

**DIABETES-RELATED KNOWLEDGE, ATTITUDES AND
PRACTICES [KAP] OF ADULT PATIENTS WITH TYPE
2 DIABETES IN MASERU, LESOTHO**

by

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DEDICATION

*A journey of a thousand miles begins with a single step. Lao Tzu

To all patients living with diabetes, their families and friends. Together, we pledge a world free of diabetes.

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ABSTRACT

Type 2 diabetes mellitus (T2DM) is a major public health concern in Lesotho and is the fourth ranking cause of death in that country. A steady increase in the proportion of patients admitted into hospitals with diabetes-related complications has been observed and may be attributed to poor diabetes-related knowledge, attitudes and practices of adults with T2DM.

The study followed a quantitative, descriptive design. Convenient selection of clinics followed by convenient selection of participants (n=291) was used. The researcher interviewed participants using a pre-designed questionnaire based on Azjen's theory of planned behaviour. Descriptive statistics, namely frequencies and percentages for categorical data, and medians and percentiles for continuous data were calculated. The study received ethical clearance from the University of the Free State and the Lesotho Health Research an Ethics Committee.

The majority (63%) of participants were elderly (median 61 years), obese (65.6%) black females with less than four years of secondary school education completed (79%). The study found median percentage of behavioural, normative and control beliefs (reflecting the **knowledge** component) to be (range: 73.9%-77.8.5%), implying that most participants (85.2%) had a positive attitude towards diabetes (reflecting the **attitudes** component), which would positively influence the intention to act out certain positive diabetes health-related behaviour. The subjective norms and perceived behavioural control (reflecting the **practices** component) median was 50%. The participants (95.2%) had very strong intentions to act out certain diabetes-related behaviour.

Behavioural, normative and control beliefs (knowledge) were found to be high, while normative beliefs and perceived behavioural control was low. These findings lead to specific recommendations related to the way healthcare providers comprehensively manage T2DM in Maseru. To begin with, diabetes related pamphlets should be distributed to patients to further strengthen their knowledge about the disease. Secondly, clinic based buddie or caregiver support groups are recommended to change

the negative perceptions about T2DM of the community within which the patients stay, as it negatively affects patients' self-management. Lastly, support groups focussed on skills counselling for T2DM patients are recommended to strengthen good practices that reinforce self-management.

LIST OF ABBREVIATIONS

“A journey of a thousand miles begins with a single step.” – Lao Tzu

BMI	-	body mass index
CDC	-	centres for disease control
CHAL	-	Christian health association Lesotho
DHMT	-	district health management team
DKN	-	diabetes knowledge scale
DM	-	diabetes mellitus
HIV	-	human immunodeficiency virus
IDF	-	International Diabetes Federation
KAP	-	knowledge attitudes and practices
mmol/L	-	millimol per liter
PHC	-	primary health care
PHCC	-	primary health care clinics
SD	-	standard deviation
STIs	-	sexually transmitted infections
T2DM	-	type 2 diabetes mellitus
TB	-	tuberculosis
TPB	-	Theory of Planned Behaviour
UFS	-	University of the Free State
WHO	-	World Health Organization

OPERATIONAL AND CONCEPTUAL DEFINITIONS

ADULT PATIENTS

The Lesotho Public Health Order (Lesotho, 1970a:36) defines an **adult patient** as anyone above the age of eighteen years, who seeks healthcare services from healthcare facilities. In the context of this study, an adult patient is either a male or female individual who is eighteen years and above, and who sought services for type 2 diabetes mellitus from a primary health care clinic (PHCC) in Maseru.

ATTITUDES

Attitude refers to the emotions triggered by certain events as well as the interpretation of certain feelings affected by predetermined beliefs towards that event (Kaliyaperumal, 2004:7). In this study, **attitude** refers to the intention and ultimate practice related to diabetes mellitus in Maseru expressed by adult patients with type 2 diabetes mellitus to internalise diabetes-related information and make good judgments in relation to diabetes self-care and management as expressed by themselves through a questionnaire completed by an interviewer.

KNOWLEDGE

Lakhan and Sharma (2010:102) define **knowledge** as a combination of intellectual ability to achieve, preserve and make use of information through experience, good judgment and expertise. In this study, **knowledge** refers to intellectual ability manifested through behavioural, normative and control beliefs of adult patients with type 2 diabetes mellitus in Maseru to internalise diabetes-related information and make good judgments in relation to diabetes self-care and management as expressed by themselves through the questionnaire completed by an interviewer.

PRACTICES

Kaliyaperumal (2004:7) defines **practice** as the actions that demonstrate the comprehension and application of rules, beliefs, ideas or methods. In this study, **practice** refers to the intention as well as elements controlling the end behaviour of adults with type 2 diabetes mellitus in Maseru to internalise diabetes-related information and make good judgments in relation to diabetes self-care and management as determined by a questionnaire completed by the interviewer.

PHC

Primary Health Care (PHC) is defined as the necessary healthcare built upon sound practical, scientifically proven, socially acceptable and affordable methods, which are within easy reach of the communities through their full participation (WHO, 1978). In this study, **PHC** refers to the preventive and curative care provided at primary health care clinics (PHCCs) in Maseru, which act as the first point of contact with the patients within the healthcare system of Lesotho.

TYPE 2 DIABETES MELLITUS

Type 2 diabetes mellitus (T2DM) refers to a form of diabetes characterised by a deficiency of insulin secretion, which commonly results in insulin resistance and most frequently arises from obesity and a lack of exercise (WHO, 2016a). Whenever the researcher refers to type 2 diabetes in this study, reference is implied to type 2 diabetes mellitus. Therefore, the WHO (2016a) definition described was also used in this study presenting with a medical diagnosis of T2DM on their medical record.

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CHAPTER 1

Overview of the study

1.1 INTRODUCTION TO THE STUDY

Laughter is said to be the best medicine, but if you have diabetes, insulin is probably much better. Insulin is a hormone produced by the pancreas, and its major function is to control the levels of glucose in the blood (Hinkle & Cheever, 2013:91). A well-controlled blood glucose level is essential for the proper functioning of major body organs, namely the brain, liver and kidneys. When the pancreas fails to produce adequate insulin, or when the body cannot use the insulin effectively, it results in a chronic condition known as diabetes mellitus (DM) (World Health Organization [WHO], 2016a: online).

DM can be classified as type 1, 2 and other types, such as gestational diabetes and diabetes secondary to illnesses, such as tumours (Hinkle & Cheever, 2013:1151).

- Type 1 diabetes mellitus is common below the age of 30 years, and is characterised by autoimmune destruction of the beta cells in the pancreas thereby reducing insulin production (American Diabetes Association [ADA], 2014: online).
- Type 2 diabetes mellitus (T2DM) usually occurs at later ages and is characterised by inadequate use of insulin by the body (insulin resistance), and this was the focus of this study. T2DM is also referred to as a 'lifestyle condition' because it is associated with risk factors such as obesity, physical inactivity and poor nutritional intake (Hinkle & Cheever, 2013:1152).

