have been tabled in full and it is therefore unnecessary to describe these findings in words (cf. Appendix Y, Final Round Results). The percentage of participants indicating a specific point on the Likert scale is indicated according to the following criteria:

Column 1 = % of participants who indicated that statement is essential and must be included in the education programme.

Column 2 = % of participants who indicated that statement is useful and could be included in the education programme.

Column 3 = % of participants who indicated that statement is unnecessary and should not be included in the education programme.

Consensus was reached on 230 of the 262 statements in the questionnaire = 88% consensus. Of these 230 statements the following results were obtained:

Consensus was reached on 220 selections for option 1 on the Likert scale deemed as essential = 95.65%.

Consensus was reached on eight selections for option 2 on the Likert scale deemed as useful = 3.47%.

Consensus was reached on two selections for option 3 on the Likert scale deemed as unnecessary = 0.86%.

There were only two statements upon which consensus had been reached that ranked as unnecessary for the proposed education programme. This meant that only those two statements should be specifically excluded from the programme. The two statements read as follows:

"In **developing** an education programme for the prevention and management of the ocular complications of diabetes:

- a post-graduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 9 (Master's degree level)
- the diabetes education programme should be offered by a private training college/organisation"

For both these statements upon which consensus had been reached, they were both rated as follows:

1 = 0.00% (essential, must be included in the programme).

2 = 0.00% (useful, could be included in the programme).

3 = 100.0% (unnecessary, must definitely be excluded from the programme).

For the rest of the consensus statements, when compiling the diabetes education programme, a distinction will be made between the essential and useful statements.

- **Findings on stability statements**

The statements upon which stability was reached have been tabled in full and it is again unnecessary to describe these findings in words (cf. Table 5.12). According to Linstone and Turoff (2002) "... stability of the distribution of the group's response along the interval scale over successive rounds is a more significant measure for developing a stopping criterion than degree of convergence." Therefore stability of the Delphi process can be declared when movement of the opinion of the group has reached stability. The table provides a full description of the statements in Round Three upon which stability was reached. The percentage of participants selecting a specific point on the Likert scale is once again indicated according to the criteria described above.

Stability was reached on 32 of the 262 statements of the Delphi questionnaire = 12.21%. For the statements on which stability had been reached, it was decided that, in developing the diabetes education programme, that statements where 50% or more of the Delphi respondents had indicated a point 3 on the Likert scale (indicating that the statement was unnecessary), would be eliminated (due to the statistical significance of 50%).

There was only one statement upon which stability had been reached that had a statistically significant 50% response, indicating it to be unnecessary. This is shown in Table 5.12 under the Section dealing with Educational Methodologies. It reads as follows:

"The following **educational methodologies** should be utilised in the programme:

- research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills".

This was a statement on which stability was reached and which was rated as follows:

1 = 41.67% (essential, must be included in the programme).

2 = 8.33% (useful, could be included in the programme).

3 = 50.0% (unnecessary, must definitely be excluded from the programme).

Of the remaining 32 statements the following results were obtained:

There were 200 selections for "Essential", option 1 on the Likert scale = 52.08%.

There were 158 selections for "Useful", option 2 on the Likert scale = 41.14%.

There were 26 selections for "Unnecessary", option 3 on the Likert scale = 6.78%.

Table 5.12 which follows provides a full description of the statements in Round Three upon which stability was reached:

TABLE 5.12: Round Three (Final Round) Stability Statements

SECTION A				
CURRICULUM DEVELOPMENT IN HIGHER EDUCATION				
This section deals with curriculum and programme development in the higher education sector.				
1 = % of participants who indicated that statement is essential and must be included in the education programme				
2 = % of participants who indicated that statement is useful and could be included in the education programme				
3 = % of participants who indicated that statement is unnecessary and should not be included in the education programme				
4 IMPLEMENTING AND EVALUATING THE CURRICULUM				
Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to implementing and evaluating the curriculum, therefore:				
		1	2	3
e	any social and political factors that may negatively impact on the provision of the programme should be considered	33	58	8
m	the programme should allow for individual differences in learners and learning methods	25	67	8
o	there should be provision for pilot testing of the proposed programme prior to final implementation	67	25	8
5 LEARNER ASSESSMENT				
In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for learner assessment in order to ensure that:				
		1	2	3
f	there is the establishment of an assessment taskforce, which will include an assessment expert	50	50	0
i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors	33	50	17

	SECTION C PUBLIC HEALTH IN SOUTH AFRICA			
	This section deals with issues related to the provision of public health in South Africa			
12	POLICIES OF THE SOUTH AFRICAN DEPARTMENT OF HEALTH			
	In terms of the policies of the South African Department of Health, the following policies must be integral to an education programme for the prevention and management of the ocular complications of diabetes:			
		1	2	3
f	The Patient's Rights Charter	67	25	8
	SECTION D ACADEMIC AND ADMINISTRATIVE ASPECTS			
	This section deals with issues related to the academic and administrative aspects of a diabetes education programme:			
16	ADVISORY COMMITTEE			
	In terms of the advisory committee for the programme, there must be:			
		1	2	3
d	the advisory committee should have regular meetings	33	67	0
e	the advisory committee should plan and review the programme on an annual basis	67	33	0
f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators	42	58	0
	17 DIABETES EDUCATION PROGRAMME			
	In terms of the overall diabetes education programme :			
		1	2	3
f	the curriculum document of the programme should reflect the educational materials to be used	75	25	0
g	the curriculum document of the programme should reflect the evaluation and assessment instruments	75	25	0

h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice	58	42	0
20 EDUCATIONAL METHODOLOGIES				
The following educational methodologies should be utilised in the programme:				
		1	2	3
a	interactive learner participation with modalities such as group work, self-study, class presentations and projects or assignments	58	42	0
g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills	42	8	50
h	uses reflective practice, problem-solving and decision-making skills as part of its learning process	75	25	0
i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning	33	67	0
22 FORMAT OF PROGRAMME AND MODULES				
The following should be considered for the format of programme and modules :				
		1	2	3
d	learner development of individual research projects and assignments at the appropriate post-graduate level	33	67	0
e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme	67	25	8
24 ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS				
The following should constitute the required academic qualifications for programme lecturers and instructors :				
		1	2	3
a	a post-graduate qualification in the appropriate field (at least a Master's Degree, preferably a Doctorate)	25	67	8

b	a formal qualification in higher education teaching methodology	8	67	25
SECTION E STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES				
This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes:				
27	CRITICAL CROSS-FIELD OUTCOMES			
Upon completion of the diabetes education programme, learners should have the ability:				
		1	2	3
f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others	67	25	8
g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation	17	75	8
28 CRITICAL OUTCOMES FOR HEALTH CARE WORKERS				
Upon completion of the diabetes education programme, learners should have the ability:				
		1	2	3
d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care	25	58	17
j	to evaluate quality of care delivered as an ongoing and cumulative process	67	33	0
k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care	75	17	8
l	to use science in the practice of health and medicine	58	42	0
35 SCREENING FOR DIABETIC EYE DISEASE				
Upon completion of the diabetes education programme, learners should demonstrate the ability to:				
		1	2	3

a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy	58	42	0
SECTION F BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES				
This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:				
39	BENEFITS TO HEALTH CARE WORKERS			
Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will benefit through:				
		1	2	3
a	increased professional status	67	33	0
f	increased chances of promotion or advancement in employment	67	25	8
SECTION G AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES				
This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:				
41	ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES			
The following aspects should be addressed in the diabetes education programme for the prevention and management of the ocular complications of diabetes:				
		1	2	3
a	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa	67	25	8
d	the programme must address the academic and administrative processes involved with a diabetes education programme	67	25	8
g	all of the above	58	25	8

5.6 CONCLUSION

The results of the research have been presented in this chapter and the data findings have been described. Tables and figures were used to summarise the comments and findings. All the diabetic patients and health care workers invited to participate in the research responded (100%) and there was a 100% response by the participants of the Delphi study in all three rounds.

Of the 262 statements compiled and presented in the Delphi questionnaire, consensus was reached on 230. Of these 230 statements consensus was reached on 220 statements for option 1 (deemed essential for the education programme). Of the remaining 10 statements, consensus was reached on 8 statements for option 2 (deemed useful for the education programme) and only two statements, option 3, were deemed unnecessary for the education programme.

Stability was reached on the remaining 32 statements. Of these statements, only one statement was eventually not used for the development of the programme due to the fact that 50% of the respondents indicated that it was unnecessary for the programme.

The fact that there was a 100% response rate in all three rounds by the Delphi respondents and that consensus was reached on 88% of the statements, is a very positive aspect for the study. This also indicates that the Delphi questionnaire was accurate, detailed and comprehensively compiled as a result of the literature review and questionnaires completed by the diabetic patients and health care workers.

In the following chapter, Chapter Six, the development of a post-graduate education programme for the prevention and management of the ocular complications of diabetes will be presented and described.

CHAPTER 6

THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND TRAINING PROGRAMME FOR HEALTH CARE WORKERS FOR THE PREVENTION AND MANAGEMENT OF OCULAR COMPLICATIONS IN DIABETIC PATIENTS

6.1 INTRODUCTION

This study was undertaken in order to develop a post-graduate education programme that would enable health care workers to implement interventions designed to prevent or manage the ocular complications arising in diabetic patients. The research methods used in developing such a programme included a comprehensive literature review; the use of questionnaires for diabetic patients and health care workers dealing with such patients; and, finally, the Delphi technique for the development and validation of the programme.

Chapter 1 dealt with the introduction and orientation to the study, whilst Chapter 2 considered the criteria for the development of post-graduate programmes in diabetes education. Chapter 3 reviewed the management of the ocular complications in diabetic patients and Chapter 4 described the research design, methodology, sampling and selection. Chapter 5 provided the results and discussion of the research. In this chapter a detailed discussion on the development of the diabetes education will be provided. The premises for the development of such a programme will be outlined in addition to the benefits of such a programme. The educational and public health needs addressed by the programme will receive attention, together

with the academic and administrative aspects of the programme. The standards and outcomes for the programme will then be comprehensively described, followed by perspectives and recommendations for the implementation and delivery of the programme.

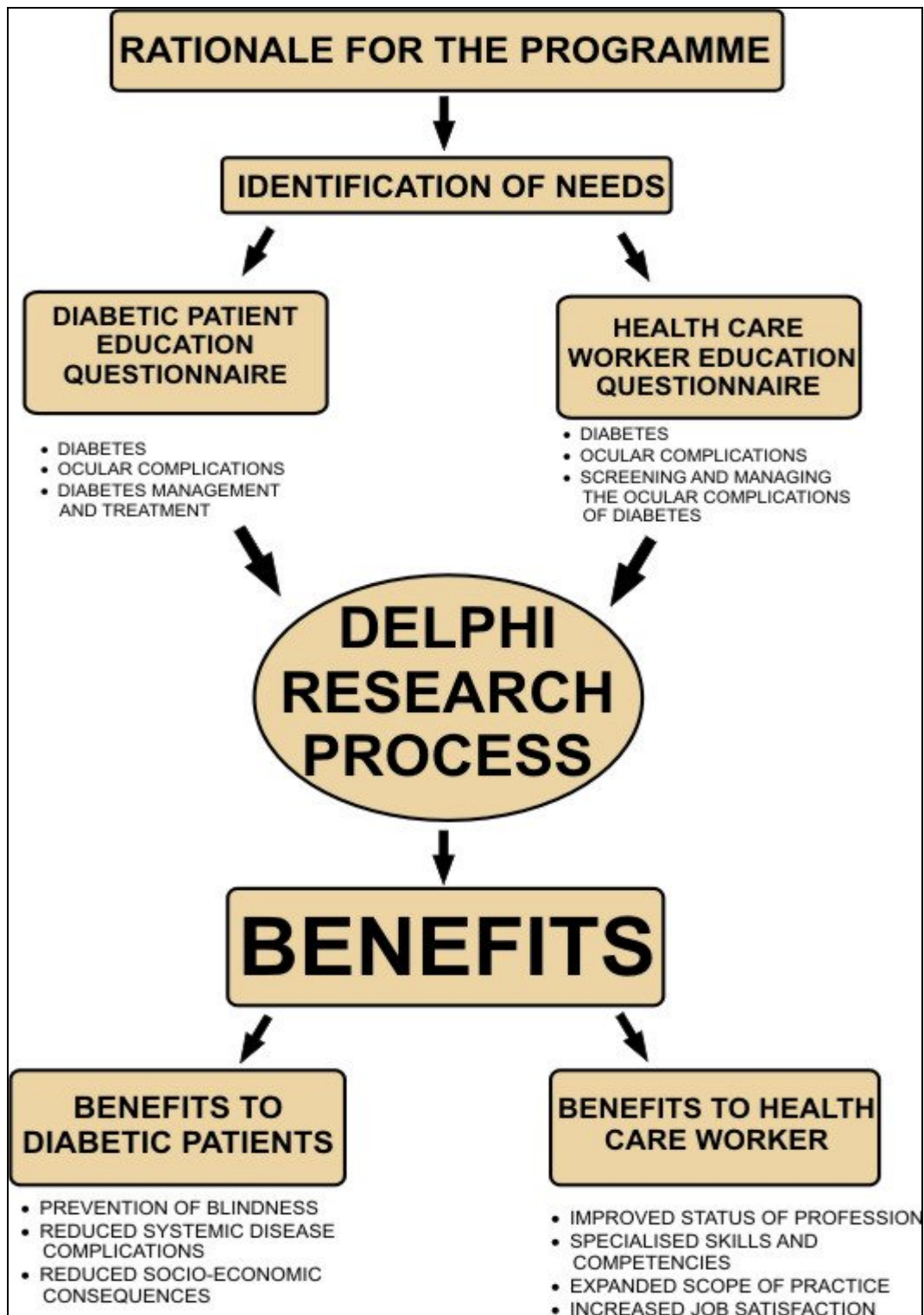
6.2 PREMISES FOR THE DEVELOPMENT OF THE DIABETES EDUCATION PROGRAMME

In order to justify the development of a post-graduate education programme for the prevention and management of the ocular complications of diabetes, it is important to provide a clear rationale and justification for the provision of such a programme. This will be discussed in this section by considering the background of diabetes and its effects on the eyes, as well as how an education programme might enable health care workers to better educate diabetic patients about their disease and to facilitate better management of their disease. Furthermore, the rationale for the programme will be considered in the context of the wider benefits to the community and society as a whole. A diagrammatic representation of the premises for the development of the diabetes education programme is given in Figure 6.1 as follows.

6.2.1 Background and needs to be addressed by the education programme

The epidemiology of diabetes and diabetic retinopathy was described in Chapter 3 together with evidence demonstrating the potentially devastating effect that diabetes may have on the eyes, leading to eventual blindness. A significant factor contributing to this is the lack of patient education on diabetes and its effects on the eyes, together with the lack of a structured learning programme available for health care workers dealing with such patients.

FIGURE 6.1: Premises for the development of the Post-graduate Diabetes Education Programme



The role of prevention in the management of diabetic eye disease was also discussed (cf. section 3.8.1) and it is important to understand the full socio-economic aspects of diabetic eye disease, as this not only results in blindness to the patient, but also social and financial constraints on the immediate family. Therefore, if the educational needs of both the patient and the health care workers are addressed, the possibility exists for a significant reduction in the number of ocular complications and instances of preventable blindness.

This research has identified the educational needs that should be addressed by the diabetes education programme. These needs were determined in respect of what diabetic patients would need to know with regard to their knowledge of diabetes, their knowledge of the ocular complications of diabetes, and their knowledge of the management and treatment of diabetes (cf. section 6.5). The research also established the educational needs of the health care workers in terms of their knowledge of diabetes, as well as their skills and training in screening and managing the ocular complications of diabetes.

Having established the educational needs of the diabetic patients and the health care workers, these then informed the development of the Delphi questionnaire. The research process was subsequently able to finalise the standards and outcomes for the health care workers that would be needed in order to educate and manage the diabetic patients with regard to their disease and its ocular complications. These outcomes are described in full later in this Chapter (cf. section 6.7). It is envisaged that, if all these educational needs of the diabetic patients and health care workers are met, then a major contribution will be made to the prevention of sight-threatening disease in diabetic patients.

6.2.2 Benefits of the proposed education programme to the community and society

This research was premised on the basis that significant benefits must be derived from the education programme and that these benefits should apply to the diabetic patients, the health care workers and, indeed, the very community in which these people reside. The research established that there were significant benefits likely to accrue as a result of the implementation of the programme. Consensus was reached on the premise that this programme would benefit the health care workers' profession, specifically by creating greater participation of their profession in providing public health care. Indirectly this would also contribute to the improvement of the status of their profession, particularly in the eyes of the South African government and DoH. A significant benefit being increased patient access to specialised public health care services. There would also be an increase in the specialist skills and expertise of the health care workers in providing care and education to the diabetic patients.

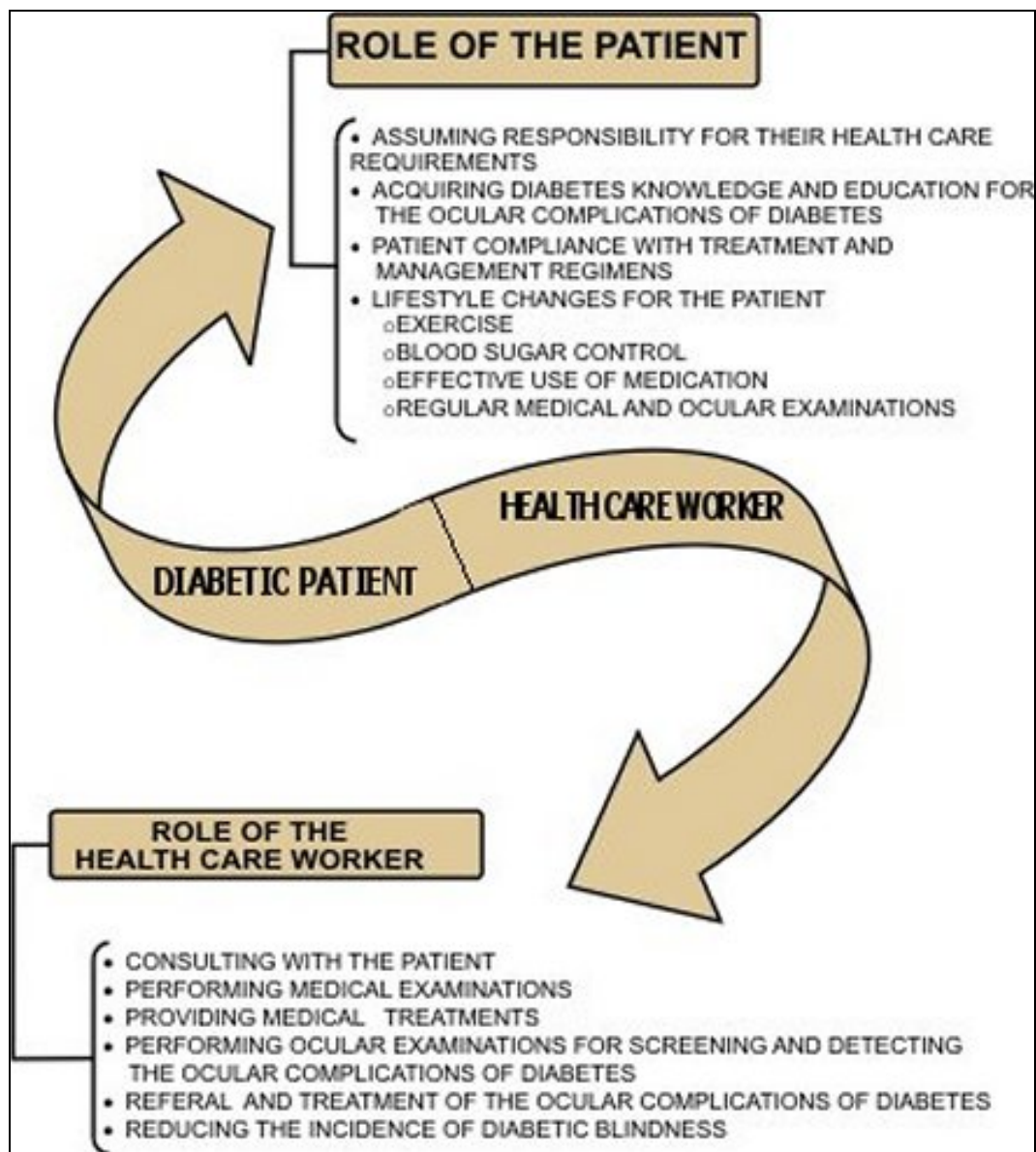
The patients and the community would also benefit from this programme, most importantly, by the prevention of blindness through the early detection of the ocular pathology arising in diabetic patients. This is perhaps the most critical benefit of the programme and the basic premise for the entire research project. The provision of diabetic patient education by the health care workers would also be of benefit in terms of reducing the patient's general systemic disease risk and would also help to reduce the severity of Type II diabetes by educating the patient on good methods of diabetes control. The research found that all of these aspects would help to alleviate the serious socio-economic aspects of uncontrolled diabetes and its ocular complications.

The study also found significant benefits to the health care workers, including an expansion of their scope of practice, improved specialist skills and competencies, and a resulting increase in job satisfaction. However, the research found that health care workers would not automatically receive greater remuneration as a result of completing this education programme, although there would be greater likelihood of promotion or advancement in their place of employment. It was felt that once trained in this sub-speciality field, that health care workers should be retained to work within this specific discipline or else their skills would be lost to that sector.

6.3 POINTS OF DEPARTURE FOR THE DEVELOPMENT OF THE DIABETES EDUCATION PROGRAMME

At the centre of this research is the diabetic patient and the health care worker treating and managing these patients. If the prevalence of sight-threatening diabetic retinopathy is to be reduced, the role of the patient and that of the health care worker dealing with diabetic patients must be addressed. These aspects are considered in the following sections and are summarised in Figure 6.2.

FIGURE 6.2: Points of departure for the development of the Diabetes Education Programme



6.3.1 The role of the patient in the prevention and management of the ocular complications of diabetes

Critical to the success of the diabetes education programme would be the role of the patients in taking responsibility for their own health care requirements. The research with the diabetic patients found that a number of aspects of their knowledge about diabetes and its ocular effects needs to be addressed before the possible ocular complications of diabetes could be prevented or managed effectively. Also, not only is it important for patients to be educated about the disease and its ocular effects, but that the patients have to adhere to the treatment and management instructions from their health care provider as well as undergo lifestyle changes required for managing diabetes.

The results of the patient questionnaires suggest a number of areas where the patients' roles are critical to their diabetes management. These include following a healthy diabetes-specific lifestyle, taking regular exercise, measuring their blood sugar, taking their medication exactly as prescribed, and going for medical check-ups and eye examinations as required by their health care professionals. Patient compliance in all these areas would therefore be a very important factor and a key role for the patient in preventing and managing the ocular complications of diabetes.

It is, however, beyond the scope of this research to establish the access available for such patients to receive eye examinations due to such aspects as financial constraints or geographical distance to the eye care professional. However, this further emphasises the need that health care professionals employed in the public health sector should receive education and training to

perform eye screening in order to detect the ocular complications of diabetes. This aspect is addressed in the following section.

6.3.2 The role of the health care worker in patient education and the prevention and management of the ocular complications of diabetes

Section 3.3 of this thesis dealt with the epidemiology of diabetes, both from a global perspective as well as for the prevalence of diabetes and diabetic retinopathy in South Africa. What is evident from the literature is that diabetes is an extremely serious disease in terms of its systemic and ocular effects. In addition, in the South African public health sector, major changes need to be implemented in order to screen, detect and treat/refer diabetic eye disease.

Currently most private sector optometrists are located in urban areas and there are limited posts for optometrists in the public health sector. There are equally as few ophthalmologist posts in the public health sector and therefore the health care workers dealing with diabetic patients in community health centres or clinics on a daily basis must be the focus of any attempts to screen for ocular complications in diabetic patients.

These health care workers in the community health centres and clinics are ideally suited to screening diabetic patients at the primary level, as they are usually the first line of health care workers that the patient encounters when seeking medical attention. However, there may be logistical and infrastructural difficulties with health care workers screening and detecting diabetic eye disease. For example, limited time and availability of equipment in the community health centres/clinics is likely to be a major obstacle

precluding the widespread screening of diabetic patients. However, it is at this level of health care provision that the overwhelming majority of diabetic patients are seen and where the greatest benefits of a screening programme for sight-threatening diabetic eye disease may be realised.

The role and value of the health care worker in such a context should not be underestimated. Having undergone an education training programme for the prevention and management of the ocular complications of diabetes, the health care worker could fulfil the role of consulting with the patient regarding his/her diabetic disease and performing general examinations concurrent with his/her level of health sciences training. Additionally, on completing the diabetes education programme, patients would be equipped with the knowledge and skills to perform the appropriate form of ocular examination necessary to detect sight-threatening complications of diabetes that might exist in the patient.

The health care worker would also be well-trained to deal with the urgency of referral of such patients for tertiary level eye treatment and would furthermore be equipped to educate the patients about their disease. Such health care workers would then be able to facilitate better compliance of the patients with their treatment and management regimens. Therefore the role of the health care worker would be far-reaching in its potential to reduce the incidence of diabetic blindness.

6.4 THE DIABETES EDUCATION PROGRAMME IN THE CONTEXT OF HIGHER EDUCATION IN SOUTH AFRICA

It is important when developing an education programme to justify and contextualise its development particularly in terms of the higher education

sector in South Africa. The processes of undergoing programme approval through the various legislative bodies were documented in this thesis (cf. section 2.8.2) and it is unnecessary to discuss them further, as they are applicable to any form of programme approval in higher education. However, there are various aspects specifically pertaining to the development of this diabetes education programme which will be discussed in the following sections.

6.4.1 Policies and procedures

The research considered the development of the education programme in terms of the policies and procedures required for programme development and accreditation in the context of higher education in South Africa. Consensus was reached that such a programme for the prevention and management of the ocular complications of diabetes should be implemented at the current NQF level 7 (proposed new level NQF level 8) as a post-graduate diploma programme. Although it was felt unnecessary for the programme to be implemented at NQF 8 or Master's degree level (proposed new level NQF level 9), the work and modules comprising the programme could be credited towards an overall Master's degree qualification.

It was felt by the Delphi panel that the South African DoE and the DoH should support this unique education programme and that the optical industry in South Africa, together with the Professional Board for Optometry and Dispensing Opticians, would favour the implementation thereof. Furthermore, a measure of support and acceptance by the stakeholders of the outcomes specified was required. It was also essential that the programme should be offered as a structured formally registered SAQA-approved programme to ensure credibility of the training and qualification to be offered.

The research found that it would be useful for the programme to be offered by a University or a University of Technology and there was overwhelming consensus that it was unnecessary for the programme to be offered by a private training college or organisation. Similarly, the diabetes education programme should be affiliated to an ophthalmic/optometric programme or nursing programme, but it was felt that other health professionals such as pharmacists and rehabilitation therapists could also benefit from this diabetes programme.

6.4.2 Outcomes-based education

The Delphi panel established for this research had to consider the statement that: "in developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes-based education...". Various aspects of outcomes-based education then had to be considered by the panel.

There was consistent and overwhelming support for the philosophy of outcomes-based education in the diabetes education programme for a number of reasons. In terms of the proposed programme, fairness of both testing and grading would be facilitated through the use of outcomes-based education and this methodology would also ensure that the course, content and evaluation procedures would both be consistent and interrelated. The outcomes-based methodology would encourage self-evaluation by the students to ensure that they knew what was expected of them. A benefit of this would be that efficient student learning would be facilitated and anxiety would be reduced by providing direction and identifying instructional priorities. In order to achieve this, demonstrations of competence must take place at the end point of the candidates' learning experience and these

demonstrations must occur in some context or performance setting. They must be in other words relevant and appropriate to their work in the community health centre or clinics and relevant to the diabetic patients with whom they are working.

Equally as important, the research accepted that the demonstrations, which are the key component of outcomes-based education, must show evidence of significant learning. There was full support from the expert Delphi panel that the outcomes must be significant, that they must be clear, and that they must be concise in order to ensure that the demonstrations are of high quality. Therefore, in order to achieve this aspect, the outcomes developed for this education programme had to satisfy these criteria. Learner assessment also had to adhere to these accepted principles. These aspects of the programme are discussed further in this chapter.

6.4.3 Development of the curriculum

The development of the education programme for the prevention and management of the ocular complications of diabetes had to recognise the various aspects involved with curriculum planning, development and design. It was established that the curriculum development process should be sensitive to the academic setting of the project and this was achieved in the research through the use of specialists having particular expertise in this particular academic field. It was also felt that the curriculum must be flexible enough to allow for easy changes if required and that learners would need to know essentially what was in their prevention or management role in their working environment.

Although the curriculum development process should be sensitive to the capabilities, interests and priorities of the students whom the programme is designed to serve, it is important that there are still stringent requirements for what the learners should be able to do in terms of their management of the diabetic patients. This is reflected in the requirement that the development of the programme should require a detailed knowledge and appreciation of the discipline. This aspect was achieved through the composition of the Delphi panel who were not only highly qualified experts, but also largely representative of all the stakeholders involved in the field of treating and managing diabetes and its ocular complications. Having a representative sample of the Delphi panel from the higher education sector also meant that the development of the diabetes education programme could be achieved with an understanding of the resources and options available to the educators involved with the project.

The research was able to reach consensus on a rationale to explain and justify the creation or existence of the programme. Furthermore, the overall aims of what the programme would achieve are clearly articulated in terms of the educational and public health care needs that are addressed by the programme. Outcome statements have been developed to indicate the knowledge, skills and attitudes learners are required to achieve through the programme, while content areas of knowledge comprising student learning have been agreed upon. In addition, consensus was reached on the assessment methodologies to be utilised in order to indicate how student learning will be assessed and reported.

The curriculum for the diabetes education programme will be structured so that processes will be in place to recognise prior knowledge in diabetes. The learners will gain knowledge and develop skills and competencies required to

deliver diabetes education and be taught to perform various procedures for screening and referring the ocular complications of diabetes. Such a programme cannot function in isolation and so an essential aspect of the curriculum will involve collaboration with relevant diabetes organisations, professional associations and other bodies involved with diabetic patients. There must be resources available to deliver the curriculum and, in particular, appropriately qualified teachers and instructors must be appointed to ensure the correct quantity and quality of clinical experience and supervision.

The curriculum will not only aim to provide theoretical learning, but will also aim to equip the learners to deal with professional issues such as resolution of situational conflict and the delivery of diabetes education according to the role that they are expected to perform. There will be procedures and guidelines in place to approve and monitor the facilities where clinical experience is undertaken, particularly on the job or in-service learning. The curriculum will be defined in the context of the particular society and health care system in which the programme is delivered and, in particular, this programme will aim to address the needs of the patients in the public health sector. Upon successful completion of the course, the curriculum will then enable learners to obtain a qualification in the prevention and management of the ocular complications in diabetic patients.

6.4.4 Implementing and evaluating the curriculum

Prior to implementing the programme a demonstrable need for such a programme had to be established and this formed part of the curriculum development process. The research determined that the academic area was stable and well defined in terms of what knowledge would comprise the programme and a clear potential for success of the programme was

identified. It was important that the department or institution providing the programme have the necessary resources available and that a needs assessment should be conducted in terms of the programme objectives. The needs assessment has been achieved through the use of the questionnaires which aimed to establish the levels of knowledge, education and training of the health care workers.

In order to implement the curriculum there was consensus that the aims and exit level outcomes of the curriculum should be developed (cf. section 6.7) and the rationale and justification for the provision of the programme would be established (cf. section 6.2). The assessment criteria and educational methodologies involved with the programme will be described (cf. section 6.6.5) and the context and community in which the programme resides are evident from the role of the diabetic patients and the health care workers dealing with these patients. The entry and admission criteria to the programme will be dealt with (cf. section 6.6.4) together with the methods of instruction appropriate to the learners' needs. In order to satisfy the criteria that the programme should allow for individual differences in learners and learning methods, the use of outcomes-based education together with a more flexible mode of delivery aims to achieve this aspect.

In order to deliver on the requirement that provision must be made for adequate availability of learner resources, materials and facilities, this would be achieved through having the education programme offered at NOF level 8 as a formal SAQA-approved programme to ensure that all the student support services of the university offering the programme would be available to such learners. The research found that it was not essential for pilot testing of the education programme to be conducted prior to implementation of the

programme, but rather, that criteria must be available for evaluation of all aspects of the programme for the purposes of quality assurance. This will be ensured through the programme approval and accreditation processes required by the HEQC of the CHE.

In addition, there was broad consensus that there must be evidence of significant groups and subject specialists involved throughout the development of the programme curriculum. Once again, this was achieved through the fully representative Delphi panel consisting of specialists in the fields of optometry, ophthalmology, nursing, public health, as well as education and health professions education. Furthermore, the role and value of the advisory committee in reviewing the curriculum on a regular basis is addressed later in this Chapter (cf. section 6.6.2).

6.5 EDUCATIONAL AND PUBLIC HEALTH NEEDS THAT ARE ADDRESSED BY THE DIABETES EDUCATION PROGRAMME

Having described the premises for the development of the programme and contextualised the programme in the higher education sector, this section will deal specifically with the needs that will be addressed by the programme. The educational needs were arrived at through the use of questionnaires developed to determine the knowledge of diabetic patients about their disease and its ocular complications as well as through a similar process that was followed in order to determine the educational needs of the health care workers. Having established these needs, proposed statements of intent to deal with these aspects were included in the Delphi research process and the results of which form part of the education programme.

6.5.1 Diabetic patients' knowledge of diabetes

The diabetes education programme aims to address the patients' needs in terms of their knowledge of the disease. The Delphi panel considered the various areas of knowledge that diabetic patients should be educated about and made aware of in terms of their disease. In order to achieve this, health care workers completing the diabetes education programme must ensure that diabetic patients are fully informed and educated on a number of important issues regarding their disease.

There was full consensus that diabetic patients must be informed about the different types of diabetes, as well as the type of diabetes that the patients themselves had. They should be made aware of the risk factors contributing to the development of the disease, including the effects of pregnancy on the development of diabetes. Critically, the patients must be made aware of the importance of checking and maintaining good control over their blood sugar levels, having their blood pressure checked and controlled, and of not smoking.

6.5.2 Diabetic patients' knowledge of the ocular complications of diabetes

The education programme is unique in that it aims to address the patients' needs in terms of their knowledge of the ocular complications of diabetes. Once more, the Delphi panel considered which aspects of the ocular complications of diabetes these patients would need to be informed of, and that this would then form a critical component of the health care worker's education programme.

There was overwhelming consensus that, first and foremost, patients must be informed that untreated diabetic retinopathy can lead to blindness, but that this is preventable provided that measures are implemented to educate the patients on the need for ocular examinations on a regular basis. Having established this as the foundation of the patient education, it is important that diabetic patients be made aware that diabetes may affect their vision at distance and near and also that it can change their refractive error or spectacle prescription. They should know that cataracts may form as a result of diabetes and that diabetes may cause bleeding and damage to the retinas of the eyes. As a result of this, new vessels may grow inside the eyes, where the possibility exists for a retinal detachment to occur, or for the pressure to rise inside the eye, leading to glaucoma.

The research also established that patients should be educated that diabetes may affect colour vision and the ability of the eyes to heal after injury, as well as the possibility that diabetes may affect the nerves of the eyes, causing them to become squint. However, these aspects were less important than the fact that patients should be fundamentally informed that diabetes can cause blindness, but that this is totally preventable through early detection and treatment.

6.5.3 Diabetic patients' knowledge of the management and treatment of diabetes

The proposed education programme will address the issue of diabetes management and treatment in terms of what the health care workers will be expected to emphasise to the diabetic patients. The following aspects are included in the education programme in respect of what the health care

worker would therefore need to know in order to address the educational needs of the patient:

The importance of following a healthy diet and lifestyle together with an attempt to maintain an appropriate body weight through diet and regular exercise is critical to the success of managing not only diabetes, but all the other systemic complications that may occur. The education programme will enable health care workers to educate the patient about the systemic complications that may occur in uncontrolled diabetes. Diabetic patients must also be informed about the importance of attending regular medical check-ups and of measuring their blood sugar regularly as scheduled by their medical practitioner, including taking their medication exactly as prescribed. Most importantly, in terms of this research, the education programme will ensure that health care workers are able to create an awareness in patients about the ocular complications of diabetes, how they may be managed and treated, and why it is of critical importance to undergo regular eye examinations by an eye care professional.

6.5.4 Health care workers' knowledge of the management and treatment of diabetes

In order to educate the diabetic patients on the management and treatment of diabetes, the proposed education programme aims to address this need by providing an appropriate high-quality education programme for health care workers managing and treating diabetic patients.

Comprehensive questionnaires were compiled during the research phase in order to determine the levels of education and training that the health care workers had received in respect of diabetes education and, in particular, their

training with regard to the ocular complications of diabetes. The results of this aspect of the research are described in section 5.4. Having established a baseline for their level and training, the Delphi study established the knowledge and skills required for these health care workers to enable them to screen and manage diabetic patients and, in particular, to appropriately manage and refer those patients at risk of developing sight-threatening diabetic retinopathy. These standards and outcomes are described in detail in section 6.7 of this chapter and as such address the educational needs of the health care workers.

6.5.5 Reduction in the incidence of preventable blindness

The public health needs addressed by the education programme will be mainly in terms of the reduction in preventable blindness, although concurrently, any programme aimed at improving education and compliance of diabetic patients will inherently reduce their risks of developing other systemic complications. The Delphi panel identified one critical aspect that must be stressed to diabetic patients, which is that diabetes causes blindness, not just poor vision, but that this is preventable if, and only if, they have regular check-ups by an appropriate clinician.

It is also very important that diabetic patients should be made aware of the prevalence of diabetic blindness, as this is often not taken seriously enough, since they feel that the ocular complications of diabetes will not happen to them (29% of diabetic patients surveyed believed that diabetes would not affect their eyes; cf. section 5.3.1.4). These aspects are therefore included in the health care workers' education programme to ensure that they have the appropriate skills and knowledge to provide this education to the diabetic patients. The research also found that family members should be included in the management of the disease as much as possible, as they frequently offer

much needed emotional support and guidance, as well as ensuring continued motivation and compliance in the management and treatment of the disease.

In terms of national policies and priorities, the health care workers will receive education and training with regard to those policies relevant to the prevention and management of the ocular complications of diabetes. The education programme will review the South African DoH's *National Programme for the Control and Management of Type 2 Diabetes* as well as the *National Guidelines for the Prevention of Blindness in South Africa*.

The Delphi panel felt it was also essential that the programme included the *Strategic Priorities for the National Health System 2004-2009* as well as *The Primary Health Care Package for South Africa: A set of Norms and Standards*. The health care workers when dealing with the diabetic patients would furthermore have to comply with all the relevant acts and/or professional guidelines issued by the HPCSA and it would be useful for the education programme to inform the health care workers about the Patient's Rights Charter. It is then expected that, by addressing these educational aspects, a major contribution will be made towards reducing the incidence of sight-threatening diabetic retinopathy in the public health sector.

6.6 ACADEMIC AND ADMINISTRATIVE ASPECTS PERTAINING TO THE DIABETES EDUCATION PROGRAMME

The Delphi process reached broad consensus on the academic and administrative aspects pertaining to the diabetes education programme. The panel considered the mission and purpose of the programme and how the diabetes curriculum will be organised. The role of the advisory board was discussed and the academic aspects were dealt with in detail. The human

resources and academic staffing issues were addressed. These academic and administrative aspects of the programme are described in detail in the following sections.

6.6.1 Mission and purpose of the diabetes programme

It was established that the mission and purpose of the programme must be clearly stated as was elucidated in section 6.2 in terms of the programme rationale. It would be useful, but not essential, for the mission and purpose of the programme to fit into the broad mission statement of the institution at which it is provided and the mission of the programme should address the needs of the community in which the institution resides. It is essential that the purpose statement of the programme indicates what learners will be able to do upon successful completion of the programme. The proposed purpose statement of the post-graduate diabetes education programme is as follows:

“Upon successful completion of the learning programme, learners will be able to comprehensively screen, detect, manage and refer patients with sight-threatening complications of diabetes to an appropriate eye care practitioner, according to international referral guidelines for diabetes and its ocular complications.”

6.6.2 Organisation and coordination of the programme

In terms of the organisation of the diabetes curriculum, there must be written objectives for the education programme. These will be discussed in more detail in section 6.7 when describing the required standards and outcomes for the education programme. Provision must be made for all necessary resources to be made available in order to achieve the proposed objectives and in order to coordinate the programme as a whole. It is also essential that a specific programme coordinator is appointed to be responsible for overseeing the

overall progress of the programme, including the planning, implementation and evaluation thereof.

6.6.3 Role and value of the advisory committee

It is essential that an advisory committee be established for the education programme in order to ensure, among other things, that there is a level of external quality assurance in the programme. The advisory committee should have interdisciplinary and intersectoral integration. This committee should in other words comprise of members from different but associated disciplines such as medicine, ophthalmology, optometry, nursing and nutrition. Furthermore, in order to ensure intersectoral integration, the panel should include members from private practice, the public health sector, as well as from government and non-governmental organisations.

These members of the advisory committee should have current experience and understanding of diabetes management and this committee should have regular meetings. In the early stages of the offering of the programme, it would be expected that the committee would meet more often than at later stages. It would be considered useful to review the programme on an annual basis but more frequently than this in the early stages. Although not strictly a function of the advisory committee, it may be useful for the committee to review the knowledge, skills, abilities and experience of the educators, so as to ensure a level of quality assurance in the programme.

6.6.4 Mode of delivery of the programme

The mode of delivery of the programme was considered to be a particularly important aspect in this research, which established that the programme must aim to ensure accessibility to the overall learner population to whom it is directed. The programme curriculum must be suitably flexible in terms of

delivery in order to accommodate the diversity of circumstances of potential learners. This is particularly true of the health care workers who usually work long hours and may work and reside some distance from the educational institution offering the proposed programme.

It was felt that the traditional emphasis on instruction time or programme duration should be replaced with greater emphasis on student learning and achievement of outcomes. This is exactly what is aimed to be achieved through the use of carefully considered specific outcomes for the diabetes education programme. Time-based learning policies will therefore shift towards a mastery of skills and knowledge as required by the stated outcomes. Learning will take place through a learner-centred approach, necessitated by the fact that the learners will usually be required to conduct a certain level of self-study considering that the programme will be offered at a post-graduate diploma level. Furthermore, open and flexible learning will be facilitated through the delivery of modular-based learning and instructional methodologies designed to offer broad and easy access to learning.

6.6.5 Admission requirements and learning assumed to be in place

The Delphi panel considered the admission requirements for the proposed education programme and established that the minimum requirements must be clearly documented. Usually these would be a National Diploma or Bachelor's degree in the appropriate health field. However, these minimum requirements must not be aimed at excluding potential learners, as there is clearly a role for all health workers at some level for the prevention and management of the ocular complications of diabetes.

It was felt that different role players in the health care team may have different requirements and so the use of RPL must be considered for such learners not meeting the minimum admission requirements. Therefore a formal policy on RPL must exist in the institution and for the programme. It is important that the requirements for clinical and theoretical learning assumed to be in place prior to admission to the programme are documented and available to the learners so that in cases requiring RPL, portfolios of learning/work completed may be compiled and presented when applying for admission to the programme.