Management of diabetes varies per type. While type 1 focuses on insulin replacement, the mainstay of type 2 is dietary adjustment, weight loss and regular exercise (Shrivastava, Shrivastava & Ramasamy, 2013:3). Failure to maintain the appropriate blood glucose levels results in immediate complications such as hyperglycaemia, and

long-term complications such as diabetic foot, gingivitis, neuropathy, retinopathy as well as sleep apnoea (International Diabetes Federation [IDF], 2015:28). The aforementioned outcomes may be attributed to ignorance about diabetes coupled with poor health systems (Makinga & Beke, 2013:193). It is important to be aware of the extent of the disease worldwide.

Globally, an estimated 415 million people were living with diabetes mellitus (DM) by 2015, and five million deaths were attributed to diabetes-related complications in the same year (IDF, 2015:50-52). These figures point to a global prevalence of approximately 8.8% (IDF, 2015:50). An estimated 75% of these people live in low-income countries and emerging economies such as China, Russia, India and Mexico, and most of them are between the ages of 40 and 59 years (IDF, 2015:51). The African region currently has the smallest population living with diabetes, with prevalence estimated at just below 7% (IDF, 2015:71). However, people in their most productive years die from DM-related complications due to poor health systems and a lack of knowledge (Thinyane & Theketsa, 2013:18). The number of people with diabetes in the African region is on the increase, and is expected to double by the year 2030 (IDF, 2015:71; WHO, 2014: online). Falling in the same region is Lesotho, which is a Southern African country that is an enclave of South Africa bordered by the Free State, KwaZulu-Natal and Eastern Cape. The population of the country is estimated at just over 2.1 million (Worldometers, 2017:online).

For Lesotho to deal adequately with the increasing diabetes incidence highlighted above, the country uses the step-up approach, which was adapted from the World Health Organization (WHO) *Guidelines for management of the disease at primary health care level* (WHO, 2012:20). The step-up approach involves the initial diagnosis of DM using a fasting blood glucose level, followed by non-pharmacological management that involves diet change and weight reduction, and finally pharmacologic management to reduce blood glucose (Ministry of Health and Social Welfare, 2014a:6; WHO, 2012:20). The patient moves up the successive steps when the blood glucose is not successfully controlled in the previous step. Diabetes in Lesotho is managed at primary, secondary and tertiary level, as structured within the Lesotho healthcare system (Ministry of Health and Social Welfare, 2014a:5).

Lesotho is divided into 10 administrative districts, of which Maseru, the capital, also serves as a district on its own. Health services in Lesotho conform to the Declaration of Alma Ata (WHO, 1978), which emphasises comprehensive care that is affordable, accessible, accountable, acceptable and equitable to the population that needs it (WHO, 1978). Maseru district is governed by a district health management team (DHMT), which consists of health professionals whose purpose is to oversee health service activities in the district. The DHMT consists of medical doctors, professional nurses, environment specialists, pharmacists and counsellors.

Health services in Maseru district comprise primary health care clinics (PHCCs) and a tertiary hospital. According to the Health Facility Survey Report of Lesotho there are 68 clinics at PHC level in Maseru (Ministry of Health and Social Welfare, 2014b:2). The PHCCs are operated by the Lesotho government, faith-based organisations, private organisations in partnership with the government (public-private partnership) or private organisations. The government and faith-based clinics have standard clinic equipment and are manned by professional nurses while the three public-private partnership clinics have more equipment than the government and faith-based clinics (World Bank Group, 2015: online). The public-private partnership PHCCs are additionally staffed with medical doctors who can respond to complications outside the scope of practice of professional nurses who are registered per the Nurses and Midwives Act (19 of 1998). The private clinics are owner-operated, and the range of services provided depend on whether the owner is a doctor or a professional nurse. All categories of PHCCs alluded to above provide diabetes-related health education, diagnostic services, treatment initiation and monitoring.

Health care at tertiary level in Maseru is offered at the only referral hospital in Lesotho, the Queen Mamohato Memorial Hospital. Queen Mamohato Memorial Hospital was opened in 2012 as a public-private partnership between the government of Lesotho and several private organisations led by Netcare, to replace Queen Elizabeth II Hospital, a tertiary hospital that was owned and operated by government (Ministry of Health and Social Welfare, 2014b:4). The remaining nine administrative districts have PHCCs and secondary-level hospitals, and the same administration structure as Maseru district.

1.2 PROBLEM STATEMENT

Despite the widely distributed PHCCs in Maseru, there is still an increase in the number of patients being admitted for diabetes-related complications. In 2010, an estimated 31 000 people in Lesotho suffered from T2DM, IDF (2015:71) and this number is expected to rise to about 42 000 by 2030 (WHO, 2014). According to the *Lesotho Annual Joint Review Report of 2010*, WHO (2010:8), there was an approximate 5% rise in the number of people being hospitalised in Queen Elizabeth II hospital in due to diabetes-related complications with about 67% of them being admitted for hyperglycaemia. Makinga and Beke's (2013:190) study had even more pronounced results, showing 85% of patients admitted to Queen Elizabeth II hospital for hyperglycaemia between November 2004 and July 2005.

Makinga and Beke (2013:190) cite poor adherence to medication and poorly controlled blood glucose levels as the major contributors to complications of T2DM. Of the patients admitted to the said hospital between November 2004 and July 2005, 51% had diabetes-related complications, such as retinopathy, neuropathy and diabetic foot (Makinga & Beke, 2013:192). It can be argued that the number of people admitted for poorly controlled diabetes is increasing based on the aforementioned statistics. Makinga and Beke (2013:191) emphasised that self-management of patients with T2DM largely depends on the knowledge, attitudes and practices (KAP) of such people regarding the condition.

Other factors that may be related to the increasing rate of diabetes-related complications include the high rate of human immunodeficiency virus (HIV) infection and its consequent effects on resources (Monyamane M, personal interview, Sep 11, 2014). Lesotho is experiencing the second-highest HIV prevalence rate in the world, estimated at 23.7% (UNAIDS, 2015:2) Most human and financial resources are being pooled towards alleviating the effects of the HIV pandemic. As such, there are lots of healthcare workers being trained on HIV management and other opportunistic infections at the expense of non-communicable diseases such as T2DM (Monyamane M, Sept 11, 2014). The mainstay of successful management of non-communicable

diseases, which are mostly chronic, is the patients' attitude and common cultural beliefs regarding the disease (Handicap International, 2009:8).

Kaliyaperumal (2004:7) proposes that a diagnostic tool, such as a KAP survey, is needed to understand the community's comprehension of beliefs towards and the way in which patients live with a disease. A KAP survey founded on the theory of planned behaviour (Ajzen, Joyce, Sheikh & Cole, 2011:101) will assist researchers to obtain a deeper understanding of how diabetes-related beliefs and attitudes can influence intentions and actual behaviour amongst patients diagnosed with T2DM in Maseru PHCCs. The present study will therefore help health care professionals in Maseru to identify which areas need to be strengthened regarding the KAP of patients diagnosed with T2DM, to strengthen positive practices of these patients.

1.3 AIM OF THE STUDY

The main aim of this study was to assess the diabetes-related KAP of adults living with T2DM in Maseru, Lesotho.

1.4 RESEARCH QUESTION

What are the diabetes-related knowledge, attitude and practices of adult patients with T2DM in Maseru?

1.5 CONCEPTUAL FRAMEWORK

A conceptual framework is a set of inter-connected ideas, which identify the key concepts in the research and describe their relationship with one another (LoBiondo-Wood & Haber, 2014:78; Polit & Beck, 2012:128). This study was guided by the conceptual framework depicted in Figure 1.1.

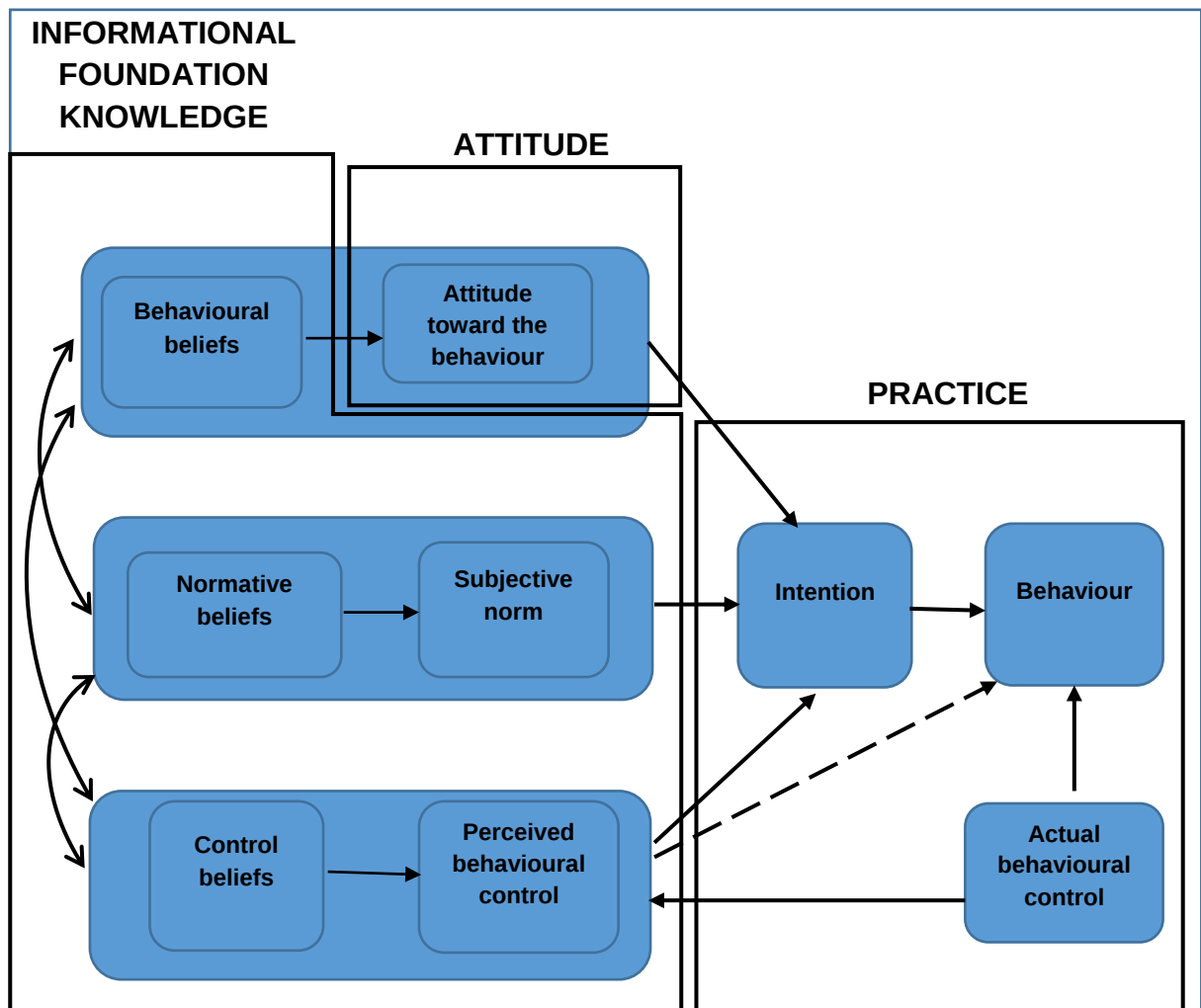


FIGURE 1.1: Conceptual framework of study (Ajzen *et al.*, 2011:101-102)

This study was based upon Ajzen’s theory of planned behaviour (Ajzen *et al.*, 2011). According to this theory, a person’s intention to act out a specific behaviour originates with an informational foundation that closely links with the knowledge component of the KAP survey used in this study. However, the knowledge component did not necessarily reflect the degree of knowledge patients show towards diabetes, but rather the beliefs that ultimately determined their behaviour/practice. Three groups of beliefs were identified, namely behavioural, normative and control beliefs. **Behavioural** beliefs depict the link between a specific DM-related behaviour and a consequence that arises from this behaviour. **Normative** beliefs reflect the link between a specific DM-related behaviour and an expectation the patient may have due to the enacted behaviour. Flowing from the normative beliefs are subjective norms. The subjective norm not only

provides a link to specific DM-related behaviour, but in this case, the expectation is linked to the expectations of significant others in the patient's life. **Control** beliefs portray factors the patient perceives could either assist or hamper him/her in being in control over DM-related issues. Lastly, the patient's perceived behavioural control reflects the link between specific DM-related behaviour and the patient's perception of his/her ability to perform the specific behaviour.

In line with the KAP survey, specific attention was further given to the attitude of the patient as an element playing a role in the actual DM-related behaviour/practice of the patient. The patient's attitudes towards DM-related issues, as well as his/her subjective norms and perceived behavioural control of such issues all strengthen or weaken the patient's intention to perform a specific DM-related behaviour. The researcher set Ajzen's reference to behaviour as equal to what the KAP survey refers to as 'practice' (Ajzen *et al.*, 2011:102). Therefore, patients' DM-related behaviour will depend on their intention to act out a behaviour as well as the actual behavioural control the patient has over performing such behaviour in the long run.

1.6 RESEARCH DESIGN

A quantitative descriptive design was used in this study, as it helped to examine the variables concerned, namely knowledge, attitudes and practices of adult patients with T2DM. These variables in turn were measured by means of a questionnaire, which enabled numerical data to be analysed using statistical procedures.

1.7 RESEARCH TECHNIQUE: STRUCTURED QUESTIONNAIRE

To describe the diabetes-related knowledge, attitudes and practices of adult patients with T2DM in Maseru, a questionnaire was used as the research technique to ensure consistency throughout the whole study period. The questionnaire was structured according to the components of the theory of planned behaviour and the question numbers were divided as follows in the questionnaire. In the questionnaire –

- demographic and biographic data was requested by Question 2.1 to 2.16

- the knowledge component was divided into:
 - behavioural beliefs – Question 3.1;
 - normative beliefs – Question 3.2 to 3.4;
 - subjective norms – Questions 3.5 to 3.6; and
 - control beliefs – Questions 3.7 to 3.9.
- the attitude component in the questionnaire was related to Question 4
- the practice component was divided into:
 - intention – Question 5.1;
 - actual behaviour control – Questions 5.2; and
 - behaviour – Questions 5.3.