The specific requirements for admission to examinations must be documented, although these may vary slightly depending upon the individual institution and/or faculty offering the programme. Most importantly, promotion criteria from module to module or to the following level of study must be explicitly stated to ensure that learners know what is expected of them and how they may be expected to progress throughout the learning programme.

6.6.6 Educational methodologies and learner assessment

There was full consensus from the Delphi panel that the curriculum document of the programme must reflect the objectives, course contents and outcomes. It should reflect the teaching methodology, ordering, sequencing and duration of the modules or coursework, including the educational materials to be used. The curriculum document should also describe the evaluation and assessment instruments and how these fit with the educational methodologies of instruction.

It is proposed that the diabetes education programme should include interactive learner participation with modalities such as group work, self-

study, class presentation and projects or assignments where appropriate. This aspect would be enhanced through the use of innovative multimedia programmes and presentations. It would also be useful for learning to take place through the use of individual research projects and assignments at the appropriate post-graduate level in order to develop creative thinking and problem-solving skills.

Smaller group teaching should be encouraged in order to facilitate closer interaction between learner and educator, and this is likely to be highly successful considering that the learners would be at a post-graduate level and able to interact at the level of a learner who is involved in dealing with clinical problems on a daily basis. The philosophy of the learning experience should also be for the learners to use reflective practice to reflect on how they are learning and what they are learning in the context of the work that they are required to do with the diabetic patients and, furthermore, to use problem-solving and decision-making skills as part of this process.

More specifically, targeted clinical and practical training will be inherent in the diabetes education programme in order to develop skills required for the treatment and management of diabetic patients. Practical training aimed at exposing learners to clinics, community health centres and hospitals treating diabetic patients will ensure relevance of the programme to the learners. Ideally the programme will also include theoretical and practical training aimed at exposing learners to ophthalmological treatment of diabetic patients. This aspect could be facilitated through the visits of learners to tertiary teaching hospitals where large numbers of diabetic patients attend for surgical treatment of their ocular complications of diabetes.

The mechanisms for learner assessment were established for the education programme and there was consensus that the emphasis should be shifted away from the input or content aspect of programmes towards the objective assessment of the performance of learners in terms of clearly stated outcomes. This will be achieved through the use of the outcomes documented in section 6.8. The assessment process must, however, be objective and verifiable and the ultimate outcomes for each and every person learning in the programme must be equivalent and clearly stated. This will be facilitated by ensuring that the responsibilities learners are expected to assume to monitor their own learning are defined in the outcome statements. The assessment criteria for each of the skills must be defined and there should be an integrated method of assessment covering all aspects of the learning programme. This means that assessment must include theoretical, clinical and practical assessment and that these should not be seen or conducted in isolation.

The uniformity of assessment throughout the programme will be ensured through the moderation of learner assessment to ensure that the required level, standard, appropriateness and fairness are observed throughout the assessment process. All forms of assessment must be moderated by appropriately trained moderators with specific expertise in the learning area and it would be expected of them to have received formal training in assessment methodology in terms of the SAQA requirements for assessors (SAQA 2001:8-10).

The Delphi panel established the forms of learner assessment to be included in the education programme. Depending on the nature of the specific learning area and activity, it is required that both formative and summative

assessment methodologies be used in the assessment of learners. There must be a full evaluation of all theoretical learning as well as of all practical or clinical learning. Finally, in terms of assessment, it would be necessary to employ a variety of forms of assessment to ensure that learners' knowledge is assessed by the most appropriate means for that specific section of work or learning area.

6.6.7 Human resources and academic staffing

The diabetes education programme will require the composition of the organisation to include the teaching team and its members, a programme co-ordinator and an advisory committee. The core teaching team should include, but not be limited to, an optometrist, a medical practitioner/ophthalmologist, a nurse, a nutritionist, a diabetes educator, as well as any other appropriately trained health care professional. This may also include a social worker and a diabetes counsellor.

The teaching personnel should have specialised knowledge of all aspects of the diagnosis, control and treatment/management of diabetes. For the teaching and instruction concerning the ocular complications of diabetes, the use of an optometrist and an ophthalmologist will facilitate the expertise required in this area. The members of the teaching team should preferably have appropriate educational qualifications and experience to instruct at the higher educational level of post-graduate diploma (NQF level 8).

More specifically, the Delphi study found that it would be useful but not essential for programme lecturers and instructors to hold a post-graduate qualification in the appropriate field (at least a Master's degree but preferably a Doctorate) as well as a formal qualification in higher education studies. It would be beneficial for such lecturers to have a minimum of five years of

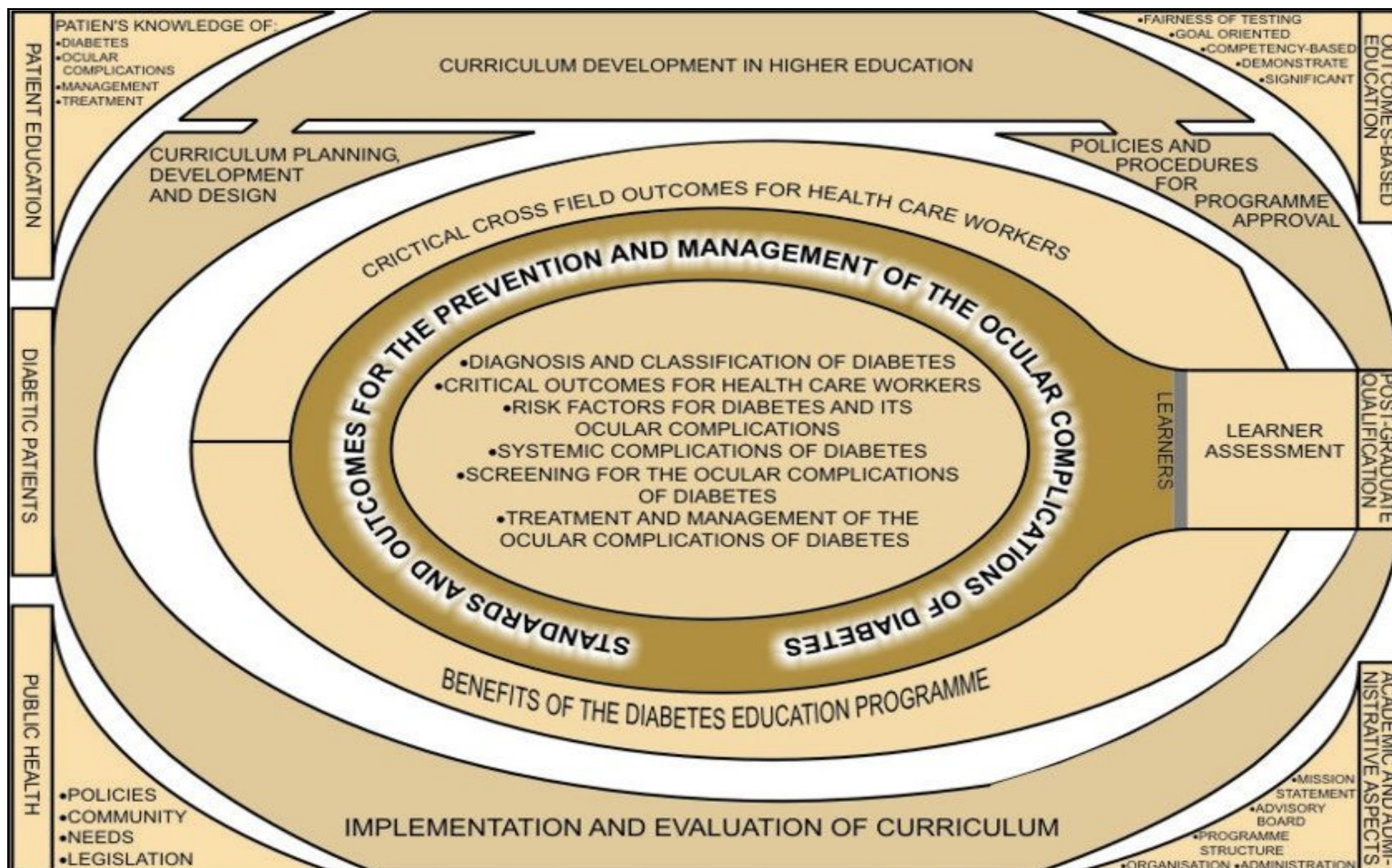
experience lecturing in higher education although it is mandatory that programme lecturers and instructors are registered with their appropriate Health Professions Board or Nursing Council.

6.7 STANDARDS AND OUTCOMES FOR AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

The Delphi panel determined the outcomes that the learners would be expected to achieve upon successful completion of the diabetes education programme. The outcomes have been generated with increasing specificity, beginning with the more general critical cross-field outcomes all learners are expected to achieve, becoming more discipline-focused when describing the critical outcomes for health care workers in general.

The outcomes then refer specifically to the classification and diagnosis of diabetes as well as to the risk factors contributing to the development of the disease. The outcomes required in terms of the systemic complications of diabetes are then described, including the ocular complications of diabetes. Thereafter the screening outcomes are described as well as the outcomes required for the management and treatment of diabetic eye disease. A graphical representation of the processes involved with the development of the standards and outcomes for the prevention and management of the ocular complications of diabetes is provided in Figure 6.3 as follows:

FIGURE 6.3: Processes involved with the development of the standards and outcomes for the prevention and management of the ocular complications of diabetes



6.7.1 Critical cross-field outcomes for the education programme

The Delphi panel reached consensus on the following critical cross-field outcomes (originally developed SAQA) that were considered to be *essential* for learners completing the diabetes education programme:

- The ability to identify and solve problems with responsible decisions shown to be the result of critical and creative thinking.
- The ability to work effectively with others as a member of a team, group, organisation and community.
- The ability to organise and manage oneself and one's activities responsibly and effectively.
- The ability to collect, analyse, organise and critically evaluate information.
- The ability to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation.
- The ability to demonstrate cultural and aesthetic sensitivity to all patients and colleagues in the everyday working environment.

Although the Delphi panel was unable to reach full consensus on the following critical cross-field outcome, the majority of the panel considered the following outcome to be *essential* for learners completing the diabetes education programme and it will therefore be included in the programme:

- The ability to use science and technology effectively and critically, showing responsibility towards the environments and health of others.

The majority of the Delphi panel considered the following critical cross-field outcome to be *useful* for learners completing the diabetes education programme and it will therefore be included in the programme:

- The ability to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

6.7.2 Critical outcomes for health care workers

The proposed critical outcomes for health care workers were adapted for the Delphi study from the English National Board for Nursing, Midwifery and Health Visiting (1991) and the Exit Level Outcomes for the National Certificate in Diabetes Nursing (SAQA 2003). These revised outcomes were then considered by the Delphi panel. The panel reached consensus on the following critical outcomes for health care workers and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes:

- The ability to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations.
- The ability to practise effectively in accordance with the professional and legal framework (knowledge, skills and attitudes/values) as a member of the health team.
- The ability to use specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs.
- The ability to work as part of a multi-professional team, in which the leadership role changes in response to changing client needs.
- The ability to have an understanding of health promotion and preventative policies and strategies.

- The ability to facilitate and assess the professional and other development needs of all for whom responsible, including where appropriate learners, and to act as a role model for professional practice.
- The ability to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.
- The ability to diagnose, prevent and manage diseases (within their scope).
- The ability to use prior training and education for problem-solving in a clinical situation.
- The ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards.
- The ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration.

Consensus was reached by the Delphi panel on the following critical outcome for health care workers considered to be *useful* for learners and it will also be included in the diabetes education programme:

- The ability to develop and use flexible and innovative approaches to practise appropriate to the needs of the client/patient or group in line with the goals of the health service and the employing authority.

Although the Delphi panel was unable to reach full consensus on the following critical outcomes for health care workers, the majority of the panel considered the following outcomes to be *essential* for learners completing the

diabetes education programme and they will therefore be included in the programme:

- The ability to evaluate quality of care delivered as an ongoing and cumulative process.
- The ability to facilitate, initiate, manage and evaluate change in practice to improve quality of care.
- The ability to use science in the practice of health and medicine.

Although the Delphi panel was unable to reach full consensus on the following critical outcome for health care workers, the majority of the panel considered the following outcome to be *useful* for learners completing the diabetes education programme and it will therefore still be included in the programme:

- The ability to use research to plan, implement and evaluate concepts and strategies leading to improvements in care.

6.7.3 Outcomes relating to the classification and diagnosis of diabetes

Consensus was reached by the Delphi panel on the following specific outcomes relating to the classification and diagnosis of diabetes and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes.

Upon completion of the diabetes education programme, learners should be able to:

- comprehensively describe the various types of diabetes;
- classify the various types of diabetes;

- comprehensively describe the various causes of Type I diabetes;
- comprehensively describe the various causes of Type II diabetes;
- comprehensively describe the various effects of uncontrolled diabetes on the human body;
- comprehensively describe the pathophysiology of diabetes;
- describe the primary actions of insulin;
- describe the diagnostic criteria for diabetes;
- describe the diagnostic criteria for diabetes according to international standards; and
- describe the diagnostic criteria for diabetes taking into account the criteria outlined by the South African DoH as part of its National Programme for the Control and Management of Type II Diabetes.

6.7.4 Outcomes relating to the risk factors contributing to the development of diabetes

Consensus was reached by the Delphi panel on the following specific outcomes relating to the risk factors contributing to the development of diabetes and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes.

Upon completion of the diabetes education programme, learners should be able to:

- identify and describe the known modifiable and non-modifiable risk factors for developing Type I diabetes;
- identify and describe the known modifiable and non-modifiable risk factors for developing Type II diabetes; and

- identify and describe all the risk factors having an influence on the incidence and progression of diabetic retinopathy.

6.7.5 Outcomes relating to the systemic complications of diabetes

Consensus was reached by the Delphi panel on the following specific outcomes relating to the systemic complications of diabetes and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes.

Upon completion of the diabetes education programme, learners should be able to:

- explain the acute (short-term) systemic complications of diabetes; and
- explain the long-term systemic complications of diabetes mellitus.

6.7.6 Outcomes relating to the ocular complications of diabetes

Consensus was reached by the Delphi panel on the following specific outcomes relating to the ocular complications of diabetes and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes.

Upon completion of the diabetes education programme, learners should be able to comprehensively describe the following conditions:

- The refractive changes that may occur in diabetic patients.
- The changes that may occur in the eyes in terms of visual performance (such as reduced visual acuity, blue-yellow colour defects, abnormal contrast sensitivity and field loss).
- The nerve palsies and defects that may occur in diabetic patients.
- The various pathophysiological effects of diabetes on the cornea.
- The lenticular changes and processes leading to diabetic cataracts.

- The neovascular response of the eye to ocular ischaemia secondary to the diabetes, including the development of rubeosis irides.
- The development of ocular hypertension and glaucoma in diabetic patients.
- The neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders.
- The processes leading to tractional retinal and vitreous detachments due to diabetes.
- The skin and eyelid disorders and infections that may be encountered in diabetic patients.
- All aspects of ocular or diabetic retinopathy.
- The pathogenesis of ocular retinopathy.
- The various forms of classification of diabetic retinopathy.
- The various forms of ocular pathology comprising diabetic retinopathy.

6.7.7 Outcomes relating to screening for diabetic eye disease

Consensus was reached by the Delphi panel on the following specific outcomes relating to the screening for diabetic eye disease and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes.

Upon completion of the diabetes education programme, learners should be able to:

- describe the World Health Organization's requirements for a screening programme for diabetic retinopathy;
- describe and perform the screening methods required to detect diabetic retinopathy and the ocular complications of diabetes;

- describe the screening interval and frequency of retinal examinations for Type I diabetic patients;
- describe the screening interval and frequency of retinal examinations for Type II diabetic patients;
- describe the general screening and referral protocols for diabetic retinopathy;
- describe the specific referral criteria from primary level to secondary level according to the National Guidelines for the Prevention of Blindness in South Africa; and
- Correctly use the recommended instrumentation for diabetic retinopathy screening.

6.7.8 Outcomes relating to the management and treatment modalities for diabetic eye disease

Consensus was reached by the Delphi panel on the following specific outcomes relating to the management and treatment modalities for diabetic eye disease and these outcomes, considered *essential*, will be included in the education programme for the prevention and management of the ocular complications of diabetes.

Upon completion of the diabetes education programme, learners should be able to demonstrate the following outcomes:

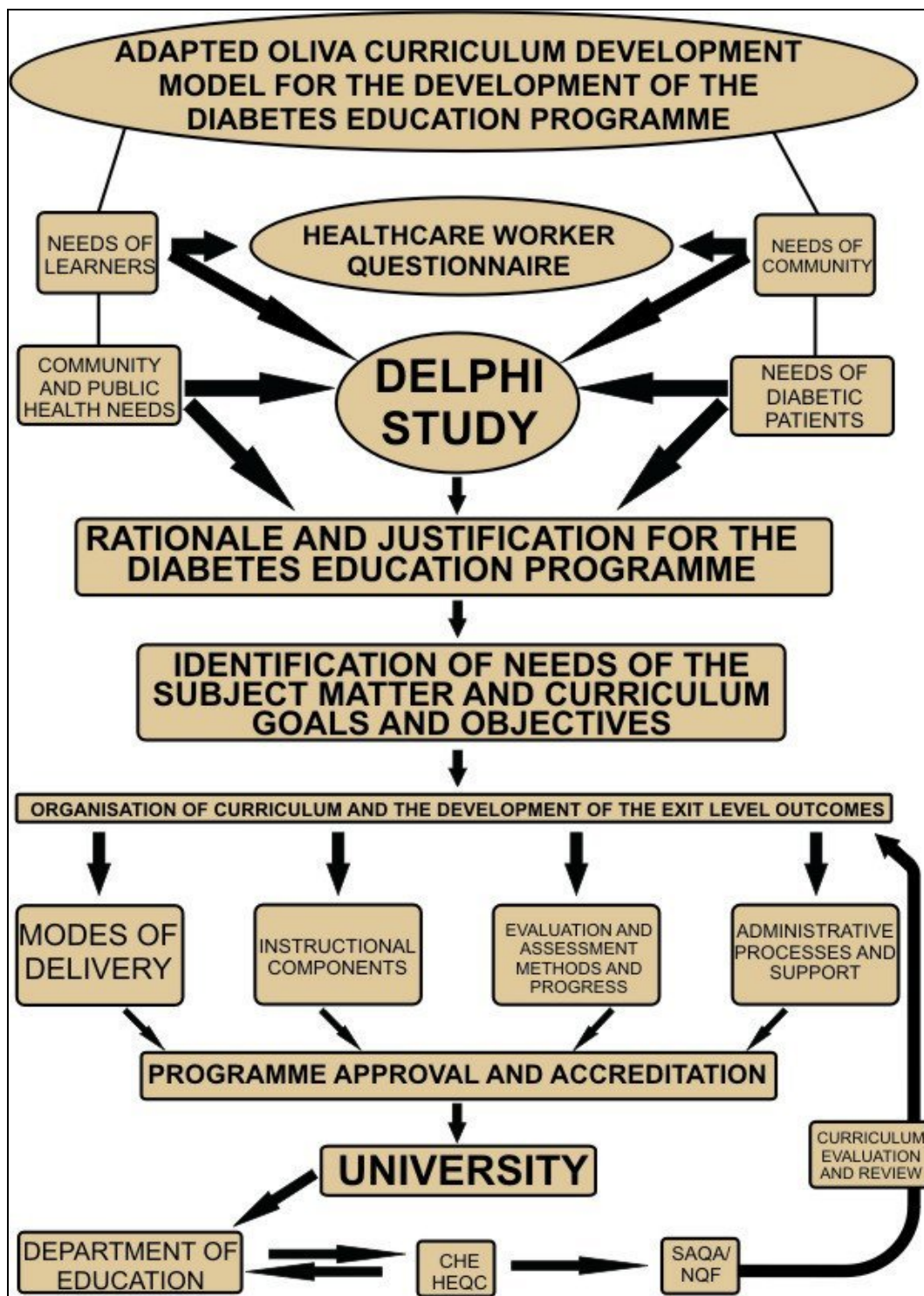
- An understanding of the role of prevention in the management of diabetic eye disease.
- An understanding of the role of early detection of retinopathy and the monitoring of existing retinopathy with regular and appropriately timed fundus examinations.
- An understanding of the importance of effective appropriately-timed laser treatment.

- An understanding of the importance of effective education of patients, the public, and health care professionals.
- An understanding of the various types of interventions and treatment modalities for the different types of diabetic eye disease.
- An understanding of the stages of diabetic eye disease at which treatment regimens are commenced.
- An ability to manage diabetic eye disease according to the health care workers' skills and professional scope.
- An ability to refer patients for further treatment at the appropriate stage and to ensure follow-up of the patient.

6.8 PERSPECTIVES CONCERNING THE DEVELOPMENT AND DELIVERY OF THE PROPOSED DIABETES EDUCATION PROGRAMME

This section will deal with the processes concerning the implementation and delivery of the proposed education programme for the prevention and management of the ocular complications of diabetes. A diagrammatic representation of these processes is provided in Figure 6.4. Chapter Two dealt with the processes to be followed for post-graduate programme approval in South Africa and the following sections will deal with how those aspects pertain to the proposed diabetes education programme.

FIGURE 6.4: Perspectives around the development and delivery of the Diabetes Education Programme



6.8.1 The development of the programme according to the Oliva model of curriculum development

The steps involved with the development of the diabetes education programme followed those proposed in the Oliva model of curriculum development (Oliva 1997:158). The steps are discussed in Chapter 2, section 2.5.4, which notes that the needs of the students/learners in general should begin the curriculum process. The questionnaires from the health care workers dealt with this aspect.

The needs of the learners in general were considered by the Delphi panel and these recommendations are included in the final round results of the Delphi study. Next the needs of society had to be addressed and this was achieved in three ways, namely through consideration of the eye care imperatives from the South African DoH, through the epidemiological statistics demonstrating the major health and socio-economic implications of diabetes and its ocular complications; as well as through the Delphi process which considered the more general needs of society by the expert panel.

Having identified and formulated these needs, the philosophy and aims of the education programme could be written. This was done in section 6.2 of this chapter in terms of providing a clear rationale and justification for the provision of the programme together with the programme aims that will satisfy the stated needs. The specific needs of the particular diabetic community in the Western Cape region of South Africa were also researched in the form of the patient diabetes education questionnaire and this added further credibility and validity to the curriculum development process. The educational and public health needs that are addressed by the programme were discussed in section 6.5 of this chapter.

The needs of the subject matter, together with the curriculum goals and objectives of the programme were clearly identified through the various research processes which culminated in the Delphi study. The organisation of the curriculum was also considered by the expert panel and the instructional goals/objectives were derived by the panel. These exit level outcomes were presented in this chapter under section 6.7.

The Oliva model (Oliva 1997:158) then requires the curriculum developer to select instructional strategies and to begin selection of evaluation techniques. These aspects were also considered by the Delphi panel and their recommendations were included in the final Delphi results. Modes of delivery and flexibility in educational instruction were considered important for the programme and both formative and summative assessment methods were proposed in terms of evaluation techniques. The last two aspects of the Oliva model (Oliva 1997:158) require the developer to evaluate the instructional offerings and modify instructional components, as well as to evaluate the curriculum and modify curricula components. These last aspects of the development process will commence once the programme has been implemented and these evaluations will form part of the accreditation procedures required by the HEQC and CHE.

6.8.2 Criteria for the submission of the diabetes education programme

The criteria for the recognition and registration of whole qualifications, as required by SAQA (SAQA 1998), were discussed in Chapter Two (cf. section 2.8.2). A recommendation for the submission of the proposed diabetes education programme for the prevention and management of the ocular complications in diabetic patients in terms of these criteria follows.

- **Statement of the purpose of the qualification:**

This criterion was previously discussed in this chapter under section 6.6.1. It is proposed that the statement of the purpose of the qualification is as follows:

“Upon successful completion of the learning programme, learners will be able to comprehensively screen, detect, manage and refer patients with sight-threatening complications of diabetes, to an appropriate eye care practitioner, according to international referral guidelines for diabetes and its ocular complications”.

- **Learning assumed to be in place before the programme leading to the qualification commences:**

This criterion was previously discussed in this chapter under section 6.6.5. The learning assumed to be in place for the health care workers would usually require a National Diploma or a Bachelor's degree in the appropriate health field. The policy for RPL will be offered to candidates where necessary.

- **Exit level outcomes and their associated assessment criteria (as specified in the Regulations and explained above):**

This criterion was previously discussed in this chapter under section 6.7 which refers to the standards and outcomes for the education programme. As these outcomes were already comprehensively discussed in this chapter, as well as presented in the final Delphi questionnaire (cf. Appendix Y), it would be unnecessary to provide further discussion here.

- **Total credits required (including maximum and minimum credits as specified in the Regulations):**

It is proposed that this qualification be offered at the NOF post-graduate diploma level 8. This is supported by the findings of the Delphi study (cf. Appendix Y). The total number of credits for this offering would be 120.

- **An integrated assessment that is appropriately incorporated into the qualification achievement requirement and that demonstrates that the purpose of the qualification has been achieved:**

Section 6.6.6 of this chapter deals with the assessment processes for the learning programme. The Delphi study (cf. Appendix Y, section 5) supports an integrated method of assessment covering all aspects of the learning programme and the establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all subjects/modules in the programme. It is agreed that, for all outcomes, the assessment process must be objective and verifiable and that assessment methodologies will be provided to indicate how student learning will be assessed and reported.

The programme will include formative assessment methodologies on an on-going basis throughout the learning process together with summative assessment of theoretical, practical and clinical learning. A variety of forms of assessment will be conducted by means of methodologies such as tutorials, case studies, projects, assignments, tests, examinations and practical/clinical demonstrations. These diverse assessments will be employed to ensure that the learners' knowledge is assessed by the most appropriate means.

- **A statement of the articulation possibilities with other and related qualifications, together with a statement of arrangements (implicit or specific) for such articulation:**

This learning programme has been developed for all health care workers dealing with diabetic patients. Such health care workers include, but are not limited to, nurses, optometrists, dispensing opticians, social workers, diabetes educators, as well as other paramedical professionals. As such, this programme aims to articulate with other health-related qualifications so that health care professionals from a variety of different clinical disciplines can pursue study in this area. It is also envisaged that learners completing this post-graduate qualification will articulate with, and accumulate credits towards, Master's degree programmes in a variety of nursing, optometric and other health-related fields.

- **Criteria for the registration of assessors:**

The Delphi study found it useful for assessors to have received formal training in assessment methodology in terms of SAQA requirements for assessors (SAQA 2001:8-10). It is proposed that in terms of the requirements for assessors, the educators should have appropriate educational qualifications and experience to instruct at the higher education level and be registered as assessors with SAQA.

- **Options for moderation, including the recommendation of moderator/s and/or moderating bodies:**

Section 6.6.6 of this chapter dealt with the aspect of moderation for the diabetes programme. All forms of assessment in this learning programme will be moderated by appropriately trained moderators with specific expertise in the learning area. Furthermore moderation of learner assessments will take

place to ensure that the required levels, standards, appropriateness and fairness are observed. In addition to the general criteria for the appointment of moderators, approved moderators will also be expected to be sourced from professional bodies such as the HPCSA and SANC.

6.8.3 Approval and accreditation of the diabetes education programme

Having developed the curriculum for the programme for the prevention and management of the ocular complications of diabetes, it is necessary for the proposed programme to undergo the necessary approval and accreditation processes leading to full registration with the HEQC and SAQA. This was previously discussed in Chapter Two, but is restated here to clarify the processes for accreditation of the proposed diabetes education programme.

First, the application for the programme will be approved by the Faculty Board and Executive in which the Department offering the programme resides. Thereafter the application must be approved by the University's Council and/or Senate and signed by the Vice-Chancellor or designate and then submitted to the DoE on the prescribed form. The documentation to be submitted to the Department describes the qualification type, full title of the qualification, as well as the abbreviated title if necessary. The majors or fields of study by second order CESM categories should be stated, together with course level of majors in the final year of study.

Provision is made on the form to state delivery mode such as full-time or part-time as well as to state the delivery sites for the offering of the programme. The minimum total duration time and minimum experiential time must also be included, together with clearly stated exit points. Last, projected

enrolment numbers would be an important substantiating criterion to be included as well as the numbers of learners in undergraduate programmes feeding into the programme. Letters of support of the programme from stakeholders and industry together with a letter of regional clearance, such as the Cape Higher education Consortium (CHEC) would complete the application.

Institutions are allowed to submit applications twice a year, usually in March and in June and thereafter the DoE will analyse and evaluate applications. The decisions of the DoE in this regard will be conveyed to institutions no later than one month after receipt of the application. In the event of this application being approved, the DoE will communicate such outcomes to the HEQC and SAQA.

If the DoE decides that all or part of an institution's application is acceptable, then that institution must submit an application for accreditation to the HEQC and at the same time apply to SAQA for the registration of the new qualification on the NQF. This will be done online in an "html" format. This form replaces the previous FORM 2 or trial templates that were issued before. The necessary information will be entered into this file and it will then undergo the necessary institutional processes before being uploaded onto the HEQC website. The university administrator will be responsible for uploading institutional policies and documents as a permanent repository of information. In addition, faculty-specific information and policies have to be included in the particular application. Only those programmes which are accredited and registered by the HEQC, will be submitted to the Minister of Education for formal approval.

The information contained in the submission relates to the Criteria for Programme Accreditation as required by the CHE's HEQC (RSA HEQC 2004:6-7). These criteria for the programme will be discussed in terms of the results of the research and the Delphi study.

Criterion 1 - Programme design:

The proposed diabetes education programme will meet this criterion through its alignment with the institution's mission and goals as consensus. A decision was reached by the Delphi panel on this aspect being useful to the programme. This criterion is also satisfied by this programme having been developed in line with the national requirements and regulations for programme approval. Furthermore, the learning outcomes comprising the programme were developed by the expert Delphi panel in line with the needs of its targeted student intake. The competencies expected of students who successfully complete the programme are clearly documented in the proposed programme (cf. Appendix Y).

The design of the programme offers students learning and career pathways within the health professions/nursing fields and the course was designed to articulate in a flexible way with a variety of health-related programmes and disciplines. It is also possible that this articulation of the programme may occur within and across institutions and between various post-graduate courses. The requirements of professional bodies were taken into account through expert representation on the Delphi panel by members currently appointed to professional boards and bodies together with academic peers from a variety of higher education institutions who also served on the panel. Stakeholders from all the related health fields were represented on the panel.

The requirements of professional and vocational education are catered for in the design of the programme whereby the programme promotes an understanding of the specific occupation for which learners are being trained, namely nursing, public health, and community eye care. The Delphi panel has defined the techniques and skills that the learners are expected to master for the work expected of them in their occupations and the results of the Delphi and the health care workers' questionnaires support the need for work-based service learning and placement in a work-based environment to form a critical aspect of the curriculum.

Criterion 2 - Student recruitment, admission and selection:

In order to satisfy this criterion, the marketing and advertising for the diabetes education programme will have to be done in accordance with the DoE and CHE regulations and accurate information about the NQF level and accreditation status of the programme will have to be provided. This will mean that the programme will be advertised at the level of post-graduate diploma, NQF level 8, and in the candidacy phase of accreditation with the HEQC.

The Delphi panel considered it essential that the admission requirements and learning assumed to be in place are clearly documented for the programme. These will be stated in terms of previous studies undertaken in appropriate health-related disciplines. A National Diploma or a Bachelor's degree will form the expected minimum requirement for admission to the programme but these admission criteria must be viewed in line with the goal of widening access to higher education without compromising standards. To achieve this, provision was made for flexible entry routes in order that the admission

requirements are not exclusionary and that this process is facilitated through the policy for RPL.

In line with the HEQC's criterion, in the case of a professional/vocational programme such as this, the quality and number of students admitted to the programme take into account the needs of the particular profession, but at the same time aim to facilitate access in terms of equity and redress. The number of learners will, however, need to be balanced against the learning outcomes and the mode of delivery. It is expected that, in order to meet these requirements, the learner intake should not exceed 40 students for a particular site of delivery.

Criteria - 3 and 4 Staffing:

The HEQC criteria for staffing (RSA HEQC 2004:14) specify that academic staff for post-graduate programmes should have relevant academic qualifications at least on the same level as the exit level of the programme. The research considered this aspect by means of the Delphi panel and consensus was achieved that teaching personnel should have appropriate educational qualifications and experience in order to instruct at the higher education level. It was considered useful and therefore proposed that lecturers should hold a post-graduate qualification in the appropriate field (at least a Master's degree, but preferably a Doctorate) as well as a formal qualification in higher education. Consensus was reached on the usefulness for such educators to have had a minimum of five years of experience lecturing in higher education and to be registered with the appropriate Health Professions Board or Council.

These minimum requirements derived by the Delphi panel will also satisfy the HEQC's requirements for academic staff to be competent to apply the assessment policies of the institution offering the diabetes education programme. It will also be expected that academic staff members involved with the programme have research experience, particularly in terms of the specialised areas of the programme including public health, ophthalmology, community eye care, diabetic retinopathy, and optometry.

In order to satisfy the rest of the HEQC's criteria for staffing, the institution offering the diabetes education programme will have to ensure that the staff to learner ratio or FTE is suitable for the nature and field of the programme and number of enrolled learners. Since it is proposed that the diabetes programme will reside in a department offering undergraduate programmes in the health field, it is expected that the administrative, technical and academic support staff in that department will be competent to handle the duties associated with the implementation of the new programme. The appointment of additional staff may be necessary for both lecturing and administrative tasks, but the experience of the staff already involved with the undergraduate learning programme should ease this aspect and offer support to newly appointed staff members.

Criterion 5 - Teaching and learning strategy:

The teaching and learning strategy for the diabetes education programme was considered in detail by the Delphi panel. This was discussed in depth in section 6.6.6 of this chapter which deals with the educational methodologies of the programme and the importance of promoting student learning. The panel considered it essential that the learning in the programme should take

place through a learner-centred approach rather than a lecturer-centred approach.

In order to achieve this shift in emphasis, the institution offering the programme will need to ensure that a teaching and learning strategy, over and above that for the programme, is in place at the institution to provide for staff development in terms of qualifications and innovative teaching methodologies. This will be necessary in order to deal with issues defined by the Delphi panel, such as the need for flexible modes of delivery and diverse learner composition that are considered likely consequences of the implementation of the programme.

Criterion 6 - Student assessment policies and procedures:

The various aspects relating to student assessment were considered by the Delphi panel (cf. Appendix Y, sections 5 a-l and 22 a-e) with consensus being reached on the mechanisms and methodologies for assessment. A full discussion on this aspect was provided in section 6.6.6 of this chapter. In terms of the criterion for the HEQC, the proposed programme will have appropriate policies and procedures in all modes of delivery for internal and external assessment of student learning. This would include ensuring the validity and reliability of assessment practices and the appointment of moderators according to clear criteria and procedures.

Assessors will be expected to have received formal training in terms of the SAQA requirements for assessors and moderation of learner assessments will take place in accordance with higher education principles and the respective institutional policies. The institution offering the programme will also be expected to provide a secure assessment system for tests and examinations

as well as a secure and reliable system for the recording and data storage for the assessment results.

Criterion 7 - Infrastructure and library resources:

Suitable and sufficient venues for the offering of the programme must be available at all official sites of learning. This would include laboratories and clinics to enable practical and clinical demonstrations to take place. Although most learners will be expected to be employed in clinics, community health centres or hospitals, all the required practical/clinical equipment must also be available at the institution offering the diabetes programme. It would be expected that departments offering medicine, nursing or optometry would by their nature be expected to have the minimum necessary clinical infrastructure and equipment for the provision of the programme.

Although not specific to this education programme, the institution offering the programme will be expected to provide for the necessary infrastructure and library resources to facilitate efficient and effective access to information. The responsibility of the Department offering the diabetes education programme will, however, be to ensure that the necessary books, journals, media and other resources necessary for student learning for the diabetes programme are available to the learners. The use of information technology such as through the use of the internet and online journals should also be offered as an additional resource that will encourage learners to pursue independent study to support their studies.

Criterion 8 - Programme administrative services:

The HEQC (RSA HEQC 2004:13) requires that “the programme has effective administrative services for providing information, managing the programme

information system, dealing with a diverse student population, and ensuring the integrity of processes leading to certification of the qualification obtained through the programme." This criterion is generic to all programme offerings and it is not necessary to provide for a detailed discussion of this aspect, as it relates to the proposed diabetes programme. It is expected, however, that the institution offering the proposed diabetes education programme will ensure that the necessary institutional programme administrative services support the diabetes programme and that the necessary additional support is budgeted for and implemented as the programme expands and develops.

Criterion 9 - Post-graduate policies, procedures and regulations:

As it is proposed that the diabetes education programme will be offered as a post-graduate diploma level programme, it will therefore have to satisfy the HEQC's criterion for such a level (RSA HEQC 2004:14). This would require that the necessary policies, procedures and regulations pertaining to the selection and admission of learners are adhered to, including the policies and criteria for the appointment of lecturers and supervisors. The Delphi panel considered the aspect of research in the proposed diabetes education programme with the majority of the panel concluding that an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice (cf. Appendix Y, section 17h).

The Delphi panel, however, deemed that research methodology and individual research dissertations need not form a critical aspect of the learning process, but that it would be useful to include individual research projects and assignments at the appropriate post-graduate level in order to develop the learners in the field of research and independent/critical thinking. This would contribute to the learner outcome on using research to plan,

implement and evaluate concepts and strategies leading to improvements in patient care as well as to integrate diabetic theory, research and clinical practice.

Once more, the policies referring to the admission to post-graduate study must address the issues of access, equity and the pursuit of lifelong learning. The policies of admission as discussed under criterion two referring to student recruitment and selection will apply equally under this criterion and the policy of RPL would be expected to apply for the purposes of assessing undergraduate qualifications for entry to the proposed post-graduate diabetes education programme.

6.9 CHALLENGES REGARDING THE DELIVERY OF THE DIABETES EDUCATION PROGRAMME

It is expected that there would be some challenges regarding the delivery of the diabetes education programme. Although not major challenges, they should, however, be discussed now to ensure that a full account of all the issues surrounding the development of the programme has been provided.

6.9.1 Legislation and scope of practice of health care workers' professions

The Delphi study considered the legislation and scope pertaining to the health care workers' professions (cf. Appendix Y, sections 11a-l). Consensus was reached by the panel on this aspect when considering that the relevant legislative aspects pertaining to health care workers must form an integral part of the diabetes education programme.

It would be important for health care workers undertaking the education programme to be aware of the scope of practice of nurses, doctors and

optometrists and to be aware of the acts and procedures that fall within the scope of these professions. Furthermore, the health care workers should be aware of the legislation pertaining to the acts and procedures performed during the screening, management and treatment of diabetic patients in order to ensure that they do not infringe upon the defined scope of other health care professions. The conduct of an eye test for the purposes of providing a visual correction to the diabetic patient would be an example of such an infringement of scope.

The very nature of the diabetes education programme requires that health care workers completing the programme will be equipped with certain skills, knowledge and competencies that would enable them to perform certain professional acts for the purposes of screening and managing diabetes and its ocular complications. Currently the performance of visual screening falls within the scope of practice of optometry and dispensing opticianry, while the performance of eye examinations falls within the scope of optometry. Therefore, under current legislation, the performance of these two acts, namely diabetic eye screening and ocular examination might render the health care worker liable for prosecution in terms of infringement of the scope of practice of optometry.

There is, however, a strong lobby on the part of the Professional Board for Optometry and Dispensing Opticians to create a health care worker cadre, possibly in the form of a "community eye care worker" and that this health care worker would be permitted to perform certain acts or procedures falling within the scope of optometry and dispensing opticianry within the context of providing eye care in the public health sector.

The Delphi panel consisted of members of the Professional Board for Optometry and Dispensing Opticians and the panel reached full consensus on the need for such a health care worker to be trained for the public health sector to deal with screening, management, as well as treatment/referral of diabetic patients in terms of their ocular complications. With the demonstrable support of the Professional Board, it is expected that this education programme will be supported and authorised by them and that any required changes to the current scope of practice will be reviewed to accommodate any aspects relating to the provision of eye care in the public health sector.

The time taken to implement these changes by the Professional Board may be considered to be an indirect challenge to the proposed diabetes education programme. However, there appears to be an urgency and a commitment of the Professional Board towards providing eye care to the public health sector and it is expected that this commitment will drive the process so that all initiatives developed for the public health sector, such as this diabetes education programme, will be supported and implemented.

6.9.2 Policies of the South African Department of Health

The Delphi panel had representation from the South African DoH and the panel as a whole had to consider the programme in the context of the policies of the Department as well as other policies relating to health and eye care.

It was considered essential by the panel (cf. Appendix Y, sections 12 a-f) that various policies relating to health care and eye care form part of the diabetes education programme. Specifically, the DoH's Policy for the *National Programme Control and Management of Type 2 Diabetes*, the *National*

Guidelines for the Prevention of Blindness in South Africa, the *Strategic Priorities for the National Health System 2004-2009*, and the *Primary Health Care Package for South Africa: A Set of Norms and Standards* should be included in the programme.

The challenge for the diabetes education is to consider how the health care worker may be trained to screen, manage and treat diabetic patients at risk of developing ocular complications, within the public health system and within the confines and context of the policies of the South African DoH. There are a number of strategic priorities for the National Health System and these must all be taken into account when developing any new initiative to serve the public health system. Moreover, any programme or initiative must fit within the strategic priorities of the DoH and the National Health System.

The specific strategic priorities that the proposed diabetes education programme will aim to serve and fulfil would include the following (RSA DoH 2004:13-14):

- Strategy 2: To promote healthy lifestyles.
- Strategy 3: To contribute towards human dignity by improving quality of care.
- Strategy 4: To improve management of communicable and non-communicable diseases.
- Strategy 5: To strengthen primary health care, emergency medical services (EMS) and hospital service delivery systems.

It can be seen when considering the policies and priorities of the South African DoH that all primary health care operations function within the

confines of the National Health System and are therefore subject to a number of budgetary and human resources constraints. The education and training of health care workers for the purposes of performing additional services in the form of the screening, management and treatment/referral of diabetic patients will place an additional burden on the already overworked health care workers. This may be considered a significant challenge for the programme in terms of the health care workers' function within the public health care system.

That there is support from the DoH for the education and training of health care workers for this important task of diabetes management is without question; the challenge will be as to how the health care workers will be able to perform the additional tasks if there is not the necessary provision of additional staffing and budget in the system. However, the training of health care workers for the public health system, specifically, is highly desirable as in the South African context, there appears to be a shift towards provision of world class health care in private hospital facilities and a neglect of the health professions serving the less privileged in the public health sector. This was an important finding of the Delphi panel and may be summarised in a quote from one of the panel members as follows:

"Health Professionals need to be educated/trained to be innovative so as to spread resources without compromising quality services to meet the needs of the people, in particular, the 80% of the population that relies on the public sector. One cannot turn a "blind eye" on the masses" (Delphi panellist: 2005).

6.9.3 Perceived benefits to health care workers

According to the Delphi panel (cf. Appendix Y, sections 39 a-f) there will be a number of benefits of the diabetes education programme to health care workers. These were already discussed in this chapter under section 6.2.2. It should be noted, however, that although there is no doubt that the education programme will benefit the health care workers in terms of skills and competencies, it may not necessarily result in increased remuneration or chances of promotion.

According to a representative from the DoH who served on the Delphi panel, increased remuneration was not necessarily an automatic result of having completed the proposed diabetes education programme, but this could potentially happen in the future. Only certain qualifications obtained by staff employed by the DoH attracted greater remuneration and it would need to be seen whether this qualification would form a part of this package of qualifications.