1.8 POPULATION

The study population comprised all adult patients with T2DM attending care at PHCCs in Maseru.

1.9 SAMPLE

Initial stratified sampling of various primary healthcare (PHC) clinics lead to proportional random sampling (n=24) of the PHC clinics, followed by convenience sampling (n=291) of adults diagnosed with T2DM.

1.10 PILOT STUDY

A pilot study was conducted, about which more detail is provided in Chapter 3.

1.11 DATA COLLECTION

Figure 1.2 graphically depicts the steps of data collection, which are discussed in detail in Chapter 3. The pilot study and actual data collection at each of the facilities were conducted in the same manner as depicted in Figure 1.2.

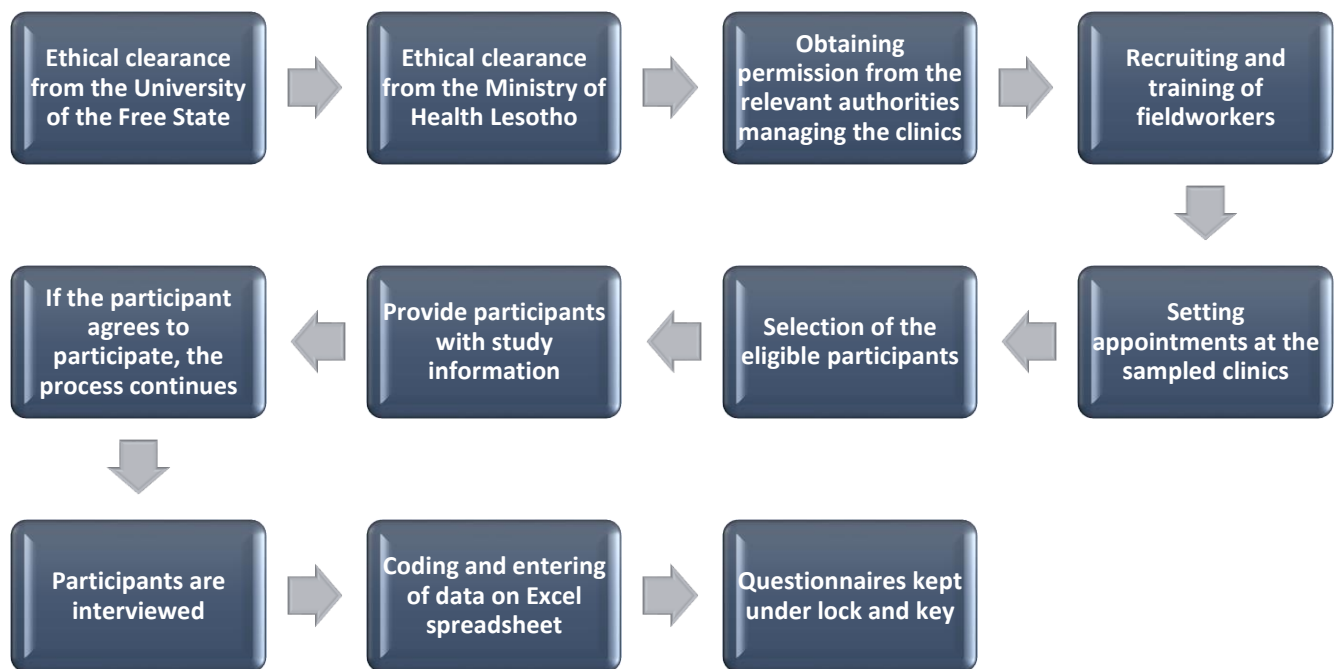


FIGURE 1.2: Data collection plan

1.12 VALIDITY AND RELIABILITY

Validity and reliability were enhanced in this study.

1.12.1 Validity

In this study, content and face validity were enhanced and these are discussed in detail in Chapter 3.

1.12.2 Reliability

Internal reliability was enhanced in this study, and will be further discussed in Chapter 3.

1.13 ETHICAL ISSUES

In this study, the researcher upheld the principles of beneficence, confidentiality, human dignity and justice (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). These principles are discussed in detail in Chapter 3.

1.14 DATA ANALYSIS

Data analysis was done by a biostatistician of the Department of Biostatistics at the University of the Free State (UFS). Descriptive statistics, namely frequencies and percentages for categorical data, means and standard deviations or medians and percentiles for continuous data were calculated.

1.15 CONCLUSION

Chapter 1 provided a brief overview of the study. In this overview, the problem statement, aim, objectives and research question – What are the diabetes-related knowledge, attitude and practices of adult patients with T2DM in Maseru? – emphasised why the study was done, while the conceptual framework, research design and technique elaborated on how this study was undertaken. Furthermore, sections on the population, sample, pilot study and data collection itself indicated who took part and who conducted the study to ensure accuracy of results and the universal respect of the study participants. Validity, reliability and ethical considerations were briefly mentioned at the end of the chapter.

Following Chapter 1, Chapter 2 will provide a detailed discussion of the literature regarding global, national and local knowledge, attitudes and practices (KAP) of adult patients with T2DM. Chapter 3 will give a detailed discussion of the methodology of the study. The results of the study, in the form of an academic article, will form Chapter 4, and this leads to Chapter 5, which will give a summary of the whole study and the recommendations to the problems noted during the research.

CHAPTER 2

Literature review

2.1 INTRODUCTION

Chapter 1 provided an overview of the study, and introduced the reader to the gap in awareness about the KAP of adult patients living with T2DM in Maseru, Lesotho while also providing an outline of the study. Firstly, in this chapter, the researcher will review the relevant literature and discuss the health system of Lesotho in relation to the legislative framework and the different cadres of professionals offering health care. Secondly, the researcher will discuss the different facets of diabetes including epidemiology and classifications but mainly concentrating on T2DM, the pathophysiology, diagnosis, signs and symptoms, complications as well as the management of T2DM. Lastly, a discussion on the theory of planned behaviour by Ajzen *et al.*, (2011) and its link to the KAP of adult patients living with T2DM in Maseru, Lesotho.

2.2 HEALTH SYSTEM IN LESOTHO

Defining a health system can be a challenging task since it involves several functions towards achieving the ultimate goal of healthcare service delivery. According to the World Health Organization (2015:online), a health system can be explained as a combination and organisation of human and financial resources in order to carry out all the activities whose chief purpose is to promote, restore and maintain health. A health system can also be understood by describing the individual health system functions as proposed by the World Bank (The World Bank, 2007:2; WHO, 2007:5). These functions include health service provision, health service inputs, stewardship, and health financing (WHO, 2016c: online).

Health service provision entails the delivery of the health services to the clients in need and is the most visible product of the health system. Good health service delivery includes disease prevention measures through effective health education and curative measures (WHO, 2007:1). Health service inputs involve mobilisation of human resources, medications and medical equipment necessary for health service delivery (WHO, 2015: online). Stewardship is usually a government function in which the context and policy framework of the health system is set (Hibbard & Greene, 2013:209). This function ensures that the public resources are utilised to address priority health issues as well as generating appropriate data for policymaking. Policies and frameworks in combination with effective oversight help in addressing accountability issues (WHO, 2007:online). Health service financing is the strategic purchasing of services through revenue collecting, pooling financial risk and allocating finances appropriately (WHO, 2015: online). These functions are fulfilled in the Lesotho health system through the Ministry of Health and Social Welfare in collaboration with support partners that include civil society, WHO, UNICEF, UNAIDS and other bilateral donor agencies. The health service function will be discussed further in the next paragraph to provide an overview of the health services in Lesotho.

The health service provision function of the health system in Lesotho is tailored according to the District Health Care model as per the Alma Ata Declaration (WHO, 1978). Primary health care (PHC) forms the foundation of the PHC model, where PHC is seen as an essential healthcare package. Such a package implies that the most cost-effective, affordable and acceptable interventions are used to address diseases and their associated factors (Ministry of Health and Social Welfare, 2013:7; Ministry of Health and Social Welfare, 2012:16). The major providers of health in Lesotho are the government, faith-based organisations, public-private partnerships as well as private doctors and nurses.

Government is the main health service provider with over 100 clinics and nine out of ten district hospitals falling under the management of the different DHMTs (Ministry of Health and Social Welfare, 2013:17). Faith-based organisations provide the second largest healthcare service in Lesotho. In 1974, six churches (faith-based organisations) formed an association commonly known as the Christian Health Association of Lesotho that runs healthcare services and training of healthcare providers in 19 clinics and four

district hospitals in Lesotho (Ministry of Health and Social Welfare, 2013:13; WHO, 2013b:10;). The public-private partnership between the government of Lesotho and a consortium led by Netcare, a South African private healthcare provider, operates three clinics and the only tertiary hospital in Lesotho. In addition to the aforementioned health care services, private practices owner-managed by doctors and nurses also provide health services and these health services are regulated by the Lesotho Medical, Dental and Pharmacy Order (13 of 1970b) through the Lesotho Medical, Dental and Pharmacy council and Nurses and Midwives Act No (19 of 1998) through the Lesotho Nursing Council respectively.

Health care in Lesotho is delivered on three levels of care, namely primary, secondary and tertiary. PHC is the first level of contact between patients and the health system, and patients are seen at the PHCCs (Ministry of Health and Social Welfare, 2013:9). The PHCCs are situated within the communities for ease of access, and they provide T2DM (The Lesotho Review, 2015: online). In a typical government, faith-based or public-private PHCC, there is a staff complement of about five professional nurses and a medical doctor who is either residential or visits occasionally (Ministry of Health and Social Welfare, 2013:10). Village health workers who are trained lay individuals support PHCCs by providing a package of health services at community level, including condom distribution, contraceptives distribution and tracing of service visit defaulters (Ministry of Health and Social Welfare, 2013:33). PHCCs refer complicated cases to the district hospital for further management. In a private PHCC, there is usually the owner (a doctor or nurse) and a few support staff, and no village health workers. Private PHCCs tend to refer patients needing secondary-level care to the few private hospitals in the country, or to South Africa.

The secondary level of care is provided through district hospitals operated by the government of Lesotho and faith-based organisations and serve as entry points for specialised care. Three small private hospitals also provide secondary-level care for private patients. The district hospitals have doctors and specialised professional nurses who are able to deal with cases too complicated for the PHCC. There are 17 district hospitals in Lesotho, and each of the ten districts has at least one district hospital (Ministry of Health and Social Welfare, 2013:13).

The tertiary healthcare level receives complicated cases from the district hospitals. There is only one referral hospital in Lesotho, and it is located in Maseru. The referral hospital is staffed with specialist doctors and professional nurses across all the departments of the hospital. If a patient's condition is too complicated to be treated at this level, another transfer is made to neighbouring South Africa in the nearest city Bloemfontein where further specialist care can be received. At the three levels of care, healthcare providers operate within a legal environment that governs their practices (Ministry of Health and Social Welfare, 2013:16).

2.2.1 Legal framework governing Lesotho health services

The health system is governed by three major health policies, namely the Public Health Order Number 12 of 1970, the Health Professions Act No. (6 of 2012) and the National Health and Social Welfare Research Policy (Ministry of Health and Social Welfare, 2008:48), as discussed below.

- **Public Health Order No. 12 of 1970**

Public Health Order (12 of 1970) states the functions of the Ministry of Health and Social Welfare, particularly the promotion of health and prevention of diseases. Other provisions of this order are effective governance, health financing, decentralisation of services and effective utilisation (Lesotho, 1970a). The order also regulates the scope of practice for doctors and professional nurses.

- **The Health Professions Act No. 6 of 2012;**

The purpose of the Health Professions Act (6 of 2012) is to ensure that all the health service providers such as professional nurses and doctors are accountable through establishment of the nursing and the medical, dental and pharmacy councils. The Health Professions Act (6 of 2012) also regulates education, training and registration of these professions.

- **National Health and Social Welfare Research Policy;**

The National Health and Social Welfare Research Policy was developed mainly to strengthen the research capabilities of the Ministry of Health and Social Welfare by supporting talent, encouraging innovation and use of research-based knowledge and to develop a well-resourced agenda for priority research (Ministry of Health and Social Welfare, 2008:13).

2.2.2 Health care providers in Lesotho

The major healthcare service providers within the Lesotho health system are doctors, professional nurses and nursing assistants.

A doctor is an individual who has successfully completed a bachelor's degree in medicine and surgery as recognised by the Lesotho Medical, Dental and Pharmacy Council and whose membership is up to date as seen in the register in accordance with the Medical, Dental and Pharmacy (Degrees) (Amendment) Regulations No. (12 of 1972). Doctors have a moral responsibility towards their patients and must abide by the rules and regulations as set by the Lesotho Medical, Dental and Pharmacy Council. According to the Health Facility Survey done by the Ministry of Health and Social Welfare (2014b:2), doctors represent the second largest cadre after professional nurses, accounting for approximately 5.8% of the health workforce in Lesotho. The majority of these professional nurses and doctors are employed by the government (Ministry of Health and Social Welfare, 2014b:36).

According to the Nurses and Midwives Act (No. 12 of 1998), a professional nurse is one who has completed a diploma or degree in general nursing, while a nursing assistant has completed a certificate in assistant nursing. Both must be registered with the Lesotho Nursing Council in accordance with this Act. Nurses in Lesotho are the largest cadre of health workers in the formal sector and account for about 73% of all health workers (Ministry of Health and Social Welfare, 2014b:37).

Nurses at PHCCs are assisted by village health workers when conducting follow-ups of patients with chronic illnesses such as T2DM. Village health workers are individuals chosen by the community. The chosen individuals are trained and paid by the government through the DHMT. Training for the village health workers includes prevention of mother-to-child transmission of HIV/AIDS, correct administration of anti-tuberculosis drugs and complications due to chronic illnesses such as hypertension and diabetes (Monyamane M, Sept 11 2014).