A similar situation would also apply to the chances for promotion or advancement in the employment of the health care worker. Again, the successful completion of this diabetes education programme would not automatically qualify the employee for promotion in the National Health System. However, the increased scope and skills obtained through having completed the programme, as well as the additional roles and responsibilities commensurate with these specialised skills, would certainly justify the promotion of such employees where career paths allow for such.

6.10 RECOMMENDATIONS MADE WITH REGARD TO THE EDUCATION PROGRAMME

Having discussed in detail the various aspects pertaining to the development of the diabetes education programme together with the statutory requirements for the registration and accreditation of the programme, it is recommended that the process continue with regard to the implementation and delivery of the programme. Aside from the procedures and processes required for programme approval, a number of recommendations will be made to ensure the successful presentation of the programme.

First, the required application and documentation must proceed through to the DoE through the stipulated processes for the university wishing to offer the programme. Should the DoE approve the programme, the necessary documentation must be lodged with the HEQC and SAQA for approval.

Second, it is recommended that the proposed diabetes education programme serve before the Professional Board for Optometry and Dispensing Opticians for consideration in terms of the scope of practice issues of the health care workers. A request should be made to the Board to facilitate the process whereby health care workers from the public health sector, having successfully completed the diabetes education programme, will be empowered and authorised to provide screening and ocular health exams for the purposes of managing and treating/referring diabetic patients at risk of developing ocular complications of the disease.

Third, it is recommended that the diabetes education programme be submitted to the DoH for consideration in terms of the skills and competencies that their nurses and health care workers will be able to

perform with diabetic patients in the public health sector. A specific request should be made to the Department to recognise the post-graduate education programme for the purposes of greater remuneration and career advancement. Furthermore, it is recommended that these additional competencies, in terms of the scope of practice, be approved by the DoH for the health care workers treating diabetic patients.

Fourth, it is recommended that the results of this research and information regarding the diabetes programme itself be forwarded to interested organisations dealing with diabetic patients. These would include, the South African National Council for the Blind, the South African Diabetes Association, Diabetes South Africa, the South African Optometric Association as well as any other organisations involved with the treatment, management and/or education of diabetic patients.

Finally it is recommended that various aspects of the programme be offered as possible short courses or modules to informal groups or volunteers who deal with diabetic patients. It is imperative that diabetic patients receive comprehensive education and advice about their disease, especially in terms of its ocular complications. The further training of additional volunteers or persons not having formal health professions qualifications, but nonetheless working with diabetic patients, is strongly recommended. These persons should be offered the opportunity to attend modules or short courses derived from the post-graduate diabetes education programme so as to be able to better educate and support diabetic patients with whom they may be involved.

6.11 CONCLUSION

This chapter dealt with the development of a post-graduate education and training programme for health care workers for the prevention and management of the ocular complications in diabetic patients. The premises for the development of the programme were discussed together with the points of departure and the needs to be addressed by such a programme. The development of the curriculum was described, with particular attention to the processes and procedures for programme approval and accreditation in the higher education sector of South Africa. The programme outcomes were presented in detail together with a discussion on the academic and administrative aspects pertaining to the programme and its delivery. The final product of the research, its delivery and the various expected challenges with regard to this aspect were described.

In the following chapter, Chapter Seven, the Conclusions and Recommendations for the study will be presented.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

This research was undertaken in order to determine the levels of education and training of health care workers in the area of diabetes and its ocular complications. Thereafter a diabetes education programme for the prevention and management of the ocular complications in diabetic patients was developed. This chapter will summarise the key findings of the study and draw conclusions on the results of the research. The limitations of the study will be addressed together with recommendations with regard to the work completed. The chapter will be completed with a conclusive remark.

7.2 CONCLUSION

At the commencement of the research, a statement of the problem was compiled together with key questions or objectives of the research. The research aimed to determine the following:

- The levels of education and training of health care workers, specifically for the management of diabetic patients.
- The knowledge, skills and education that health care workers have pertaining to the lifestyle risk factors that may contribute to diabetic eye complications.
- The knowledge and education that the diabetic patients have with regard to diabetes and the lifestyle risk factors that may contribute to diabetic eye complications.

- The educational interventions required for the health care workers and the diabetic patients in order to best manage and prevent sight-threatening complications in those patients.

The researcher wishes to provide the following conclusions:

- The researcher is of the opinion that the overall goal, aim and objectives of the study were addressed (cf. Chapter 1, section 1.3).
- That the knowledge and education that the diabetic patients in the community health centres and clinics have with regard to diabetes and its ocular complications are inadequate (cf. Chapter 5, section 5.3). This is based on the careful analysis of the responses from the diabetic patients and the remarks of the health care workers treating and managing these patients. Furthermore, their knowledge and education of the lifestyle risk factors that may contribute to diabetic eye disease should also receive attention.
- That the levels of education and training of health care workers for the management of diabetic patients are insufficient and could be enhanced and expanded in order to better deal with diabetic patients in community health centres and clinics (cf. Chapter 5, section 5.4). Specifically, the education and training for the screening, management, detection and referral of diabetic patients for the ocular complications of diabetes should receive attention.
- The researcher furthermore concludes that there is a definite need for educational interventions for both the health care workers and the diabetic patients in order to best manage and prevent sight-threatening complications in diabetic patients (cf. Chapter 5, section 5.4.3). If the health care workers received appropriate education and training, they could provide additional services over and above their medical training.

These services could include the basic examination of the eyes and the screening and referral where necessary in order to treat and manage diabetic eye disease at an early stage. This would also mean that the prevalence of diabetic blindness could be reduced in the future.

- It can be concluded that this study will make a direct contribution to the education and training of health care workers. The methods by which this will be achieved are included in the diabetes education programme derived from the Delphi study (cf. Chapter 5, section 5.5 and Chapter 6). The clinical outcomes for the education programme were articulated together with the administrative aspects pertaining to the implementation and management of the programme. The researcher concludes that the proposed education programme is highly-needed, it is viable, and it will make a substantial contribution to the training of health care workers in South Africa.
- It is evident from the study that this research could make a significant contribution to health care and eye care in South Africa (cf. Chapter 6 section 6.2.2). No formal studies have been undertaken to determine the knowledge and education of diabetic patient patients about their disease and especially in terms of its ocular manifestations. Likewise, no studies have been undertaken to determine the knowledge of health care workers specifically for the ocular complications of diabetes. The study is new in that the researcher can conclude that the scope of the health care worker may be significantly enhanced and expanded through the successful completion of the education programme, and that their role and function in the health care system will be groundbreaking for South Africa and help to reduce the prevalence of preventable diabetic blindness.
- It can also be concluded that there is clear potential for successful implementation and delivery of the proposed diabetes education

programme cf. Chapter 6, section 6.8). Indicators for success include the comprehensive curriculum development process undertaken for this research, which included a wide range of stakeholders and experts in the subject field; the fact that various needs will be addressed through the programme; the fact that the programme will make a significant contribution to health education in South Africa; as well as the fact that there are likely to be large numbers of potential learners interested in undertaking study in this field.

- This study could lay the foundation and serve as reference for further scientific research once the programme has been implemented. Future research could then be undertaken in order to determine the empirical benefits of the programme to the health care workers; the diabetic patients; the community health clinics in the Western Cape Province; as well as to the public health sector as a whole.

7.3 LIMITATIONS OF THE STUDY

The researcher recognises the following limitations of the study:

- The knowledge and education of the diabetic patients were based on 98 patients selected from the community health centres and clinics of the Western Cape region of South Africa. Although this might not provide for a complete analysis of the knowledge and education of the diabetic patients across South Africa as a whole, it nonetheless provides for a broad overview of the various areas of knowledge and education that need to be addressed in terms of diabetes and its ocular complications.
- The fact that the knowledge, education and training of the health care workers were based on the results from 52 of these workers might be construed as a limitation in this respect. However, the questionnaire was

constructed in such a way as to obtain a general overview of the knowledge and forms of education that such health care workers had received and that this could be applied to most health care workers, as this sample was representative of most health care workers based at community health care centres and clinics.

- The current limitations in the scope of practice of the health care nurses may also be considered to be a limitation to the study. Through the research process, the researcher and the Delphi panel had to be aware that the outcome of the research would most likely result in legislative changes for health care workers in terms of the acts and procedures that are proposed. It is a widely held philosophy by the researcher and many members of the Delphi panel that we should “educate before legislate” and therefore this aspect may only be regarded as a minor limitation of the study in that once the educational process has commenced, the justification for the education and training of these health care workers will result in the required legislative/scope of practice changes.

7.4 RECOMMENDATIONS

The following recommendations are made:

- That the educational needs of the diabetic patients and the health care workers will receive further attention through the mechanisms and interventions proposed in this research.
- That the information and findings of the study will be used to finalise and implement a post-graduate education programme for the prevention and management of the ocular complications in diabetic patients. Furthermore, that this programme will be submitted by the university wishing to offer the programme, to the DoE and thereafter to the CHE/HEQC and SAQA for approval.

- That the findings and recommendations of this study will be successfully implemented and that health care workers be encouraged to undertake further study in this area in order to enhance their knowledge, skills, education, and scope of practice when treating and managing diabetic patients.
- That the DoH supports this initiative and facilitates the necessary mechanisms for its employees to undertake study in this area and furthermore provides incentives and benefits to such employees successfully completing the post-graduate education programme.
- That the proposed programme be implemented, as a pilot programme initially, and that, further research be conducted in order to validate the training programme.

7.5 CONCLUSIVE REMARK

The researcher wishes to emphasise that bold steps must be taken and clear leadership must be shown when addressing the public health and eye care issues in South Africa. There is clear potential for great success to be achieved in the provision of “eye care for all”, but only if the necessary support and will is demonstrated. Education must therefore play a key role in all aspects pertaining to eye care; first for the diabetic patients, second for the health care workers and, finally, for the institution itself offering the diabetes education programme. Only when all three of these aspects are addressed will we be able to reduce the incidence of preventable diabetic blindness in South Africa.

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PERSONAL COMMUNICATIONS

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Hartley, R. Sr. 2004. Status of Diabetic Patients attending Community Health Care Centres and Clinics in the Helderberg Region of the Western Cape. Interviewed by P. Clarke-Farr in Cape Town, South Africa, on 23 June.

APPENDICES

LETTER OF REQUEST TO HEALTHCARE WORKERS

Dear Colleague

I would like to take this opportunity to invite you to participate in an important research activity involving diabetes education.

The aim of this project will be to develop an educational programme that will enable healthcare workers to effectively detect, manage and to refer those diabetic patients at risk of developing sight-threatening ocular complications. An important additional feature of the study will be to propose a model or programme for the education of diabetic patients in community health clinics.

In order for us to develop such a programme, we would be grateful if you would give the following questions your serious attention. This should not take more than a few minutes of your time and it is important that you write down the answer that you feel is right for you. Your responses will be kept strictly confidential and any information provided will be used only for this research initiative.

Thank you for your co-operation in this important task,

Yours sincerely



Peter Clarke-Farr

Researcher

Dept. Ophthalmic and Wellness Sciences

Cape Peninsula University of Technology

FORM OF CONSENT FOR HEALTH CARE WORKER**Consent**

I, the undersigned, hereby agree and give consent to my participation in this study and give permission for my details and results to be used for the statistical analysis in this study. I understand that no personal information will be divulged as part of this study and that my personal details will be kept confidential.

Signature _____

Date _____

Toestemming

Ek, die ondergetekende, verleen hiermee toestemming aan die studieleiers om my gegewens en resultate te gebruik vir die statistiese analiese verbonde aan hierdie studie. Ek verstaan verder dat geen inligting van 'n persoonlike aard uitgegee sal word nie en dat my persoonlike gegewens vertroulik gehou sal word.

Handtekenig _____

Datum _____

LETTER OF REQUEST FOR DIABETIC PATIENTS

Dear Sister

DIABETIC PATIENT EDUCATION QUESTIONNAIRE

I would like to request permission to conduct a research questionnaire with the diabetic patients attending your clinic. I have already obtained permission from Dr. Joey Cupido, Chief Director: District Health Services, PAWC for such research. (See copy of letter attached).

The aim of this project will be to develop an educational programme that will enable healthcare workers to effectively detect, manage and to refer those diabetic patients at risk of developing sight-threatening ocular complications. An important additional feature of the study will be to propose a model or programme for the education of diabetic patients in community health clinics.

In order for us to develop such a programme, we would be grateful if you would give the following questionnaires to your diabetic patients. The questionnaire should not take more than a few minutes of their time and it is important that they write down the answer that they feel is right for them. Their responses will be kept strictly confidential and any information provided will be used only for this research initiative.

Thank you for your co-operation in this important task,

Yours sincerely



Peter Clarke-Farr (Researcher)
Dept. Ophthalmic and Wellness Sciences
Cape Peninsula University of Technology

FORM OF CONSENT FOR DIABETIC PATIENTS**Consent**

I, the undersigned, hereby agree and give consent to my participation in this study and give permission for my details and results to be used for the statistical analysis in this study. I understand that no personal information will be divulged as part of this study and that my personal details will be kept confidential.

Signature _____

Date _____

Toestemming

Ek, die ondergetekende, verleen hiermee toestemming aan die studieleiers om my gegewens en resultate te gebruik vir die statistiese analiese verbonde aan hierdie studie. Ek verstaan verder dat geen inligting van 'n persoonlike aard uitgegee sal word nie en dat my persoonlike gegewens vertroulik gehou sal word.

Handtekening _____

Datum _____

LETTER OF PERMISSION TO CONDUCT RESEARCH
WITH DIABETIC PATIENTS

P Clarke-Farr

From: Joey Cupido [jcupido@pgwc.gov.za]
Sent: 13 January 2004 11:48
To: pclarke@ctech.ac.za
Cc: Fareed Abdullah; Lawrence Bitalo
Subject: RE: Research proposal: Screening for ocular problems in diabetics in W/Cape

Dear Peter,
The research proposal is supported and approved by the department ,
subject to:
(a) proof of support and ethical clearance by relevant university;
(b) compliance by the research team with the assurances provided by you
in your e-mail correspondence.
We wish you success and "better vision" for our patients afflicted by
the ocular problems you will manage.
Yours,
Joey

Dr Joey Cupido
Chief Director: District Health Services
Department of Health
Provincial Administration Western Cape
T C Newman CHC
Private Bag X 3012
PAARL
7620
tel: 27-21-872 1711 x 2369
fax:27-21-862 1048
e-mail: jcupido@pawc.wcape.gov.za

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binding contract on behalf of the PGWC unless he/she
is an Accounting Officer of the PGWC, or his or her
authorised representative.

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named recipient only, except where the sender specifically
states otherwise. If you are not the intended recipient you
may not copy or deliver this message to anyone.

DIABETIC PATIENT RECORD CARD AND EDUCATION QUESTIONNAIRE (ENGLISH)	
1. Name of Clinic	
2. Title	
3. Surname	
4. First Name	
5. Middle Initial	
6. Date of Birth	
7. I.D. Number	
8. Gender	
9. Population Group	
10. Language Preference	
11. Residential Address	
12. Postal Code	
13. Phone Number	
14. Fax Number	
15. Occupation	
16. What is your highest education level	
17. Tick (✓) your total household income per month:	
<R2000 <input type="checkbox"/>	
R2000 - R5000 <input type="checkbox"/>	
R5000 - R10000 <input type="checkbox"/>	
>R10 000 <input type="checkbox"/>	
18. Do you wear glasses? YES <input type="checkbox"/> NO <input type="checkbox"/>	
19. How long have you worn glasses?	
20. Date of last eye exam?	
21. List any previous eye injuries, diseases or operations	
22. What are your main eye problems at present?	
23. List all health problems that you may have such as high blood pressure, heart disease, diabetes, kidney problems, cholesterol, TB etc	
24. List all medications that you are currently taking	
25. List any EYE PROBLEMS or EYE DISEASES that your parents or close family may have	
26. List any GENERAL HEALTH problems or diseases that your parents or close family may have	

27. List any allergies that you may have?
28. Do you exercise regularly? YES <input type="checkbox"/> NO <input type="checkbox"/>
29. If YES, How often do you exercise per week?
30. What type of exercise do you do?
31. Rate your intensity of exercise, or
<input type="checkbox"/> Light
<input type="checkbox"/> Moderate
<input type="checkbox"/> Heavy
32. Do you have hypertension (High Blood Pressure)? YES <input type="checkbox"/> NO <input type="checkbox"/>
33. Age of diagnosis of Hypertension
34. Duration of Hypertension (Years)
35. Is the hypertension well controlled? YES <input type="checkbox"/> NO <input type="checkbox"/>
36. How is the hypertension controlled? (Tick all that apply)
<input type="checkbox"/> Medication
<input type="checkbox"/> Diet
<input type="checkbox"/> Exercise
37. Is there a family history of Hypertension (high blood pressure) YES <input type="checkbox"/> NO <input type="checkbox"/>
38. List the members of your family, including parents, who have high blood pressure
39. Do you suffer from Diabetes? YES <input type="checkbox"/> NO <input type="checkbox"/>
40. If yes, state whether: or Type 2
<input type="checkbox"/> Type 1 Insulin Dependant (Injection)
<input type="checkbox"/> Type 2 Non-Insulin Dependant (Tablets)
41. When was your diabetes diagnosed? State the year and month if possible.
42. Is there a family history of Diabetes? YES <input type="checkbox"/> NO <input type="checkbox"/>
43. List the members of your family, including parents, who have diabetes
44. State which type of diabetes your family has?
<input type="checkbox"/> Type 1 Insulin Dependant (Injection)
<input type="checkbox"/> Type 2 Non-Insulin Dependant (Tablets)
<input type="checkbox"/> Don't know
45. Is your diabetes under good control? YES <input type="checkbox"/> NO <input type="checkbox"/>
46. What is your current sugar level?
47. How is your diabetes treated? (Tick all that apply)
<input type="checkbox"/> Insulin Injection
<input type="checkbox"/> Tablets
<input type="checkbox"/> Diet

48. Do you find that your vision changes during the day and from day to day? YES <input type="checkbox"/> NO <input type="checkbox"/>
49. Do you suffer from kidney disease? YES <input type="checkbox"/> NO <input type="checkbox"/>
50. If yes, then what is the duration of your kidney disease? (Years)
51. Are you pregnant? YES <input type="checkbox"/> NO <input type="checkbox"/>
52. If yes, then state the number of weeks pregnant
53. Do you smoke? YES <input type="checkbox"/> NO <input type="checkbox"/>
54. If you smoke, how many cigarettes do you smoke per day?
55. Do you take aspirin tablets (disprin) on a regular basis? YES <input type="checkbox"/> NO <input type="checkbox"/>
56. On average how many aspirin tablets do you take per week?
57. Weight (Kg)
58. Height (cm)
59. Waist Circumference (cm)
60. Mid Upper Arm Circumference (cm)
61. Body Mass Index (Weight (Kg) / Height ² (m))

DIABETIC PATIENT EDUCATION QUESTIONNAIRE		<i>For office use</i>										
Date	_____											
Patient Name	_____											
Date of Birth / Age	_____											
Occupation	_____											
		1	2	3								
SECTION 1: KNOWLEDGE OF DIABETES												
1.1	How many different types of diabetes do you know about?											
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="background-color: #cccccc;">One</td><td style="text-align: center;">1</td></tr> <tr><td style="background-color: #cccccc;">Two</td><td style="text-align: center;">2</td></tr> <tr><td style="background-color: #cccccc;">More than 2</td><td style="text-align: center;">3</td></tr> <tr><td style="background-color: #cccccc;">Don't know</td><td style="text-align: center;">4</td></tr> </table>	One	1	Two	2	More than 2	3	Don't know	4	4		
One	1											
Two	2											
More than 2	3											
Don't know	4											
1.2	Which type of diabetes do you have?											
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="background-color: #cccccc;">Insulin Type (Injection)</td><td style="text-align: center;">1</td></tr> <tr><td style="background-color: #cccccc;">Non insulin type (Tablets)</td><td style="text-align: center;">2</td></tr> <tr><td style="background-color: #cccccc;">Don't know</td><td style="text-align: center;">3</td></tr> </table>	Insulin Type (Injection)	1	Non insulin type (Tablets)	2	Don't know	3	5				
Insulin Type (Injection)	1											
Non insulin type (Tablets)	2											
Don't know	3											
1.3	Do you think that your diabetes is hereditary? (inherited from your parents)											
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="background-color: #cccccc;">Yes</td><td style="text-align: center;">1</td></tr> <tr><td style="background-color: #cccccc;">No</td><td style="text-align: center;">2</td></tr> <tr><td style="background-color: #cccccc;">Don't know</td><td style="text-align: center;">3</td></tr> </table>	Yes	1	No	2	Don't know	3	6				
Yes	1											
No	2											
Don't know	3											
1.4	Do you think that your waist size may be used To predict your risk of developing diabetes?											
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="background-color: #cccccc;">Yes</td><td style="text-align: center;">1</td></tr> <tr><td style="background-color: #cccccc;">No</td><td style="text-align: center;">2</td></tr> <tr><td style="background-color: #cccccc;">Don't know</td><td style="text-align: center;">3</td></tr> </table>	Yes	1	No	2	Don't know	3	7				
Yes	1											
No	2											
Don't know	3											

1.5 Do you feel that pregnancy may affect diabetes and its complications?

Yes	1
No	2
Don't know	3

8

1.6 For the following questions, please rate what you feel is the relative importance of each of the statements listed:

In order for me to reduce the problems that may arise from diabetes I feel that...	Not important	Slightly important	Important	Very important
...a healthy diet and lifestyle is...	1	2	3	4
...the age when I was diagnosed as a diabetic is...	1	2	3	4
...the duration of my diabetes is...	1	2	3	4
...having good control of my blood sugar level is...	1	2	3	4
...having my blood pressure checked and controlled is...	1	2	3	4
...not smoking is...	1	2	3	4

9

10

11

12

13

14

**SECTION 2:
KNOWLEDGE OF OCULAR COMPLICATIONS OF DIABETES**

2.1 The following questions refer to the effects that diabetes may have on your eyes. Please rate how you feel about each statement.

	Strongly disagree	Disagree	Agree	Strongly Agree	
Diabetes may affect the way I see when looking far or near	1	2	3	4	15
Diabetes may affect the way I see colours	1	2	3	4	16
Diabetes may cause my eyes to become squint	1	2	3	4	17
Diabetes may affect the way my eyes heals if they become injured	1	2	3	4	18
Diabetes may cause a cataract in my eyes making my vision cloudy	1	2	3	4	19
Diabetes may increase the pressure in my eyes and lead to glaucoma	1	2	3	4	20
Diabetes may cause bleeding and damage inside the back of my eyes?	1	2	3	4	21
Diabetes will not affect my eyes	1	2	3	4	22

**SECTION 3:
KNOWLEDGE OF MANAGEMENT AND TREATMENT OPTIONS**

In order to best control my diabetes, I feel that...	Not important	Slightly important	Important	Very important	
...following a healthy diet is...	1	2	3	4	23
... measuring my blood sugar is...	1	2	3	4	24
...regular exercise is...	1	2	3	4	25
... maintaining an ideal body weight is...	1	2	3	4	26
...taking my medication exactly as prescribed is...	1	2	3	4	27
... going for regular medical check ups at the clinic / doctor is...	1	2	3	4	28
...going to have my eyes tested is...	1	2	3	4	29

3.2 For each of the following statements, please state whether they apply to you

3.2.1 I follow a healthy diet specially designed for my diabetes

Yes	1
No	2

30

3.2.2 I measure my blood sugar on a daily basis

Yes	1
No	2

31

3.2.3 I exercise for at least half an hour at least 3 times a week

Yes	1
No	2

32

3.2.4	I feel that my body weight is about right for me to help control my diabetes	<table border="1"> <tr> <td>Yes</td> <td>1</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </table>	Yes	1	No	2	33		
Yes	1								
No	2								
3.2.5	I take my diabetes medication regularly and exactly as prescribed	<table border="1"> <tr> <td>Yes</td> <td>1</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </table>	Yes	1	No	2	34		
Yes	1								
No	2								
3.2.6	I go for medical check ups at the clinic or doctor about once a month	<table border="1"> <tr> <td>Yes</td> <td>1</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </table>	Yes	1	No	2	35		
Yes	1								
No	2								
3.2.7	I feel that controlling my diabetes may help to prevent eye complications and vision problems	<table border="1"> <tr> <td>Yes</td> <td>1</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </table>	Yes	1	No	2	36		
Yes	1								
No	2								
3.2.8	I have my eyes checked and tested every year	<table border="1"> <tr> <td>Yes</td> <td>1</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </table>	Yes	1	No	2	37		
Yes	1								
No	2								
<p>SECTION 4: ADDITIONAL INFORMATION</p>									
<p>Please indicate whether you feel the following statements are true or false</p>									
4.1	About 40% of people with diabetes have diabetic retinopathy (a common eye complication of diabetes).	<table border="1"> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </table>	True	1	False	2	Don't know	3	38
True	1								
False	2								
Don't know	3								
4.2	"if you can see right, there's nothing wrong with your eyes"	<table border="1"> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </table>	True	1	False	2	Don't know	3	39
True	1								
False	2								
Don't know	3								

4.3	Diabetic eye disease can develop even if diabetes is under control	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>4</td> </tr> </tbody> </table>	True	1	False	2	Don't know	4	40
True	1								
False	2								
Don't know	4								
4.4	People with diabetes should have annual comprehensive eye examinations with dilated pupils	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </tbody> </table>	True	1	False	2	Don't know	3	41
True	1								
False	2								
Don't know	3								
4.5	Diabetes affects everyone the same	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </tbody> </table>	True	1	False	2	Don't know	3	42
True	1								
False	2								
Don't know	3								
4.6	If detected early, diabetic eye disease may be well treated and vision preserved in most patients	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </tbody> </table>	True	1	False	2	Don't know	3	43
True	1								
False	2								
Don't know	3								
4.7	Eye examinations are needed only if there are symptoms present	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </tbody> </table>	True	1	False	2	Don't know	3	44
True	1								
False	2								
Don't know	3								
4.8	Controlling blood sugar levels eliminates the risk of visual loss	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </tbody> </table>	True	1	False	2	Don't know	3	45
True	1								
False	2								
Don't know	3								
4.9	Early diagnosis and prompt treatment can protect against vision loss	<table border="1"> <tbody> <tr> <td>True</td> <td>1</td> </tr> <tr> <td>False</td> <td>2</td> </tr> <tr> <td>Don't know</td> <td>3</td> </tr> </tbody> </table>	True	1	False	2	Don't know	3	46
True	1								
False	2								
Don't know	3								

THANK YOU FOR PARTICIPATING IN THIS IMPORTANT STUDY

DIABETIC PATIENT RECORD CARD AND EDUCATION QUESTIONNAIRE (XHOSA)	
1. Igama le Kliniki:	
2. Isini:	
3. Ifani:	
4. Igama:	
5. Igama lesibini:	
6. Umhla wokuzalwa:	
7. Inombolo yesazisi:	
8. Ubuni:	
9. Uhlanga:	
10. Ulwimi lakho:	
11. Idilesi yakho:	
:	
:	
12. Inombolo yePosi:	
13. Inombolo ye Foni:	
14. Inombolo ye Fax:	
15. Umsebenzi:	
16. Leliphi ibanga elikhulu owaliphumelelayo:	
17. Chaza umvuzo wakho owurholayo nge nyanga:	
<input type="checkbox"/> <R2000	
<input type="checkbox"/> R2000 - R5000	
<input type="checkbox"/> R5000 - R10000	
<input type="checkbox"/> >R10 000	
18. Uyazinxiba na lindondo?	
19. Uzinxibe ixesha elingakanani?	
20. Umhla wokugqiba woxilongo?	
21. Nika uludwe lwezifo noqhaqho olwenziwe kuwe emehlweni:	
22. Zeziphi ezona ngxaki unazo emehlweni	
23. Xela zonke ezinye izigulo onazo umzekelo, izifo ze ntliziyo, izintso, iswekile, i TB njalo njalo.	
24. Nika lonke unyango (amayeza) oluthathayo kwizigulo onazo	
25. Xela nasiphi na ISIGULO SAMEHLO okanye INGXAKI YAMEHLO ekhoyo kumntu wakowenu	
26. Nika nasiphi ISIGULO ESIQHELEKILEYO okanye isifo esikhoyo kumntu wakowenu	
27. Nika nayiphi na into engalungelaniyo nomzimba wakho (Allergies)	
28. Uyawolula umzimba wakho mihla le? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>	
29. Ukuba ewe, uwolula kangaphi ngeveki?	
30. Uwolula kanjani?	

31. Nika umxhelo wakho xa usolula umzimba
<input type="checkbox"/> mncinci
<input type="checkbox"/> ngokufanelekileyo
<input type="checkbox"/> mkhulu
32. Ingaba une High blood pressure EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
33. Iminyaka wazifumana une High blood pressure?
34. Ixesha wazifumana une High blood pressure (Unyaka)
35. I high blood yakho ikwiqondo elihle na? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
36. Uyikhusela njani I high blood yakho (xela ezingqamene nawe)
<input type="checkbox"/> Ngamayeza
<input type="checkbox"/> Ngokutya okunetswane
<input type="checkbox"/> Ngokolula umzimba
37. Ingaba ikhona intsusa yayo kwi Family yakho?
38. Nika uludwe lwabantu abane high blood, endlini ubandakanye nabazali
39. Ingaba ugula yi swekile? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
40. Ukuba ewe, chaza luhlobo loku 1 okanye lwe 2
<input type="checkbox"/> Uhlobo 1 Insulin Dependant (Inaliti)
<input type="checkbox"/> Uhlobo 2 Non Insulin Dependant (lipilisi)
41. Kwakunini wazifumanisa ukuba uneswekile? Nika inyanga nonyaka ukuba usakhumbula.
42. Ingaba ikhona imbali ngeswekile kwi Family yakho? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
43. Nika uludwe lwabantu kwi family yakho abaneswekile ubandakanye nabazali
44. Nika uhlobo lwe swekile abanayo
<input type="checkbox"/> Uhlobo 1 Insulin (Inaliti)
<input type="checkbox"/> Uhlobo 2 Non Insulin (lipilisi)
<input type="checkbox"/> Awazi
45. Ingaba iswekile yakho ikwiqondo elihle EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
46. Lithini iqondo lakho lweswekile ngoku?
47. Uyikhusela njani iswekile yakho ngoku? (xela ezingqamene nawe)
<input type="checkbox"/> Inaliti ye Insulin
<input type="checkbox"/> NgePilisi
<input type="checkbox"/> Ngokutya okunentswane
48. Ucinga ukuba uhlobo obona ngalo luya tshintsha mihla le EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
49. Ingaba ugula sisifo sezintso? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
50. Ukuba ewe, unexesha elingakanani? (Iminyaka)
51. Ingaba ukhulelwe? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
52. Ukuba ewe, chaza inani leeveki. Ukhulelwe

53. Ingaba uyatshaya EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
54. Ukuba uyatshaya, utshaya iisigareti ezingaphi ngemini?
55. Ingaba uyazithabatha iiPilisi ze aspirin (disprin) mihla le? EWE <input type="checkbox"/> HAYI <input type="checkbox"/>
56. Ngokunokuqikelela uthabatha iipilisi ze aspirin ezingaphi nge veiki
57. Ubunzima (kg)
58. Ubude (cm)
59. Ubungakanani besinqe (cm)
60. Ubungakanani bomzimba wangasentla? (cm)
61. Body Mass Index (Weight (kg)/ Height ² (m))

DIABETIC PATIENT EDUCATION QUESTIONNAIRE		<i>For office use</i>		
Umhla:	_____			
Igama lomguli:	_____			
Umhla wokuzalwa / Iminyaka:	_____			
Umsebenzi:	_____			
		1	2	3
SECTION 1: ULWAZI NGESWEKILE				
1.1	Zingaphi Intlobo ze Swekile ozaziyo?			
		Lunye	1	
		Zimbini	2	
		Ngaphezulu kwesibini	3	
		Awazinto	4	4
1.2	Loluphi uhlobo onalo wena?			
		Luhlobo lwe Insulin (Inaliti)	1	
		Ayilohlobo lwe Insulin (Ipilisi)	2	
		Awazinto	3	5
1.3	Ucinga ukuba iswekile onayo yimfuzo? (iza kubazali bakho)			
		Ewe	1	
		Hayi	2	6
1.4	Ucinga ukuba ukuba isinqa sakho singasetyenziswa njengokujonga amathuba okuba ufumane Iswekile?			
		Ewe	1	
		Hayi	2	7

1.5 Ucinga ukuba nzima (umitho) kungaphazamisana ne swekile?

Ewe	1
Hayi	2

8

1.6 Ngokunale mibuzo ilandelayo, nika impendulo ocinga ukuba ifanele umbuzo ngamnye kuleyo idwelisiweyo:

Ukuze mna ndikhusele ingxaki enothi ivele kwi Swekile ndicinga ukuba...	Akubalul ekanga	Kubaluleke nje kancici	Kubalule kile	Kubaluleke ka khulu
...ukutya okusempilweni nohlobo oziphethe ngalo...	1	2	3	4
...iminyaka ngosuku endazifumana ndineswekile ...	1	2	3	4
...ixesha ndazifumana ndineswekile ...	1	2	3	4
...ukugcina iqondo lwe blood sugar level ...	1	2	3	4
...ukuhlolwa nokunakekela I blood sugar level ...	1	2	3	4
...ukuyeka ukutshaya...	1	2	3	4

9

10

11

12

13

14

**SECTION 2:
ULWAZI NGEENGXAKI ZAMEHLO EZIBANGELWA YI-SWEKILE**

2.1 Le mibuzo ilandelayo ingqamene neegxaki ezithi zibangelwe yi swekile emehlweni. Xela ukuba ucinga ntoni ngombuzo ngamnye.

	Andivumi kwaphela	Andivumi	Ndiyavuma	Ndivuma ngamandla
Iswekile ingaphazamisana nohlobo endibona ngalo kude okanye kufutshane	1	2	3	4
Iswekile ingaphazamisana nohlobo endibona ngayo imibala	1	2	3	4
Iswekile ingakhokelela kubugxwemu (ithoba) beliso	1	2	3	4
Iswekile ingaphazamisana nonyango emveni komonzakalo kwiliso.	1	2	3	4
Iswekile ingabangela urhatyazo (cataract) lwenze ukubona kube nkungu	1	2	3	4
Iswekile ingakhokela kuxinezelelo phakathi kwi liso (Glaucoma)	1	2	3	4
Iswekile ingabangela ukopha nokumoshakala kanye ngaphakathi kwi liso?	1	2	3	4
Iswekile ayinakuphazamisana namehlo wam	1	2	3	4

15

16

17

18

19

20

21

22

**SECTION 3:
ULWAZI LOKUKHUSELA NEENDLELA ZOKUNYANGA**

Eyona ndlela ibalulekileyo ekukhuseleni iswekile ndicinga...	Akubalulekanga	Kubaluleke kancinci nje	Kubalulekile	Kubaluleke kakhulu	
...ukulandela ukutya okusempilweni ...	1	2	3	4	23
... ukuhlola I blood sugar yam...	1	2	3	4	24
...ukolula umzimba rhoqo ...	1	2	3	4	25
... ukugcina umzimba wam ukwiqondo elihle...	1	2	3	4	26
...ukulandela imiyalelo kagqirha ngokuthabatha amayeza ...	1	2	3	4	27
... uhlolo rhoqo e clinic/ kwa gqirha...	1	2	3	4	28
...uhlolo lwamehlo wam ...	1	2	3	4	29

3.2 Kwezizivakalisi zilandelayo, nceda uxele ingaba ziyangqamana na nawe

3.2.1 Ndilandela ukutya okusempilweni ingakumbi okwenzelwe iswekile endinayo

Ewe	1	
Hayi	2	30

3.2.2 Ndihlola I blood sugar level yam ntsukuzonke

Ewe	1	
Hayi	2	31

3.2.3	Ndolula umzimba kathathu ngeveki malunga nemizuzu engama 30 (30min)	<table border="1"> <tr> <td>Ewe</td> <td>1</td> </tr> <tr> <td>Hayi</td> <td>2</td> </tr> </table>	Ewe	1	Hayi	2	32
Ewe	1						
Hayi	2						
3.2.4	Ndicinga ukuba ubunzima bomzimba wam bulungile ekundincedeni ukunqanda iswekile endinayo	<table border="1"> <tr> <td>Ewe</td> <td>1</td> </tr> <tr> <td>Hayi</td> <td>2</td> </tr> </table>	Ewe	1	Hayi	2	33
Ewe	1						
Hayi	2						
3.2.5	Ndithatha amayeza wam weswekile rhoqo ngokwemilinganiselo endiyiyalelweyo	<table border="1"> <tr> <td>Ewe</td> <td>1</td> </tr> <tr> <td>Hayi</td> <td>2</td> </tr> </table>	Ewe	1	Hayi	2	34
Ewe	1						
Hayi	2						
3.2.6	Ndisoloko ndiyozihlola e kliniki okanye kwagqirha kanye enyangeni	<table border="1"> <tr> <td>Ewe</td> <td>1</td> </tr> <tr> <td>Hayi</td> <td>2</td> </tr> </table>	Ewe	1	Hayi	2	35
Ewe	1						
Hayi	2						
3.2.7	Ndicinga ngokukhusela iswekile endinayo ndithintela iingxaki zamehlo endinothi ndizifumane.	<table border="1"> <tr> <td>Ewe</td> <td>1</td> </tr> <tr> <td>hayi</td> <td>2</td> </tr> </table>	Ewe	1	hayi	2	36
Ewe	1						
hayi	2						
3.2.8	Ndihlola amehlo wam axilongwe kanye enyakeni	<table border="1"> <tr> <td>Ewe</td> <td>1</td> </tr> <tr> <td>Hayi</td> <td>2</td> </tr> </table>	Ewe	1	Hayi	2	37
Ewe	1						
Hayi	2						

**SECTION 4:
ULWAZI OLONGZELELWEYO**

Nceda uchaze ezizivakalisi zilandelayo ukuba yinyaniso okanye zibubuxoki

- 4.1 Malunga nesine kwishumi labantu abane swekile bane diabetic retinopathy (isigulo esithi senziwe yiswekile emehlweni).

Yinyaniso	1
Bubuxoki	2

38

- 4.2 "ukuba uyabona akukho ngxaki emehlweni"

Yinyaniso	1
Bubuxoki	2
Andazi	3

39

- 4.3 Isifo esenziwa yiswekile emehlweni singaqhubeka nokuba iswekile yakho ikwi qondo elihle

Yinyaniso	1
Bubuxoki	2
Andazi	3

40

- 4.4 Abantu abaneswekile kufuneka bayokwenza uxilongo lwamehlo kanye ngonyaka

Yinyaniso	1
Bubuxoki	2

41

- 4.5 Iswekile yosulela wonke umntu ngohlobo olufanayo

yinyaniso	1
Bubuxoki	2

42

- 4.6 Ukuba ibonakele kwangethuba, izifo ezibangwa yiswekile emehlweni zinganyangwa kwaye umntu abone kakuhle kwakhona

Yinyaniso	1
Bubuxoki	2

43

- 4.7 Uxilongo lwamehlo lufuneka kuphela xa kukho iimpawu zoko

Yinyaniso	1
Bubuxoki	2

44

4.8	Ukunakekela iblood sugar level unqanda ukuphulukana nokubona		
		Yinyaniso	1
		Bubuxoki	2
			45
4.9	Unyango lwangethuba namayeza angawo kuthintela ukuphulukana nokubona		
		Yinyaniso	1
		Bubuxoki	2
			46

ENKOSI NGOKUNCEDISA KWEZIZIFUNDO ZIBALULEKILEYO

DIABETIC PATIENT RECORD CARD AND EDUCATION QUESTIONNAIRE (AFRIKAANS)	
1. Naam van Kliniek	
2. Mnr/Mev/Me	
3. Van	
4. Voornaam	
5. Tweede Naam	
6. Geboortedatum	
7. I.D. Nommer	
8. Geslag	
9. Bevolkingsgroep	
10. Taalvoorkeur	
11. Woonadres	
12. Poskode	
13. Telefoon Nr.	
14. Fax Nr.	
15. Beroep	
16. Hoogste opvoedkundige kwalifikasie	
17. Maandelikse Huishoudelike Inkomste	
< R2000	<input type="checkbox"/>
R2000 – R5000	<input type="checkbox"/>
R5000 – R10 000	<input type="checkbox"/>
>R10 000	<input type="checkbox"/>
18. Dra u 'n bril? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
19. Indien wel, hoe lank?	
20. Datum van laaste oogtoets?	
21. Enige vorige oogbeserings, oogsiektes of operasies? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
22. Watter oogprobleme ondervind u tans?	
23. Watter ander gesonheidsprobleme ondervind u tans, bv Bloeddruk, suikersiekte, kolesterol, hartsiekte, nierprobleme, skuldklier, TB?	
24. Watter medikasies neem u tans?	
25. Enige oogprobleme of oogsiektes van u ouers of naasbestaandes?	

26. Enige algemene gesondheidsprobleme of siektes van u ouers of naasbestaandes?
27. Waaraan is u allergies?
28. Oefen u gereeld? JA <input type="checkbox"/> NEE <input type="checkbox"/>
29. Indien wel, hoe dikwels per week?
30. Watter sort oefening doen u?
31. Teen watter intensiteit?
Lig <input type="checkbox"/>
Matig <input type="checkbox"/>
Hewig <input type="checkbox"/>
32. Het u hoë bloeddruk? JA <input type="checkbox"/> NEE <input type="checkbox"/>
33. Ouderdom toe u gediagnoseer is?
34. Hoe lank het u bloeddruk?
35. Is dit goed onder beheer? JA <input type="checkbox"/> NEE <input type="checkbox"/>
36. Hoe word dit beheer? (Merk almal wat van toepassing is)
Medikasie <input type="checkbox"/>
Dieët <input type="checkbox"/>
Ander <input type="checkbox"/>
37. Is daar 'n familiegeskiedenis van Hoë bloeddruk? JA <input type="checkbox"/> NEE <input type="checkbox"/>
38. Wie in die familie, insluitend u ouers, het hoë bloeddruk?
39. Het u diabetes (suikersiekte)? JA <input type="checkbox"/> NEE <input type="checkbox"/>
40. Indien wel, Tipe 1 <input type="checkbox"/>
Of Tipe 2 <input type="checkbox"/>
41. Wanneer is u suikersiekte gediagnoseer? (Jaar en maand indien moontlik)
42. Is daar 'n familiegeskiedenis van suikersiekte? JA <input type="checkbox"/> NEE <input type="checkbox"/>
43. Wie in u familie, insluitend u ouers, het suikersiekte?
44. Watter sort suikersiekte het u familielede?
Tipe 1 <input type="checkbox"/>
Tipe 2 <input type="checkbox"/>
Weet nie <input type="checkbox"/>
45. Is is usuikersiekte goed beheer? JA <input type="checkbox"/> NEE <input type="checkbox"/>
46. Wat is u huidige suikervlak?