2.3 DIABETES

There are two major forms of diabetes. Type 1 diabetes is characterised by a lack of insulin production, the cause is unknown and it cannot be prevented. Type 2 diabetes is far more common, accounting for about 90% of all diabetes worldwide. Often preventable, it results from the body's ineffective use of insulin (Hinkle & Cheever, 2013:1151). The third type of diabetes is gestational diabetes, which occurs in pregnant women and often resolves after birth. Diabetes can also occur as a secondary complication of pancreatitis, drugs such as cortical-steroids, endocrine disorders and certain malignancies (Waugh & Grant, 2010:227). The following discussion focuses on T2DM, especially investigating epidemiology, diagnosis, pathophysiology, complications and management of the disease.

2.3.1 Epidemiology

An analysis done by the World Health Organization (2013a:8) of the disease pattern, demonstrated two epidemics – one of rapidly escalating infectious diseases (mainly HIV, tuberculosis [TB] and sexually transmitted infections [STIs]) and another of non-communicable diseases. The major non-communicable diseases are cardiovascular diseases, accidents/injuries, cancer and diabetes mellitus.

Diabetes mellitus is estimated as the third highest cause of premature deaths according to the WHO (2016b: online) with hypertension and smoking cited as the first and second highest causes respectively. The International Diabetes Federation (IDF) (2015:47) estimates that some 415 million adults aged 20-79 have diabetes worldwide.

The age distribution being 320.5 million adults with diabetes between the ages of 20 and 64 years, and 94.2 million between 65 and 79. The federation projects that if this trend persists, some 642 million people, or one adult in ten, will have diabetes by 2040 with sizeable escalations occurring in the regions where economies are moving from low-income to middle-income levels (IDF, 2015: 82). Although relative proportions of type 1 and type 2 diabetes have not been extensively studied, type 1 diabetes seems less common than type 2 diabetes internationally with about 87-91% of all people with diabetes having type 2 diabetes and 7-12% having type 1 and the remaining 1-3% the other types of diabetes (IDF, 2015:48). Rapid urbanisation has also increased the number of people with diabetes with current studies showing 269.7 million people in the urban areas and only 145.1 million people in the rural areas being affected by the disease. The gap between these global figures is expected to increase as the rate of urbanisation increases (Ginter & Simko, 2013:42; IDF, 2015:48).

The risk of developing T2DM increases with age, obesity and a lack of physical activity (Ruderman, Carling, Prentki & Cacicedo, 2013:2766). Kwak, Choi, Jung, Cho, Lim, Cho, Kim, Park and Jang (2013:744) in their study done at a hospital in Korea, concluded that T2DM frequently occurs in women who previously suffered from gestational diabetes. Hypertension is present in more than 50% of patients with diabetes mellitus and contributes significantly to both micro and macro vascular diseases in diabetes. A widely criticised and ongoing area of study is that of the effect of race and ethnicity on diabetes (Menke, Rust, Fradkin, Cheng & Cowie, 2014:329). The American Diabetes Association (ADA) (2016: online) asserts that African Americans, Mexican Americans, American Indians, Native Hawaiians, Pacific Islanders and Asian Americans have increased risk for developing T2DM. T2DM is often associated with a strong genetic predisposition, and is more common in the middle-aged and elderly than younger people (Davidson, 2014:806).

The Africa region has an estimated 14.2 million adults between the ages of 20 and 79 living with diabetes (IDF, 2015:70). Over 66.7% of the people with diabetes are unaware that they have the condition, making Africa the region with the highest proportion of undiagnosed diabetes (IDF, 2015:70). About 58.8% of the people with diabetes in Africa live in the cities even though 61.3% of the population live in rural areas.

In Lesotho, it is estimated that 32300 adults between the ages of 20 and 79 are living with diabetes and 19600 people unaware they have the condition (IDF, 2015:112).

2.3.2 Type 2 Diabetes Mellitus

The following is a discussion regarding the pathology, diagnosis and signs and symptoms of the disease. Following that, the author discusses the management as well as the complications of diabetes. The management also includes that of the complications, which are either acute or chronic.

2.3.2.1 *Pathophysiology of type 2 diabetes mellitus (T2DM)*

Normally, insulin binds to special receptors on cell surfaces and initiates a series of reactions involved in glucose metabolism (Hinkle & Cheever, 2013:90). In the presence of risk factors of T2DM, the intracellular reactions are reduced, making insulin less effective at stimulating glucose uptake by the tissues and at regulating glucose release by the liver (McCance & Huether, 2014:736). To compensate for the insulin resistance and avert accumulation of glucose in the blood, the body produces more insulin to keep the blood glucose levels normal. If the beta cells however fail to keep up with the increased demand for insulin, the glucose levels increase and T2DM occurs (Davidson, 2014:805; McCance & Huether, 2014:736). Despite the impaired insulin secretion that is characteristic of T2DM, there is enough insulin present to prevent the breakdown of fat and the accompanying production of ketone bodies meaning that diabetic keto-acidosis does not typically occur in T2DM (Hinkle & Cheever, 2013:1152).

2.3.2.2 *Diagnosis of T2DM*

T2DM can remain undetected for many years, and a diagnosis is usually made when a complication appears or during routine blood or urine tests (Waugh & Grant, 2010:227).

The World Health Organization (2016a: online), recommends algorithms for healthcare professionals to follow in order to diagnose T2DM early. The diagnosis of T2DM involves initially screening tests that are then followed by diagnostic tests.

2.3.2.3 *Screening tests*

Risk assessment as part of a screening test are administration of pre-designed questionnaires to establish grading of T2DM and coupling that with patients who report the classical symptoms of T2DM (see 2.3.2.5). The American Diabetes Association (2016: online) recommends routine screening for T2DM beginning at age 45, especially in overweight patients, and repeating the test every three years if the initial results are normal. Other high-risk individuals are people who suffer from heart disease or who have diabetes risk factors, such as obesity, sedentary lifestyle, family history of type 2 diabetes, personal history of gestational diabetes or blood pressure above 140/90 (mmHg).

Blood glucose test

Blood is collected from a small prick on the finger and mounted via a small cartridge onto a glucometer. Sensitivity of between 40% and 65% makes this rapid test less accurate in the diagnosis of T2DM but rather useful in just screening and continuous monitoring of blood glucose levels (WHO, 2013a:12). Most PHCCs are equipped with the glucometer, the challenge however is the refilling the cartridges once depleted leaving the clinics with stock outs for weeks or even months.

Urine glucose test

The urine glucose test is based on the changes in colour of the urine dipstick against a set standard on the container. The sensitivity of the urine test ranges from 21% to 64% and is not adequate to make a final diagnosis (Hinkle & Cheever, 2013:1163; WHO, 2013a:12). The urine test, like the blood glucose test is useful in resource-limited settings such as Maseru. The healthcare workers depend on this urine test to screen for and diagnose diabetes mellitus in combination with risk assessment and, where available, the blood glucose using the glucometer.

2.3.2.4 *Diagnostic tests*

Glycated haemoglobin (HbA1C) test

The glycated haemoglobin test shows blood glucose levels for the past eight to twelve weeks (Hinkle & Cheever, 2013:1163). The World Health Organization (2016b: online) currently recommends the glycated haemoglobin test as the preferred test as it does not require any special preparation such as fasting and can be done any time of the day. Such properties have also made it useful in the assessment of glycaemic control in people living with diabetes. The test measures the percentage of blood glucose attached to haemoglobin, and the higher the blood sugar levels, the more haemoglobin with sugar attached. Normal readings of the HbA1C level is below 5.7%. A value between 5.8% and 6.4% indicates prediabetes and a value above 6.5% indicates diabetes (Hinkle & Cheever, 2013:1163; WHO, 2016b: online). Although recommended by the WHO, this test is expensive and can only be ordered in the private clinics.

Random blood glucose test

In a random blood sugar test, a blood sample is collected at any time regardless of the patient's last meal (Hinkle & Cheever, 2013:1163). The values are expressed in millimoles per litre (mmols/L) and a result above 11.1 mmols/L suggests diabetes especially when the patient also presents with signs and symptoms of diabetes (WHO, 2016b: online). Due to the limitations of resources in Maseru, the Random blood

glucose test is not readily accessible to government PHCC but can be used by private PHCCs.

Oral glucose tolerance test

In the oral glucose tolerance test, the patient is instructed to fast overnight, and the fasting blood sugar level is measured when drinking a sugary liquid. Blood sugar levels are then measured periodically over two hours (Hinkle & Cheever, 2013:1162). A normal value is below 7.8 mmol/L, pre-diabetes is indicated by a result between 7.8 mmol/L and 11.0 mmol/L, and diabetes is indicated by any value higher than 11.1 mmol/L after two hours (WHO, 2016b: online). Due to the instructions given for this test, and the need for the patient to visit the clinic many times, the glucose oral test is not used in the public and faith based PHCCs of Maseru but rather it is used more in the public-private clinics which have capacity to admit patients overnight.

2.3.2.5 Signs and symptoms

The most definitive symptoms of T2DM are polyuria, which is excessive micturition (urination) and polydipsia (increased thirst). Both arise from increased loss of fluid and is associated with osmotic diuresis (Davidson, 2014:800). The patient also experiences polyphagia (increased appetite) resulting from the catabolic state induced by insulin deficiency and the breakdown of proteins and fats (Davidson, 2014:801). Other symptoms that may or may not be experienced by individuals are weight loss, fatigue, tingling sensation of extremities, lack of concentration, frequent infections, blurred vision, slow wound healing, vomiting and stomach aches (Hinkle & Cheever, 2013:1151).

2.3.2.6 Management

The goals of the management of patients living with T2DM are aimed at alleviating symptoms and minimising the risk of long-term complications (Hinkle & Cheever, 2013:1155). Optimal control of glucose and other cardiovascular risk factors, such as smoking, sedentary lifestyle, hypertension, dyslipidaemia (abnormal amounts of lipids in

the blood) and obesity is crucial; hence, the need to tailor the management to suit the individual (WHO, 2016a: online). People with type 2 diabetes can often initially manage their condition through lifestyle changes achieved by thorough health education and blood glucose monitoring (Davidson, 2014:805; Hinkle & Cheever, 2013:1155).

Health education

In their study done in China, Gao, Wang, Zheng, Haardofer, Kegler, Zhu and Fu (2013:5) concluded that efficient communication between the patient and healthcare professional combined with family support led to improved outcomes regarding glycaemic control.

In a randomised trial, Young, Muyamoto, Ward, Dharmar, Tang-Feldman and Berglund (2014:832) evaluated the advantages of nurse tele-health education for persons with diabetes living in rural California, and observed that the experimental group had higher self-management scores than the control group and concluded that nurse-oriented education results in improved glycaemic control. Tele-health, however, is not used in the Lesotho context, but rather face-to-face interactions with patients.

Upon diagnosis of T2DM, the doctor and professional nurse give a detailed health session on T2DM (Ministry of Health and Social Welfare, 2014a:8). Usually, the doctor will give the patient health education on how to prevent complications, including lifestyle changes, such as alcohol and smoking cessation, eating a balanced diet, increased physical activity through exercise and weight management (Monyamane M, Sept 11, 2014). Doctor Monyamane further explained that the professional nurse gives a more detailed lecture and helps the patient and his/her family to adjust to living with T2DM. The professional nurse also teaches the patient about the complications of T2DM and about appropriate responses to complications such as hypo- and hyperglycaemia as well as foot care.

Monitoring

Blood glucose monitoring is important in the management of diabetes as it helps the healthcare professionals to monitor the effectiveness of the treatment. In Lesotho, once

the diagnosis has been made, the patient is monitored fortnightly for three months whilst on non-pharmacological treatment (Ministry of Health and Social Welfare, 2014a:5). Non-pharmacological treatment refers to change of diet, weight reduction, increasing physical activity, alcohol and smoking cessation and general hygiene and foot care (Buysschaert & Hermans, 2014:14). If, after these interventions, the blood glucose levels remain above 11.1 mmols/l, the Guideline for Management of Diabetes and Hypertension at PHC (Ministry of Health and Social Welfare, 2014a:7) recommends the use of two oral agents. Sulphonylureas, namely Glibenclamide, and biguanides, namely Metformin, are the two-preferred oral anti-diabetic drugs. Insulin therapy is indicated in thin or ill patients who remain with poorly controlled blood glucose levels despite lifestyle modification and effective doses of Glibenclamide and Metformin in combination (Ministry of Health and Social Welfare, 2014a:7). The patient is monitored monthly thereafter and if there is still no improvement in the blood glucose levels, the patient is referred to the doctor for initiation of insulin therapy.

2.3.2.7 *Complications*

Elevated plasma glucose and free fatty acids exert a toxic effect on the pancreatic beta cells thereby impairing insulin secretion and increasing glucagon secretion leading to short-term complications such as hypoglycaemia and hyperglycaemic hyperosmolar non-ketotic syndrome (Davidson, 2014:806). Over time, damage to the heart, blood vessels, eyes, kidneys and nerves results in chronic complications, including macrovascular problems, diabetic nephropathy, neuropathy and retinopathy, pregnancy complications, and sexual dysfunction and eventually death (Hinkle & Cheever, 2013:1178).

Hypoglycaemia

Hypoglycaemia refers to a state in which the blood glucose levels fall to below 4 mmols/L. Such a state occurs when there is too much insulin or oral hypoglycaemic agents in the blood. Other causes of hypoglycaemia are excessive physical activity and hunger (Hinkle & Cheever, 2013:1178). Signs and symptoms of hypoglycaemia include sweating, irritability, confusion, palpitations, fatigue, seizures and even

unconsciousness. These vary from one individual to another (IDF, 2015:28). Treatment of the milder symptoms comprises eating a simple sugar whilst the more complicated symptoms, such as unconsciousness, require hospitalisation (ADA, 2016: online).