47. Hoe word u suikersiekte behandel? (Merk almal wat van toepassing is)	
Inspuiting	<input type="checkbox"/>
Pille	<input type="checkbox"/>
Dieët	<input type="checkbox"/>
48. Vind u dat u sig verander deur die dag en van dag tot dag? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
49. Ly u aan niersiekte? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
50. Indien wel, hoe lank?	
51. Is u swanger? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
52. Indien wel, hoe vêr?	
53. Rook u? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
54. Indien wel, hoeveel sigarette per dag?	
55. Neem u enige asperientablette (Disprin)? JA <input type="checkbox"/> NEE <input type="checkbox"/>	
56. Indien wel, gemiddeld hoeveel per week?	
57. Gewig	Kg
58. Lengte	cm
59. Middelyf	cm
60. Bo-arm omtrek	cm
61. Liggaam/massa indeks (BMI)	

DIABETIESE PASIENT OPVOEDKUNDIGE VRAELYS*For
office
use*

Datum _____

Pasiënt Naam _____

Geboortedatum/ouderdom _____

Beroep _____

1 2 3

**AFDELING 1:
KENNIS VAN DIABETES**

1.1 Hoeveel tipes diabetes (suikersiekte) weet u van?

Een	1
Twee	2
Meer as 2	3
Weet nie	4

4

1.2 Watter tipe suikersiekte het u?

Insulienne tipe (inspuit)	1
Nie-insulienne tipe (Tablette)	2
Weet nie	3

5

1.3 Dink u u suikersiekte is oorerflik?
(vanaf u ouers)

Ja	1
Nee	2
Weet nie	3

6

1.4	Dink u dat u middelyf groote gebruik kan word om u risiko vir suikersiekte te voorspel?					7	
		Ja	1				
		Nee	2				
		Weet nie	3				
1.5	Dink u swangerskap mag suikersikte en sy komplikasies affekteer?					8	
		Ja	1				
		Nee	2				
		Weet nie	3				
1.6	In die volgende vrae, dui asseblief aan die belangrikheid van elk van die volgende stellings:						
		Om die probleme wat mag ontstaan van suikersiekte te verminder voel ek dat...	Nie belangrik	Effe belangrik	Belangrik	Baie belangrik	
		...’n gesonde dieët en leefstyl is...	1	2	3	4	9
		...die ouderdom wat ek as diabeet gediagnoseer is...	1	2	3	4	10
		...die tydsduur van my diabetes is...	1	2	3	4	11
		...om my bloedsuiker goed te beheer is...	1	2	3	4	12
		...om my bloeddruk te laat lees en beheer is...	1	2	3	4	13
		...om nie te rook nie is...	1	2	3	4	14

**AFDELING 2:
KENNIS VAN DIE OOGKOMPLIKASIES VAN DIABETES**

2.1 Die volgende vrae verwys na die effek wat suikersiekte op u oë mag hê. Dui asseblief aan die belangrikheid van elke stelling wat volg.

	Stem definitief nie saam nie	Stem nie saam nie	Stem saam	Stem definitief saam	
Diabetes mag affekteer hoe ek sien vêr óf naby	1	2	3	4	15
Diabetes mag affekteer hoe ek kleure sien	1	2	3	4	16
Diabetes mag veroorsaak dat my oë skeel trek	1	2	3	4	17
Diabetes mag affekteer hoe my oë genees na 'n oogbeseering	1	2	3	4	18
Diabetes mag 'n katarak veroorsaak wat my sig dof sal maak	1	2	3	4	19
Diabetes mag die druk in my oog vermeerder en lei tot gloukoom	1	2	3	4	20
Diabetes mag bloeding binne of agter in my oë veroorsaak	1	2	3	4	21
Diabetes sal my oë nie affekteer nie	1	2	3	4	22

**AFDELING 3:
KENNIS VAN BEHEER EN BEHANDELINGSOPSIES**

Om my diabetes beste te beheer voel ek dat...	Nie belangrik	Effe belangrik	Belangrik	Baie belangrik	
... 'n gesonde dieët is...	1	2	3	4	23
... om my bloedsuiker te meet is...	1	2	3	4	24
... gereelde oefening is...	1	2	3	4	25
... handhawing van 'n ideale liggaamsgewig is...	1	2	3	4	26
... om my medikasie te neem net soos voorgeskryf is...	1	2	3	4	27
... om gereeld na die dokter/kliniek te gaan is...	1	2	3	4	28
... om gereeld my oë te laat toets is...	1	2	3	4	29

3.2 Vir elkeen van die volgende stellings dui asseblief aan of dit op u van toepassing is:

3.2.1 Ek volg 'n gesonde dieët spesifiek ontwerp vir my suikersiekte

Ja	1	
Nee	2	30

3.2.2 Ek meet my bloedsuiker op 'n daaglikse basis

Ja	1	
Nee	2	31

3.2.3	Ek oefen minstens 30 minute ten minste 3 keer per week	<table border="1"> <tbody> <tr> <td>Ja</td> <td>1</td> </tr> <tr> <td>Nee</td> <td>2</td> </tr> </tbody> </table>	Ja	1	Nee	2	32
Ja	1						
Nee	2						
3.2.4	Ek voel my gewig is net reg om my suikersiekte te help beeer	<table border="1"> <tbody> <tr> <td>Ja</td> <td>1</td> </tr> <tr> <td>Nee</td> <td>2</td> </tr> </tbody> </table>	Ja	1	Nee	2	33
Ja	1						
Nee	2						
3.2.5	Ek neem my diabetiese medikasie gereeld en net soos voorgeskryf	<table border="1"> <tbody> <tr> <td>Ja</td> <td>1</td> </tr> <tr> <td>Nee</td> <td>2</td> </tr> </tbody> </table>	Ja	1	Nee	2	34
Ja	1						
Nee	2						
3.2.6	Ek gaan minstens een keer 'n maand na die dokter of kliniek	<table border="1"> <tbody> <tr> <td>Ja</td> <td>1</td> </tr> <tr> <td>Nee</td> <td>2</td> </tr> </tbody> </table>	Ja	1	Nee	2	35
Ja	1						
Nee	2						
3.2.7	Ek voel dat om my suikersiekte te beheer mag help om oog en sien probleme te voorkom	<table border="1"> <tbody> <tr> <td>Ja</td> <td>1</td> </tr> <tr> <td>Nee</td> <td>2</td> </tr> </tbody> </table>	Ja	1	Nee	2	36
Ja	1						
Nee	2						
3.2.8	Ek laat my oë toets elke jaar	<table border="1"> <tbody> <tr> <td>Ja</td> <td>1</td> </tr> <tr> <td>Nee</td> <td>2</td> </tr> </tbody> </table>	Ja	1	Nee	2	37
Ja	1						
Nee	2						

**AFDELING 4:
BYKOMENDE INLIGTING**

Dui asseblief aan of u dink die volgende stellings waar of onwaar is:

- 4.1 Omtrent 40% van diabetese het diabetiese oogsiekte ('n algemene komplikasie van diabetes)

Waar	1
Onwaar	2
Weet nie	3

38

- 4.2 "As ek reg kan sien is daar nie fout met my oë"

Waar	1
Onwaar	2
Weet nie	3

39

- 4.3 Diabetiese oogsiekte kan ontwikkel al is u bloedsuiker goed beheer

Waar	1
Onwaar	2
Weet nie	3

40

- 4.4 Mense met suikersiekte behoort elke jaar 'n volledige oogondersoek te kry, met gedilateerde pupille

Waar	1
Onwaar	2
Weet nie	3

41

- 4.5 Suikersiekte affekteer almal dieselfde

Waar	1
Onwaar	2
Weet nie	3

42

- 4.6 Indien vroeg gediagnoseer, mag diabetiese oogsiekte behandel word en

	sig gespaar word		
		Waar	1
		Onwaar	2
		Weet nie	3
			43
4.7	Oogondersoeke is slegs nodig indien daar simptome is		
		Waar	1
		Onwaar	2
		Weet nie	3
			44
4.8	Om bloedsuikervlak te beheer elimineer die risiko van sig verlies		
		Waar	1
		Onwaar	2
		Weet nie	3
			45
4.9	Vroeë diagnose en vinnige behandeling kan sig verlies voorkom		
		Waar	1
		Onwaar	2
		Weet nie	3
			46
DANKIE VIR U DEELNAME AAN HIERDIE BELANGRIKE STUDIE			

**HEALTHCARE WORKER DIABETES EDUCATION QUESTIONNAIRE
(ENGLISH)**

Dear Colleague

Thank you for participating in this important research initiative.

The aim of this project will be to develop an educational programme that will enable healthcare workers to effectively detect, manage and to refer those diabetic patients at risk of developing sight-threatening ocular complications. An important additional feature of the study will be to propose a model or programme for the education of diabetic patients in community health clinics.

In order for us to develop such a programme, we would be grateful if you would give the following questions your serious attention. This should not take more than a few minutes of your time and it is important that you write down the answer that you feel is right for you. Your responses will be kept strictly confidential and any information provided will be used only for this research initiative.

Thank you for your co-operation in this important task,

Yours sincerely



Peter Clarke-Farr

Researcher

Dept. Ophthalmic and Wellness Sciences

Cape Peninsula University of Technology

Consent form to be completed for each participant**Consent**

I , the undersigned, hereby agree and give consent to my participation in this study and give permission for my details and results to be used for the statistical analysis in this study. I understand that no personal information will be divulged as part of this study and that my personal details will be kept confidential.

Name: _____

Signature: _____

Date: _____

HEALTHCARE WORKER DIABETES EDUCATION QUESTIONNAIRE

Name _____

Date of Birth / Age _____

Date _____

Occupation _____

For office use

(1)
 (2)

1. EDUCATION AND TRAINING FOR ASSESSMENT OF DIABETES RISK FACTORS

This section asks questions on the risk factors that may contribute to the development of diabetes.

1.1 Please rate the relative importance of the following diabetes risk factors that you feel may have an effect on the development of **Type 1 (Insulin-Dependant)** diabetes

Place a cross (X) in the appropriate column:

	Not important	Slightly important	Important	Very important
Age of Patient	1	2	3	4
Race / Ethnicity	1	2	3	4
Family History	1	2	3	4
Upper body fat distribution	1	2	3	4
Physical Inactivity	1	2	3	4
Poor Diet	1	2	3	4

(3)
 (4)
 (5)
 (6)
 (7)
 (8)

1.2 Please list any other factors that you feel may contribute to the development of Type 1 (Insulin-Dependant) Diabetes

(9)

For office use

1.3 Please rate the relative importance of the following diabetes risk factors that you feel may have an effect on the development of **Type 2 (Non-Insulin Dependant)** diabetes

Place a cross (X) in the appropriate column:

	Not important	Slightly important	Important	Very important
Age of Patient	1	2	3	4
Race / Ethnicity	1	2	3	4
Family History	1	2	3	4
Upper body fat distribution	1	2	3	4
Physical Inactivity	1	2	3	4
Poor Diet	1	2	3	4

- (10)
- (11)
- (12)
- (13)
- (14)
- (15)

1.4 Please list any other factors that you feel may contribute to the development of Type 1 (Insulin-Dependant) Diabetes

(16)

1.5 State whether you agree with the following statement:

"The risk factors for developing Type 1 (Insulin-Dependant) Diabetes are the same as the risk factors for developing Type 2 (Non-Insulin Dependant) diabetes.

1. YES	2. NO
-----------	----------

(17)

1.6 How well do you feel that your education and training has prepared you for assessing and managing diabetic patients' *risk factors*?

1. Not at all	2. Poorly	3. Adequately	4. Well	5. Very Well
---------------	-----------	---------------	---------	--------------

(18)

2. EDUCATION AND TRAINING FOR ASSESSMENT OF OCULAR COMPLICATIONS OF DIABETES

For office use

This section asks questions about the risk factors that may contribute to the development of *diabetic eye disease*.

2.1 Please rate what you feel to be the relative importance of each factor in contributing to diabetic eye disease:

	Not important	Slightly important	Important	Very important
Genetic Factors	1	2	3	4
Age of diagnosis of diabetes	1	2	3	4
Duration of diabetes	1	2	3	4
Race or ethnic background of patient	1	2	3	4
Poor control of blood sugar	1	2	3	4
High blood pressure	1	2	3	4
Proteinuria, and Renal / Kidney Disease	1	2	3	4
Pregnancy	1	2	3	4
Body Weight	1	2	3	4
Socioeconomic Status	1	2	3	4
Alcohol	1	2	3	4
Serum Lipids / Hypercholesterolaemia	1	2	3	4

- (19)
- (20)
- (21)
- (22)
- (23)
- (24)
- (25)
- (26)
- (27)
- (28)
- (29)
- (30)

2.2 Please list any other factors that you feel may contribute to diabetic eye disease.

(31)

For office use

3. EDUCATION AND TRAINING FOR SCREENING AND MANAGING DIABETIC PATIENT'S EYE DISEASE

This section asks questions about your training in eye problems that may occur in diabetic patients.

3.1 How well do you feel that your education and training has prepared you to screen and manage the following ocular complications that may occur in diabetic patients?

My education and training has prepared me to screen and manage:	Not at all	Poorly	Adequately	Well
...fluctuations and changes in vision	1	2	3	4
...loss of areas of the visual field	1	2	3	4
...changes in colour vision perception	1	2	3	4
...changes and damage to nerves affecting the eyes and eye muscles	1	2	3	4
...squints of recent onset	1	2	3	4
...cataracts	1	2	3	4
...abnormal growth of new blood vessels in the eyes	1	2	3	4
...increased pressure in the eyes	1	2	3	4
...glaucoma	1	2	3	4
...diabetic changes to the retina such as diabetic retinopathy	1	2	3	4

- (32)
- (33)
- (34)
- (35)
- (36)
- (37)
- (38)
- (39)
- (40)
- (41)

3.2 Please list any other areas of education and training that you feel would help you to screen and manage the eye diseases that may occur in diabetic patients:

(42)

4. EDUCATION AND TRAINING FOR DIABETIC PATIENT COUNSELLING

For office use

4.1 Have you undergone education and training specifically for educating and counselling diabetic patients?

1. YES	2. NO
-----------	----------

<input type="checkbox"/>	(43)
--------------------------	------

4.2 If your answer to 4.1 is yes, state the type of education and training you have undergone:

- 4.2.1 Formal nursing programme
- 4.2.2 Certified short courses
- 4.2.3 Workshops
- 4.2.4 Skills development training courses
- 4.2.5 On the job experience
- 4.2.6 Other, please state: _____

<input type="checkbox"/>	(44)
--------------------------	------

<input type="checkbox"/>	(45)
--------------------------	------

4.3 If your answer to 4.1 is yes, then rate how well you feel your education and training has prepared you to educate and counsel diabetic patients

1. Not at all	2. Poorly	3. Adequately	4. Well	5. Very Well
---------------	-----------	---------------	---------	--------------

<input type="checkbox"/>	(46)
--------------------------	------

4.4 Based on your prior education and training are you confident in your ability to effectively educate and counsel diabetic patients?

1. YES	2. NO
-----------	----------

<input type="checkbox"/>	(47)
--------------------------	------

4.5 Please rate the importance of each of the following educational components, that might form part of a patient education and counseling programme:

For office use

I feel that for a diabetes patient education programme, knowledge of:	Not important	Slightly important	Important	Very important
...psychosocial factors and stress in diabetic patients is...	1	2	3	4
...nutrition is...	1	2	3	4
...exercise is...	1	2	3	4
...medications and treatment options is...	1	2	3	4
...glucose monitoring is...	1	2	3	4
...the relationships between diet, exercise and blood glucose levels is...	1	2	3	4
...prevention, detection and treatment of diabetic complications is...	1	2	3	4
...ocular complications of diabetes is...	1	2	3	4
...referral and co-management with other health care services is...	1	2	3	4

(48)

(49)

(50)

(51)

(52)

(53)

(54)

(55)

(56)

4.6 Please list any other aspects that could form part of a diabetes patient education programme:

(57)

THANK YOU FOR YOUR PARTICIPATION IN THIS IMPORTANT EXERCISE

**HEALTHCARE WORKER DIABETES EDUCATION
QUESTIONNAIRE (XHOSA)**

Molweni Zihlobo

Enkosi ngenxaxheba enithe nayenza kulenkqubo yophando ibalulekileyo.

Injongo yalenkqubo kukufundisa abo bajongene nezempilo ekuphawuleni, balawule bathumele nakanjalo abantu abagula yiswekile abanokuthi ekuhambeni kwexesha babe nee ngxaki zamehlo ezinokukhokela ekungaboneni kweliso. Enye into ebalulekileyo kwezizifundo kukuveza ngaphambili inkqubo yofundiso kubaguli beswekile kwii kliniki zempilo esinazo ekuhlaleni.

Ukuze siyiqalise thina lenkqubo, singavuya kakhulu ukuba ungabambisana nathi ekunikeni ingqwalasela lemibuzo ilandelayo. Lento ayizukuthabatha ixesha lakho olunintsi kwaye kubalulekile ukuba ubhale phantsi impendulo ocinga ukuba ilungile kuwe. Iimpendulo zakho zizakugcinwa ziyimfihlo kwaye nayiphi na iinkcazelo ethe yanikwa iyakusetyenziswa koluphando kuphela.

Siyabulela ngentsebenziswano yakho koluphando lubalulekileyo,

Ozithobileyo



Peter Clarke-Farr

Umphandi

Icandelo. Ophthalmic and Wellness Sciences

Cape Peninsula University of Technology

Consent form to be completed for each participant

Isivumelwano

Mna, ndisayinileyo ngezantsi ndiyavuma kwaye ndinikeza ngegunya ngenkxaxheba yam kwezizifundo ndinikeza nangemvume ngenkcukaca zam ezinokuthi zisetyenziswe koluphando. Ndiyaqonda ukuba inkcukacha zam azizukupapashwa esithubeni koluphando ziyakugcinwa ziyimfihlo.

Igama: _____

Sayina: _____

Umhla: _____

HEALTHCARE WORKER DIABETES EDUCATION QUESTIONNAIRE

Igama _____ Usuku lokuzalwa/iminyaka _____
 Umhla _____ Umsebenzi _____

*For office
use*

(1)
 (2)

1. EDUCATION AND TRAINING FOR ASSESSMENT OF DIABETES RISK FACTORS

Elihlelo libuza imibuzo kwiingozi ezinokunxulumana nokukhula kwesifo seswekile.

1.1 Nceda unike okona kubalulekileyo malunga naleswekile kwiingozi ocinga ukuba zingaxulumaniswa no **Hlobo loku 1 (Insulin-Dependant)** lweswekile

Beka u (X) kwindawo efanelekileyo:

	Aku balulekanga	Kubaluleke kancinci	Kubalulekile	Kubaluleke kakhulu
Iminyaka yomguli	1	2	3	4
Uhlanga	1	2	3	4
Imvelaphi yakuni	1	2	3	4
Ukulawula kokutyeba komzimba wangasentle	1	2	3	4
Ukungoluli Umzimba	1	2	3	4
Ukutya okungenantswane	1	2	3	4

(3)
 (4)
 (5)
 (6)
 (7)
 (8)

1.2 Nceda unike nayiphi na into ocinga ukuba inganegalelo ekukhuleni kohlobo lokuqala (Insulin-Dependant) Lweswekile

(9)

1.3 Nceda unike okona kubalulekileyo malunga naleswekile kwiingozi ocinga ukuba zingaxulumaniswa no **Nohlobo lwesi 2 (Non-Insulin Dependant)** lweswekile

Beka u (X) kwindawo efanelekileyo:

	Aku balulekanga	Kubaluleke Kancinci	Kubalulekile	Kubaluleke Kakhulu
Iminyaka yomguli	1	2	3	4
Uhlanga	1	2	3	4
Imvelaphi yakuni	1	2	3	4
Ukulawula kokutyeba komzimba wangasentle	1	2	3	4
Ukungoluli Umzimba	1	2	3	4
Ukutya okungenantswane	1	2	3	4

For office use

- (10)
- (11)
- (12)
- (13)
- (14)
- (15)

1.4 Nceda unike nayiphi na into ocinga ukuba inganegalelo ekukhuleni kohlobo lwesi 2 (Insulin-Dependant) lweswekile

(16)

1.5 Chaza ukuba uyavumelana na nalemiqolo ilandelayo:

"Iingozi zokufumana iswekile uhlobo lokuqala (Insulin-Dependant) ziyafana nezo zikhokelela ekufumaneni uhlobo lwesi 2 (Non-Insulin Dependant) lweswekile.

1. EWE	2. HAYI
-----------	------------

(17)

1.6 Ucinga imfundo yakho ikuncede kangakanani ekuqhubeni nasekulawuleni abaguli abaneswekile' *kwi ngozi?*

1. Ayindincedanga	2. Kancinci	3. Kancinci nje	4. Indincedile	5. Incede kakhulu
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(18)

2. EDUCATION AND TRAINING FOR ASSESSMENT OF OCULAR COMPLICATIONS OF DIABETES

Eli candelo libuza imibuzo malunga neengozi ezinokuba negalelo ekukhuleni kwe *sifo seswekile*.

2.1 Nceda uchace ukuba sesiphi ocinga ukuba sibalulekile kwezizivakalisi zilandelayo ezithabatha inkxaxheba kwisifo samehlo esibangelwa yiswekile:

	Aku balulekanga	Kubaluleke Kancinci	Kubalulekile	Kubaluleke Kakhulu
Isigulo sakuni	1	2	3	4
Ixesha wazazi ukuba unezswkile	1	2	3	4
Ixesha leswekile yakho	1	2	3	4
Uhlanga okanye imvelaphi yomguli	1	2	3	4
Ukungahoyi ihigh-high	1	2	3	4
High blood pressure	1	2	3	4
Isigulo sezintso	1	2	3	4
Ukhulelo (Umitho)	1	2	3	4
Ubunzima Bomzimba	1	2	3	4
Uhlobo oziphethe ngalo	1	2	3	4
Utywala	1	2	3	4
Ucoceko	1	2	3	4

2.2 Nceda unike nayiphi na into ocinga ukuba ingane galelo kwisifo seswekile.

For office use

(19)

(20)

(21)

(22)

(23)

(24)

(25)

(26)

(27)

(28)

(29)

(30)

(31)

*For office
use*

3. EDUCATION AND TRAINING FOR SCREENING AND MANAGING DIABETIC PATIENT'S EYE DISEASE

Eli candelo liqonda ngemibuzo ekuzilolongeni kwiingxaki zamehlo ezithi zibangelwe kukuba nesifo seswekile.

3.1 Ucinga ukuba ezizifundo zikuncede kangakanani ekuzilungiseleleni nasekulawuleni iingxaki zamehlo ezinokuvela kumntu oneswekile?

Izifundo zam zindincedile ekuzilungiseleleni nasekulawuleni:	Ayindi ncedanga	Kancinci nje	Indincedile	Indincede kakhulu
...utshintsho kwindlela obona ngayo	1	2	3	4
...ukulahlekelwa libala lokunjonga	1	2	3	4
...utshintsho kwindlela esibona ngayo imibala	1	2	3	4
...utshintsho nomenzakalo kwi nerve echaphazela imehlo nemisipha yamehlo	1	2	3	4
...ubugxwemu obuqalisayo	1	2	3	4
...urhatyazo (cataract)	1	2	3	4
...ukungakhuli kwemithambo yegazi esemehlweni	1	2	3	4
...ukukhula koxinizelelo emehlweni	1	2	3	4
...glaucoma	1	2	3	4
...iswekile ethi yenze utshintsho phakathi emehlweni (Diabetic Retinopathy)	1	2	3	4

 (32) (33) (34) (35) (36) (37) (38) (39) (40) (41)

3.2 Nceda unike uludwe lwezinye izinto eziyimfundo ocinga ukuba zingaluncedo kubaguli ekulawuleni izifo zamehlo ezibangwa yiswekile:

 (42)

For office use

4. EDUCATION AND TRAINING FOR DIABETIC PATIENT COUNSELLING

4.1 Wawukhe wathabatha izifundo zokufundisa nasekucebiseni abaguli abaneswekile?

1.	2.
EWE	HAYI

(43)

4.2 Ukubangaba impendulo yakho ku 4.1 ngu ewe, chaza uhlobo lwemfundo othe wayithabatha:

- 4.2.1 Formal nursing programme
- 4.2.2 Certified short courses
- 4.2.3 Workshops
- 4.2.4 Skills development training courses
- 4.2.5 On the job experience
- 4.2.6 Other, please state: _____

(44)

(45)

4.3 Ukubangaba impendulo yakho ku 4.1 ngu ewe nceda uchaze ukuba ezizifundo zakho zikuncede kangakanani ekuncedeni umgulu oneswekile

1. Ayindi ncedanga	2. kancinci	3. Kancinci nje	4. Indincedile	5. Indincede kakhulu
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(46)

4.4 Kulo lonke ulwazi onalo ingaba uzithembile ukuba unganako ukufundisa nase kucebiseni abaguli abane swekile?

1.	2.
EWE	HAYI

(47)

*For office**Use*

4.5 Nceda unike ukubaluleka kwezizifunod zilandelayo ezinokuthi zancedisane nemfundo nokucebisa umguli oneswekile:

Ndicinga ukuba izifundo zomguli oneswekile, ulwazi lwe:	Aku balulekanga	Kubalulek e Kancinci	Kubalulekile	Kubalulek e Kakhulu
...ndlela oziphethe ngayo nenkxalabo kumguli ...	1	2	3	4
...ukutya ...	1	2	3	4
...ukolula umzimba ...	1	2	3	4
...ukuthabatha amayeza ...	1	2	3	4
...ukunakekela iglukhozi...	1	2	3	4
...ubudlelwane kwindlela otya ngayo, uhlobo owolula ngalo umzimba ...	1	2	3	4
...ukhuseleko, nonyango kwiingxaki ezibangwa yi swekile ...	1	2	3	4
...iingxaki zamehlo ezibangwa yiswekile ...	1	2	3	4
...uthumelo, nonxulumelwaniso nezinye iintlalo ntle ...	1	2	3	4

 (48) (49) (50) (51) (52) (53) (54) (55) (56)

4.6 Nceda unike uludwe lwezinye izinto ezinokubaluncedo kwinkqubo yokufundisa izigulana ezineswekile:

 (57)

ENKOSI NGENXAXHEBA YAKHO KULOMSEBENZI UBALULEKILEYO

LETTER OF INVITATION AND REQUEST TO DELPHI PANELISTS

Dear Colleague

REQUEST TO PARTICIPATE IN A PH.D. STUDY ENTITLED:

THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND TRAINING PROGRAMME FOR HEALTH CARE WORKERS FOR THE PREVENTION AND MANAGEMENT OF OCULAR COMPLICATIONS IN DIABETIC PATIENTS

I am writing to request your assistance in a study I am conducting regarding diabetes education in South Africa. Please regard this letter as an invitation to participate in this research exercise. I am requesting the involvement of a limited number of subject experts in the field of diabetes and education. More specifically, the purpose of this research is to determine the critical factors pertaining to the development of an education programme for the prevention and management of the ocular complications in diabetic patients.

Currently I am writing a thesis to obtain a PhD Degree in Higher Education Studies in The Centre For Higher Education And Development at the University Of The Free State (Student Number: 2004159865).

My supervisors are:

Prof. Dr. M.M. Nel

Head of Educational Development

Faculty of Health Sciences

University of the Free State

Bloemfontein, South Africa.

Co-study supervisor

Prof. Dr. A. Wilkinson

Centre of Higher Education Studies and Development

University of the Free State,

Bloemfontein, South Africa.

As indicated by the title of the thesis, it is the purpose of my study to design a programme for health care workers for the prevention and management of the ocular complications that may occur in diabetic patients. I chose this specific subject since my optometric experience has demonstrated the dire lack of qualified personnel available to manage and educate diabetes patients about the ocular consequences of diabetes. The problems that have to be addressed include the following:

- Identifying and diagnosing diabetic patients as early as possible
- Educating diabetic patients about their condition as well as the ocular consequences of diabetes
- Managing their condition in terms of treatments and referrals
- Encouraging lifestyle changes that would reduce the progression of diabetes and its complications

Additional problems that restrict the amelioration of these aspects include:

- The lack of screening protocols for ocular complications of diabetes
- The lack of physical resources for diabetic screenings
- The lack of staff and personnel adequately trained to undertake such screenings
- The lack of staff and personnel that have been specially trained to manage and educate diabetic patients about their condition and its ocular complications.

Therefore the **aim** of the study is to develop an education programme that will facilitate the professional development of health care workers in this specific field. The criteria obtained from questionnaires completed by diabetic

patients and healthcare workers and a comprehensive literature review will be subjected to a Delphi process and the final set of criteria will be obtained in order to design the diabetes education programme that will be the researcher's final product.

The **methods** that will be employed in this study are firstly a comprehensive literature study has been completed. Secondly, a series of questionnaires were developed and provided to diabetic patients in order to determine their knowledge about diabetes and the way it affects their eyes. Simultaneously, a separate questionnaire was developed and provided to health care workers, such as nurses and optometrists in order to determine their knowledge of diabetes and its ocular complications. The criteria obtained from these questionnaires and the intensive literature review informed the development of the Delphi questionnaire that will now be explained.

The Delphi technique is employed as the final methodology for this research. This method utilises a consensus building approach among individuals with recognised experience and advanced knowledge in a particular subject area. It is a recognised scientific method of gathering data and this study will be conducted utilising up to three rounds of questionnaires. The Delphi technique has been proven to be a sound and effective research process particularly in terms of health research where predictions around possible health interventions and strategies are required.

The Delphi technique seeks expert opinion, as critical decisions require critical thinking and reasoning. The technique provides a rigorous and systematic strategy in collecting and disseminating such critical information. The technique allows for individuals to participate in decision-making without having to travel. According to the literature, Delphi can be described as a method that is used to obtain the most reliable consensus of opinion of a group through a series of intensive questionnaires interspersed with controlled feedback. The technique involves questioning of the individuals

while avoiding direct confrontation of group members with one another. Participants will not be asked to simply choose from a number of alternatives, but they will be required to make an evaluation, based on clearly defined areas. Approximately three rounds of the Delphi will be required to reach consensus. Most researchers report that positions are usually unlikely to change after two to three rounds. The process is anonymous in that only the researcher will have access to aspects like the origin of the feedback and the responses. The findings of each round of questionnaire implementation will be processed and the prepositions will be edited accordingly, where after the questionnaire will be sent to the respondents once again for comments and rating. The consolidation and assessment processes alternate until only that on which consensus has been reached is retained.

The **benefit** and **value** of this research will be such that by implementing such an education programme, health care workers will be able to develop much needed knowledge, skills and abilities that will enable them to screen, educate and appropriately manage diabetic patients which will ultimately contribute to the upliftment of such patients and the public health care system in general. The final results, as well as the relevant requirements and findings of the research will be submitted to the Delphi-experts as well as to the relevant Departments of Health and Education through the required procedures.

Having explained the process to you, I would like to request your expert co-operation in completing this research project. The completion of the questionnaire will take approximately 45 minutes to one hour of your time. The questionnaire, as well as any relevant information will be e-mailed to you whilst a hard copy may be posted to you upon request.

My particulars are as follows:

Telephone Number: (W) 021 460-3169
(H) 021 671-7473 Cell 082 882-3840
Fax: 021 460-3723
e-mail address: clarkefarr@cput.ac.za
Postal Address: Department of Ophthalmic and Wellness Sciences
Cape Peninsula University of Technology
P.O. Box 652
Cape Town 8000

I would therefore like to request you to take part in the **Delphi process**, which is scheduled to take place during the period between **20 June 2005 and 22 July 2005**. Should you be willing to participate, please fill in the accompanying consent form and return it to me electronically or by fax as soon as possible.

Thank you very much for your consideration of this initiative and I look forward to hearing from you. Your participation will contribute to the improvement of the health, lifestyles and eyecare of many diabetic patients in South Africa in the future.

Yours sincerely



Peter Clarke-Farr

(Student Number:2004159865)

Researcher: Dept. Ophthalmic and Wellness Sciences

Cape Peninsula University of Technology

FORM OF CONSENT FOR DELPHI PANELISTS

Date.....

Hereby I, the undersigned, consent to participate in the Delphi process, which is scheduled to take place from 20 June 2005 to approximately 22 July 2005. I also undertake to ensure that my participation in this process remains confidential and that no information from the research process may be divulged.

Title:
Surname:
Full names:
Postal Address:
e-mail Address:
Tel. Number:
Cell. Number:
Signature:

Please return this form on or before 10th May 2005.

My full particulars are as follows:

Postal Address: Department of Ophthalmic and Wellness Sciences
Cape Peninsula University of Technology
P.O. Box 652
Cape Town 8000
Telephone Number: (W) 021 460-3169
(H) 021 671-7473 Cell 082 882-3840
Fax: 021 460-3723
e-mail address: clarkefarrp@cput.ac.za

Thank you in advance for your kind co-operation.

Yours Faithfully

[Handwritten signature]

Peter Clarke-Farr
Dept. Ophthalmic and Wellness Sciences
Cape Peninsula University of Technology

ACCOMPANYING LETTER TO DELPHI PANEL ROUND ONE

**THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND
TRAINING PROGRAMME FOR HEALTH CARE WORKERS FOR THE
PREVENTION AND MANAGEMENT OF OCULAR COMPLICATIONS IN
DIABETIC PATIENTS**

Dear Colleague

Thank you for agreeing to participate in this Delphi research process. Attached please find the first round questionnaire for the Delphi process. Thank you for making time to complete this document and for returning it to me, your willingness to participate in this research is very much appreciated. The attached questionnaire was compiled after conducting a thorough literature review as well as a battery of questionnaires with diabetic patients and also with health care workers, nurses and optometrists.

INFORMATION ON THE STRUCTURE OF THE QUESTIONNAIRE

The structuring of the questionnaire has been developed in order for you to offer your opinion regarding the relative importance of the listed criteria. These criteria are all envisaged to contribute to the training programme for the ocular complications of diabetes. The questionnaire contains numbered statements that also provide the opportunity to offer additional suggestions and comments. The questionnaire is subdivided into seven sections from A through G. In each section precise statements are provided that indicate the specific theme of that section to you.

PROCEDURE OF THE DELPHI PROCESS

The opinion of each participant is needed with regard to the relevance and importance of each criterion for such an education programme. All information provided and opinions offered by all participants will be treated as strictly confidential. Please note that no respondent will know the identity of any other respondent. The researcher and supervisors alone will have knowledge on the identity of the respondents. In terms of the research process, please ensure that you keep all information pertaining to this research and questionnaire confidential. This will also be applicable to the subsequent rounds of the Delphi process. The Delphi process has been proven to be a very useful research tool and particularly in terms of health based research where predictions and strategies around health and health education are developed. The researcher would like to stress once again that it is of utmost importance that no discussion takes place around the contents of the questionnaire, as this would contaminate the research process.

The Delphi process is conducted in such a way that feedback will be given to all participants. The researcher will indicate outcomes of each statement in the follow-up rounds.

PLEASE ANSWER ALL QUESTIONS IN ALL SECTIONS

PLEASE COMPLETE THE QUESTIONNAIRE AS FOLLOWS:

Each statement must be evaluated in respect of its importance as an aspect or criterion that must be included in the education programme for the ocular complications of diabetes. Please indicate your opinion on the three-point Likert scale provided. These points are defined as follows:

- 1 = Essential (this criterion must **DEFINITELY BE INCLUDED** in the programme)
- 2 = Useful (it **DOES NOT MATTER** whether this criterion is included in the programme)
- 3 = Unnecessary (this criterion must **DEFINTELY BE EXCLUDED** from the programme)

If possible, please complete the questionnaire in its electronic form. If, however, you prefer to print it out and complete it in paper format, please feel free to do so. In both cases please answer all the points by placing an **X** over the specific number of your choice in the scale provided with each statement. Space is also provided in each section for any further comments that you would like to make regarding that particular section.

The questionnaire in this round should take up at most approximately one hour of your time. Please contact me if anything is unclear to you. Once again, the purpose of this research is to develop an education programme for health care workers, to enable them to effectively prevent, manage and educate diabetic patients at risk of developing ocular complications. Thank you for agreeing to give of your time for this important initiative.

Thanking you in anticipation



Peter Clarke-Farr

Student Number: 2004159865

Tel: 021 460-3169 / Cell 082 882-3840

Fax: 021 460-3723

e-mail: clarkefarr@cput.ac.za

QUESTIONNAIRE FOR DELPHI PANEL ROUND ONE

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SECTION A				
CURRICULUM DEVELOPMENT IN HIGHER EDUCATION				
<p>This section deals with curriculum and programme development in the Higher Education Sector.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>				
1 POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL				
In developing an education programme for the prevention and management of the ocular complications of diabetes:				
	<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a				a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 8 (postgraduate diploma level)
b				a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 9 (masters degree level)
c				the Department of Education and Department of Health should support a diabetes education programme for the prevention and management of the ocular complications of diabetes
d				the optical industry and the Professional Board for Optometry and Dispensing Opticians should support the diabetes education programme
e				the diabetes education programme should be offered as a structured formally registered SAQA approved programme pegged at the appropriate level on the National Qualifications Framework
f				the diabetes education programme should be offered as an informal or non-SAQA approved short course programme
g				the diabetes education programme should be offered as a SAQA accredited short course programme
h				the diabetes education programme should be offered by a University/ University of Technology
i				the diabetes education programme should be offered by a private training college/organisation
j				the diabetes education programme should be affiliated to an ophthalmic (optometry or opticianry) programme or nursing programme
2 OUTCOMES BASED EDUCATION				

	In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes based education to ensure that:				
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	fairness of both testing and grading is facilitated				
b	goals of the course, content and evaluation procedures are both consistent and interrelated				
c	course and materials evaluation identify what is effective and working and also what is not				
d	orientation from "what I (as a lecturer) must cover" is changed to what a student should be able to do as a consequence of instruction				
e	self-evaluation by the students should be encouraged to ensure they know what is expected of them				
f	efficient student learning is facilitated, and anxiety is reduced by providing direction and identifying instructional priorities				
g	demonstrations of competence must take place at the culminating or end point of the candidates' learning experience				
h	demonstrations must occur in some context or performance setting				
i	demonstrations must show evidence of significant learning				
j	demonstrations must be of high quality				
k	the outcomes must be significant, they must be clear and they must be concise.				
3 CURRICULUM PLANNING, DEVELOPMENT AND DESIGN					
	In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of curriculum planning, development and design , therefore:				
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	the curriculum development process should be sensitive to the academic setting of the project				
b	the curriculum development process should be sensitive to the capabilities, interests and priorities of the students for whom the programme is designed to serve				
c	the development of the programme should require a detailed knowledge and appreciation of the discipline				
d	the development of the programme should require an understanding of the resources and options available to the faculty and educators involved				
e	it is of utmost importance that appropriate stakeholders are identified and then contribute to the development of the education programme				
f	a measure of support and acceptance, by the stakeholders, of the outcomes specified is required				
g	the programme should have a rationale (or mission statement) to explain why the programme exists				
h	the overall programme aims must be clearly stated, in order to explain what the programme will achieve				

i	outcome statements must be developed to indicate the knowledge, skills and attitudes learners are to acquire through the programme				
j	content statements must be provided to indicate what areas of knowledge will comprise the student learning				
k	teaching strategy statements must be provided in order to indicate how the learning activities will be organised				
l	assessment methodologies must be provided to indicate how student learning will be assessed and reported				

4 IMPLEMENTING AND EVALUATING THE CURRICULUM

Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to **implementing and evaluating** the curriculum, therefore:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	there must be a demonstrable need for the programme				
b	the academic area must be stable and well defined in terms of the knowledge comprising the programme				
c	there must be clear potential for success of the programme				
d	the department/institution providing the programme must have the necessary resources available				
e	any social and political factors that may negatively impact the provision of the programme should be considered				
f	a needs assessment should be conducted in terms of the programme objectives				
g	the aims/exit level outcomes of the curriculum should be stated				
h	there should be a clear rationale and justification for the provision of the programme				
i	assessment criteria and procedures must be clearly stated				
j	the context and community in which the programme resides should be articulated				
k	the entry and admission criteria for the programme must be adequately described				
l	the form of instruction should be appropriate to the learners' needs				
m	the programme should allow for individual differences in learners and learning methods				
n	provision must be made for adequate availability of learner resources, materials and facilities				
o	there should be provision for pilot testing of the proposed programme prior to final implementation				
p	criteria must be available for evaluation of all aspects of the programme for the purposes of quality assurance				
q	there must be evidence of significant groups and subject specialists involved throughout the development of the proposed programme curriculum				

5 LEARNER ASSESSMENT

In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for **learner assessment** in order to ensure that:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments

a	the emphasis should be shifted away from the input or content aspect of programmes towards the objective assessment of the performance of learners in terms of clearly stated outcomes				
b	the ultimate outcome for each and every person learning in a particular programme should be equivalent and clearly stated				
c	the assessment process must be objective and verifiable				
d	the responsibilities learners are expected to assume to monitor their own learning must be defined.				
e	the assessment criteria for each of the abilities/skills that have been developed should be defined				
f	there is the establishment of an assessment taskforce, which will include an assessment expert				
g	there is an integrated method of assessment covering all aspects of the learning programme				
h	there is the establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all subjects/modules				
i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors				
j	the flow of assessment information, lines of communication and promotion and exclusion processes of students are reflected				
k	all forms of assessment are moderated by appropriately trained moderators with specific expertise in the learning area				
l	moderation of learner assessments takes place to ensure that the required level, standard, appropriateness and fairness is observed				

6 ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?

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**SECTION B
PATIENT DIABETES EDUCATION**

This section deals with the education of diabetes patients.

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

7 PATIENT'S KNOWLEDGE OF DIABETES

In terms of the patient's knowledge of **diabetes** it would be important for diabetic patients to be aware of:

	ESSENTIAL	USEFUL	UNNECESSARY	Comments
a				
b				
c				
d				

e	the importance of maintaining good control over their blood sugar level				
f	the importance of having their blood pressure checked and controlled if necessary				
g	the importance of not smoking				

8 PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES

In terms of the patient's knowledge of the **ocular complications of diabetes**, it would be important for diabetic patients to be aware that:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	diabetes may affect vision at distance and near				
b	diabetes may change their refractive error / spectacle prescription				
c	diabetes may affect colour perception				
d	diabetes may affect the nerves of the eyes cause the eyes to become squint				
e	diabetes may affect the ability of the eyes to heal if they become injured				
f	diabetes may contribute to cataract formation				
g	diabetes may cause bleeding and damage to the retinas of the eyes?				
h	diabetes may cause new blood vessels to grow inside the eyes				
i	diabetes may cause the pressure in the eyes to increase thus leading to glaucoma				
j	diabetes may cause a retinal detachment to occur				

9 PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES

In terms of the patient's knowledge of the **management and treatment of diabetes**, they should be educated about:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	the importance of following a healthy prescribed diet and lifestyle				
b	the importance of regularly measuring their blood sugar as scheduled by their medical practitioner				
c	the importance of regular exercise				
d	the importance of maintaining an ideal body weight				
e	the importance of taking their medication exactly as prescribed				
f	the importance of going for regular medical check ups at the clinic / doctor				
g	the importance of undergoing regular eye examinations				
h	the general systemic complications that may occur with diabetes				
i	the ocular complications that may occur with diabetes and how they may be managed/treated				

10 ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?

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SECTION C	
PUBLIC HEALTH IN SOUTH AFRICA	

This section deals with issues related to the provision of public health in South Africa.

Please indicate how important each of the following statements is according to the following scale:

1 = Essential
2 = Useful
3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS	
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In terms of the **legislation and scope** of the health care workers' professions, the following must be integral to an education programme for the prevention and management the ocular complications of diabetes:

	<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a the definition of a primary health care nurse				
b the definition of an ophthalmic nurse				
c the definition of a diabetes educator				
d the definition of an optometrist				
e the scope of practice of a nurse				
f the scope of practice of an optometrist				
g the function and scope of allied health care workers				
h the acts and procedures that fall within the scope of nursing				
i the acts and procedures that fall within the scope of optometry				
j the acts or procedures that should be performed during the management and treatment of the ocular complications of diabetic patients				
k the responsibilities of the patient				
l the relevant health legislation pertaining to the provision of health care in South Africa				

12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH	
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In terms of the policies of the South Africa Department of Health, the following **policies** must be integral to an education programme for the prevention and management of the ocular complications of diabetes:

	<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments

a	The RSA Department of Health's National Programme for Control and Management of Type 2 Diabetes				
b	The National Guidelines for the Prevention of Blindness in South Africa				
c	Strategic Priorities for the National Health System 2004-2009				
d	The Primary Health Care Package for South Africa: A Set of Norms and Standards				
e	All relevant acts and/or professional guidelines issued by the HPCSA				
f	The Patient's Rights Charter				

13 ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA

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**SECTION D
ACADEMIC AND ADMINISTRATIVE ASPECTS**

This section deals with issues related to the academic and administrative aspects of a diabetes education programme:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

14 ORGANISATION OF THE PROGRAMME

In terms of the **organisation** of a diabetes curriculum, there must be:

		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	
a	written objectives for the education programme				Comments
b	the provision of all necessary resources in order to achieve the proposed objectives				
c	the composition of the organisation must include the teaching team and its members, a co-ordinator and an advisory committee				

15 PROGRAMME CO-ORDINATION

In terms of the **programme co-ordination**, there must be:

		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	
a	a specific programme co-ordinator who will be responsible for overseeing the overall progress of the programme, including the planning, implementation and evaluation thereof				Comments

16 ADVISORY COMMITTEE					
In terms of the advisory committee for the programme, there must be:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	an advisory committee established to ensure quality assurance of the <u>diabetes education programme</u>				
b	the advisory committee should have interdisciplinary and intersectoral integration				
c	the advisory committee should have current experience and understanding of diabetes management				
d	the advisory committee should have regular meetings				
e	the advisory committee should plan and review the programme on <u>an annual basis</u>				
f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators				
17 DIABETES EDUCATION PROGRAMME					
In terms of the overall diabetes education programme :					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	the programme must aim to ensure accessibility to the overall learner population to whom it is directed				
b	the target population should be defined with regard to the potential number of patients, type of diabetes, age, language, regional characteristics and special educational needs.				
c	the programme curriculum must be suitably flexible in terms of mode of delivery to accommodate the diversity of circumstances of potential learners				
d	the curriculum document of the programme should reflect the objectives, course contents and outcomes				
e	the curriculum document of the programme should reflect the teaching methodology, ordering, sequencing and duration of modules/coursework				
f	the curriculum document of the programme should reflect the educational materials to be used				
g	the curriculum document of the programme should reflect the evaluation and assessment instruments				
h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice				
18 MISSION AND PURPOSE					
In terms of the mission and purpose of the diabetes programme:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	the mission and purpose of the programme must be clearly stated				
b	the mission and purpose of the programme should fit into the broad mission statement of the Institution at which it is provided				
c	the mission of the programme should address the needs of the <u>community in which the Institution resides</u>				
d	the purpose statement of the programme must indicate what learners will be able to do upon successful completion of the programme				

19 TEACHING PERSONNEL					
The teaching personnel of the organisation and programme should meet the following requirements:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	they should have specialised knowledge of all aspects of the diagnosis, control and treatment/management of all aspects of diabetes				
b	the core teaching team should include an optometrist, medical practitioner, nutritionist, nurse, diabetes educator and/or other appropriately trained health care professional				
c	they should have appropriate educational qualifications and experience to instruct at the higher education level				
20 EDUCATIONAL METHODOLOGIES					
The following educational methodologies should be utilised in the programme:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	interactive learner participation with modalities such as group work, self study, class presentations and projects or assignments				
b	clinical and practical training in order to develop skills required for the treatment and management of diabetic patients				
c	practical training aimed at exposing learners to clinics, community health centres and hospitals treating diabetic patients				
d	theoretical and practical training aimed at exposing learners to ophthalmological treatment of diabetic patients				
e	theoretical and practical/clinical training that may be effectively supervised and assessed by instructors / lecturers				
f	small group teaching should be encouraged in order to facilitate closer interaction between learner and educator				
g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills				
h	uses reflective practice, problem-solving and decision-making skills as part of its learning process				
i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning				
21 LEARNER ASSESSMENT					
The following forms of learner assessment must be included in the education programme:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	formative assessment methodologies				
b	summative assessment methodologies				
c	evaluation of theoretical learning				
d	evaluation of practical/clinical learning				
e	a variety of forms of assessment should be employed to ensure that learner's knowledge is assessed by the most appropriate means				

22 FORMAT OF PROGRAMME AND MODULES					
The following should be considered for the format of programme and modules :					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	the traditional emphasis on instructional time or programme duration should be replaced with greater emphasis on student learning and <u>achievement of outcomes</u>				
b	time-based learning policies should shift to mastery of skills and <u>knowledge by the learners</u>				
c	learning should take place through a learner-centred approach rather than a lecturer-centred approach				
d	learner development of individual research projects and assignments at the <u>appropriate post-graduate level</u>				
e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme				
23 ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE					
The following admission requirements & learning assumed to be in place must be clearly documented:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	the minimum admission requirements to the training programme				
b	the requirements for clinical and theoretic learning assumed to be in place prior to admission to the programme				
c	a formal policy of recognition of prior learning				
d	the specific requirements for admission to examinations				
e	promotion criteria from module to module or to the following level of study				
24 ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS					
The following should constitute the required academic qualifications for programme lecturers and instructors :					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	Comments
a	a post-graduate qualification in the appropriate field (at least Masters Degree, preferably Doctorate)				
b	a formal qualification in higher education teaching methodology				
c	a minimum of 5 years of experience lecturing in higher education				
d	registration with the appropriate Health Professions Board or Council				
25 ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS					
SECTION E					

STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

26 OVERVIEW AND CLASSIFICATION OF DIABETES

Upon **completion** of the diabetes education programme, learners should be able to:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	comprehensively describe the various TYPES of diabetes				
b	CLASSIFY the various types of diabetes				
c	comprehensively describe the various CAUSES of TYPE I diabetes				
d	comprehensively describe the various CAUSES of TYPE II diabetes				
e	comprehensively describe the various EFFECTS of uncontrolled diabetes on the human body				
f	comprehensively describe the pathophysiology of diabetes				
g	describe the primary actions of insulin				

27 CRITICAL CROSS-FIELD OUTCOMES

Upon completion of the diabetes education programme, learners should have the **ability**:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	to identify and solve problems with responsible decisions shown to be the result of critical and creative thinking				
b	to work effectively with others as a member of a team, group, organisation and community				
c	to organise and manage oneself and one's activities responsibly and effectively				
d	to collect, analyse, organise and critically evaluate information				
e	to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation				
f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others				
g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation				
h	to demonstrate cultural and aesthetic sensitivity to all patients and colleagues and learners in the everyday working environment				

28 CRITICAL OUTCOMES FOR HEALTH CARE WORKERS

Upon completion of the diabetes education programme, learners should have the **ability**:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations				
b	to practice effectively in accordance with the professional and legal framework (knowledge, skills and attitudes/values) as a member of the health team				
c	to use specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs				
d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care				
e	to work as part of a multi-professional team, in which the leadership role changes in response to changing client needs				
f	to develop and use flexible and innovative approaches to practice appropriate to the needs of the patient in line with the goals of the health service and the employing authority				
g	to have an understanding of health promotion and preventative policies and strategies				
h	to facilitate and assess the professional and other development needs of all for whom they are responsible, including where appropriate learners, and to act as a role model for professional practice				
i	to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.				
j	to evaluate quality of care delivered as an ongoing and cumulative process				
k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care				
l	to use science in the practice of health and medicine				
m	to diagnose, manage and prevent diseases				
n	to use prior training and education in problem solving in a clinical situation				
o	the ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards				
p	the ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration				

29 DIABETES STANDARDS FOR EDUCATION PROGRAMMES

The **curriculum for diabetes education** will need to demonstrate that it:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	supports students to gain knowledge, and develop skills and competence to deliver diabetes education in general and the ocular complications of diabetes in particular				
b	has processes in place to recognise prior diabetes learning				
c	has processes for collaboration with relevant diabetes organisations, associations and other bodies where appropriate				
d	integrates diabetic theory, research and clinical practice				
e	has appropriate resources to deliver the curriculum, including the quantity and quality of clinical experience and supervision				

f	is delivered by a teacher/instructor with the appropriate education and qualifications to teach the subjects allocated to them				
g	has procedures in place to approve and monitor facilities where clinical experience is undertaken				
h	will, upon successful completion of the course lead to a qualification in the prevention, management and treatment of the ocular complications of diabetes				
i	equips the student to deal with professional issues, role conflict and the delivery of diabetes education according to the role they are expected to perform				
j	is clearly defined in the context of the particular society and healthcare system in which the programme is to be delivered.				

30 CRITERIA FOR DIAGNOSIS OF DIABETES

Upon completion of the diabetes education programme, learners should be able to **describe**:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	the diagnostic criteria for diabetes				
b	the diagnostic criteria for diabetes conforming to internationally accepted standards and norms				
c	the diagnostic criteria for diabetes taking into account the criteria outlined by the South African Department of Health as part of its National Programme for Control and Management of Diabetes Type 2				

31 RISK FACTORS FOR DIABETES

Upon completion of the diabetes education programme, learners should be able to **identify**:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	the known modifiable and non-modifiable risk factors for developing Type 1 diabetes				
b	the known modifiable and non-modifiable risk factors for developing Type 2 diabetes				
c	all the risk factors having an influence on the incidence and progression of diabetic retinopathy				

32 SYSTEMIC COMPLICATIONS

Upon completion of the diabetes education programme, learners should be able to **explain**:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	explain the acute (short term) systemic complications of diabetes mellitus				
b	explain the long term systemic complications of diabetes mellitus				

33 OCULAR COMPLICATIONS

Upon completion of the diabetes education programme, learners should be able to **comprehensively describe**:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments

a	the refractive changes that may occur in diabetic patients				
b	the changes that may occur in the eyes in terms of visual performance (Such as reduced visual acuity, blue-yellow colour defects, abnormal contrast sensitivity and field loss)				
c	the nerve palsies and defects that may occur in diabetic patients				
d	the various pathophysiological effects of diabetes on the cornea				
e	the lenticular changes and processes leading to diabetic cataracts				
f	the neovascular response of the eye to ocular ischaemia secondary to the diabetes, including the development of rubeosis irides				
g	the development of ocular hypertension and glaucoma in diabetic patients				
h	the neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders				
i	the processes leading to tractional retinal and vitreous detachments due to diabetes				
j	the skin and eyelid disorders and infections that may be encountered in diabetic patients				
k	all aspects of ocular or diabetic retinopathy				
l	the pathogenesis of ocular retinopathy				
m	the various forms of classification of diabetic retinopathy				
m	the various forms of ocular pathology comprising diabetic retinopathy				

34 MANAGEMENT OF DIABETIC EYE DISEASE

For managing diabetic eye disease, upon completion of the education programme, learners should be able to:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	emphasise the role of prevention in the management of diabetic eye disease				
b	emphasise the role of early detection of retinopathy and the monitoring of existing retinopathy with regular and appropriately timed fundus examinations				
c	emphasise the importance of effective appropriately-timed laser treatment				
d	emphasise the importance of effective education of patients, the public and health care professionals				
e	detail the various types of interventions and treatment modalities for the different types of diabetic eye disease				
f	detail the stages of diabetic eye disease at which treatment regimens are commenced				
g	manage diabetic eye disease according to their skills and professional scope				
h	refer patients for further treatment at the appropriate stage				

35 SCREENING FOR DIABETIC EYE DISEASE

Upon completion of the diabetes education programme, learners should demonstrate the ability to:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy				
b	describe and perform the screening methods required to detect diabetic retinopathy and the ocular complications of diabetes				

c	describe the screening interval and frequency of retinal examinations for Type I diabetic patients				
d	describe the screening interval and frequency of retinal examinations for Type II diabetic patients				
e	describe the general screening and referral protocols for diabetic retinopathy				
f	describe the specific referral criteria from primary level to secondary level according to the National Guidelines for the Prevention of Blindness in South Africa				
g	correctly use the recommended instrumentation for diabetic retinopathy screening				

36 ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?

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**SECTION F
BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES**

This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

37 BENEFITS TO THE PROFESSION

Health Care Professionals completing an education programme for the prevention and management of the ocular complications of diabetes will **enhance their profession** through:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	greater participation of their Profession in the provision of public health care				
b	contributing to the improvement of the status of the profession				
c	increasing the specialist skills and expertise of the members of their Profession				
d	increasing patient access to health care through increased provision of specialised health care services				

38 BENEFITS TO COMMUNITY AND SOCIETY

Health care workers trained for the prevention and management of the ocular complications of diabetes will **benefit the community and society** through:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	the early detection and referral of sight threatening ocular pathology				

b	preventing or reducing the severity of the ocular complications of diabetes				
c	preventing blindness through early detection of ocular pathology				
d	alleviating the serious socio-economic aspects of uncontrolled diabetes and its ocular complications				
e	reducing the diabetic patient's general systemic disease risk and mortality				
f	providing diabetic patient education for the prevention, management and treatment of diabetes and its complications				
g	reducing the prevalence and severity of Type 2 diabetes in South Africa				
h	reducing the prevalence of the ocular complications of diabetes				

39 BENEFITS TO HEALTH CARE WORKERS

Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will **benefit** through:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	increased professional status				
b	an expansion of their scope of practice				
c	greater job satisfaction				
d	improved specialised competencies and skill				
e	greater remuneration				
f	increased chances of promotion or advancement in employment				

40 ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?

SECTION G

AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

41 ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

The following aspects should be **addressed** in the diabetes education programme for the prevent and management of the ocular complications of diabetes:

		ESSENTIAL	USEFUL	UNNECESSARY	Comments
a	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa				
b	the programme must address the education of diabetic patients in terms of the disease as well as its complications affecting the eyes				
c	the programme must address the issues and policies relating to the provision of public health in South Africa				
d	the programme must address the academic and administrative processes involved with a diabetes education programme				
e	the programme must provide standards and outcomes for the prevention and management of the ocular complications of diabetes				
f	clearly stated benefits of a diabetes education programme				
g	all of the above				
42	ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?				

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LETTER OF FEEDBACK FOR DELPHI PANEL ROUND ONE

**The Development of a Post-Graduate Education and Training
Programme for Health Care Workers for the Management and
Prevention of Ocular Complications in Diabetic Patients**

Dear Delphi panellist

Thank you once again for participating in the Delphi process so far and for taking the time to complete the documentation sent to you. Attached please find the results of the first round of the Delphi process. This feedback is sent to you with the sole purpose of providing you with the results and information regarding the first round. **YOU DO NOT NEED TO DO ANYTHING WITH IT.**

According to Larson and Wissman (2005:45) consensus is reached when 80% of the participants indicate the same value to a specific item, as their choice. In the attached results you will find values in the three columns referring to "1. Essential", "2. Useful" and "3. Unnecessary". These values refer to the percentages of the Delphi panel who rated each particular statement. In the last column is the number of the column that you rated as your choice in the first round. Round two of the Delphi process will reach you very soon. That document will NOT include any of the questions on which consensus was reached in the first round. It will therefore be a very much shortened questionnaire!

Thank you once again for your participation.

Kind regards



Peter Clarke-Farr

FEEDBACK RESULTS TO DELPHI PANEL ROUND ONE

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SECTION A										
CURRICULUM DEVELOPMENT IN HIGHER EDUCATION										
<p>This section deals with curriculum and programme development in the Higher Education Sector.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>										
1 POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL										
In developing an education programme for the prevention and management of the ocular complications of diabetes:										
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
1	a	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 8 (postgraduate diploma level)	7	58	4	33	1	8	Diabetes is a major public health issue in SA and should be integrated into basic training / Not having post-graduate training must not prevent a person from being involved in diabetic prevention or management	
2	b	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 9 (masters degree level)	3	25	2	17	7	58	Diabetes is a major public health issue in SA and should be integrated into basic training / Only if not dealt with comprehensively at level 8 or if it latches on to a remedial module	
3	1	c the Department of Education and Department of Health should support a diabetes education programme for the prevention and management of the ocular complications of diabetes	10	83	2	17	0	0	"Support" means different things to different people/departments/organisations	
4	2	d the optical industry and the Professional Board for Optometry and Dispensing Opticians should support the diabetes education programme	10	83	2	17	0	0	As core competencies for undergraduate education	
5	e	the diabetes education programme should be offered as a structured formally registered SAQA approved programme pegged at the appropriate level on the National Qualifications Framework	7	58	3	25	2	17		
6	f	the diabetes education programme should be offered as an informal or non-SAQA approved short course programme	1	8	6	50	5	42	Could be done as short courses, but only as a help, for referral purposes	
7	g	the diabetes education programme should be offered as a SAQA accredited short course programme	3	25	8	67	1	8	Could be done as short courses, but only as a help, for referral purposes	
8	h	the diabetes education programme should be offered by a University/ University of Technology	4	33	7	58	1	8	Essential if not included in other postgraduate courses / Refresher courses can be offered by various bodies / There must still be education programmes further down the "education ladder" as well	
9	i	the diabetes education programme should be offered by a private training college/organisation	1	8	1	8	10	83	Unless it can be applied commercially	
10	j	the diabetes education programme should be affiliated to an ophthalmic (optometry or opticianry) programme or nursing programme	9	75	3	25	0	0	Both optometry/opticianry as well as nursing as well as inter-institutional bodies	
10	2	20 % CONSENSUS FOR QUESTION 1	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL							
2 OUTCOMES BASED EDUCATION										
In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes based education to ensure that:										
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
11	a	fairness of both testing and grading is facilitated	8	67	2	17	2	17	OBE Does NOT guarantee fairness in grading and testing	
12	b	goals of the course, content and evaluation procedures are both consistent and interrelated	9	75	3	25	0	0		
13	c	course and materials evaluation identify what is effective and working and also what is not	8	67	4	33	0	0		
14	d	orientation from "what I (as a lecturer) must cover" is changed to what a student should be able to do as a consequence of instruction	8	67	3	25	1	8	However, background knowledge needs to underpin "skills"	

15	e	self-evaluation by the students should be encouraged to ensure they know what is expected of them	6	50	5	42	1	8	This however should be carefully monitored	
16	3	f	efficient student learning is facilitated, and anxiety is reduced by providing direction and identifying instructional priorities	10	83	1	8	1	8	
17	4	g	demonstrations of competence must take place at the culminating or end point of the candidates' learning experience	10	83	1	8	1	8	There could be continuous evaluations / This aspect should be on continuous basis
18	h	demonstrations must occur in some context or performance setting	9	75	3	25	0	0	This should be well structured	
19	5	l	demonstrations must show evidence of significant learning	11	92	1	8	0	0	
20	6	j	demonstrations must be of high quality	10	83	2	17	0	0	And should remain current i.e. at cutting edge
21	7	k	the outcomes must be significant, they must be clear and they must be concise.	11	92	1	8	0	0	
11	5	45	% CONSENSUS FOR QUESTION 2	OUTCOMES BASED EDUCATION						
		3	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN							
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of curriculum planning, development and design , therefore:							
22	a	the curriculum development process should be sensitive to the academic setting of the project	6	50	6	50	0	0	Comments And be flexible enough to allow for easy changes if required / People only need to know what is needed for their particular role in the prevention / management "tree"	
23	b	the curriculum development process should be sensitive to the capabilities, interests and priorities of the students for whom the programme is designed to serve	7	58	3	25	2	17	You are dealing with pathology and there are things students should be able to do / Increasing burden of diabetes and potential complications would not allow this.	
24	8	c	the development of the programme should require a detailed knowledge and appreciation of the discipline	10	83	2	17	0	0	
25	d	the development of the programme should require an understanding of the resources and options available to the faculty and educators involved	5	42	5	42	2	17		
26	9	e	it is of utmost importance that appropriate stakeholders are identified and then contribute to the development of the education programme	9	75	3	25	0	0	
27	10	f	a measure of support and acceptance, by the stakeholders, of the outcomes specified is required	9	75	3	25	0	0	
28	11	g	the programme should have a rationale (or mission statement) to explain why the programme exists	10	83	2	17	0	0	This will require some data prior to setting a mission statement
29	12	h	the overall programme aims must be clearly stated, in order to explain what the programme will achieve	12	100	0	0	0	0	
30	13	i	outcome statements must be developed to indicate the knowledge, skills and attitudes learners are to acquire through the programme	10	83	2	17	0	0	Outcomes must be allowed to be slightly flexible
31	j	content statements must be provided to indicate what areas of knowledge will comprise the student learning	9	75	3	25	0	0		
32	k	teaching strategy statements must be provided in order to indicate how the learning activities will be organised	8	67	4	33	0	0	Should however be flexible to allow for changes	
33	l	assessment methodologies must be provided to indicate how student learning will be assessed and reported	9	75	3	25	0	0	In line with the institution and SAQA	
12	6	50	% CONSENSUS FOR QUESTION 3	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN						
		4	IMPLEMENTING AND EVALUATING THE CURRICULUM							
			Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to implementing and evaluating the curriculum, therefore:							
34	14	a	there must be a demonstrable need for the programme	11	92	1	8	0	0	Comments
35	15	b	the academic area must be stable and well defined in terms of the knowledge comprising the programme	11	92	1	8	0	0	It should in fact create a specialised unit in the Department
36	16	c	there must be clear potential for success of the programme	11	92	1	8	0	0	
37	17	d	the department/institution providing the programme must have the necessary resources available	11	92	1	8	0	0	
38	e	any social and political factors that may negatively impact the provision of the programme should be considered	5	42	6	50	1	8	Relevant stakeholders should be identified up front	

39		f	a needs assessment should be conducted in terms of the programme objectives	8	67	4	33	0	0	
40	18	g	the aims/exit level outcomes of the curriculum should be stated	12	100	0	0	0	0	
41	19	h	there should be a clear rationale and justification for the provision of the programme	12	100	0	0	0	0	
42	20	i	assessment criteria and procedures must be clearly stated	11	92	1	8	0	0	
43	21	j	the context and community in which the programme resides should be articulated	11	92	1	8	0	0	
44		k	the entry and admission criteria for the programme must be adequately described	7	58	4	33	1	8	This should be carefully thought through
45	22	l	the form of instruction should be appropriate to the learners' needs	11	92	1	8	0	0	However note must be taken that we are dealing with pathology / to include part time and not only full time
46		m	the programme should allow for individual differences in learners and learning methods	5	42	6	50	1	8	Debateable
47	23	n	provision must be made for adequate availability of learner resources, materials and facilities	11	92	1	8	0	0	
48		o	there should be provision for pilot testing of the proposed programme prior to final implementation	5	42	5	42	2	17	Unnecessary
49		p	criteria must be available for evaluation of all aspects of the programme for the purposes of quality assurance	9	75	3	25	0	0	
50		q	there must be evidence of significant groups and subject specialists involved throughout the development of the proposed programme curriculum	9	75	3	25	0	0	
17	10	59	% CONSENSUS FOR QUESTION 4	IMPLEMENTING AND EVALUATING THE CURRICULUM						
		5	LEARNER ASSESSMENT							
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for learner assessment in order to ensure that:							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
51	24	a	the emphasis should be shifted away from the input or content aspect of programmes towards the objective assessment of the performance of learners in terms of clearly stated outcomes	11	92	1	8	0	0	Will require careful thought / Is the performance of a learner and the outcome not dependent on the quality of the input and content, to some extent?
52		b	the ultimate outcome for each and every person learning in a particular programme should be equivalent and clearly stated	8	67	2	17	2	17	Modularization
53	25	c	the assessment process must be objective and verifiable	10	83	2	17	0	0	
54		d	the responsibilities learners are expected to assume to monitor their own learning must be defined.	9	75	2	17	1	8	
55	26	e	the assessment criteria for each of the abilities/skills that have been developed should be defined	11	92	1	8	0	0	Be careful, subjectivity cannot always be discarded
56		f	there is the establishment of an assessment taskforce, which will include an assessment expert	4	33	8	67	0	0	
57		g	there is an integrated method of assessment covering all aspects of the learning programme	7	58	4	33	1	8	
58		h	there is the establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all subjects/modules	8	67	2	17	2	17	If it is always possible it would be ideal
59		i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors	5	42	5	42	2	17	
60		j	the flow of assessment information, lines of communication and promotion and exclusion processes of students are reflected	8	67	2	17	2	17	
61	27	k	all forms of assessment are moderated by appropriately trained moderators with specific expertise in the learning area	12	100	0	0	0	0	
62	28	l	moderation of learner assessments takes place to ensure that the required level, standard, appropriateness and fairness is observed	11	92	1	8	0	0	
12	5	42	% CONSENSUS FOR QUESTION 5	LEARNER ASSESSMENT						
		6	ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?							
			SECTION B							
			PATIENT DIABETES EDUCATION							
			This section deals with the education of diabetes patients.							
			Please indicate how important each of the following statements is according to the following scale:							
			1 = Essential							

2 = Useful
3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

7 PATIENT'S KNOWLEDGE OF DIABETES

In terms of the patient's knowledge of **diabetes** it would be important for diabetic patients to be aware of:

			ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
63	a	the different types of diabetes	9	75	3	25	0	0	
64	29	b the type of diabetes affecting the patient's themselves	11	92	1	8	0	0	
65	30	c the risk factors that may contribute to the development of diabetes	10	83	1	8	1	8	These cannot be emphasised greatly enough!
66	d	the effect of pregnancy on the development of diabetes	9	75	3	25	0	0	These cannot be emphasised greatly enough!
67	31	e the importance of maintaining good control over their blood sugar level	12	100	0	0	0	0	These cannot be emphasised greatly enough!
68	32	f the importance of having their blood pressure checked and controlled if necessary	12	100	0	0	0	0	These cannot be emphasised greatly enough!
69	33	g the importance of not smoking	12	100	0	0	0	0	These cannot be emphasised greatly enough!

71 % CONSENSUS FOR QUESTION 7

PATIENT'S KNOWLEDGE OF DIABETES

8 PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES

In terms of the patient's knowledge of the **ocular complications of diabetes**, it would be important for diabetic patients to be aware that:

			ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
70	34	a diabetes may affect vision at distance and near	11	92	0	0	1	8	
71	35	b diabetes may change their refractive error / spectacle prescription	10	83	1	8	1	8	
72	c	diabetes may affect colour perception	6	50	5	42	1	8	
73	d	diabetes may affect the nerves of the eyes cause the eyes to become squint	8	67	2	17	1	8	
74	e	diabetes may affect the ability of the eyes to heal if they become injured	9	75	2	17	1	8	
75	36	f diabetes may contribute to cataract formation	10	83	2	17	0	0	
76	37	g diabetes may cause bleeding and damage to the retinas of the eyes?	10	83	2	17	0	0	These are important as they are the serious complications that we see everyday and battle to treat
77	h	diabetes may cause new blood vessels to grow inside the eyes	9	75	3	25	0	0	These are important as they are the serious complications that we see everyday and battle to treat
78	i	diabetes may cause the pressure in the eyes to increase thus leading to glaucoma	7	58	4	33	1	8	
79	j	diabetes may cause a retinal detachment to occur	8	67	3	25	1	8	

40 % CONSENSUS FOR QUESTION 8

PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES

9 PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES

In terms of the patient's knowledge of the **management and treatment of diabetes**, they should be educated about:

			ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
80	38	a the importance of following a healthy prescribed diet and lifestyle	11	92	1	8	0	0	
81	39	b the importance of regularly measuring their blood sugar as scheduled by their medical practitioner	12	100	0	0	0	0	"medical practitioner" to be changed to "health care professional"
82	40	c the importance of regular exercise	11	92	1	8	0	0	
83	41	d the importance of maintaining an ideal body weight	10	83	2	17	0	0	change "ideal" to appropriate
84	42	e the importance of taking their medication exactly as prescribed	12	100	0	0	0	0	
85	43	f the importance of going for regular medical check ups at the clinic / doctor	12	100	0	0	0	0	
86	44	g the importance of undergoing regular eye examinations	12	100	0	0	0	0	
87	45	h the general systemic complications that may occur with diabetes	11	92	1	8	0	0	and how they may be managed and treated

88	46	i	the ocular complications that may occur with diabetes and how they may be managed/treated	12	100	0	0	0	0	
9	9	100	% CONSENSUS FOR QUESTION 9	PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES						
		10	ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?							
			All these aspects have to be part of the basic undergraduate training / It must be stressed that diabetes causes BLINDNESS, not just poor vision, but that this is PREVENTABLE if, and only if, they have REGULAR eye check ups by an appropriate clinician / Family members should be included in the management as much as possible / Also to know signs and symptoms of too high or too low blood sugar levels and then what to do / A helpline should exist for such patients as many have had amputations and have no means of getting to even a clinic / Patients should know the Prevalence of Blindness due to Diabetes as this is often not taken seriously and they feel it wont happen to them.							
			SECTION C PUBLIC HEALTH IN SOUTH AFRICA							
			This section deals with issues related to the provision of public health in South Africa. Please indicate how important each of the following statements is according to the following scale: 1 = Essential 2 = Useful 3 = Unnecessary Please mark the appropriate block with an X. Only mark one option.							
		11	LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS							
			In terms of the legislation and scope of the health care workers' professions, the following must be integral to an education programme for the prevention and management the ocular complications of diabetes:							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
89	47	a	the definition of a primary health care nurse	10	83	2	17	0	0	
90	48	b	the definition of an ophthalmic nurse	10	83	2	17	0	0	
91	49	c	the definition of a diabetes educator	10	83	1	8	0	0	
92		d	the definition of an optometrist	9	75	2	17	1	8	
93	50	e	the scope of practice of a nurse	11	92	1	8	0	0	
94	51	f	the scope of practice of an optometrist	10	83	2	17	0	0	
95		g	the function and scope of allied health care workers	8	67	4	33	0	0	
96	52	h	the acts and procedures that fall within the scope of nursing	10	83	1	8	1	8	
97	53	i	the acts and procedures that fall within the scope of optometry	10	83	2	17	0	0	
98	54	j	the acts or procedures that should be performed during the management and treatment of the ocular complications of diabetic patients	12	100	0	0	0	0	
99	55	k	the responsibilities of the patient	10	83	2	17	0	0	
100		l	the relevant health legislation pertaining to the provision of health care in South Africa	9	75	2	17	1	8	
12	9	75	% CONSENSUS FOR QUESTION 11	LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS						
		12	POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH							
			In terms of the policies of the South Africa Department of Health, the following policies must be integral to an education programme for the prevention and management of the ocular complications of diabetes:							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
101	56	a	The RSA Department of Health's National Programme for Control and Management of Type 2 Diabetes	11	92	1	8	0	0	
102	57	b	The National Guidelines for the Prevention of Blindness in South Africa	10	83	2	17	0	0	
103		c	Strategic Priorities for the National Health System 2004-2009	7	58	5	42	0	0	
104	58	d	The Primary Health Care Package for South Africa: A Set of Norms and Standards	10	83	1	8	1	8	
105		e	All relevant acts and/or professional guidelines issued by the HPCSA	9	75	2	17	1	8	

106		f	The Patient's Rights Charter	7	58	4	33	1	8	
6	3	50	% CONSENSUS FOR QUESTION 12	POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH						
		13	ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA							
			Public health at Universities cover disease profiles (morbidity and mortality), the DHS, interdisciplinary and inter-sectoral collaborations / Adhering to and trying to "please" all the above policies will lead to a lot of frustrations. Primary Health Care Standard Treatment Guidelines and Essential Drugs List + Hospital level Standard Treatment Guidelines and Essential Drug List for Adults + Hospital level Standard Treatment Guidelines and Essential Drug List for Paediatrics +all additional/ updated pertinent guidelines / policies that may be developed +Cataract Surgery Guidelines + Refractive Errors Screening Guidelines							
			SECTION D							
			ACADEMIC AND ADMINISTRATIVE ASPECTS							
			This section deals with issues related to the academic and administrative aspects of a diabetes education programme:							
			Please indicate how important each of the following statements is according to the following scale:							
			1 = Essential 2 = Useful 3 = Unnecessary							
			Please mark the appropriate block with an X. Only mark one option.							
		14	ORGANISATION OF THE PROGRAMME							
			In terms of the organisation of a diabetes curriculum, there must be:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
107	59	a	written objectives for the education programme	12	100	0	0	0	0	
108	60	b	the provision of all necessary resources in order to achieve the proposed objectives	10	83	2	17	0	0	
109		c	the composition of the organisation must include the teaching team and its members, a co-ordinator and an advisory committee	9	75	2	17	1	8	
3	2	67	% CONSENSUS FOR QUESTION 14	ORGANISATION OF THE PROGRAMME						
		15	PROGRAMME CO-ORDINATION							
			In terms of the programme co-ordination , there must be:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
110	61	a	a specific programme co-ordinator who will be responsible for overseeing the overall progress of the programme, including the planning, implementation and evaluation thereof	11	92	0	0	1	8	Essential initially, useful thereafter
1	1	100	% CONSENSUS FOR QUESTION 15	PROGRAM						
		16	ADVISORY COMMITTEE							
			In terms of the advisory committee for the programme, there must be:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
111		a	an advisory committee established to ensure quality assurance of the diabetes education programme	6	50	5	42	1	8	
112		b	the advisory committee should have interdisciplinary and intersectoral integration	4	33	6	50	2	17	
113	62	c	the advisory committee should have current experience and understanding of diabetes management	11	92	0	0	1	8	
114		d	the advisory committee should have regular meetings	4	33	7	58	1	8	Maybe initially
115		e	the advisory committee should plan and review the programme on an annual basis	6	50	4	33	2	17	More frequent than on an annual basis
116		f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators	5	42	4	33	3	25	Is this the advisory committee function?
6	1	17	% CONSENSUS FOR QUESTION 16	ADVISORY COMMITTEE						

17		DIABETES EDUCATION PROGRAMME								
		In terms of the overall diabetes education programme :								
			<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments	
117	63	a	the programme must aim to ensure accessibility to the overall learner population to whom it is directed	11	92	1	8	0	0	According to specific criteria / Transport costs are a big deterrent to learners and patients etc
118		b	the target population should be defined with regard to the potential number of patients, type of diabetes, age, language, regional characteristics and special educational needs.	8	67	2	17	2	17	
119		c	the programme curriculum must be suitably flexible in terms of mode of delivery to accommodate the diversity of circumstances of potential learners	8	67	4	33	0	0	
120	64	d	the curriculum document of the programme should reflect the objectives, course contents and outcomes	10	83	2	17	0	0	
121		e	the curriculum document of the programme should reflect the teaching methodology, ordering, sequencing and duration of modules/coursework	8	67	3	25	1	8	Individual initiative also to be encouraged
122		f	the curriculum document of the programme should reflect the educational materials to be used	6	50	6	50	0	0	Should however be flexible
123		g	the curriculum document of the programme should reflect the evaluation and assessment instruments	8	67	4	33	0	0	
124		h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice	5	42	5	42	2	17	Only at higher levels
8	2	25	% CONSENSUS FOR QUESTION 17							DIABETES EDUCATION PROGRAMME
18		MISSION AND PURPOSE								
		In terms of the mission and purpose of the diabetes programme:								
			<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments	
125	65	a	the mission and purpose of the programme must be clearly stated	10	83	1	8	0	0	
126		b	the mission and purpose of the programme should fit into the broad mission statement of the Institution at which it is provided	4	33	6	50	1	8	
127		c	the mission of the programme should address the needs of the community in which the Institution resides	6	50	3	25	2	17	
128		d	the purpose statement of the programme must indicate what learners will be able to do upon successful completion of the programme	9	75	1	8	1	8	
4	1	25	% CONSENSUS FOR QUESTION 18							MISSION AND PURPOSE
19		TEACHING PERSONNEL								
		The teaching personnel of the organisation and programme should meet the following requirements:								
			<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments	
129	66	a	they should have specialised knowledge of all aspects of the diagnosis, control and treatment/management of all aspects of diabetes	10	83	1	8	1	8	Collectively
130		b	the core teaching team should include an optometrist, medical practitioner, nutritionist, nurse, diabetes educator and/or other appropriately trained health care professional	7	58	5	42	0	0	Could also include social workers and counsellors
131	67	c	they should have appropriate educational qualifications and experience to instruct at the higher education level	10	83	1	8	1	8	
3	2	67	% CONSENSUS FOR QUESTION 19							TEACHING PERSONNEL
20		EDUCATIONAL METHODOLOGIES								
		The following educational methodologies should be utilised in the programme:								
			<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments	
132		a	interactive learner participation with modalities such as group work, self study, class presentations and projects or assignments	6	50	5	42	1	8	Should be structured as in-service training and adapted to context
133	68	b	clinical and practical training in order to develop skills required for the treatment and management of diabetic patients	12	100	0	0	0	0	
134	69	c	practical training aimed at exposing learners to clinics, community health centres and hospitals treating diabetic patients	12	100	0	0	0	0	

135		d	theoretical and practical training aimed at exposing learners to ophthalmological treatment of diabetic patients	9	75	3	25	0	0	Keeping their scope in mind / Fine in theory, but quite difficult in practice	
136	70	e	theoretical and practical/clinical training that may be effectively supervised and assessed by instructors / lecturers	11	92	1	8	0	0		
137	71	f	small group teaching should be encouraged in order to facilitate closer interaction between learner and educator	10	83	2	17	0	0		
138		g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills	3	25	4	33	5	42		
139		h	uses reflective practice, problem-solving and decision-making skills as part of its learning process	8	67	4	33	0	0		
140		i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning	5	42	7	58	0	0		
9	4	44	% CONSENSUS FOR QUESTION 20	EDUCATIONAL METHODOLOGIES							
		21	LEARNER ASSESSMENT								
			The following forms of learner assessment must be included in the education programme:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
141		a	formative assessment methodologies	8	67	2	17	2	17		
142	72	b	summative assessment methodologies	10	83	1	8	1	8		
143		c	evaluation of theoretical learning	9	75	3	25	0	0		
144	73	d	evaluation of practical/clinical learning	12	100	0	0	0	0		
145		e	a variety of forms of assessment should be employed to ensure that learner's knowledge is assessed by the most appropriate means	9	75	3	25	0	0	Learners must be able to identify disease. It is not crucial if they don't know exactly how it developed etc	
5	2	40	% CONSENSUS FOR QUESTION 21	LEARNER ASSESSMENT							
		22	FORMAT OF PROGRAMME AND MODULES								
			The following should be considered for the format of programme and modules :								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
146		a	the traditional emphasis on instructional time or programme duration should be replaced with greater emphasis on student learning and achievement of outcomes	8	67	3	25	1	8	Within limits and with clear parameters / An excellent "mind-set" change	
147	74	b	time-based learning policies should shift to mastery of skills and knowledge by the learners	10	83	2	17	0	0	However there should be an ultimate period defined within which the learner gains the necessary skills and knowledge	
148		c	learning should take place through a learner-centred approach rather than a lecturer-centred approach	9	75	3	25	0	0	Would have to be careful	
149		d	learner development of individual research projects and assignments at the appropriate post-graduate level	5	42	6	50	1	8		
150		e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme	5	42	4	33	3	25	Would be an ideal learning environment Course needs to be ordered and well structured	
5	1	20	% CONSENSUS FOR QUESTION 22	FORMAT OF PROGRAMME AND MODULES							
		23	ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE								
			The following admission requirements & learning assumed to be in place must be clearly documented:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
151	75	a	the minimum admission requirements to the training programme	11	92	0	0	1	8	Try not to exclude people who are keen as there is a role for everyone at some level of prevention and management. Different role players have to have different requirements	
152		b	the requirements for clinical and theoretic learning assumed to be in place prior to admission to the programme	7	58	5	42	0	0	May not always be possible	
153		c	a formal policy of recognition of prior learning	8	67	4	33	0	0	Be implemented carefully	
154		d	the specific requirements for admission to examinations	9	75	3	25	0	0		
155	76	e	promotion criteria from module to module or to the following level of study	10	83	1	8	1	8		
5	2	40	% CONSENSUS FOR QUESTION 23	ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE							
		24	ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS								
			The following should constitute the required academic qualifications for programme lecturers and instructors :								

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
156		a	a post-graduate qualification in the appropriate field (at least Masters Degree, preferably Doctorate)	4	33	6	50	2	17	Good educators may not have post-graduate qualifications
157		b	a formal qualification in higher education teaching methodology	2	17	6	50	4	33	Not an imperative
158		c	a minimum of 5 years of experience lecturing in higher education	0	0	7	58	5	42	Questionable
159	77	d	registration with the appropriate Health Professions Board or Council	10	83	0	0	2	17	Be flexible with "appropriate"
4	1	25	% CONSENSUS FOR QUESTION 24		ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS					
		25	ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS							
			The reason for the word "assumed" in statement number 23 is not clear							
			SECTION E							
			STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES							
			<p>This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes:</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>							
		26	OVERVIEW AND CLASSIFICATION OF DIABETES							
			Upon completion of the diabetes education programme, learners should be able to:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
160	78	a	comprehensively describe the various TYPES of diabetes	12	100	0	0	0	0	
161	79	b	CLASSIFY the various types of diabetes	11	92	1	8	0	0	
162	80	c	comprehensively describe the various CAUSES of TYPE I diabetes	10	83	1	8	1	8	
163	81	d	comprehensively describe the various CAUSES of TYPE II diabetes	11	92	1	8	0	0	
164	82	e	comprehensively describe the various EFFECTS of uncontrolled diabetes on the human body	11	92	1	8	0	0	
165	83	f	comprehensively describe the pathophysiology of diabetes	10	83	2	17	0	0	
166	84	g	describe the primary actions of insulin	10	83	2	17	0	0	.What about oral medication? Also consider interactions, side-effects, special precautions.
7	7	100	% CONSENSUS FOR QUESTION 26		OVERVIEW AND CLASSIFICATION OF DIABETES					
		27	CRITICAL CROSS-FIELD OUTCOMES							
			Upon completion of the diabetes education programme, learners should have the ability :							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
167	85	a	to identify and solve problems with responsible decisions shown to be the result of critical and creative thinking	10	83	2	17	0	0	
168	86	b	to work effectively with others as a member of a team, group, organisation and community	10	83	2	17	0	0	
169		c	to organise and manage oneself and one's activities responsibly and effectively	9	75	3	25	0	0	
170		d	to collect, analyse, organise and critically evaluate information	9	75	2	17	1	8	
171		e	to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation	8	67	4	33	0	0	
172		f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others	6	50	5	42	1	8	

173		g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation	5	42	6	50	1	8	Unsure of this very broad statement
174		h	to demonstrate cultural and aesthetic sensitivity to all patients and colleagues and learners in the everyday working environment	9	75	3	25	0	0	
8	2	25	% CONSENSUS FOR QUESTION 27	CRITICAL CROSS-FIELD OUTCOMES						
		28	CRITICAL OUTCOMES FOR HEALTH CARE WORKERS							
			Upon completion of the diabetes education programme, learners should have the ability :							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
175		a	to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations	9	75	3	25	0	0	
176	87	b	to practice effectively in accordance with the professional and legal framework (knowledge, skills and attitudes/values) as a member of the health team	11	92	1	8	0	0	
177		c	to use specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs	9	75	2	17	0	0	Need to define specialist skills
178		d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care	4	33	5	42	3	25	May need to provide service
179	88	e	to work as part of a multi-professional team, in which the leadership role changes in response to changing client needs	11	92	1	8	0	0	
180		f	to develop and use flexible and innovative approaches to practice appropriate to the needs of the patient in line with the goals of the health service and the employing authority	5	42	7	58	0	0	
181		g	to have an understanding of health promotion and preventative policies and strategies	9	75	3	25	0	0	
182		h	to facilitate and assess the professional and other development needs of all for whom they are responsible, including where appropriate learners, and to act as a role model for professional practice	7	58	4	33	1	8	
183		i	to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.	6	50	6	50	0	0	
184		j	to evaluate quality of care delivered as an ongoing and cumulative process	6	50	6	50	0	0	
185		k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care	7	58	4	33	1	8	
186		l	to use science in the practice of health and medicine	6	50	5	42	1	8	Depends at what level
187	89	m	to diagnose, manage and prevent diseases	10	83	1	8	1	8	Within their scope, Should state prevent, diagnose and manage (prevent should appear first)
188		n	to use prior training and education in problem solving in a clinical situation	9	75	3	25	0	0	
189		o	the ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards	7	58	3	25	2	17	Different role players will have different roles in the management. It is not crucial that learners be expected to do all of the above mentioned
190		p	the ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration	8	67	4	33	0	0	There may be more
16	3	19	% CONSENSUS FOR QUESTION 28	CRITICAL OUTCOMES FOR HEALTH CARE WORKERS						
		29	DIABETES STANDARDS FOR EDUCATION PROGRAMMES							
			The curriculum for diabetes education will need to demonstrate that it:							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
191	90	a	supports students to gain knowledge, and develop skills and competence to deliver diabetes education in general and the ocular complications of diabetes in particular	11	92	1	8	0	0	
192		b	has processes in place to recognise prior diabetes learning	6	50	5	42	1	8	Should not necessarily be a prerequisite
193		c	has processes for collaboration with relevant diabetes organisations, associations and other bodies where appropriate	7	58	5	42	0	0	
194	91	d	integrates diabetic theory, research and clinical practice	10	83	2	17	0	0	
195	92	e	has appropriate resources to deliver the curriculum, including the quantity and quality of clinical experience and supervision	12	100	0	0	0	0	
196	93	f	is delivered by a teacher/instructor with the appropriate education and qualifications to teach the subjects allocated to them	12	100	0	0	0	0	Or perhaps sometimes just experience
197	94	g	has procedures in place to approve and monitor facilities where clinical experience is undertaken	11	92	1	8	0	0	

198	95	h	will, upon successful completion of the course lead to a qualification in the prevention, management and treatment of the ocular complications of diabetes	11	92	1	8	0	0	Within their scope
199		l	equips the student to deal with professional issues, role conflict and the delivery of diabetes education according to the role they are expected to perform	8	67	4	33	0	0	
200		j	is clearly defined in the context of the particular society and healthcare system in which the programme is to be delivered.	9	75	3	25	0	0	
10	6	60	% CONSENSUS FOR QUESTION 29	DIABETES STANDARDS FOR EDUCATION PROGRAMMES						
		30	CRITERIA FOR DIAGNOSIS OF DIABETES							
			Upon completion of the diabetes education programme, learners should be able to describe :							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
201	96	a	the diagnostic criteria for diabetes	12	100	0	0	0	0	
202		b	the diagnostic criteria for diabetes conforming to internationally accepted standards and norms	8	67	3	25	1	8	International criteria may be adjusted to South African criteria for particular reasons, chief among them would be resources. It would then be imperative that S A criteria be utilised.
203	97	c	the diagnostic criteria for diabetes taking into account the criteria outlined by the South African Department of Health as part of its National Programme for Control and Management of Diabetes Type 2	12	100	0	0	0	0	
3	2	67	% CONSENSUS FOR QUESTION 30	CRITERIA FOR DIAGNOSIS OF DIABETES						
		31	RISK FACTORS FOR DIABETES							
			Upon completion of the diabetes education programme, learners should be able to identify :							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
204		a	the known modifiable and non-modifiable risk factors for developing Type 1 diabetes	9	75	2	17	1	8	
205	98	b	the known modifiable and non-modifiable risk factors for developing Type 2 diabetes	12	100	0	0	0	0	
206	99	c	all the risk factors having an influence on the incidence and progression of diabetic retinopathy	11	92	1	8	0	0	
3	2	67	% CONSENSUS FOR QUESTION 31	RISK FACTORS FOR DIABETES						
		32	SYSTEMIC COMPLICATIONS							
			Upon completion of the diabetes education programme, learners should be able to explain :							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
207	100	a	explain the acute (short term) systemic complications of diabetes mellitus	10	83	2	17	0	0	
208	101	b	explain the long term systemic complications of diabetes mellitus	12	100	0	0	0	0	
2	2	100	% CONSENSUS FOR QUESTION 32	SYSTEMIC COMPLICATIONS						
		33	OCULAR COMPLICATIONS							
			Upon completion of the diabetes education programme, learners should be able to comprehensively describe :							
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
209	102	a	the refractive changes that may occur in diabetic patients	11	92	0	0	1	8	
210	103	b	the changes that may occur in the eyes in terms of visual performance (Such as reduced visual acuity, blue-yellow colour defects, abnormal contrast sensitivity and field loss)	11	92	1	8	0	0	
211	104	c	the nerve palsies and defects that may occur in diabetic patients	11	92	0	0	1	8	
212	105	d	the various pathophysiological effects of diabetes on the cornea	10	83	0	0	2	17	
213	106	e	the lenticular changes and processes leading to diabetic cataracts	10	83	2	17	0	0	
214	107	f	the neovascular response of the eye to ocular ischaemia secondary to the diabetes, including the development of rubeosis irides	12	100	0	0	0	0	
215	108	g	the development of ocular hypertension and glaucoma in diabetic patients	10	83	0	0	2	17	

216		h	the neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders	9	75	1	8	2	17	
217	109	i	the processes leading to tractional retinal and vitreous detachments due to diabetes	10	83	1	8	1	8	
218	110	j	the skin and eyelid disorders and infections that may be encountered in diabetic patients	10	83	0	0	2	17	
219	111	k	all aspects of ocular or diabetic retinopathy	10	83	2	17	0	0	
220	112	l	the pathogenesis of ocular retinopathy	10	83	1	8	1	8	
221	113	m	the various forms of classification of diabetic retinopathy	11	92	1	8	0	0	
222	114	m	the various forms of ocular pathology comprising diabetic retinopathy	12	100	0	0	0	0	
15	14	93	% CONSENSUS FOR QUESTION 33	OCULAR COMPLICATIONS						
		34	MANAGEMENT OF DIABETIC EYE DISEASE							
			For managing diabetic eye disease, upon completion of the education programme, learners should be able to:							
					ESSENTIAL	%	USEFUL	%	UNNECESSARY	%
										Comments
223	115	a	emphasise the role of prevention in the management of diabetic eye disease	12	100	0	0	0	0	Delete the words "in the management" - The aim is to prevent the development of diabetic eye disease
224	116	b	emphasise the role of early detection of retinopathy and the monitoring of existing retinopathy with regular and appropriately timed fundus examinations	12	100	0	0	0	0	
225	117	c	emphasise the importance of effective appropriately-timed laser treatment	11	92	1	8	0	0	Linked to the above
226	118	d	emphasise the importance of effective education of patients, the public and health care professionals	12	100	0	0	0	0	
227	119	e	detail the various types of interventions and treatment modalities for the different types of diabetic eye disease	10	83	2	17	0	0	
228	120	f	detail the stages of diabetic eye disease at which treatment regimens are commenced	10	83	2	17	0	0	
229	121	g	manage diabetic eye disease according to their skills and professional scope	10	83	1	8	1	8	
230	122	h	refer patients for further treatment at the appropriate stage	11	92	1	8	0	0	ensure that the patient does not get 'lost' within the system without the appropriate intervention/ treatment).
8	8	100	% CONSENSUS FOR QUESTION 34	MANAGEMENT OF DIABETIC EYE DISEASE						
		35	SCREENING FOR DIABETIC EYE DISEASE							
			Upon completion of the diabetes education programme, learners should demonstrate the ability to:							
					ESSENTIAL	%	USEFUL	%	UNNECESSARY	%
										Comments
231		a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy	5	42	6	50	1	8	
232	123	b	describe and perform the screening methods required to detect diabetic retinopathy and the ocular complications of diabetes	11	92	0	0	1	8	
233	124	c	describe the screening interval and frequency of retinal examinations for Type I diabetic patients	10	83	1	8	1	8	
234		d	describe the screening interval and frequency of retinal examinations for Type II diabetic patients	8	67	1	8	1	8	Repeated, Essential if Type II, You mean Type II here
235	125	e	describe the general screening and referral protocols for diabetic retinopathy	11	92	0	0	1	8	
236	126	f	describe the specific referral criteria from primary level to secondary level according to the National Guidelines for the Prevention of Blindness in South Africa	11	92	0	0	1	8	
237	127	g	correctly use the recommended instrumentation for diabetic retinopathy screening	12	100	0	0	0	0	
7	5	71	% CONSENSUS FOR QUESTION 35	SCREENING FOR DIABETIC EYE DISEASE						
		36	ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?							
			Be able to distinguish between referral for diabetic retinopathy and other ocular conditions. If patients are screened they should be referred for refractive errors etc even if they do not have diabetic eye disease.							
			SECTION F							
			BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES							
			This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:							

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
		37	BENEFITS TO THE PROFESSION							
		Health Care Professionals completing an education programme for the prevention and management of the ocular complications of diabetes will enhance their profession through:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
238	128	a	greater participation of their Profession in the provision of public health care	10	83	2	17	0	0	More posts for government employed optometrists need to be created
239		b	contributing to the improvement of the status of the profession	7	58	5	42	0	0	
240		c	increasing the specialist skills and expertise of the members of their Profession	9	75	3	25	0	0	
241	129	d	increasing patient access to health care through increased provision of specialised health care services	12	100	0	0	0	0	
4	2	50	% CONSENSUS FOR QUESTION 37		BENEFITS TO THE PROFESSION					
		38	BENEFITS TO COMMUNITY AND SOCIETY							
		Health care workers trained for the prevention and management of the ocular complications of diabetes will benefit the community and society through:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
242	130	a	the early detection and referral of sight threatening ocular pathology	12	100	0	0	0	0	
243	131	b	preventing or reducing the severity of the ocular complications of diabetes	12	100	0	0	0	0	
244	132	c	preventing blindness through early detection of ocular pathology	12	100	0	0	0	0	
245	133	d	alleviating the serious socio-economic aspects of uncontrolled diabetes and its ocular complications	12	100	0	0	0	0	
246	134	e	reducing the diabetic patient's general systemic disease risk and mortality	12	100	0	0	0	0	
247	135	f	providing diabetic patient education for the prevention, management and treatment of diabetes and its complications	12	100	0	0	0	0	
248	136	g	reducing the prevalence and severity of Type 2 diabetes in South Africa	11	92	1	8	0	0	
249	137	h	reducing the prevalence of the ocular complications of diabetes	12	100	0	0	0	0	
8	8	100	% CONSENSUS FOR QUESTION 38		BENEFITS TO COMMUNITY AND SOCIETY					
		39	BENEFITS TO HEALTH CARE WORKERS							
		Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will benefit through:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
250		a	increased professional status	7	58	4	33	1	8	Probably yes, but nurses are often rotated through other disciplines and the training would be 'lost' They must be retained within this specific field and a clause to this effect should be stipulated in the "contract of further education"
251	138	b	an expansion of their scope of practice	10	83	1	8	0	0	
252	139	c	greater job satisfaction	11	92	1	8	0	0	
253	140	d	improved specialised competencies and skill	11	92	0	0	0	0	
254		e	greater remuneration	3	25	5	42	2	17	Part of basic comprehensive exam / Not necessarily but potentially / Only certain qualifications attract
255		f	increased chances of promotion or advancement in employment	6	50	3	25	1	8	Not necessarily but potentially
5	3	60	% CONSENSUS FOR QUESTION 39		BENEFITS TO HEALTH CARE WORKERS					
		40	ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?							

The issue of whether the diploma will be recognised in the career structure needs to be looked at. Will hospitals see this as a promotional qualification?

SECTION G

AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

41 ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

The following aspects should be **addressed** in the diabetes education programme for the prevention and management of the ocular complications of diabetes:

			ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
256		a	4	33	4	33	2	17	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa
257	141	b	11	92	0	0	0	0	the programme must address the education of diabetic patients in terms of the disease as well as its complications affecting the eyes
258		c	6	50	4	33	1	8	the programme must address the issues and policies relating to the provision of public health in South Africa
259		d	6	50	2	17	2	17	the programme must address the academic and administrative processes involved with a diabetes education programme
260		e	6	50	4	33	0	0	the programme must provide standards and outcomes for the prevention and management of the ocular complications of diabetes
261		f	9	75	1	8	0	0	clearly stated benefits of a diabetes education programme
262		g	4	33	2	17	0	0	all of the above

7 1 14 % CONSENSUS FOR QUESTION 41 ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

42 ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?

Answers would change if the level was pitched at a higher or lower academic level / A section should be included which deals in greater depth with other than only ocular complications. Also for patients to realise the other risks. There may be a problem if the programme is aimed at a high level which may limit the pool of graduates and therefore limit the "penetration" into the general public. The problem could be solved if specific skills are rewarded in rural posts, but for that one needs DoH action in order to ensure accessibility / Need to focus on key causes of blindness so that when they are screening they do not ignore other potentially blinding conditions. Also it is important that skills around program planning are incorporated so that they can use the education to develop appropriate interventions.

262 141 54 TOTAL PERCENTAGE CONSENSUS FOR ENTIRE QUESTIONNAIRE

ACCOMPANYING LETTER TO DELPHI PANEL ROUND TWO

**THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND TRAINING
PROGRAMME FOR HEALTH CARE WORKERS FOR THE PREVENTION
AND MANAGEMENT OF OCULAR COMPLICATIONS IN DIABETIC
PATIENTS**

Dear Delphi Participant

Thank you once again for your time and co-operation so far with this Delphi process. You should have received results and feedback from the first round.

Attached please find the second round of the Delphi process. You will notice that it is very much shorter as I have removed those questions/statements upon which consensus was reached by the 12 members of the Delphi panel. This questionnaire will therefore only include statements/questions on which consensus was not reached in the first round. The questionnaire has also been adapted to reflect the percentage scores of the panel members from the last round in the three columns. The fourth column is the number of your particular choice from the last round.

Round two enables you to reconsider your opinion on a specific statement in light of the opinions of the other participants. During this second round you are allowed to change your opinion if you so wish. You can therefore indicate a different level of importance to any of the statements should you think it appropriate. **Please place an "X" in the column of your choice and do this even if your choice remains the same as the first round.** Please answer all the questions.

Please note that even if your comments are not reflected in the statements of this round, rest assured that all comments will be included in the final development of the programme. You may once again include any additional comments in this questionnaire. Your response will remain anonymous and confidential to all other participants and will only be known by the researcher.

The completion of this second round should take you no longer than 20 to 30 minutes. If possible I would like to receive feedback on this round not later than 22 July 2005.

Thank you again for your time and assistance in this research.

Kind regards

A handwritten signature in black ink, appearing to read 'P. Clarke-Farr', written in a cursive style.

Peter Clarke-Farr

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QUESTIONNAIRE FOR DELPHI PANEL ROUND TWO

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SECTION A						
CURRICULUM DEVELOPMENT IN HIGHER EDUCATION						
<p>This section deals with curriculum and programme development in the Higher Education Sector.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>						
1 POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL						
In developing an education programme for the prevention and management of the ocular complications of diabetes:						
		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 8 (postgraduate diploma level)	58	33	8	2	
b	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 9 (masters degree level)	25	17	58	3	
e	the diabetes education programme should be offered as a structured formally registered SAQA approved programme pegged at the appropriate level on the National Qualifications Framework	58	25	17	1	
f	the diabetes education programme should be offered as an informal or non-SAQA approved short course programme	8	50	42	2	
g	the diabetes education programme should be offered as a SAQA accredited short course programme	25	67	8	2	
h	the diabetes education programme should be offered by a University/ University of Technology	33	58	8	2	
i	the diabetes education programme should be offered by a private training college/organisation	8	8	83	3	
j	the diabetes education programme should be affiliated to an ophthalmic (optometry or opticianry) programme or nursing programme	75	25	0	1	
2 OUTCOMES BASED EDUCATION						
In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes based education to ensure that:						
		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments

a	fairness of both testing and grading is facilitated	67	17	17	1	
b	goals of the course, content and evaluation procedures are both consistent and interrelated	75	25	0	1	
c	course and materials evaluation identify what is effective and working and also what is not	67	33	0	2	
d	orientation from "what I (as a lecturer) must cover" is changed to what a student should be able to do as a consequence of instruction	67	25	8	1	
e	self-evaluation by the students should be encouraged to ensure they know what is expected of them	50	42	8	2	
h	demonstrations must occur in some context or performance setting	75	25	0	1	

3 CURRICULUM PLANNING, DEVELOPMENT AND DESIGN

In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of **curriculum planning, development and design**, therefore:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	the curriculum development process should be sensitive to the academic setting of the project	50	50	0	2	
b	the curriculum development process should be sensitive to the capabilities, interests and priorities of the students for whom the programme is designed to serve	58	25	17	3	
d	the development of the programme should require an understanding of the resources and options available to the faculty and educators involved	42	42	17	2	
e	it is of utmost importance that appropriate stakeholders are identified and then contribute to the development of the education programme	75	25	0	1	
f	a measure of support and acceptance, by the stakeholders, of the outcomes specified is required	75	25	0	2	
j	content statements must be provided to indicate what areas of knowledge will comprise the student learning	75	25	0	2	
k	teaching strategy statements must be provided in order to indicate how the learning activities will be organised	67	33	0	1	
l	assessment methodologies must be provided to indicate how student learning will be assessed and reported	75	25	0	1	

4 IMPLEMENTING AND EVALUATING THE CURRICULUM

Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to **implementing and evaluating** the curriculum, therefore:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
e	any social and political factors that may negatively impact the provision of the programme should be considered	42	50	8	2	
f	a needs assessment should be conducted in terms of the programme objectives	67	33	0	1	
k	the entry and admission criteria for the programme must be adequately described	58	33	8	1	
m	the programme should allow for individual differences in learners and learning methods	42	50	8	2	
o	there should be provision for pilot testing of the proposed programme prior to final implementation	42	42	17	3	
p	criteria must be available for evaluation of all aspects of the programme for the purposes of quality assurance	75	25	0	1	

q	there must be evidence of significant groups and subject specialists involved throughout the development of the proposed programme curriculum	75	25	0	2	
5 LEARNER ASSESSMENT						
In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for learner assessment in order to ensure that:						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
b	the ultimate outcome for each and every person learning in a particular programme should be equivalent and clearly stated	67	17	17	1	
d	the responsibilities learners are expected to assume to monitor their own learning must be defined.	75	17	8	2	
f	there is the establishment of an assessment taskforce, which will include an assessment expert	33	67	0	2	
g	there is an integrated method of assessment covering all aspects of the learning programme	58	33	8	2	
h	there is the establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all subjects/modules	67	17	17	1	
i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors	42	42	17	2	
j	the flow of assessment information, lines of communication and promotion and exclusion processes of students are reflected	67	17	17	1	
6 ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?						
SECTION B PATIENT DIABETES EDUCATION						
<p>This section deals with the education of diabetes patients.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>						
7 PATIENT'S KNOWLEDGE OF DIABETES						
In terms of the patient's knowledge of diabetes it would be important for diabetic patients to be aware of:						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
a	the different types of diabetes	75	25	0	1	
d	the effect of pregnancy on the development of diabetes	75	25	0	1	
8 PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES						

In terms of the patient's knowledge of the ocular complications of diabetes , it would be important for diabetic patients to be aware that:						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
c	diabetes may affect colour perception	50	42	8	1	
d	diabetes may affect the nerves of the eyes cause the eyes to become squint	67	17	8	2	
e	diabetes may affect the ability of the eyes to heal if they become injured	75	17	8	1	
h	diabetes may cause new blood vessels to grow inside the eyes	75	25	0	2	
i	diabetes may cause the pressure in the eyes to increase thus leading to glaucoma	58	33	8	2	
j	diabetes may cause a retinal detachment to occur	67	25	8	1	

10 ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?

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**SECTION C
PUBLIC HEALTH IN SOUTH AFRICA**

This section deals with issues related to the provision of public health in South Africa.

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS

In terms of the **legislation and scope** of the health care workers' professions, the following must be integral to an education programme for the prevention and management the ocular complications of diabetes:

		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
d	the definition of an optometrist	75	17	8	1	
g	the function and scope of allied health care workers	67	33	0	1	
l	the relevant health legislation pertaining to the provision of health care in South Africa	75	17	8	1	

12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH

In terms of the policies of the South Africa Department of Health, the following **policies** must be integral to an education programme for the prevention and management of the ocular complications of diabetes:

--

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
c	Strategic Priorities for the National Health System 2004-2009	58	42	0	1	
e	All relevant acts and/or professional guidelines issued by the HPCSA	75	17	8	1	
f	The Patient's Rights Charter	58	33	8	2	

13 ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA

SECTION D ACADEMIC AND ADMINISTRATIVE ASPECTS

This section deals with issues related to the academic and administrative aspects of a diabetes education programme:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

14 ORGANISATION OF THE PROGRAMME

In terms of the **organisation** of a diabetes curriculum, there must be:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
c	the composition of the organisation must include the teaching team and its members, a co-ordinator and an advisory committee	75	17	8	2	

16 ADVISORY COMMITTEE

In terms of the **advisory committee** for the programme, there must be:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	an advisory committee established to ensure quality assurance of the diabetes education programme	50	42	8	1	
b	the advisory committee should have interdisciplinary and intersectoral integration	33	50	17	2	
d	the advisory committee should have regular meetings	33	58	8	2	
e	the advisory committee should plan and review the programme on an annual basis	50	33	17	1	
f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators	42	33	25	2	

17 DIABETES EDUCATION PROGRAMME						
In terms of the overall diabetes education programme :						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
b	the target population should be defined with regard to the potential number of patients, type of diabetes, age, language, regional characteristics and special educational needs.	67	17	17	3	
c	the programme curriculum must be suitably flexible in terms of mode of delivery to accommodate the diversity of circumstances of potential learners	67	33	0	2	
e	the curriculum document of the programme should reflect the teaching methodology, ordering, sequencing and duration of modules/coursework	67	25	8	1	
f	the curriculum document of the programme should reflect the educational materials to be used	50	50	0	1	
g	the curriculum document of the programme should reflect the evaluation and assessment instruments	67	33	0	1	
h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice	42	42	17	2	
18 MISSION AND PURPOSE						
In terms of the mission and purpose of the diabetes programme:						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
b	the mission and purpose of the programme should fit into the broad mission statement of the Institution at which it is provided	33	50	8	3	
c	the mission of the programme should address the needs of the community in which the Institution resides	50	25	17	3	
d	the purpose statement of the programme must indicate what learners will be able to do upon successful completion of the programme	75	8	8	1	
19 TEACHING PERSONNEL						
The teaching personnel of the organisation and programme should meet the following requirements:						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
b	the core teaching team should include an optometrist, medical practitioner, nutritionist, nurse, diabetes educator and/or other appropriately trained health care professional	58	42	0	2	
20 EDUCATIONAL METHODOLOGIES						
The following educational methodologies should be utilised in the programme:						
		<i>1. ESSENTIAL %</i>	<i>2. USEFUL %</i>	<i>3. UNNECESSARY %</i>	<i>YOUR RESPONSE</i>	Comments
a	interactive learner participation with modalities such as group work, self study, class presentations and projects or assignments	50	42	8	2	

d	theoretical and practical training aimed at exposing learners to ophthalmological treatment of diabetic patients	75	25	0	1	
g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills	25	33	42	3	
h	uses reflective practice, problem-solving and decision-making skills as part of its learning process	67	33	0	1	
i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning	42	58	0	2	

21 LEARNER ASSESSMENT

The following forms of **learner assessment** must be included in the education programme:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	formative assessment methodologies	67	17	17	1	
c	evaluation of theoretical learning	75	25	0	1	
e	a variety of forms of assessment should be employed to ensure that learner's knowledge is assessed by the most appropriate means	75	25	0	2	

22 FORMAT OF PROGRAMME AND MODULES

The following should be considered for the **format of programme and modules**:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	the traditional emphasis on instructional time or programme duration should be replaced with greater emphasis on student learning and achievement of outcomes	67	25	8	3	
c	learning should take place through a learner-centred approach rather than a lecturer-centred approach	75	25	0	1	
d	learner development of individual research projects and assignments at the appropriate post-graduate level	42	50	8	2	
e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme	42	33	25	3	

23 ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE

The following **admission requirements & learning assumed to be in place** must be clearly documented:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
b	the requirements for clinical and theoretic learning assumed to be in place prior to admission to the programme	58	42	0	2	
c	a formal policy of recognition of prior learning	67	33	0	2	
d	the specific requirements for admission to examinations	75	25	0	1	

24 ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS

The following should constitute the **required academic qualifications for programme lecturers and instructors**:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	a post-graduate qualification in the appropriate field (at least Masters Degree, preferably Doctorate)	33	50	17	2	
b	a formal qualification in higher education teaching methodology	17	50	33	3	
c	a minimum of 5 years of experience lecturing in higher education	0	58	42	3	

25 ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS

SECTION E

STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

27 CRITICAL CROSS-FIELD OUTCOMES

Upon completion of the diabetes education programme, learners should have the **ability**:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
c	to organise and manage oneself and one's activities responsibly and effectively	75	25	0	1	
d	to collect, analyse, organise and critically evaluate information	75	17	8	1	
e	to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation	67	33	0	1	
f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others	50	42	8	2	
g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation	42	50	8	2	
h	to demonstrate cultural and aesthetic sensitivity to all patients and colleagues and learners in the everyday working environment	75	25	0	2	

28 CRITICAL OUTCOMES FOR HEALTH CARE WORKERS

Upon completion of the diabetes education programme, learners should have the **ability**:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments

a	to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations	75	25	0	1	
c	to use specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs	75	17	0	2	
d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care	33	42	25	3	
f	to develop and use flexible and innovative approaches to practice appropriate to the needs of the patient in line with the goals of the health service and the employing authority	42	58	0	2	
g	to have an understanding of health promotion and preventative policies and strategies	75	25	0	1	
h	to facilitate and assess the professional and other development needs of all for whom they are responsible, including where appropriate learners, and to act as a role model for professional practice	58	33	8	2	
l	to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.	50	50	0	1	
j	to evaluate quality of care delivered as an ongoing and cumulative process	50	50	0	1	
k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care	58	33	8	1	
l	to use science in the practice of health and medicine	50	42	8	2	
n	to use prior training and education in problem solving in a clinical situation	75	25	0	2	
o	the ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards	58	25	17	2	
p	the ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration	67	33	0	2	

29 DIABETES STANDARDS FOR EDUCATION PROGRAMMES

The **curriculum for diabetes education** will need to demonstrate that it:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
b	has processes in place to recognise prior diabetes learning	50	42	8	1	
c	has processes for collaboration with relevant diabetes organisations, associations and other bodies where appropriate	58	42	0	1	
l	equips the student to deal with professional issues, role conflict and the delivery of diabetes education according to the role they are expected to perform	67	33	0	1	
j	is clearly defined in the context of the particular society and healthcare system in which the programme is to be delivered.	75	25	0	1	

30 CRITERIA FOR DIAGNOSIS OF DIABETES

Upon completion of the diabetes education programme, learners should be able to **describe**:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
b	the diagnostic criteria for diabetes conforming to internationally accepted standards and norms	67	25	8	1	

31 RISK FACTORS FOR DIABETES

Upon completion of the diabetes education programme, learners should be able to **identify**:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	the known modifiable and non-modifiable risk factors for developing Type 1 diabetes	75	17	8	1	
33 OCULAR COMPLICATIONS						
Upon completion of the diabetes education programme, learners should be able to comprehensively describe :						
		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
h	the neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders	75	8	17	3	
35 SCREENING FOR DIABETIC EYE DISEASE						
Upon completion of the diabetes education programme, learners should demonstrate the ability to :						
		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy	42	50	8	2	
d	describe the screening interval and frequency of retinal examinations for Type II diabetic patients	67	8	8	1	
36 ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?						
SECTION F						
BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES						
<p>This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>						
37 BENEFITS TO THE PROFESSION						
Health Care Professionals completing an education programme for the prevention and management of the ocular complications of diabetes will enhance their profession through:						

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
b	contributing to the improvement of the status of the profession	58	42	0	1	
c	increasing the specialist skills and expertise of the members of their Profession	75	25	0	1	

39 BENEFITS TO HEALTH CARE WORKERS

Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will **benefit** through:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	increased professional status	58	33	8	1	
e	greater remuneration	25	42	17	1	
f	increased chances of promotion or advancement in employment	50	25	8	1	

40 ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?

SECTION G

AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

41 ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

The following aspects should be **addressed** in the diabetes education programme for the prevention and management of the ocular complications of diabetes:

		1. ESSENTIAL %	2. USEFUL %	3. UNNECESSARY %	YOUR RESPONSE	Comments
a	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa	33	33	17	3	
c	the programme must address the issues and policies relating to the provision of public health in South Africa	50	33	8	1	
d	the programme must address the academic and administrative processes involved with a diabetes education programme	50	17	17	1	

e	the programme must provide standards and outcomes for the prevention and management of the ocular complications of diabetes	50	33	0	2	
f	clearly stated benefits of a diabetes education programme	75	8	0	1	
g	all of the above	33	17	0	?	

42 ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?

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LETTER OF FEEDBACK FOR ROUND TWO

**The Development of a Post-Graduate Education and Training
Programme for Health Care Workers for the Management and
Prevention of Ocular Complications in Diabetic Patients**

Dear Delphi panellist

Thank you once again for participating in the Delphi process so far and for completing the second round Delphi Questionnaire. Attached please find the results of the second round of the Delphi process. This feedback is sent to you with the sole purpose of providing you with the results and information regarding the second round. **AGAIN, YOU DO NOT NEED TO DO ANYTHING WITH IT.**

As in the feedback from the first round, you will find in the attached results the panel's responses in the three columns referring to "1. Essential", "2. Useful" and "3. Unnecessary". These values refer to the percentages of the Delphi panel who rated each particular statement. In the last column is the number of the column that you rated as your choice in the second round. Round Three (Final Round) of the Delphi process will reach you very soon. That document will NOT include any of the questions on which consensus was reached in the first and second rounds.

Thank you once again for your participation.

Kind regards



Peter Clarke-Farr

COMBINED ROUNDS ONE AND TWO RESULTS FEEDBACK TO DELPHI PANEL

		ROUND ONE CONSENSUS HIGHLIGHTED BLUE									
		ROUND TWO CONSENSUS HIGHLIGHTED YELLOW									
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<p>SECTION A CURRICULUM DEVELOPMENT IN HIGHER EDUCATION</p>											
<p>This section deals with curriculum and programme development in the Higher Education Sector.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>											
		1	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL								
			In developing an education programme for the prevention and management of the ocular complications of diabetes:								
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
1	a		7	58	4	33	1	8			Diabetes is a major public health issue in SA and should be integrated into basic training / Not having post-graduate training must not prevent a person from being involved in diabetic prevention or management
2	b		3	25	2	17	7	58			Diabetes is a major public health issue in SA and should be integrated into basic training / Only if not dealt with comprehensively at level 8 or if it latches on to a remedial module
3	1	c	10	83	2	17	0	0			"Support" means different things to different people/departments/organisations
4	2	d	10	83	2	17	0	0			As core competencies for undergraduate education
5		e	7	58	3	25	2	17			
6		f	1	8	6	50	5	42			Could be done as short courses, but only as a help, for referral purposes
7		g	3	25	8	67	1	8			Could be done as short courses, but only as a help, for referral purposes
8		h	4	33	7	58	1	8			Essential if not included in other postgraduate courses / Refresher courses can be offered by various bodies / There must still be education programmes further down the "education ladder" as well
9	3	i	0	0	0	0	12	100			Unless it can be applied commercially / Unnecessary, only if "g" and "h" are in place
10	4	j	12	100	0	0	0	0			Both optometry/opticianry as well as nursing as well as inter-institutional bodies / Not exclusively. Other health professions e.g., Pharmacy, rehabilitation therapists, also need this education
10	4	40	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL								
		2	OUTCOMES BASED EDUCATION								
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes based education to ensure that:								
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
11	5	a	10	83	1	8	1	8			OBE Does NOT guarantee fairness in grading and testing
12	6	b	11	92	1	8	0	0			
13		c	8	67	4	33	0	0			
14	7	d	12	100	0	0	0	0			However, background knowledge needs to underpin "skills"

15		e	self-evaluation by the students should be encouraged to ensure they know what is expected of them	6	50	5	42	1	8		This however should be carefully monitored
16	8	f	efficient student learning is facilitated, and anxiety is reduced by providing direction and identifying instructional priorities	10	83	1	8	1	8		
17	9	g	demonstrations of competence must take place at the culminating or end point of the candidates' learning experience	10	83	1	8	1	8		There could be continuous evaluations / This aspect should be on continuous basis
18	10	h	demonstrations must occur in some context or performance setting	11	92	1	8	0	0		This should be well structured
19	11	i	demonstrations must show evidence of significant learning	11	92	1	8	0	0		
20	12	j	demonstrations must be of high quality	10	83	2	17	0	0		And should remain current i.e. at cutting edge
21	13	k	the outcomes must be significant, they must be clear and they must be concise.	11	92	1	8	0	0		
11	9	82	% CONSENSUS FOR QUESTION 2		OUTCOMES BASED EDUCATION						
		3	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN								
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of curriculum planning, development and design , therefore:								
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
22		a	the curriculum development process should be sensitive to the academic setting of the project	6	50	6	50	0	0		And be flexible enough to allow for easy changes if required / People only need to know what is needed for their particular role in the prevention / management "tree"
23		b	the curriculum development process should be sensitive to the capabilities, interests and priorities of the students for whom the programme is designed to serve	7	58	3	25	2	17		You are dealing with pathology and there are things students should be able to do / Increasing burden of diabetes and potential complications would not allow this.
24	14	c	the development of the programme should require a detailed knowledge and appreciation of the discipline	10	83	2	17	0	0		
25		d	the development of the programme should require an understanding of the resources and options available to the faculty and educators involved	5	42	5	42	2	17		
26	15	e	it is of utmost importance that appropriate stakeholders are identified and then contribute to the development of the education programme	12	100	0	0	0	0		
27	16	f	a measure of support and acceptance, by the stakeholders, of the outcomes specified is required	11	92	1	8	0	0		
28	17	g	the programme should have a rationale (or mission statement) to explain why the programme exists	10	83	2	17	0	0		This will require some data prior to setting a mission statement
29	18	h	the overall programme aims must be clearly stated, in order to explain what the programme will achieve	12	100	0	0	0	0		
30	19	i	outcome statements must be developed to indicate the knowledge, skills and attitudes learners are to acquire through the programme	10	83	2	17	0	0		Outcomes must be allowed to be slightly flexible
31	20	j	content statements must be provided to indicate what areas of knowledge will comprise the student learning	12	100	0	0	0	0		
32	21	k	teaching strategy statements must be provided in order to indicate how the learning activities will be organised	11	92	1	8	0	0		Should however be flexible to allow for changes / as long as they are relevant and will be upheld during the course
33	22	l	assessment methodologies must be provided to indicate how student learning will be assessed and reported	11	92	1	8	0	0		In line with the institution and SAQA
12	9	75	% CONSENSUS FOR QUESTION 3		CURRICULUM PLANNING, DEVELOPMENT AND DESIGN						
		4	IMPLEMENTING AND EVALUATING THE CURRICULUM								
			Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to implementing and evaluating the curriculum, therefore:								
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
34	23	a	there must be a demonstrable need for the programme	11	92	1	8	0	0		
35	24	b	the academic area must be stable and well defined in terms of the knowledge comprising the programme	11	92	1	8	0	0		It should in fact create a specialised unit in the Department
36	25	c	there must be clear potential for success of the programme	11	92	1	8	0	0		
37	26	d	the department/institution providing the programme must have the necessary resources available	11	92	1	8	0	0		
38		e	any social and political factors that may negatively impact the provision of the programme should be considered	5	42	6	50	1	8		Relevant stakeholders should be identified up front
39	27	f	a needs assessment should be conducted in terms of the programme objectives	11	92	1	8	0	0		
40	28	g	the aims/exit level outcomes of the curriculum should be stated	12	100	0	0	0	0		
41	29	h	there should be a clear rationale and justification for the provision of the programme	12	100	0	0	0	0		
42	30	i	assessment criteria and procedures must be clearly stated	11	92	1	8	0	0		

43	31	j	the context and community in which the programme resides should be articulated	11	92	1	8	0	0		
44		k	the entry and admission criteria for the programme must be adequately described	7	58	4	33	1	8		This should be carefully thought through
45	32	l	the form of instruction should be appropriate to the learners' needs	11	92	1	8	0	0		However note must be taken that we are dealing with pathology / to include part time and not only full time
46		m	the programme should allow for individual differences in learners and learning methods	5	42	6	50	1	8		Debateable
47	33	n	provision must be made for adequate availability of learner resources, materials and facilities	11	92	1	8	0	0		
48		o	there should be provision for pilot testing of the proposed programme prior to final implementation	5	42	5	42	2	17		Unnecessary
49	34	p	criteria must be available for evaluation of all aspects of the programme for the purposes of quality assurance	10	83	2	17	0	0		
50	35	q	there must be evidence of significant groups and subject specialists involved throughout the development of the proposed programme curriculum	11	92	1	8	0	0		
17	13	76	% CONSENSUS FOR QUESTION 4			IMPLEMENTING AND EVALUATING THE CURRICULUM					
		5	LEARNER ASSESSMENT								
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for learner assessment in order to ensure that:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
51	36	a	the emphasis should be shifted away from the input or content aspect of programmes towards the objective assessment of the performance of learners in terms of clearly stated outcomes	11	92	1	8	0	0		Will require careful thought / Is the performance of a learner and the outcome not dependent on the quality of the input and content, to some extent?
52		b	the ultimate outcome for each and every person learning in a particular programme should be equivalent and clearly stated	8	67	2	17	2	17		Modularization
53	37	c	the assessment process must be objective and verifiable	10	83	2	17	0	0		
54	38	d	the responsibilities learners are expected to assume to monitor their own learning must be defined.	10	83	2	17	0	0		
55	39	e	the assessment criteria for each of the abilities/skills that have been developed should be defined	11	92	1	8	0	0		Be careful, subjectivity cannot always be discarded
56		f	there is the establishment of an assessment taskforce, which will include an assessment expert	4	33	8	67	0	0		
57		g	there is an integrated method of assessment covering all aspects of the learning programme	7	58	4	33	1	8		
58	40	h	there is the establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all subjects/modules	11	92	0	0	1	8		If it is always possible it would be ideal
59		i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors	5	42	5	42	2	17		
60		j	the flow of assessment information, lines of communication and promotion and exclusion processes of students are reflected	8	67	2	17	2	17		
61	41	k	all forms of assessment are moderated by appropriately trained moderators with specific expertise in the learning area	12	100	0	0	0	0		
62	42	l	moderation of learner assessments takes place to ensure that the required level, standard, appropriateness and fairness is observed	11	92	1	8	0	0		
12	7	58	% CONSENSUS FOR QUESTION 5			LEARNER ASSESSMENT					
		6	ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?								
			SECTION B								
			PATIENT DIABETES EDUCATION								
			This section deals with the education of diabetes patients.								
			Please indicate how important each of the following statements is according to the following scale:								
			1 = Essential 2 = Useful 3 = Unnecessary								
			Please mark the appropriate block with an X. Only mark one option.								
		7	PATIENT'S KNOWLEDGE OF DIABETES								
			In terms of the patient's knowledge of diabetes it would be important for diabetic patients to be aware of:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments

63	43	a	the different types of diabetes	12	100	0	0	0	0		
64	44	b	the type of diabetes affecting the patient's themselves	11	92	1	8	0	0		
65	45	c	the risk factors that may contribute to the development of diabetes	10	83	1	8	1	8		These cannot be emphasised greatly enough!
66	46	d	the effect of pregnancy on the development of diabetes	11	92	1	8	0	0		These cannot be emphasised greatly enough! Absolutely essential because of gestational diabetes that can manifest.
67	47	e	the importance of maintaining good control over their blood sugar level	12	100	0	0	0	0		These cannot be emphasised greatly enough!
68	48	f	the importance of having their blood pressure checked and controlled if necessary	12	100	0	0	0	0		These cannot be emphasised greatly enough!
69	49	g	the importance of not smoking	12	100	0	0	0	0		These cannot be emphasised greatly enough!
7	7	100	% CONSENSUS FOR QUESTION 7	PATIENT'S KNOWLEDGE OF DIABETES							
8 PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES											
In terms of the patient's knowledge of the ocular complications of diabetes , it would be important for diabetic patients to be aware that:											
											Comments
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		
70	50	a	diabetes may affect vision at distance and near	11	92	0	0	1	8		
71	51	b	diabetes may change their refractive error / spectacle prescription	10	83	1	8	1	8		
72		c	diabetes may affect colour perception	6	50	5	42	1	8		
73		d	diabetes may affect the nerves of the eyes cause the eyes to become squint	8	67	2	17	1	8		
74	52	e	diabetes may affect the ability of the eyes to heal if they become injured	10	83	1	8	1	8		
75	53	f	diabetes may contribute to cataract formation	10	83	2	17	0	0		
76	54	g	diabetes may cause bleeding and damage to the retinas of the eyes?	10	83	2	17	0	0		These are important as they are the serious complications that we see everyday and battle to treat
77	55	h	diabetes may cause new blood vessels to grow inside the eyes	11	92	1	8	0	0		These are important as they are the serious complications that we see everyday and battle to treat / NB
78	56	j	diabetes may cause a retinal detachment to occur	10	83	1	8	1	8		NB
79		j	diabetes may cause a retinal detachment to occur	8	67	3	25	1	8		
10	7	70	% CONSENSUS FOR QUESTION 8	PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES							
9 PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES											
In terms of the patient's knowledge of the management and treatment of diabetes , they should be educated about:											
											Comments
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		
80	57	a	the importance of following a healthy prescribed diet and lifestyle	11	92	1	8	0	0		
81	58	b	the importance of regularly measuring their blood sugar as scheduled by their medical practitioner	12	100	0	0	0	0		"medical practitioner" to be changed to "health care professional"
82	59	c	the importance of regular exercise	11	92	1	8	0	0		
83	60	d	the importance of maintaining an ideal body weight	10	83	2	17	0	0		change "ideal" to appropriate
84	61	e	the importance of taking their medication exactly as prescribed	12	100	0	0	0	0		
85	62	f	the importance of going for regular medical check ups at the clinic / doctor	12	100	0	0	0	0		
86	63	g	the importance of undergoing regular eye examinations	12	100	0	0	0	0		
87	64	h	the general systemic complications that may occur with diabetes	11	92	1	8	0	0		and how they may be managed and treated
88	65	i	the ocular complications that may occur with diabetes and how they may be managed/treated	12	100	0	0	0	0		
9	9	100	% CONSENSUS FOR QUESTION 9	PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES							
10 ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?											
All these aspects have to be part of the basic undergraduate training / It must be stressed that diabetes causes BLINDNESS, not just poor vision, but that this is PREVENTABLE if, and only if, they have REGULAR eye check ups by an appropriate clinician / Family members should be included in the management as much as possible / Also to know signs and symptoms of too high or too low blood sugar levels and then what to do / A helpline should exist for such patients as many have had amputations and have no means of getting to even a clinic / Patients should know the Prevalence of Blindness due to Diabetes as this is often not taken seriously and they feel it wont happen to them.											
SECTION C											
PUBLIC HEALTH IN SOUTH AFRICA											
This section deals with issues related to the provision of public health in South Africa.											

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS

In terms of the **legislation and scope** of the health care workers' professions, the following must be integral to an education programme for the prevention and management of the ocular complications of diabetes:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
89	66	a	the definition of a primary health care nurse	10	83	2	17	0	0	
90	67	b	the definition of an ophthalmic nurse	10	83	2	17	0	0	
91	68	c	the definition of a diabetes educator	10	83	1	8	0	0	
92	69	d	the definition of an optometrist	11	92	0	0	1	8	
93	70	e	the scope of practice of a nurse	11	92	1	8	0	0	
94	71	f	the scope of practice of an optometrist	10	83	2	17	0	0	
95	72	g	the function and scope of allied health care workers	10	83	2	17	0	0	
96	73	h	the acts and procedures that fall within the scope of nursing	10	83	1	8	1	8	
97	74	i	the acts and procedures that fall within the scope of optometry	10	83	2	17	0	0	
98	75	j	the acts or procedures that should be performed during the management and treatment of the ocular complications of diabetic patients	12	100	0	0	0	0	
99	76	k	the responsibilities of the patient	10	83	2	17	0	0	
100		l	the relevant health legislation pertaining to the provision of health care in South Africa	9	75	2	17	1	8	

12 11 92 % CONSENSUS FOR QUESTION 11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS

12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH

In terms of the policies of the South Africa Department of Health, the following **policies** must be integral to an education programme for the prevention and management of the ocular complications of diabetes:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
101	77	a	The RSA Department of Health's National Programme for Control and Management of Type 2 Diabetes	11	92	1	8	0	0	
102	78	b	The National Guidelines for the Prevention of Blindness in South Africa	10	83	2	17	0	0	
103		c	Strategic Priorities for the National Health System 2004-2009	7	58	5	42	0	0	
104	79	d	The Primary Health Care Package for South Africa: A Set of Norms and Standards	10	83	1	8	1	8	
105	80	e	All relevant acts and/or professional guidelines issued by the HPCSA	10	83	1	8	1	8	Provided they do not contradict govt. policies or other health professions councils in any way. (Not really likely).
106		f	The Patient's Rights Charter	7	58	4	33	1	8	

6 4 67 % CONSENSUS FOR QUESTION 12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH

13 ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA

Public health at Universities cover disease profiles (morbidity and mortality), the DHS, interdisciplinary and inter-sectoral collaborations / Adhering to and trying to "please" all the above policies will lead to a lot of frustrations. Primary Health Care Standard Treatment Guidelines and Essential Drugs List + Hospital level Standard Treatment Guidelines and Essential Drug List for Adults + Hospital level Standard Treatment Guidelines and Essential Drug List for Paediatrics +all additional/ updated pertinent guidelines / policies that may be developed +Cataract Surgery Guidelines + Refractive Errors Screening Guidelines

**SECTION D
ACADEMIC AND ADMINISTRATIVE ASPECTS**

This section deals with issues related to the academic and administrative aspects of a diabetes education programme:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

14 ORGANISATION OF THE PROGRAMME

In terms of the **organisation** of a diabetes curriculum, there must be:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
107	81	a	written objectives for the education programme	12	100	0	0	0	0	
108	82	b	the provision of all necessary resources in order to achieve the proposed objectives	10	83	2	17	0	0	
109	83	c	the composition of the organisation must include the teaching team and its members, a co-ordinator and an advisory committee	11	92	1	8	0	0	
3	3	100	% CONSENSUS FOR QUESTION 14		ORGANISATION OF THE PROGRAMME					

15 PROGRAMME CO-ORDINATION

In terms of the **programme co-ordination**, there must be:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
110	84	a	a specific programme co-ordinator who will be responsible for overseeing the overall progress of the programme, including the planning, implementation and evaluation thereof	11	92	0	0	1	8	Essential initially, useful thereafter
1	1	100	% CONSENSUS FOR QUESTION 15		PROGRAMME CO-ORDINATION					

16 ADVISORY COMMITTEE

In terms of the **advisory committee** for the programme, there must be:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
111		a	an advisory committee established to ensure quality assurance of the diabetes education programme	6	50	5	42	1	8	
112		b	the advisory committee should have interdisciplinary and intersectoral integration	4	33	6	50	2	17	
113	85	c	the advisory committee should have current experience and understanding of diabetes management	11	92	0	0	1	8	
114		d	the advisory committee should have regular meetings	4	33	7	58	1	8	Maybe initially
115		e	the advisory committee should plan and review the programme on an annual basis	6	50	4	33	2	17	More frequent than on an annual basis
116		f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators	5	42	4	33	3	25	Is this the advisory committee function?
6	1	17	% CONSENSUS FOR QUESTION 16		ADVISORY COMMITTEE					

17 DIABETES EDUCATION PROGRAMME

In terms of the overall **diabetes education programme**:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
117	86	a	the programme must aim to ensure accessibility to the overall learner population to whom it is directed	11	92	1	8	0	0	According to specific criteria / Transport costs are a big deterrent to learners and patients etc
118	87	b	the target population should be defined with regard to the potential number of patients, type of diabetes, age, language, regional characteristics and special educational needs	11	92	1	8	0	0	
119	88	c	the programme curriculum must be suitably flexible in terms of mode of delivery to accommodate the diversity of circumstances of potential learners	12	100	0	0	0	0	
120	89	d	the curriculum document of the programme should reflect the objectives, course contents and outcomes	10	83	2	17	0	0	
121	90	e	the curriculum document of the programme should reflect the teaching methodology, ordering, sequencing and duration of modules/coursework	10	83	1	8	1	8	Individual initiative also to be encouraged / fundamental to OBE
122		f	the curriculum document of the programme should reflect the educational materials to be used	6	50	6	50	0	0	Should however be flexible
123		g	the curriculum document of the programme should reflect the evaluation and assessment instruments	8	67	4	33	0	0	
124		h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice	5	42	5	42	2	17	Only at higher levels
8	5	63	% CONSENSUS FOR QUESTION 17		DIABETES EDUCATION PROGRAMME					

18 MISSION AND PURPOSE

In terms of the **mission and purpose** of the diabetes programme:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
125	91	a	the mission and purpose of the programme must be clearly stated	10	83	1	8	0	0	
126		b	the mission and purpose of the programme should fit into the broad mission statement of the Institution at which it is provided	4	33	6	50	1	8	
127		c	the mission of the programme should address the needs of the community in which the Institution resides	6	50	3	25	2	17	
128	92	d	the purpose statement of the programme must indicate what learners will be able to do upon successful completion of the programme	12	100	0	0	0	0	Basic principle of education
4	2	50	% CONSENSUS FOR QUESTION 18			MISSION AND PURPOSE				
		19	TEACHING PERSONNEL							
			The teaching personnel of the organisation and programme should meet the following requirements:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
129	93	a	they should have specialised knowledge of all aspects of the diagnosis, control and treatment/management of all aspects of diabetes	10	83	1	8	1	8	Collectively
130		b	the core teaching team should include an optometrist, medical practitioner, nutritionist, nurse, diabetes educator and/or other appropriately trained health care professional	7	58	5	42	0	0	Could also include social workers and counsellors
131	94	c	they should have appropriate educational qualifications and experience to instruct at the higher education level	10	83	1	8	1	8	
3	2	67	% CONSENSUS FOR QUESTION 19			TEACHING PERSONNEL				
		20	EDUCATIONAL METHODOLOGIES							
			The following educational methodologies should be utilised in the programme:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
132		a	interactive learner participation with modalities such as group work, self study, class presentations and projects or assignments	6	50	5	42	1	8	Should be structured as in-service training and adapted to context
133	95	b	clinical and practical training in order to develop skills required for the treatment and management of diabetic patients	12	100	0	0	0	0	
134	96	c	practical training aimed at exposing learners to clinics, community health centres and hospitals treating diabetic patients	12	100	0	0	0	0	
135	97	d	theoretical and practical training aimed at exposing learners to ophthalmological treatment of diabetic patients	11	92	1	8	0	0	Keeping their scope in mind / Fine in theory, but quite difficult in practice
136	98	e	theoretical and practical/clinical training that may be effectively supervised and assessed by instructors / lecturers	11	92	1	8	0	0	
137	99	f	small group teaching should be encouraged in order to facilitate closer interaction between learner and educator	10	83	2	17	0	0	
138		g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills	3	25	4	33	5	42	
139		h	uses reflective practice, problem-solving and decision-making skills as part of its learning process	8	67	4	33	0	0	
140		i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning	5	42	7	58	0	0	
9	5	56	% CONSENSUS FOR QUESTION 20			EDUCATIONAL METHODOLOGIES				
		21	LEARNER ASSESSMENT							
			The following forms of learner assessment must be included in the education programme:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
141		a	formative assessment methodologies	8	67	2	17	2	17	
142	100	b	summative assessment methodologies	10	83	1	8	1	8	
143	101	c	evaluation of theoretical learning	10	83	2	17	0	0	
144	102	d	evaluation of practical/clinical learning	12	100	0	0	0	0	
145	103	e	a variety of forms of assessment should be employed to ensure that learner's knowledge is assessed by the most appropriate means	11	92	1	8	0	0	Learners must be able to identify disease. It is not crucial if they don't know exactly how it developed etc
5	4	80	% CONSENSUS FOR QUESTION 21			LEARNER ASSESSMENT				
		22	FORMAT OF PROGRAMME AND MODULES							

The following should be considered for the format of programme and modules :										
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
146	104	a	the traditional emphasis on instructional time or programme duration should be replaced with greater emphasis on student learning and achievement of outcomes	10	83	2	17	0	0	Within limits and with clear parameters / An excellent "mind-set" change
147	105	b	time-based learning policies should shift to mastery of skills and knowledge by the learners	10	83	2	17	0	0	However there should be an ultimate period defined within which the learner gains the necessary skills and knowledge
148	106	c	learning should take place through a learner-centred approach rather than a lecturer-centred approach	10	83	2	17	0	0	Would have to be careful
149		d	learner development of individual research projects and assignments at the appropriate post-graduate level	5	42	6	50	1	8	
150		e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme	5	42	4	33	3	25	Would be an ideal learning environment Course needs to be ordered and well structured
5	3	60	% CONSENSUS FOR QUESTION 22			FORMAT OF PROGRAMME AND MODULES				
		23	ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE							
The following admission requirements & learning assumed to be in place must be clearly documented:										
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
151	107	a	the minimum admission requirements to the training programme	11	92	0	0	1	8	Try not to exclude people who are keen as there is a role for everyone at some level of prevention and management. Different role players have to have different requirements
152	108	b	the requirements for clinical and theoretic learning assumed to be in place prior to admission to the programme	10	83	2	17	0	0	May not always be possible
153		c	a formal policy of recognition of prior learning	8	67	4	33	0	0	Be implemented carefully
154	109	d	the specific requirements for admission to examinations	11	92	1	8	0	0	
155	110	e	promotion criteria from module to module or to the following level of study	10	83	1	8	1	8	
5	4	80	% CONSENSUS FOR QUESTION 23			ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE				
		24	ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS							
The following should constitute the required academic qualifications for programme lecturers and instructors :										
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
156		a	a post-graduate qualification in the appropriate field (at least Masters Degree, preferably Doctorate)	4	33	6	50	2	17	Good educators may not have post-graduate qualifications
157		b	a formal qualification in higher education teaching methodology	2	17	6	50	4	33	Not an imperative
158		c	a minimum of 5 years of experience lecturing in higher education	0	0	7	58	5	42	Questionable
159	111	d	registration with the appropriate Health Professions Board or Council	10	83	0	0	2	17	Be flexible with "appropriate"
4	1	25	% CONSENSUS FOR QUESTION 24			ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS				
		25	ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS							
The reason for the word "assumed" in statement number 23 is not clear										
SECTION E										
STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES										
<p>This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes:</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>										
		26	OVERVIEW AND CLASSIFICATION OF DIABETES							
Upon completion of the diabetes education programme, learners should be able to:										

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
160	112	a	comprehensively describe the various TYPES of diabetes	12	100	0	0	0	0	
161	113	b	CLASSIFY the various types of diabetes	11	92	1	8	0	0	
162	114	c	comprehensively describe the various CAUSES of TYPE I diabetes	10	83	1	8	1	8	
163	115	d	comprehensively describe the various CAUSES of TYPE II diabetes	11	92	1	8	0	0	
164	116	e	comprehensively describe the various EFFECTS of uncontrolled diabetes on the human body	11	92	1	8	0	0	
165	117	f	comprehensively describe the pathophysiology of diabetes	10	83	2	17	0	0	
166	118	g	describe the primary actions of insulin	10	83	2	17	0	0	.What about oral medication? Also consider interactions, side-effects, special precautions.
7	7	100	% CONSENSUS FOR QUESTION 26		OVERVIEW AND CLASSIFICATION OF DIABETES					
		27	CRITICAL CROSS-FIELD OUTCOMES							
			Upon completion of the diabetes education programme, learners should have the ability :							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
167	119	a	to identify and solve problems with responsible decisions shown to be the result of critical and creative thinking	10	83	2	17	0	0	
168	120	b	to work effectively with others as a member of a team, group, organisation and community	10	83	2	17	0	0	
169		c	to organise and manage oneself and one's activities responsibly and effectively	9	75	3	25	0	0	
170	121	d	to collect, analyse, organise and critically evaluate information	11	92	0	0	1	8	
171	122	e	to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation	11	92	1	8	0	0	
172		f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others	6	50	5	42	1	8	
173		g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation	5	42	6	50	1	8	Unsure of this very broad statement
174	123	h	to demonstrate cultural and aesthetic sensitivity to all patients and colleagues and learners in the everyday working environment	11	92	1	8	0	0	
8	5	63	% CONSENSUS FOR QUESTION 27		CRITICAL CROSS-FIELD OUTCOMES					
		28	CRITICAL OUTCOMES FOR HEALTH CARE WORKERS							
			Upon completion of the diabetes education programme, learners should have the ability :							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
175	124	a	to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations	11	92	1	8	0	0	
176	125	b	to practice effectively in accordance with the professional and legal framework (knowledge, skills and attitudes/values) as a member of the health team	11	92	1	8	0	0	
177	126	c	to use specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs	12	100	0	0	0	0	Need to define specialist skills
178		d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care	4	33	5	42	3	25	May need to provide service
179	127	e	to work as part of a multi-professional team, in which the leadership role changes in response to changing client needs	11	92	1	8	0	0	
180		f	to develop and use flexible and innovative approaches to practice appropriate to the needs of the patient in line with the goals of the health service and the employing authority	5	42	7	58	0	0	
181	128	g	to have an understanding of health promotion and preventative policies and strategies	12	100	0	0	0	0	
182		h	to facilitate and assess the professional and other development needs of all for whom they are responsible, including where appropriate learners, and to act as a role model for professional practice	7	58	4	33	1	8	
183		i	to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.	6	50	6	50	0	0	
184		j	to evaluate quality of care delivered as an ongoing and cumulative process	6	50	6	50	0	0	
185		k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care	7	58	4	33	1	8	
186		l	to use science in the practice of health and medicine	6	50	5	42	1	8	Depends at what level
187	129	m	to diagnose, manage and prevent diseases	10	83	1	8	1	8	Within their scope, Should state prevent, diagnose and manage (prevent should appear first)

188	130	n	to use prior training and education in problem solving in a clinical situation	12	100	0	0	0	0		
189		o	the ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards	7	58	3	25	2	17		Different role players will have different roles in the management. It is not crucial that learners be expected to do all of the above mentioned
190		p	the ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration	8	67	4	33	0	0		There may be more
16	7	44	% CONSENSUS FOR QUESTION 28		CRITICAL OUTCOMES FOR HEALTH CARE WORKERS						
		29	DIABETES STANDARDS FOR EDUCATION PROGRAMMES								
			The curriculum for diabetes education will need to demonstrate that it:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
191	131	a	supports students to gain knowledge, and develop skills and competence to deliver diabetes education in general and the ocular complications of diabetes in particular	11	92	1	8	0	0		
192		b	has processes in place to recognise prior diabetes learning	6	50	5	42	1	8		Should not necessarily be a prerequisite
193		c	has processes for collaboration with relevant diabetes organisations, associations and other bodies where appropriate	7	58	5	42	0	0		
194	132	d	integrates diabetic theory, research and clinical practice	10	83	2	17	0	0		
195	133	e	has appropriate resources to deliver the curriculum, including the quantity and quality of clinical experience and supervision	12	100	0	0	0	0		
196	134	f	is delivered by a teacher/instructor with the appropriate education and qualifications to teach the subjects allocated to them	12	100	0	0	0	0		Or perhaps sometimes just experience
197	135	g	has procedures in place to approve and monitor facilities where clinical experience is undertaken	11	92	1	8	0	0		
198	136	h	will, upon successful completion of the course lead to a qualification in the prevention, management and treatment of the ocular complications of diabetes	11	92	1	8	0	0		Within their scope
199	137	i	equips the student to deal with professional issues, role conflict and the delivery of diabetes education according to the role they are expected to perform	10	83	2	17	0	0		
200	138	j	is clearly defined in the context of the particular society and healthcare system in which the programme is to be delivered.	10	83	2	17	0	0		
10	8	80	% CONSENSUS FOR QUESTION 29		DIABETES STANDARDS FOR EDUCATION PROGRAMMES						
		30	CRITERIA FOR DIAGNOSIS OF DIABETES								
			Upon completion of the diabetes education programme, learners should be able to describe:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
201	139	a	the diagnostic criteria for diabetes	12	100	0	0	0	0		
202		b	the diagnostic criteria for diabetes conforming to internationally accepted standards and norms	8	67	3	25	1	8		International criteria may be adjusted to South African criteria for particular reasons, chief among them would be resources. It would then be imperative that S A criteria be utilised.
203	140	c	the diagnostic criteria for diabetes taking into account the criteria outlined by the South African Department of Health as part of its National Programme for Control and Management of Diabetes Type 2	12	100	0	0	0	0		
3	2	67	% CONSENSUS FOR QUESTION 30		CRITERIA FOR DIAGNOSIS OF DIABETES						
		31	RISK FACTORS FOR DIABETES								
			Upon completion of the diabetes education programme, learners should be able to identify:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
204	141	a	the known modifiable and non-modifiable risk factors for developing Type 1 diabetes	11	92	1	8	0	0		
205	142	b	the known modifiable and non-modifiable risk factors for developing Type 2 diabetes	12	100	0	0	0	0		
206	143	c	all the risk factors having an influence on the incidence and progression of diabetic retinopathy	11	92	1	8	0	0		
3	3	100	% CONSENSUS FOR QUESTION 31		RISK FACTORS FOR DIABETES						
		32	SYSTEMIC COMPLICATIONS								
			Upon completion of the diabetes education programme, learners should be able to explain:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
207	144	a	explain the acute (short term) systemic complications of diabetes mellitus	10	83	2	17	0	0		
208	145	b	explain the long term systemic complications of diabetes mellitus	12	100	0	0	0	0		

2	2	100	% CONSENSUS FOR QUESTION 32	SYSTEMIC COMPLICATIONS						
		33	OCULAR COMPLICATIONS							
			Upon completion of the diabetes education programme, learners should be able to comprehensively describe :							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
209	146	a	the refractive changes that may occur in diabetic patients	11	92	0	0	1	8	
210	147	b	the changes that may occur in the eyes in terms of visual performance (Such as reduced visual acuity, blue-yellow colour defects, abnormal contrast sensitivity and field loss)	11	92	1	8	0	0	
211	148	c	the nerve palsies and defects that may occur in diabetic patients	11	92	0	0	1	8	
212	149	d	the various pathophysiological effects of diabetes on the cornea	10	83	0	0	2	17	
213	150	e	the lenticular changes and processes leading to diabetic cataracts	10	83	2	17	0	0	
214	151	f	the neovascular response of the eye to ocular ischaemia secondary to the diabetes, including the development of rubeosis irides	12	100	0	0	0	0	
215	152	g	the development of ocular hypertension and glaucoma in diabetic patients	10	83	0	0	2	17	
216		h	the neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders	9	75	1	8	2	17	
217	153	i	the processes leading to tractional retinal and vitreous detachments due to diabetes	10	83	1	8	1	8	
218	154	j	the skin and eyelid disorders and infections that may be encountered in diabetic patients	10	83	0	0	2	17	
219	155	k	all aspects of ocular or diabetic retinopathy	10	83	2	17	0	0	
220	156	l	the pathogenesis of ocular retinopathy	10	83	1	8	1	8	
221	157	m	the various forms of classification of diabetic retinopathy	11	92	1	8	0	0	
222	158	n	the various forms of ocular pathology comprising diabetic retinopathy	12	100	0	0	0	0	
14	13	93	% CONSENSUS FOR QUESTION 33	OCULAR COMPLICATIONS						
		34	MANAGEMENT OF DIABETIC EYE DISEASE							
			For managing diabetic eye disease, upon completion of the education programme, learners should be able to:							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
223	159	a	emphasise the role of prevention in the management of diabetic eye disease	12	100	0	0	0	0	Delete the words "in the management" - The aim is to prevent the development of diabetic eye disease
224	160	b	emphasise the role of early detection of retinopathy and the monitoring of existing retinopathy with regular and appropriately timed fundus examinations	12	100	0	0	0	0	
225	161	c	emphasise the importance of effective appropriately-timed laser treatment	11	92	1	8	0	0	Linked to the above
226	162	d	emphasise the importance of effective education of patients, the public and health care professionals	12	100	0	0	0	0	
227	163	e	detail the various types of interventions and treatment modalities for the different types of diabetic eye disease	10	83	2	17	0	0	
228	164	f	detail the stages of diabetic eye disease at which treatment regimens are commenced	10	83	2	17	0	0	
229	165	g	manage diabetic eye disease according to their skills and professional scope	10	83	1	8	1	8	
230	166	h	refer patients for further treatment at the appropriate stage	11	92	1	8	0	0	Add: and ensure follow – up of the patient (This would ensure that the patient does not get 'lost' within the system without the appropriate intervention/ treatment).
8	8	100	% CONSENSUS FOR QUESTION 34	MANAGEMENT OF DIABETIC EYE DISEASE						
		35	SCREENING FOR DIABETIC EYE DISEASE							
			Upon completion of the diabetes education programme, learners should demonstrate the ability to :							
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
231		a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy	5	42	6	50	1	8	
232	167	b	describe and perform the screening methods required to detect diabetic retinopathy and the ocular complications of diabetes	11	92	0	0	1	8	
233	168	c	describe the screening interval and frequency of retinal examinations for Type I diabetic patients	10	83	1	8	1	8	
234	169	d	describe the screening interval and frequency of retinal examinations for Type II diabetic patients	12	100	0	0	0	0	Essential if Type II
235	170	e	describe the general screening and referral protocols for diabetic retinopathy	11	92	0	0	1	8	

236	171	f	describe the specific referral criteria from primary level to secondary level according to the National Guidelines for the Prevention of Blindness in South Africa	11	92	0	0	1	8				
237	172	g	correctly use the recommended instrumentation for diabetic retinopathy screening	12	100	0	0	0	0				
7	6	86	% CONSENSUS FOR QUESTION 35	SCREENING FOR DIABETIC EYE DISEASE									
		36	ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?										
			Be able to distinguish between referral for diabetic retinopathy and other ocular conditions. If patients are screened they should be referred for refractive errors etc even if they do not have diabetic eye disease.										
			SECTION F										
			BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES										
			This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:										
			Please indicate how important each of the following statements is according to the following scale:										
			1 = Essential 2 = Useful 3 = Unnecessary										
			Please mark the appropriate block with an X. Only mark one option.										
		37	BENEFITS TO THE PROFESSION										
			Health Care Professionals completing an education programme for the prevention and management of the ocular complications of diabetes will enhance their profession through:										
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments		
238	173	a	greater participation of their Profession in the provision of public health care	10	83	2	17	0	0		More posts for government employed optometrists need to be created		
239		b	contributing to the improvement of the status of the profession	7	58	5	42	0	0				
240	174	c	increasing the specialist skills and expertise of the members of their Profession	11	92	1	8	0	0				
241	175	d	increasing patient access to health care through increased provision of specialised health care services	12	100	0	0	0	0				
4	3	75	% CONSENSUS FOR QUESTION 37	BENEFITS TO THE PROFESSION									
		38	BENEFITS TO COMMUNITY AND SOCIETY										
			Health care workers trained for the prevention and management of the ocular complications of diabetes will benefit the community and society through:										
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments		
242	176	a	the early detection and referral of sight threatening ocular pathology	12	100	0	0	0	0				
243	177	b	preventing or reducing the severity of the ocular complications of diabetes	12	100	0	0	0	0				
244	178	c	preventing blindness through early detection of ocular pathology	12	100	0	0	0	0				
245	179	d	alleviating the serious socio-economic aspects of uncontrolled diabetes and its ocular complications	12	100	0	0	0	0				
246	180	e	reducing the diabetic patient's general systemic disease risk and mortality	12	100	0	0	0	0				
247	181	f	providing diabetic patient education for the prevention, management and treatment of diabetes and its complications	12	100	0	0	0	0				
248	182	g	reducing the prevalence and severity of Type 2 diabetes in South Africa	11	92	1	8	0	0				
249	183	h	reducing the prevalence of the ocular complications of diabetes	12	100	0	0	0	0				
8	8	100	% CONSENSUS FOR QUESTION 38	BENEFITS TO COMMUNITY AND SOCIETY									
		39	BENEFITS TO HEALTH CARE WORKERS										
			Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will benefit through:										
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments		
250		a	increased professional status	7	58	4	33	1	8		Probably yes, but nurses are often rotated through other disciplines and the training would be 'lost' They must be retained within this specific field and a clause to this effect should be stipulated in the "contract of further education"		

251	184	b	an expansion of their scope of practice	10	83	1	8	0	0		
252	185	c	greater job satisfaction	11	92	1	8	0	0		
253	186	d	improved specialised competencies and skill	11	92	0	0	0	0		
254		e	greater remuneration	3	25	5	42	2	17		Part of basic comprehensive exam / Not necessarily but potentially / Only certain qualifications attract greater remuneration – this is a very competitive area
255		f	increased chances of promotion or advancement in employment	6	50	3	25	1	8		Not necessarily but potentially
5	3	60	% CONSENSUS FOR QUESTION 39			BENEFITS TO HEALTH CARE WORKERS					
		40	ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?								
			The issue of whether the diploma will be recognised in the career structure needs to be looked at. Will hospitals see this as a promotional qualification?								
			SECTION G								
			AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES								
			<p>This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>								
		41	ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES								
			The following aspects should be addressed in the diabetes education programme for the prevention and management of the ocular complications of diabetes:								
											Comments
256		a	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa	4	33	4	33	2	17		
257	187	b	the programme must address the education of diabetic patients in terms of the disease as well as its complications affecting the eyes	11	92	0	0	0	0		
258		c	the programme must address the issues and policies relating to the provision of public health in South Africa	6	50	4	33	1	8		
259		d	the programme must address the academic and administrative processes involved with a diabetes education programme	6	50	2	17	2	17		
260	188	e	the programme must provide standards and outcomes for the prevention and management of the ocular complications of diabetes	11	92	1	8	0	0		
261	189	f	clearly stated benefits of a diabetes education programme	12	100	0	0	0	0		
262		g	all of the above	4	33	2	17	0	0		
7	3	43	% CONSENSUS FOR QUESTION 41			ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES					
		42	ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?								
			Answers would change if the level was pitched at a higher or lower academic level / A section should be included which deals in greater depth with other than only ocular complications. Also for patients to realise the other risks. There may be a problem if the programme is aimed at a high level which may limit the pool of graduates and therefore limit the "penetration" into the general public. The problem could be solved if specific skills are rewarded in rural posts, but for that one needs DoH action in order to ensure accessibility / Need to focus on key causes of blindness so that when they are screening they do not ignore other potentially blinding conditions. Also it is important that skills around program planning are incorporated so that they can use the education to develop appropriate interventions.								
262	189	72	TOTAL PERCENTAGE CONSENSUS FOR ENTIRE QUESTIONNAIRE								

**ACCOMPANYING LETTER TO DELPHI PANEL ROUND THREE
(FINAL ROUND)**

**THE DEVELOPMENT OF A POST-GRADUATE EDUCATION AND TRAINING
PROGRAMME FOR HEALTH CARE WORKERS FOR THE PREVENTION
AND MANAGEMENT OF OCULAR COMPLICATIONS IN DIABETIC
PATIENTS**

Dear Delphi Participant

Thank you once again for your time and co-operation with this Delphi process. You should have received combined results and feedback from the first round and second rounds.

Attached please find the third and final round of the Delphi process. Again, I have removed those questions/statements upon which consensus has been reached by the 12 members of the Delphi panel. This questionnaire will only include statements/questions on which consensus was not reached in the first or second round. The questionnaire again reflects the percentage scores of the panel members from the second round in the three columns. The fourth column is the number of your particular choice from the last round.

Round Three enables you to reconsider your opinion on a specific statement in light of the opinions of the other participants. During this third round you are allowed to change your opinion **ONE LAST TIME** if you so wish. You can therefore indicate a different level of importance to any of the statements should you think it appropriate. Please place an "X" in the column of your choice and do this even if your choice remains the same as the first round. Please answer all the questions.

Please note that even if your comments are not reflected in the statements of this round, rest assured that all comments will be included in the final development of the programme. You may once again include any additional comments in this questionnaire. Your response will remain anonymous and confidential to all other participants and will only be known by the researcher.

The completion of this third round should take you no longer than 15 to 20 minutes. If possible I would like to receive feedback on this round not later than **3 days** after receipt of the questionnaire.

Thank you again for your time and assistance in this research.

Kind regards

A handwritten signature in black ink, appearing to read 'P. Clarke-Farr', written in a cursive style.

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QUESTIONNAIRE FOR DELPHI PANEL ROUND THREE (FINAL ROUND)

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SECTION A						
CURRICULUM DEVELOPMENT IN HIGHER EDUCATION						
<p>This section deals with curriculum and programme development in the Higher Education Sector.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>						
1 POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL						
In developing an education programme for the prevention and management of the ocular complications of diabetes:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
a	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 8 (postgraduate diploma level)					
b	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 9 (masters degree level)					
e	the diabetes education programme should be offered as a structured formally registered SAQA approved programme pegged at the appropriate level on the National Qualifications Framework					
f	the diabetes education programme should be offered as an informal or non-SAQA approved short course programme					
g	the diabetes education programme should be offered as a SAQA accredited short course programme					
h	the diabetes education programme should be offered by a University/ University of Technology					
2 OUTCOMES BASED EDUCATION						
In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes based education to ensure that:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
c	course and materials evaluation identify what is effective and working and also what is not					
e	self-evaluation by the students should be encouraged to ensure they know what is expected of them					
3 CURRICULUM PLANNING, DEVELOPMENT AND DESIGN						
In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of curriculum planning, development and design , therefore:						

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
a	the curriculum development process should be sensitive to the academic setting of the project					
b	the curriculum development process should be sensitive to the capabilities, interests and priorities of the students for whom the programme is designed to serve					
d	the development of the programme should require an understanding of the resources and options available to the faculty and educators involved					

4 IMPLEMENTING AND EVALUATING THE CURRICULUM

Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to **implementing and evaluating** the curriculum, therefore:

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
e	any social and political factors that may negatively impact the provision of the programme should be considered					
k	the entry and admission criteria for the programme must be adequately described					
m	the programme should allow for individual differences in learners and learning methods					
o	there should be provision for pilot testing of the proposed programme prior to final implementation					

5 LEARNER ASSESSMENT

In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for **learner assessment** in order to ensure that:

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
b	the ultimate outcome for each and every person learning in a particular programme should be equivalent and clearly stated					
f	there is the establishment of an assessment taskforce, which will include an assessment expert					
g	there is an integrated method of assessment covering all aspects of the learning programme					
i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors					
j	the flow of assessment information, lines of communication and promotion and exclusion processes of students are reflected					

6 ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?

SECTION B

PATIENT DIABETES EDUCATION

This section deals with the education of diabetes patients.

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.						
8 PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES						
In terms of the patient's knowledge of the ocular complications of diabetes , it would be important for diabetic patients to be aware that:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
c	diabetes may affect colour perception					
d	diabetes may affect the nerves of the eyes cause the eyes to become squint					
i	diabetes may cause the pressure in the eyes to increase thus leading to glaucoma					
10 ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?						
SECTION C PUBLIC HEALTH IN SOUTH AFRICA						
<p>This section deals with issues related to the provision of public health in South Africa.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>						
11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS						
In terms of the legislation and scope of the health care workers' professions, the following must be integral to an education programme for the prevention and management the ocular complications of diabetes:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
l	the relevant health legislation pertaining to the provision of health care in South Africa					
12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH						
In terms of the policies of the South Africa Department of Health, the following policies must be integral to an education programme for the prevention and management of the ocular complications of diabetes:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
c	Strategic Priorities for the National Health System 2004-2009					
f	The Patient's Rights Charter					
13 ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA						

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SECTION D
ACADEMIC AND ADMINISTRATIVE ASPECTS

This section deals with issues related to the academic and administrative aspects of a diabetes education programme:

Please indicate how important each of the following statements is according to the following scale:

1 = Essential
2 = Useful
3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

16 ADVISORY COMMITTEE

In terms of the **advisory committee** for the programme, there must be:

		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	
						Comments
a	an advisory committee established to ensure quality assurance of the diabetes education programme					
b	the advisory committee should have interdisciplinary and intersectoral integration					
d	the advisory committee should have regular meetings					
e	the advisory committee should plan and review the programme on an annual basis					
f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators					

17 DIABETES EDUCATION PROGRAMME

In terms of the overall **diabetes education programme**:

		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	
						Comments
f	the curriculum document of the programme should reflect the educational materials to be used					
g	the curriculum document of the programme should reflect the evaluation and assessment instruments					
h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice					

18 MISSION AND PURPOSE

In terms of the **mission and purpose** of the diabetes programme:

		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	
						Comments
b	the mission and purpose of the programme should fit into the broad mission statement of the Institution at which it is provided					
c	the mission of the programme should address the needs of the community in which the Institution resides					

19 TEACHING PERSONNEL						
The teaching personnel of the organisation and programme should meet the following requirements:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
b	the core teaching team should include an optometrist, medical practitioner, nutritionist, nurse, diabetes educator and/or other <u>appropriately trained health care professional</u>					
20 EDUCATIONAL METHODOLOGIES						
The following educational methodologies should be utilised in the programme:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
a	interactive learner participation with modalities such as group work, self study, class presentations and projects or assignments					
g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills					
h	uses reflective practice, problem-solving and decision-making skills as part of its learning process					
i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning					
21 LEARNER ASSESSMENT						
The following forms of learner assessment must be included in the education programme:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
a	formative assessment methodologies					
22 FORMAT OF PROGRAMME AND MODULES						
The following should be considered for the format of programme and modules :						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
d	learner development of individual research projects and assignments at the <u>appropriate post-graduate level</u>					
e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme					
23 ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE						
The following admission requirements & learning assumed to be in place must be clearly documented:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
c	a formal policy of recognition of prior learning					
24 ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS						

The following should constitute the required academic qualifications for programme lecturers and instructors:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
a	a post-graduate qualification in the appropriate field (at least Masters Degree, preferably Doctorate)					
b	a formal qualification in higher education teaching methodology					
c	a minimum of 5 years of experience lecturing in higher education					
25 ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS						
SECTION E						
STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES						
<p>This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes:</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>						
27 CRITICAL CROSS-FIELD OUTCOMES						
Upon completion of the diabetes education programme, learners should have the ability:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
c	to organise and manage oneself and one's activities responsibly and effectively					
f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others					
g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation					
28 CRITICAL OUTCOMES FOR HEALTH CARE WORKERS						
Upon completion of the diabetes education programme, learners should have the ability:						
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care					
f	to develop and use flexible and innovative approaches to practice appropriate to the needs of the patient in line with the goals of the health service and the employing authority					
h	to facilitate and assess the professional and other development needs of all for whom they are responsible, including where appropriate learners, and to act as a role model for professional practice					

i	to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.					
j	to evaluate quality of care delivered as an ongoing and cumulative process					
k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care					
l	to use science in the practice of health and medicine					
o	the ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards					
p	the ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration					

29 DIABETES STANDARDS FOR EDUCATION PROGRAMMES

The **curriculum for diabetes education** will need to demonstrate that it:

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
b	has processes in place to recognise prior diabetes learning					
c	has processes for collaboration with relevant diabetes organisations, associations and other bodies where appropriate					

30 CRITERIA FOR DIAGNOSIS OF DIABETES

Upon completion of the diabetes education programme, learners should be able to **describe**:

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
b	the diagnostic criteria for diabetes conforming to internationally accepted standards and norms					

33 OCULAR COMPLICATIONS

Upon completion of the diabetes education programme, learners should be able to **comprehensively describe**:

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
h	the neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders					

35 SCREENING FOR DIABETIC EYE DISEASE

Upon completion of the diabetes education programme, learners should **demonstrate the ability to**:

		ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy					

36 ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?

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SECTION F
BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

1 = Essential
 2 = Useful
 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

37 BENEFITS TO THE PROFESSION

Health Care Professionals completing an education programme for the prevention and management of the ocular complications of diabetes will **enhance their profession** through:

	ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
b contributing to the improvement of the status of the profession					

39 BENEFITS TO HEALTH CARE WORKERS

Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will **benefit** through:

	ESSENTIAL	USEFUL	UNNECESSARY	YOUR RESPONSE	Comments
a increased professional status					
e greater remuneration					
f increased chances of promotion or advancement in employment					

40 ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?

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SECTION G
AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

1 = Essential
 2 = Useful
 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

41	ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES					
	The following aspects should be addressed in the diabetes education programme for the prevention and management of the ocular complications of diabetes:					
		<i>ESSENTIAL</i>	<i>USEFUL</i>	<i>UNNECESSARY</i>	<i>YOUR RESPONSE</i>	Comments
a	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa					
c	the programme must address the issues and policies relating to the provision of public health in South Africa					
d	the programme must address the academic and administrative processes involved with a diabetes education programme					
g	all of the above					
42 ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?						
	DECLARATION: PLEASE INDICATE IF THE SELECTIONS MADE IN THIS THIRD ROUND QUESTIONNAIRE ARE YOUR FINAL CHOICES AND YOU WISH TO STAND BY YOUR SELECTIONS (Please place a "X" in the YES box to the right)	YES				

LETTER OF FEEDBACK FOR ROUND THREE (FINAL ROUND)

The Development of a Post-Graduate Education and Training Programme for Health Care Workers for the Management and Prevention of Ocular Complications in Diabetic Patients

Dear Delphi panellist

Thank you once again for participating in the Delphi process and for completing the third (final) round Delphi Questionnaire. Attached please find the final results of the third round of the Delphi process. It also summarises the results of the previous two rounds.

The results are reflected as follows in the table:

ROUND ONE CONSENSUS HIGHLIGHTED IN BLUE
ROUND TWO CONSENSUS HIGHLIGHTED IN YELLOW
ROUND THREE CONSENSUS HIGHLIGHTED IN TAN
PANEL STABILITY HIGHLIGHTED IN LIME

Thank you once again for your time and expertise and your participation in this research.

Kind regards



Peter Clarke-Farr

FINAL DELPHI RESULTS FEEDBACK TO DELPHI PANEL

		ROUND ONE CONSENSUS HIGHLIGHTED BLUE										
		ROUND TWO CONSENSUS HIGHLIGHTED YELLOW										
		ROUND THREE CONSENSUS HIGHLIGHTED TAN										
		PANEL STABILITY HIGHLIGHTED LIME										
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<p>SECTION A CURRICULUM DEVELOPMENT IN HIGHER EDUCATION</p> <p>This section deals with curriculum and programme development in the Higher Education Sector.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>												
<p>1 POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL</p>												
<p>In developing an education programme for the prevention and management of the ocular complications of diabetes:</p>												
					<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
1	1	a	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 8 (postgraduate diploma level)	10	83	2	17	0	0			Diabetes is a major public health issue in SA and should be integrated into basic training / Not having post-graduate training must not prevent a person from being involved in diabetic prevention or management
2	2	b	a postgraduate programme for the prevention and management of the ocular complications of diabetes should be implemented at the national qualification framework level 9 (masters degree level)		0	0	12	100				Diabetes is a major public health issue in SA and should be integrated into basic training / Only if not dealt with comprehensively at level 8 or if it latches on to a remedial module
3	3	c	the Department of Education and Department of Health should support a diabetes education programme for the prevention and management of the ocular complications of diabetes	10	83	2	17	0	0			"Support" means different things to different people/departments/organisations
4	4	d	the optical industry and the Professional Board for Optometry and Dispensing Opticians should support the diabetes education programme	10	83	2	17	0	0			As core competencies for undergraduate education
5	5	e	the diabetes education programme should be offered as a structured formally registered SAQA approved programme pegged at the appropriate level on the National Qualifications Framework	10	83	1	8	1	8			
6	6	f	the diabetes education programme should be offered as an informal or non-SAQA approved short course programme		0	10	83	2	17			Could be done as short courses, but only as a help, for referral purposes
7	7	g	the diabetes education programme should be offered as a SAQA accredited short course programme	2	17	10	83		0			Could be done as short courses, but only as a help, for referral purposes
8	8	h	the diabetes education programme should be offered by a University/ University of Technology	1	8	11	92		0			Essential if not included in other postgraduate courses / Refresher courses can be offered by various bodies / There must still be education programmes further down the "education ladder" as well
9	9	i	the diabetes education programme should be offered by a private training college/organisation	0	0	0	0	12	100			Unless it can be applied commercially / Unnecessary, only if "g" and "h" are in place
10	10	j	the diabetes education programme should be affiliated to an ophthalmic (optometry or opticianry) programme or nursing programme	12	100	0	0	0	0			Both optometry/opticianry as well as nursing as well as inter-institutional bodies / Not exclusively. Other health professions e.g.. Pharmacy, rehabilitation therapists, also need this education
10	10	100	% CONSENSUS FOR QUESTION 1	POLICIES AND PROCEDURES FOR PROGRAMME APPROVAL								
<p>2 OUTCOMES BASED EDUCATION</p>												
<p>In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of outcomes based education to ensure that:</p>												
					<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
11	11	a	fairness of both testing and grading is facilitated	10	83	1	8	1	8			OBE Does NOT guarantee fairness in grading and testing
12	12	b	goals of the course, content and evaluation procedures are both consistent and interrelated	11	92	1	8	0	0			
13	13	c	course and materials evaluation identify what is effective and working and also what is not	11	92	1	8		0			
14	14	d	orientation from "what I (as a lecturer) must cover" is changed to what a student should be able to do as a consequence of instruction	12	100	0	0	0	0			However, background knowledge needs to underpin "skills"

15	15	e	self-evaluation by the students should be encouraged to ensure they know what is expected of them	11	92	1	8		0		This however should be carefully monitored
16	16	f	efficient student learning is facilitated, and anxiety is reduced by providing direction and identifying instructional priorities	10	83	1	8	1	8		
17	17	g	demonstrations of competence must take place at the culminating or end point of the candidates' learning experience	10	83	1	8	1	8		There could be continuous evaluations / This aspect should be on continuous basis
18	18	h	demonstrations must occur in some context or performance setting	11	92	1	8	0	0		This should be well structured
19	19	i	demonstrations must show evidence of significant learning	11	92	1	8	0	0		
20	20	j	demonstrations must be of high quality	10	83	2	17	0	0		And should remain current i.e. at cutting edge
21	21	k	the outcomes must be significant, they must be clear and they must be concise.	11	92	1	8	0	0		
11	11	100	% CONSENSUS FOR QUESTION 2	OUTCOMES BASED EDUCATION							
		3	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN								
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of curriculum planning, development and design , therefore:								
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
22	22	a	the curriculum development process should be sensitive to the academic setting of the project	10	83	2	17		0		And be flexible enough to allow for easy changes if required / People only need to know what is needed for their particular role in the prevention / management "tree"
23	23	b	the curriculum development process should be sensitive to the capabilities, interests and priorities of the students for whom the programme is designed to serve	10	83	1	8	1	8		You are dealing with pathology and there are things students should be able to do / Increasing burden of diabetes and potential complications would not allow this.
24	24	c	the development of the programme should require a detailed knowledge and appreciation of the discipline	10	83	2	17	0	0		
25	25	d	the development of the programme should require an understanding of the resources and options available to the faculty and educators involved	10	83	2	17		0		
26	26	e	it is of utmost importance that appropriate stakeholders are identified and then contribute to the development of the education programme	12	100	0	0	0	0		
27	27	f	a measure of support and acceptance, by the stakeholders, of the outcomes specified is required	11	92	1	8	0	0		
28	28	g	the programme should have a rationale (or mission statement) to explain why the programme exists	10	83	2	17	0	0		This will require some data prior to setting a mission statement
29	29	h	the overall programme aims must be clearly stated, in order to explain what the programme will achieve	12	100	0	0	0	0		
30	30	i	outcome statements must be developed to indicate the knowledge, skills and attitudes learners are to acquire through the programme	10	83	2	17	0	0		Outcomes must be allowed to be slightly flexible
31	31	j	content statements must be provided to indicate what areas of knowledge will comprise the student learning	12	100	0	0	0	0		
32	32	k	teaching strategy statements must be provided in order to indicate how the learning activities will be organised	11	92	1	8	0	0		Should however be flexible to allow for changes / as long as they are relevant and will be upheld during the course
33	33	l	assessment methodologies must be provided to indicate how student learning will be assessed and reported	11	92	1	8	0	0		In line with the institution and SAQA
12	12	100	% CONSENSUS FOR QUESTION 3	CURRICULUM PLANNING, DEVELOPMENT AND DESIGN							
		4	IMPLEMENTING AND EVALUATING THE CURRICULUM								
			Prior to implementing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of factors related to implementing and evaluating the curriculum, therefore:								
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments
34	34	a	there must be a demonstrable need for the programme	11	92	1	8	0	0		
35	35	b	the academic area must be stable and well defined in terms of the knowledge comprising the programme	11	92	1	8	0	0		It should in fact create a specialised unit in the Department
36	36	c	there must be clear potential for success of the programme	11	92	1	8	0	0		
37	37	d	the department/institution providing the programme must have the necessary resources available	11	92	1	8	0	0		
38		e	any social and political factors that may negatively impact the provision of the programme should be considered	4	33	7	58	1	8		Relevant stakeholders should be identified up front
39	38	f	a needs assessment should be conducted in terms of the programme objectives	11	92	1	8	0	0		
40	39	g	the aims/exit level outcomes of the curriculum should be stated	12	100	0	0	0	0		
41	40	h	there should be a clear rationale and justification for the provision of the programme	12	100	0	0	0	0		
42	41	i	assessment criteria and procedures must be clearly stated	11	92	1	8	0	0		
43	42	j	the context and community in which the programme resides should be articulated	11	92	1	8	0	0		

44	43	k	the entry and admission criteria for the programme must be adequately described	10	83	2	17		0		This should be carefully thought through
45	44	l	the form of instruction should be appropriate to the learners' needs	11	92	1	8	0	0		However note must be taken that we are dealing with pathology / to include part time and not only full time
46		m	the programme should allow for individual differences in learners and learning methods	3	25	8	67	1	8		Debateable
47	45	n	provision must be made for adequate availability of learner resources, materials and facilities	11	92	1	8	0	0		
48		o	there should be provision for pilot testing of the proposed programme prior to final implementation	8	67	3	25	1	8		Unnecessary
49	46	p	criteria must be available for evaluation of all aspects of the programme for the purposes of quality assurance	10	83	2	17	0	0		
50	47	q	there must be evidence of significant groups and subject specialists involved throughout the development of the proposed programme curriculum	11	92	1	8	0	0		
17	14	82	% CONSENSUS FOR QUESTION 4	IMPLEMENTING AND EVALUATING THE CURRICULUM							
		5	LEARNER ASSESSMENT								
			In developing an education programme for the prevention and management of the ocular complications of diabetes, recognition must be taken of mechanisms for learner assessment in order to ensure that:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
51	48	a	the emphasis should be shifted away from the input or content aspect of programmes towards the objective assessment of the performance of learners in terms of clearly stated outcomes	11	92	1	8	0	0		Will require careful thought / Is the performance of a learner and the outcome not dependent on the quality of the input and content, to some extent?
52	49	b	the ultimate outcome for each and every person learning in a particular programme should be equivalent and clearly stated	10	83		0	2	17		Modularization
53	50	c	the assessment process must be objective and verifiable	10	83	2	17	0	0		
54	51	d	the responsibilities learners are expected to assume to monitor their own learning must be defined.	10	83	2	17	0	0		
55	52	e	the assessment criteria for each of the abilities/skills that have been developed should be defined	11	92	1	8	0	0		Be careful, subjectivity cannot always be discarded
56		f	there is the establishment of an assessment taskforce, which will include an assessment expert	6	50	6	50		0		
57	53	g	there is an integrated method of assessment covering all aspects of the learning programme	10	83	2	17		0		
58	54	h	there is the establishment of a systemic assessment programme, which will aim to ensure uniformity of assessment across all subjects/modules	11	92	0	0	1	8		If it is always possible it would be ideal
59		i	assessors have received formal training in assessment methodology in terms of SAQA requirements for assessors	4	33	6	50	2	17		
60	55	j	the flow of assessment information, lines of communication and promotion and exclusion processes of students are reflected	10	83		0	2	17		
61	56	k	all forms of assessment are moderated by appropriately trained moderators with specific expertise in the learning area	12	100	0	0	0	0		
62	57	l	moderation of learner assessments takes place to ensure that the required level, standard, appropriateness and fairness is observed	11	92	1	8	0	0		
12	10	83	% CONSENSUS FOR QUESTION 5	LEARNER ASSESSMENT							
		6	ANY FURTHER COMMENTS ON CURRICULUM DEVELOPMENT IN HIGHER EDUCATION?								
			SECTION B								
			PATIENT DIABETES EDUCATION								
			<p>This section deals with the education of diabetes patients.</p> <p>Please indicate how important each of the following statements is according to the following scale:</p> <p>1 = Essential 2 = Useful 3 = Unnecessary</p> <p>Please mark the appropriate block with an X. Only mark one option.</p>								
		7	PATIENT'S KNOWLEDGE OF DIABETES								
			In terms of the patient's knowledge of diabetes it would be important for diabetic patients to be aware of:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
63	58	a	the different types of diabetes	12	100	0	0	0	0		
64	59	b	the type of diabetes affecting the patient's themselves	11	92	1	8	0	0		

65	60	c	the risk factors that may contribute to the development of diabetes	10	83	1	8	1	8		These cannot be emphasised greatly enough!
66	61	d	the effect of pregnancy on the development of diabetes	11	92	1	8	0	0		These cannot be emphasised greatly enough! Absolutely essential because of gestational diabetes that can manifest.
67	62	e	the importance of maintaining good control over their blood sugar level	12	100	0	0	0	0		These cannot be emphasised greatly enough!
68	63	f	the importance of having their blood pressure checked and controlled if necessary	12	100	0	0	0	0		These cannot be emphasised greatly enough!
69	64	g	the importance of not smoking	12	100	0	0	0	0		These cannot be emphasised greatly enough!
7	7	100	% CONSENSUS FOR QUESTION 7	PATIENT'S KNOWLEDGE OF DIABETES							
				8 PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES							
			In terms of the patient's knowledge of the ocular complications of diabetes , it would be important for diabetic patients to be aware that:								
											Comments
70	65	a	diabetes may affect vision at distance and near	11	92	0	0	1	8		
71	66	b	diabetes may change their refractive error / spectacle prescription	10	83	1	8	1	8		
72	67	c	diabetes may affect colour perception	10	83	1	8	1	8		
73	68	d	diabetes may affect the nerves of the eyes cause the eyes to become squint	10	83		0	2	17		
74	69	e	diabetes may affect the ability of the eyes to heal if they become injured	10	83	1	8	1	8		
75	70	f	diabetes may contribute to cataract formation	10	83	2	17	0	0		
76	71	g	diabetes may cause bleeding and damage to the retinas of the eyes?	10	83	2	17	0	0		These are important as they are the serious complications that we see everyday and battle to treat
77	72	h	diabetes may cause new blood vessels to grow inside the eyes	11	92	1	8	0	0		These are important as they are the serious complications that we see everyday and battle to treat / NB
78	73	j	diabetes may cause a retinal detachment to occur	10	83	1	8	1	8		NB
79	74	i	diabetes may cause the pressure in the eyes to increase thus leading to glaucoma	10	83	1	8	1	8		
10	10	100	% CONSENSUS FOR QUESTION 8	PATIENT'S KNOWLEDGE OF THE OCULAR COMPLICATIONS OF DIABETES							
				9 PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES							
			In terms of the patient's knowledge of the management and treatment of diabetes , they should be educated about:								
											Comments
80	75	a	the importance of following a healthy prescribed diet and lifestyle	11	92	1	8	0	0		
81	76	b	the importance of regularly measuring their blood sugar as scheduled by their medical practitioner	12	100	0	0	0	0		"medical practitioner" to be changed to "health care professional"
82	77	c	the importance of regular exercise	11	92	1	8	0	0		
83	78	d	the importance of maintaining an ideal body weight	10	83	2	17	0	0		change "ideal" to appropriate
84	79	e	the importance of taking their medication exactly as prescribed	12	100	0	0	0	0		
85	80	f	the importance of going for regular medical check ups at the clinic / doctor	12	100	0	0	0	0		
86	81	g	the importance of undergoing regular eye examinations	12	100	0	0	0	0		
87	82	h	the general systemic complications that may occur with diabetes	11	92	1	8	0	0		and how they may be managed and treated
88	83	i	the ocular complications that may occur with diabetes and how they may be managed/treated	12	100	0	0	0	0		
9	9	100	% CONSENSUS FOR QUESTION 9	PATIENT'S KNOWLEDGE OF THE MANAGEMENT AND TREATMENT OF DIABETES							
				10 ANY FURTHER COMMENTS ON PATIENT DIABETES EDUCATION?							
			All these aspects have to be part of the basic undergraduate training / It must be stressed that diabetes causes BLINDNESS , not just poor vision, but that this is PREVENTABLE if, and only if, they have REGULAR eye check ups by an appropriate clinician / Family members should be included in the management as much as possible / Also to know signs and symptoms of too high or too low blood sugar levels and then what to do / A helpline should exist for such patients as many have had amputations and have no means of getting to even a clinic / Patients should know the Prevalence of Blindness due to Diabetes as this is often not taken seriously and they feel it wont happen to them.								
			SECTION C								
			PUBLIC HEALTH IN SOUTH AFRICA								
			This section deals with issues related to the provision of public health in South Africa.								
			Please indicate how important each of the following statements is according to the following scale:								
			1 = Essential								
			2 = Useful								
			3 = Unnecessary								

Please mark the appropriate block with an X. Only mark one option.

11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS

In terms of the **legislation and scope** of the health care workers' professions, the following must be integral to an education programme for the prevention and management the ocular complications of diabetes:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
89	84	a	the definition of a primary health care nurse	10	83	2	17	0	0	
90	85	b	the definition of an ophthalmic nurse	10	83	2	17	0	0	
91	86	c	the definition of a diabetes educator	10	83	1	8	0	0	
92	87	d	the definition of an optometrist	11	92	0	0	1	8	
93	88	e	the scope of practice of a nurse	11	92	1	8	0	0	
94	89	f	the scope of practice of an optometrist	10	83	2	17	0	0	
95	90	g	the function and scope of allied health care workers	10	83	2	17	0	0	
96	91	h	the acts and procedures that fall within the scope of nursing	10	83	1	8	1	8	
97	92	i	the acts and procedures that fall within the scope of optometry	10	83	2	17	0	0	
98	93	j	the acts or procedures that should be performed during the management and treatment of the ocular complications of diabetic patients	12	100	0	0	0	0	
99	94	k	the responsibilities of the patient	10	83	2	17	0	0	
100	95	l	the relevant health legislation pertaining to the provision of health care in South Africa	10	83	2	17		0	

12 12 100 % CONSENSUS FOR QUESTION 11 LEGISLATION AND SCOPE OF THE HEALTH CARE WORKERS' PROFESSIONS

12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH

In terms of the policies of the South Africa Department of Health, the following **policies** must be integral to an education programme for the prevention and management of the ocular complications of diabetes:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
101	96	a	The RSA Department of Health's National Programme for Control and Management of Type 2 Diabetes	11	92	1	8	0	0	
102	97	b	The National Guidelines for the Prevention of Blindness in South Africa	10	83	2	17	0	0	
103	98	c	Strategic Priorities for the National Health System 2004-2009	10	83	2	17		0	
104	99	d	The Primary Health Care Package for South Africa: A Set of Norms and Standards	10	83	1	8	1	8	
105	100	e	All relevant acts and/or professional guidelines issued by the HPCSA	10	83	1	8	1	8	Provided they do not contradict govt. policies or other health professions councils in any way. (Not really likely).
106		f	The Patient's Rights Charter	8	67	3	25	1	8	

6 5 83 % CONSENSUS FOR QUESTION 12 POLICIES OF THE SOUTH AFRICA DEPARTMENT OF HEALTH

13 ANY FURTHER COMMENTS ON PUBLIC HEALTH IN SOUTH AFRICA

Public health at Universities cover disease profiles (morbidity and mortality), the DHS, interdisciplinary and inter-sectoral collaborations / Adhering to and trying to "please" all the above policies will lead to a lot of frustrations. Primary Health Care Standard Treatment Guidelines and Essential Drugs List + Hospital level Standard Treatment Guidelines and Essential Drug List for Adults + Hospital level Standard Treatment Guidelines and Essential Drug List for Paediatrics + all additional/ updated pertinent guidelines / policies that may be developed +Cataract Surgery Guidelines + Refractive Errors Screening Guidelines

**SECTION D
ACADEMIC AND ADMINISTRATIVE ASPECTS**

This section deals with issues related to the academic and administrative aspects of a diabetes education programme:

Please indicate how important each of the following statements is according to the following scale:

- 1 = Essential
- 2 = Useful
- 3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

14 ORGANISATION OF THE PROGRAMME

In terms of the **organisation** of a diabetes curriculum, there must be:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
107	101	a	written objectives for the education programme	12	100	0	0	0	0		
108	102	b	the provision of all necessary resources in order to achieve the proposed objectives	10	83	2	17	0	0		
109	103	c	the composition of the organisation must include the teaching team and its members, a co-ordinator and an advisory committee	11	92	1	8	0	0		
3	3	100	% CONSENSUS FOR QUESTION 14	ORGANISATION OF THE PROGRAMME							
		15	PROGRAMME CO-ORDINATION								
			In terms of the programme co-ordination , there must be:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
110	104	a	a specific programme co-ordinator who will be responsible for overseeing the overall progress of the programme, including the planning, implementation and evaluation thereof.	11	92	0	0	1	8	Essential initially, useful thereafter	
1	1	100	% CONSENSUS FOR QUESTION 15	PROGRAM							
		16	ADVISORY COMMITTEE								
			In terms of the advisory committee for the programme, there must be:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
111	105	a	an advisory committee established to ensure quality assurance of the diabetes education programme	10	83	2	17	0	0		
112	106	b	the advisory committee should have interdisciplinary and intersectoral integration	1	8	10	83	1	8		
113	107	c	the advisory committee should have current experience and understanding of diabetes management	11	92	0	0	1	8		
114		d	the advisory committee should have regular meetings	4	33	8	67	0	0	Maybe initially	
115		e	the advisory committee should plan and review the programme on an annual basis	8	67	4	33	0	0	More frequent than on an annual basis	
116		f	the advisory committee should review and certify the knowledge, skills, abilities and experience of the educators	5	42	7	58	0	0	Is this the advisory committee function?	
6	3	50	% CONSENSUS FOR QUESTION 16	ADVISORY COMMITTEE							
		17	DIABETES EDUCATION PROGRAMME								
			In terms of the overall diabetes education programme :								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
117	108	a	the programme must aim to ensure accessibility to the overall learner population to whom it is directed	11	92	1	8	0	0	According to specific criteria / Transport costs are a big deterrent to learners and patients etc	
118	109	b	the target population should be defined with regard to the potential number of patients, type of diabetes, age, language, regional characteristics and special educational needs.	11	92	1	8	0	0		
119	110	c	the programme curriculum must be suitably flexible in terms of mode of delivery to accommodate the diversity of circumstances of potential learners	12	100	0	0	0	0		
120	111	d	the curriculum document of the programme should reflect the objectives, course contents and outcomes	10	83	2	17	0	0		
121	112	e	the curriculum document of the programme should reflect the teaching methodology, ordering, sequencing and duration of modules/coursework	10	83	1	8	1	8	Individual initiative also to be encouraged / fundamental to OBE	
122		f	the curriculum document of the programme should reflect the educational materials to be used	9	75	3	25	0	0	Should however be flexible	
123		g	the curriculum document of the programme should reflect the evaluation and assessment instruments	9	75	3	25	0	0		
124		h	an appropriate level of research should be included in the programme in order to prepare learners for independent thinking and practice	7	58	5	42	0	0	Only at higher levels	
8	5	63	% CONSENSUS FOR QUESTION 17	DIABETES EDUCATION PROGRAMME							
		18	MISSION AND PURPOSE								
			In terms of the mission and purpose of the diabetes programme:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments	
125	113	a	the mission and purpose of the programme must be clearly stated	10	83	1	8	0	0		
126	114	b	the mission and purpose of the programme should fit into the broad mission statement of the Institution at which it is provided		0	12	100		0		

127	115	c	the mission of the programme should address the needs of the community in which the Institution resides	10	83	1	8	1	8			
128	116	d	the purpose statement of the programme must indicate what learners will be able to do upon successful completion of the programme	12	100	0	0	0	0		Basic principle of education	
4	4	100	% CONSENSUS FOR QUESTION 18									MISSION AND PURPOSE
		19	TEACHING PERSONNEL									
			The teaching personnel of the organisation and programme should meet the following requirements:									
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments	
129	117	a	they should have specialised knowledge of all aspects of the diagnosis, control and treatment/management of all aspects of diabetes	10	83	1	8	1	8		Collectively	
130	118	b	the core teaching team should include an optometrist, medical practitioner, nutritionist, nurse, diabetes educator and/or other appropriately trained health care professional	10	83	2	17		0		Could also include social workers and counsellors	
131	119	c	they should have appropriate educational qualifications and experience to instruct at the higher education level	10	83	1	8	1	8			
3	3	100	% CONSENSUS FOR QUESTION 19									TEACHING PERSONNEL
		20	EDUCATIONAL METHODOLOGIES									
			The following educational methodologies should be utilised in the programme:									
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments	
132		a	interactive learner participation with modalities such as group work, self study, class presentations and projects or assignments	7	58	5	42		0		Should be structured as in-service training and adapted to context	
133	120	b	clinical and practical training in order to develop skills required for the treatment and management of diabetic patients	12	100	0	0	0	0			
134	121	c	practical training aimed at exposing learners to clinics, community health centres and hospitals treating diabetic patients	12	100	0	0	0	0			
135	122	d	theoretical and practical training aimed at exposing learners to ophthalmological treatment of diabetic patients	11	92	1	8	0	0		Keeping their scope in mind / Fine in theory, but quite difficult in practice	
136	123	e	theoretical and practical/clinical training that may be effectively supervised and assessed by instructors / lecturers	11	92	1	8	0	0			
137	124	f	small group teaching should be encouraged in order to facilitate closer interaction between learner and educator	10	83	2	17	0	0			
138		g	research methodology and individual research dissertations should be incorporated into the learning process to develop critical thinking and analysis skills	5	42	1	8	6	50			
139		h	uses reflective practice, problem-solving and decision-making skills as part of its learning process	9	75	3	25		0			
140		i	a flexible mode of delivery using technology and electronic based sources of information to facilitate easier access to various forms of learning	4	33	8	67		0			
9	5	56	% CONSENSUS FOR QUESTION 20									EDUCATIONAL METHODOLOGIES
		21	LEARNER ASSESSMENT									
			The following forms of learner assessment must be included in the education programme:									
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments	
141	125	a	formative assessment methodologies	10	83	2	17		0			
142	126	b	summative assessment methodologies	10	83	1	8	1	8			
143	127	c	evaluation of theoretical learning	10	83	2	17	0	0			
144	128	d	evaluation of practical/clinical learning	12	100	0	0	0	0			
145	129	e	a variety of forms of assessment should be employed to ensure that learner's knowledge is assessed by the most appropriate means	11	92	1	8	0	0		Learners must be able to identify disease. It is not crucial if they don't know exactly how it developed etc	
5	5	100	% CONSENSUS FOR QUESTION 21									LEARNER ASSESSMENT
		22	FORMAT OF PROGRAMME AND MODULES									
			The following should be considered for the format of programme and modules:									
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments	
146	130	a	the traditional emphasis on instructional time or programme duration should be replaced with greater emphasis on student learning and achievement of outcomes	10	83	2	17	0	0		Within limits and with clear parameters / An excellent "mind-set" change	
147	131	b	time-based learning policies should shift to mastery of skills and knowledge by the learners	10	83	2	17	0	0		However there should be an ultimate period defined within which the learner gains the necessary skills and knowledge	
148	132	c	learning should take place through a learner-centred approach rather than a lecturer-centred approach	10	83	2	17	0	0		Would have to be careful	

149		d	learner development of individual research projects and assignments at the appropriate post-graduate level	4	33	8	67		0		
150		e	open and flexible learning in terms of access to modules and instructional methodologies should form a critical aspect of the programme	8	67	3	25	1	8		Would be an ideal learning environment Course needs to be ordered and well structured
5	3	60	% CONSENSUS FOR QUESTION 22		FORMAT OF PROGRAMME AND MODULES						
		23	ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE								
			The following admission requirements & learning assumed to be in place must be clearly documented:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
151	133	a	the minimum admission requirements to the training programme	11	92	0	0	1	8		Try not to exclude people who are keen as there is a role for everyone at some level of prevention and management. Different role players have to have different requirements
152	134	b	the requirements for clinical and theoretic learning assumed to be in place prior to admission to the programme	10	83	2	17	0	0		May not always be possible
153	135	c	a formal policy of recognition of prior learning	10	83	2	17	0	0		Be implemented carefully
154	136	d	the specific requirements for admission to examinations	11	92	1	8	0	0		
155	137	e	promotion criteria from module to module or to the following level of study	10	83	1	8	1	8		
5	5	100	% CONSENSUS FOR QUESTION 23		ADMISSION REQUIREMENTS & LEARNING ASSUMED TO BE IN PLACE						
		24	ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS								
			The following should constitute the required academic qualifications for programme lecturers and instructors:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
156		a	a post-graduate qualification in the appropriate field (at least Masters Degree, preferably Doctorate)	3	25	8	67	1	8		Good educators may not have post-graduate qualifications
157		b	a formal qualification in higher education teaching methodology	1	8	8	67	3	25		Not an imperative
158	138	c	a minimum of 5 years of experience lecturing in higher education	0	0	10	83	2	17		Questionable
159	139	d	registration with the appropriate Health Professions Board or Council	10	83	0	0	2	17		Be flexible with "appropriate"
4	2	50	% CONSENSUS FOR QUESTION 24		ACADEMIC QUALIFICATIONS OF PROGRAMME LECTURERS						
		25	ANY FURTHER COMMENTS ON THE ACADEMIC AND ADMINISTRATIVE ASPECTS								
			The reason for the word "assumed" in statement number 23 is not clear								
			SECTION E								
			STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES								
			This section deals with issues related to the standards and outcomes for a programme for the prevention and management of the ocular complications of diabetes: Please indicate how important each of the following statements is according to the following scale: 1 = Essential 2 = Useful 3 = Unnecessary Please mark the appropriate block with an X. Only mark one option.								
		26	OVERVIEW AND CLASSIFICATION OF DIABETES								
			Upon completion of the diabetes education programme, learners should be able to:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
160	140	a	comprehensively describe the various TYPES of diabetes	12	100	0	0	0	0		
161	141	b	CLASSIFY the various types of diabetes	11	92	1	8	0	0		
162	142	c	comprehensively describe the various CAUSES of TYPE I diabetes	10	83	1	8	1	8		
163	143	d	comprehensively describe the various CAUSES of TYPE II diabetes	11	92	1	8	0	0		
164	144	e	comprehensively describe the various EFFECTS of uncontrolled diabetes on the human body	11	92	1	8	0	0		
165	145	f	comprehensively describe the pathophysiology of diabetes	10	83	2	17	0	0		
166	146	g	describe the primary actions of insulin	10	83	2	17	0	0		What about oral medication? Also consider interactions, side-effects, special precautions.
7	7	100	% CONSENSUS FOR QUESTION 26		OVERVIEW AND CLASSIFICATION OF DIABETES						

27 CRITICAL CROSS-FIELD OUTCOMES											
Upon completion of the diabetes education programme, learners should have the ability :											
											Comments
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		
167	147	a	to identify and solve problems with responsible decisions shown to be the result of critical and creative thinking	10	83	2	17	0	0		
168	148	b	to work effectively with others as a member of a team, group, organisation and community	10	83	2	17	0	0		
169	149	c	to organise and manage oneself and one's activities responsibly and effectively	10	83	2	17	0	0		
170	150	d	to collect, analyse, organise and critically evaluate information	11	92	0	0	1	8		
171	151	e	to communicate effectively, using visual, mathematical and/or language skills in oral and/or written presentation	11	92	1	8	0	0		
172		f	to use science and technology effectively and critically, showing responsibility towards the environments and health of others	8	67	3	25	1	8		
173		g	to demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation	2	17	9	75	1	8		Unsure of this very broad statement
174	152	h	to demonstrate cultural and aesthetic sensitivity to all patients and colleagues and learners in the everyday working environment	11	92	1	8	0	0		
8	6	75	% CONSENSUS FOR QUESTION 27		CRITICAL CROSS-FIELD OUTCOMES						
28 CRITICAL OUTCOMES FOR HEALTH CARE WORKERS											
Upon completion of the diabetes education programme, learners should have the ability :											
											Comments
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		
175	153	a	to exercise professional accountability and responsibility, reflected in the degree to which the practitioner uses professional skills, knowledge and expertise in changing environments, across professional boundaries and in unfamiliar situations	11	92	1	8	0	0		
176	154	b	to practice effectively in accordance with the professional and legal framework (knowledge, skills and attitudes/values) as a member of the health team	11	92	1	8	0	0		
177	155	c	to use specialist skills, knowledge and expertise in the practice area where working, including a deeper and broader understanding of client/patient health needs	12	100	0	0	0	0		Need to define specialist skills
178		d	to use research to plan, implement and evaluate concepts and strategies leading to improvements in care	3	25	7	58	2	17		May need to provide service
179	156	e	to work as part of a multi-professional team, in which the leadership role changes in response to changing client needs	11	92	1	8	0	0		
180	157	f	to develop and use flexible and innovative approaches to practice appropriate to the needs of the patient in line with the goals of the health service and the employing authority	2	17	10	83	0	0		
181	158	g	to have an understanding of health promotion and preventative policies and strategies	12	100	0	0	0	0		
182	159	h	to facilitate and assess the professional and other development needs of all for whom they are responsible, including where appropriate learners, and to act as a role model for professional practice	11	92	0	0	1	8		
183	160	i	to take informed decisions about the allocation of resources for the benefit of individual clients and the client group with whom working.	10	83	2	17	0	0		
184		j	to evaluate quality of care delivered as an ongoing and cumulative process	8	67	4	33	0	0		
185		k	to facilitate, initiate, manage and evaluate change in practice to improve quality of care	9	75	2	17	1	8		
186		l	to use science in the practice of health and medicine	7	58	5	42	0	0		Depends at what level
187	161	m	to diagnose, manage and prevent diseases	10	83	1	8	1	8		Within their scope, Should state prevent, diagnose and manage (prevent should appear first)
188	162	n	to use prior training and education in problem solving in a clinical situation	12	100	0	0	0	0		
189	163	o	the ability to effectively assess, analyse, interpret, diagnose, prioritise, solve and reflectively evaluate and report clinical/health problems based on relevant frameworks/standards	10	83	2	17	0	0		Different role players will have different roles in the management. It is not crucial that learners be expected to do all of the above mentioned
190	164	p	the ability to address clinical needs/problems by taking social, economic, legal, ethical, environmental, cultural and demographic influences into consideration	10	83	2	17	0	0		There may be more
16	12	75	% CONSENSUS FOR QUESTION 28		CRITICAL OUTCOMES FOR HEALTH CARE WORKERS						
29 DIABETES STANDARDS FOR EDUCATION PROGRAMMES											
The curriculum for diabetes education will need to demonstrate that it:											
											Comments
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		
191	165	a	supports students to gain knowledge, and develop skills and competence to deliver diabetes education in general and the ocular complications of diabetes in particular	11	92	1	8	0	0		
192	166	b	has processes in place to recognise prior diabetes learning	10	83	0	0	2	17		Should not necessarily be a prerequisite

193	167	c	has processes for collaboration with relevant diabetes organisations, associations and other bodies where appropriate	10	83	2	17		0			
194	168	d	integrates diabetic theory, research and clinical practice	10	83	2	17	0	0			
195	169	e	has appropriate resources to deliver the curriculum, including the quantity and quality of clinical experience and supervision	12	100	0	0	0	0			
196	170	f	is delivered by a teacher/instructor with the appropriate education and qualifications to teach the subjects allocated to them	12	100	0	0	0	0		Or perhaps sometimes just experience	
197	171	g	has procedures in place to approve and monitor facilities where clinical experience is undertaken	11	92	1	8	0	0			
198	172	h	will, upon successful completion of the course lead to a qualification in the prevention, management and treatment of the ocular complications of diabetes	11	92	1	8	0	0		Within their scope	
199	173	i	equips the student to deal with professional issues, role conflict and the delivery of diabetes education according to the role they are expected to perform	10	83	2	17	0	0			
200	174	j	is clearly defined in the context of the particular society and healthcare system in which the programme is to be delivered.	10	83	2	17	0	0			
10	10	100	% CONSENSUS FOR QUESTION 29									DIABETES STANDARDS FOR EDUCATION PROGRAMMES
			30 CRITERIA FOR DIAGNOSIS OF DIABETES									
			Upon completion of the diabetes education programme, learners should be able to describe :									
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments	
201	175	a	the diagnostic criteria for diabetes	12	100	0	0	0	0			
202	176	b	the diagnostic criteria for diabetes conforming to internationally accepted standards and norms	10	83	1	8	1	8		International criteria may be adjusted to South African criteria for particular reasons, chief among them would be resources. It would then be imperative that S A criteria be utilised.	
203	177	c	the diagnostic criteria for diabetes taking into account the criteria outlined by the South African Department of Health as part of its National Programme for Control and Management of Diabetes Type 2	12	100	0	0	0	0			
3	3	100	% CONSENSUS FOR QUESTION 30									CRITERIA FOR DIAGNOSIS OF DIABETES
			31 RISK FACTORS FOR DIABETES									
			Upon completion of the diabetes education programme, learners should be able to identify :									
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments	
204	178	a	the known modifiable and non-modifiable risk factors for developing Type 1 diabetes	11	92	1	8	0	0			
205	179	b	the known modifiable and non-modifiable risk factors for developing Type 2 diabetes	12	100	0	0	0	0			
206	180	c	all the risk factors having an influence on the incidence and progression of diabetic retinopathy	11	92	1	8	0	0			
3	3	100	% CONSENSUS FOR QUESTION 31									RISK FACTORS FOR DIABETES
			32 SYSTEMIC COMPLICATIONS									
			Upon completion of the diabetes education programme, learners should be able to explain :									
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments	
207	181	a	explain the acute (short term) systemic complications of diabetes mellitus	10	83	2	17	0	0			
208	182	b	explain the long term systemic complications of diabetes mellitus	12	100	0	0	0	0			
2	2	100	% CONSENSUS FOR QUESTION 32									SYSTEMIC COMPLICATIONS
			33 OCULAR COMPLICATIONS									
			Upon completion of the diabetes education programme, learners should be able to comprehensively describe :									
				<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>		Comments	
209	183	a	the refractive changes that may occur in diabetic patients	11	92	0	0	1	8			
210	184	b	the changes that may occur in the eyes in terms of visual performance (Such as reduced visual acuity, blue-yellow colour defects, abnormal contrast sensitivity and field loss)	11	92	1	8	0	0			
211	185	c	the nerve palsies and defects that may occur in diabetic patients	11	92	0	0	1	8			
212	186	d	the various pathophysiological effects of diabetes on the cornea	10	83	0	0	2	17			
213	187	e	the lenticular changes and processes leading to diabetic cataracts	10	83	2	17	0	0			
214	188	f	the neovascular response of the eye to ocular ischaemia secondary to the diabetes, including the development of rubeosis irides	12	100	0	0	0	0			
215	189	g	the development of ocular hypertension and glaucoma in diabetic patients	10	83	0	0	2	17			

216	190	h	the neuro-ophthalmic disorders which may occur in diabetic patients including non-arteritic ischaemic optic neuropathy, optic atrophy, pupillary dysfunction and accommodative disorders	10	83	1	8	1	8		
217	191	i	the processes leading to tractional retinal and vitreous detachments due to diabetes	10	83	1	8	1	8		
218	192	j	the skin and eyelid disorders and infections that may be encountered in diabetic patients	10	83	0	0	2	17		
219	193	k	all aspects of ocular or diabetic retinopathy	10	83	2	17	0	0		
220	194	l	the pathogenesis of ocular retinopathy	10	83	1	8	1	8		
221	195	m	the various forms of classification of diabetic retinopathy	11	92	1	8	0	0		
222	196	n	the various forms of ocular pathology comprising diabetic retinopathy	12	100	0	0	0	0		
14	14	100	% CONSENSUS FOR QUESTION 33	OCULAR COMPLICATIONS							
		34	MANAGEMENT OF DIABETIC EYE DISEASE								
			For managing diabetic eye disease, upon completion of the education programme, learners should be able to:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
223	197	a	emphasise the role of prevention in the management of diabetic eye disease	12	100	0	0	0	0		Delete the words "in the management" - The aim is to prevent the development of diabetic eye disease
224	198	b	emphasise the role of early detection of retinopathy and the monitoring of existing retinopathy with regular and appropriately timed fundus examinations	12	100	0	0	0	0		
225	199	c	emphasise the importance of effective appropriately-timed laser treatment	11	92	1	8	0	0		Linked to the above
226	200	d	emphasise the importance of effective education of patients, the public and health care professionals	12	100	0	0	0	0		
227	201	e	detail the various types of interventions and treatment modalities for the different types of diabetic eye disease	10	83	2	17	0	0		
228	202	f	detail the stages of diabetic eye disease at which treatment regimens are commenced	10	83	2	17	0	0		
229	203	g	manage diabetic eye disease according to their skills and professional scope	10	83	1	8	1	8		
230	204	h	refer patients for further treatment at the appropriate stage	11	92	1	8	0	0		Add: and ensure follow – up of the patient (This would ensure that the patient does not get 'lost' within the system without the appropriate intervention/ treatment).
8	8	100	% CONSENSUS FOR QUESTION 34	MANAGEMENT OF DIABETIC EYE DISEASE							
		35	SCREENING FOR DIABETIC EYE DISEASE								
			Upon completion of the diabetes education programme, learners should demonstrate the ability to:								
				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%		Comments
231		a	describe the World Health Organization's requirements for a screening programme for diabetic retinopathy	7	58	5	42		0		
232	205	b	describe and perform the screening methods required to detect diabetic retinopathy and the ocular complications of diabetes	11	92	0	0	1	8		
233	206	c	describe the screening interval and frequency of retinal examinations for Type I diabetic patients	10	83	1	8	1	8		
234	207	d	describe the screening interval and frequency of retinal examinations for Type II diabetic patients	12	100	0	0	0	0		Essential if Type II
235	208	e	describe the general screening and referral protocols for diabetic retinopathy	11	92	0	0	1	8		
236	209	f	describe the specific referral criteria from primary level to secondary level according to the National Guidelines for the Prevention of Blindness in South Africa	11	92	0	0	1	8		
237	210	g	correctly use the recommended instrumentation for diabetic retinopathy screening	12	100	0	0	0	0		
7	6	86	% CONSENSUS FOR QUESTION 35	SCREENING FOR DIABETIC EYE DISEASE							
		36	ANY FURTHER COMMENTS ON THE STANDARDS AND OUTCOMES FOR A PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?								
			Be able to distinguish between referral for diabetic retinopathy and other ocular conditions. If patients are screened they should be referred for refractive errors etc even if they do not have diabetic eye disease.								
			SECTION F								
			BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES								
			This section deals with issues related to the benefits of a programme for the prevention and management of the ocular complications of diabetes:								
			Please indicate how important each of the following statements is according to the following scale:								
			1 = Essential								
			2 = Useful								
			3 = Unnecessary								

Please mark the appropriate block with an X. Only mark one option.

37 BENEFITS TO THE PROFESSION

Health Care Professionals completing an education programme for the prevention and management of the ocular complications of diabetes will **enhance their profession** through:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
238	211	a	greater participation of their Profession in the provision of public health care	10	83	2	17	0	0	More posts for government employed optometrists need to be created
239	212	b	contributing to the improvement of the status of the profession	11	92	1	8	0	0	
240	213	c	increasing the specialist skills and expertise of the members of their Profession	11	92	1	8	0	0	
241	214	d	increasing patient access to health care through increased provision of specialised health care services	12	100	0	0	0	0	

4 4 100 % CONSENSUS FOR QUESTION 37 **BENEFITS TO THE PROFESSION**

38 BENEFITS TO COMMUNITY AND SOCIETY

Health care workers trained for the prevention and management of the ocular complications of diabetes will **benefit the community and society** through:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
242	215	a	the early detection and referral of sight threatening ocular pathology	12	100	0	0	0	0	
243	216	b	preventing or reducing the severity of the ocular complications of diabetes	12	100	0	0	0	0	
244	217	c	preventing blindness through early detection of ocular pathology	12	100	0	0	0	0	
245	218	d	alleviating the serious socio-economic aspects of uncontrolled diabetes and its ocular complications	12	100	0	0	0	0	
246	219	e	reducing the diabetic patient's general systemic disease risk and mortality	12	100	0	0	0	0	
247	220	f	providing diabetic patient education for the prevention, management and treatment of diabetes and its complications	12	100	0	0	0	0	
248	221	g	reducing the prevalence and severity of Type 2 diabetes in South Africa	11	92	1	8	0	0	
249	222	h	reducing the prevalence of the ocular complications of diabetes	12	100	0	0	0	0	

8 8 100 % CONSENSUS FOR QUESTION 38 **BENEFITS TO COMMUNITY AND SOCIETY**

39 BENEFITS TO HEALTH CARE WORKERS

Health care workers qualified in the prevention and management of the ocular complications of diabetic patients will **benefit** through:

				ESSENTIAL	%	USEFUL	%	UNNECESSARY	%	Comments
250		a	increased professional status	8	67	4	33	0	0	Probably yes, but nurses are often rotated through other disciplines and the training would be 'lost' They must be retained within this specific field and a clause to this effect should be stipulated in the "contract of further education"
251	223	b	an expansion of their scope of practice	10	83	1	8	0	0	
252	224	c	greater job satisfaction	11	92	1	8	0	0	
253	225	d	improved specialised competencies and skill	11	92	0	0	0	0	
254	226	e	greater remuneration	1	8	10	83	1	8	Part of basic comprehensive exam / Not necessarily but potentially / Only certain qualifications attract greater remuneration – this is a very sensitive area.
255		f	increased chances of promotion or advancement in employment	8	67	3	25	1	8	Not necessarily but potentially

5 4 80 % CONSENSUS FOR QUESTION 39 **BENEFITS TO HEALTH CARE WORKERS**

40 ANY FURTHER COMMENTS ON THE BENEFITS OF AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES?

The issue of whether the diploma will be recognised in the career structure needs to be looked at. Will hospitals see this as a promotional qualification?

SECTION G

AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

This section deals with aspects that must be addressed in an education programme for the prevention and management of the ocular complications of diabetes:

Please indicate how important each of the following statements is according to the following scale:

1 = Essential
2 = Useful
3 = Unnecessary

Please mark the appropriate block with an X. Only mark one option.

41 ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES

The following aspects should be **addressed** in the diabetes education programme for the prevention and management of the ocular complications of diabetes:

			<i>ESSENTIAL</i>	<i>%</i>	<i>USEFUL</i>	<i>%</i>	<i>UNNECESSARY</i>	<i>%</i>	Comments
256	a	the programme must be developed in accordance with the processes and procedures governing curriculum development in higher education in South Africa	8	67	3	25	1	8	
257	227	b	the programme must address the education of diabetic patients in terms of the disease as well as its complications affecting the eyes	11	92	0	0	0	
258	228	c	the programme must address the issues and policies relating to the provision of public health in South Africa	10	83	2	17	0	
259	d	the programme must address the academic and administrative processes involved with a diabetes education programme	8	67	3	25	1	8	
260	229	e	the programme must provide standards and outcomes for the prevention and management of the ocular complications of diabetes	11	92	1	8	0	
261	230	f	clearly stated benefits of a diabetes education programme	12	100	0	0	0	
262	g	all of the above	7	58	3	25	1	8	
7	4	57	% CONSENSUS FOR QUESTION 41		ASPECTS THAT MUST BE ADDRESSED IN AN EDUCATION PROGRAMME FOR THE PREVENTION AND MANAGEMENT OF THE OCULAR COMPLICATIONS OF DIABETES				
		42	ANY FURTHER COMMENTS ON ASPECTS THAT COMPRISE THE DIABETES EDUCATION PROGRAMME?						
			Answers would change if the level was pitched at a higher or lower academic level / A section should be included which deals in greater depth with other than only ocular complications. Also for patients to realise the other risks. There may be a problem if the programme is aimed at a high level which may limit the pool of graduates and therefore limit the "penetration" into the general public. The problem could be solved if specific skills are rewarded in rural posts, but for that one needs DoH action in order to ensure accessibility / Need to focus on key causes of blindness so that when they are screening they do not ignore other potentially blinding conditions. Also it is important that skills around program planning are incorporated so that they can use the education to develop appropriate interventions.						
262	230	88	TOTAL PERCENTAGE CONSENSUS FOR ENTIRE QUESTIONNAIRE						