Diabetic ketoacidosis

Diabetic ketoacidosis is a complex disorder caused by an absence or inadequate amount of insulin. The absence of or inadequacy of insulin results in the alteration of the metabolism of carbohydrates, proteins and fat subsequently resulting in hyperglycaemia, acidosis, and ketonaemia respectively (Hinkle & Cheever, 2013:1180). During ketoacidosis, blood glucose levels are higher than 11.1mmol/L, ketones are typically 2+ on the standard urine sticks and venous pH is less than 7.3 (Hinkle & Cheever, 2013:1180). Treatment of ketoacidosis takes place in the hospital setting; however, patients are encouraged to learn urine self-testing for ketones as well as recognising symptoms such as excessive dryness of the mouth, persistent fatigue, dry or flushed skin, fruity smelling breath and confusion, to enable early diagnosis of this condition (Davidson, 2014:804).

Hyperglycaemic hyperosmolar non-ketotic syndrome

Hyperglycaemic hyperosmolar non-ketotic syndrome is a serious complication of T2DM resulting from insulin resistance, and is characterised by hyperglycaemia, extreme dehydration, hyperosmolarity and altered consciousness without significant ketoacidosis (Hinkle & Cheever, 2013:1183). Hyperglycaemic hyperosmolar non-ketotic syndrome typically affects older patients above the age of 50 years and has a higher mortality (estimated at approximately 10-20%) than diabetes ketoacidosis. The symptoms are like those of diabetes ketoacidosis and only differ in the magnitude of dehydration and severity of acidosis (Hinkle & Cheever, 2013:1183). Treatment mainly involves rigorous rehydration while maintaining electrolytes, correction of the hyperglycaemia, treatment of any underlying conditions, and restoration of cardiovascular, pulmonary, renal and central nervous system function (Davidson, 2014:810).

Macrovascular complications

Macrovascular disease relates to the condition in which blood arteries, which supply blood to the heart, brain and limbs, are affected (Hinkle & Cheever, 2013:1188). Cardiovascular disease is the most common cause of death in people with diabetes, and comes about when there is gradual accumulation of plaque in the blood vessels causing blockage of the vessels (Tufton & Huda, 2016:273). According to the ADA (2016: online), 50% to 60% of diabetes-related deaths in the United States of America are caused by coronary artery disease. Tufton and Huda (2016:124) also claim that patients presenting with macrovascular complications rarely experience the typical ischemic symptoms, and are prone to silent myocardial infarctions. Cerebral blood vessels are also affected leading to transient ischemic attacks and strokes, and according to Mann, Zipes, Libby and Bonow (2015:4), people living with diabetes have twice the risk of developing and dying from cerebrovascular disease. Disruption of blood flow to the limbs results in diabetic neuropathy. Nerve supply to the digestive and reproductive systems and the extremities (especially the feet) results in poor digestion, sexual dysfunction, and peripheral neuropathy respectively (Mann *et al.*, 2015:274). Peripheral neuropathy is of significance in diabetes as it is the reason why patients lose the sense of feeling and may be injured unknowingly and end up with extremities being amputated (Mann *et al.*, 2015:276).

Nephropathy

Diabetes nephropathy refers to the terminal stage of renal diseases and usually occurs in patients who have lived with diabetes between ten and twenty years (Hinkle & Cheever, 2013:1191). People with diabetes account for about 25% of patients with end-stage renal disease (Forbes & Cooper, 2013:139). The progression of diabetes nephropathy can be slowed down by control of hypertension, low sodium and protein diet, avoiding nephrotoxic substances and prevention and fast treatment of urinary tract infections (Fineberg, Jandeleit-Dahm & Cooper, 2013:714). Kidney transplantation is usually required when the disease has progressed.

Neuropathy

Diabetic neuropathy refers to a group of diseases that affect the peripheral, autonomic and spinal nerves (Forbes & Cooper, 2013:140). There are different types of diabetic neuropathies, namely peripheral, autonomic, proximal and focal (Forbes & Cooper, 2013:140). Peripheral neuropathy is the most common type, and results in the loss or alteration in the sensitivity of the arms, hands, toes, feet and legs (Hinkle & Cheever, 2013:1155). Autonomic neuropathy results from disruption in sensitivity of the nerve supply to the stomach, bowel and bladder, sexual response and perspiration (Hinkle & Cheever, 2013:1165). The heart, lungs, eyes, blood pressure control and hyperglycaemia awareness are also supplied by the autonomic nervous system and are affected when it fails (Forbes & Cooper, 2013:140). Proximal neuropathy causes weakness in the legs while focal neuropathy causes muscle weakness from suddenly faulty nerves from anywhere in the body (Hinkle & Cheever, 2013:1155). Treatment then depends on the extent of the damage to the nerve cells, ranging from light exercises to surgery or in extreme cases, just conservative management.

2.4 KNOWLEDE, ATTITUDES AND PRACTICES

Knowledge, attitudes and practices (KAP) surveys help to understand misconceptions that may possibly hinder behaviour change (Kaliyaperumal, 2004:4). T2DM is considered a lifestyle condition and the mainstay of its management depends on the patient's knowledge and understanding of the condition as well as acting appropriately to keep the blood glucose within the acceptable limits (Ginter & Simko, 2013:112). Knowledge, however, is not assurance for behavioural change; hence, the use of the theory of planned behaviour by Ajzen *et al.*, which helps to explain and predict people's intentions and behaviour (Ajzen *et al.*, 2011:103).

2.4.1 Theory of planned behaviour

Regardless of much debate and criticism, the theory of planned behaviour is one of the most influential models for the prediction of social behaviour (Ajzen, 2015:131). Stemming from the theory of reasoned action by Madden, Scholder Ellen and Ajzen, (1992:4), Ajzen *et al.* (2011:113) developed the theory of planned behaviour centred on the individual's intention to perform a given behaviour. The theory of planned behaviour states that intentions are the most critical determinants of behaviour (Ajzen & Madden, 1986:453). Intentions are determined by attitudes, subjective norms and perceived behavioural control (Ajzen *et al.*, 2011:103). Attitudes represent an individual's overall good or bad assessment of performing the behaviour while subjective norms reflect the perceived approval or disapproval from significant others for behavioural performance (Ajzen *et al.*, 2011:103). Perceived behavioural control explains the perceived degree to which a behaviour is under the person's control, and influences both intentions and behaviours (Ajzen *et al.*, 2011:113).

Possession of knowledge alone however is not adequate to bring about a change in behaviour but when coupled with favourable attitude and subjective norm, the stronger the person's intention to perform the behaviour in question would be (Ajzen *et al.*, 2011:102). Aspects of behaviour and attitudes, according to Ajzen and Madden (1986:453), are described as being on a continuum, with one end having little control to the other having great control. The theory of planned behaviour holds that only specific attitudes toward the behaviour in question can be expected to predict that behaviour (Ajzen, 2015:131). Many health-related behaviours are however difficult to change and may compromise an individual's commitment; therefore, perceived behavioural control must be considered in addition to intention (Ajzen *et al.*, 2011:102). Perceived behavioural control becomes truthful and can serve as a substitute for actual control and contributes to the prediction of the behaviour in question (Ajzen, 2015:133). Figure 2.1 illustrates an explanation of the original Ajzen's theory of planned behaviour:

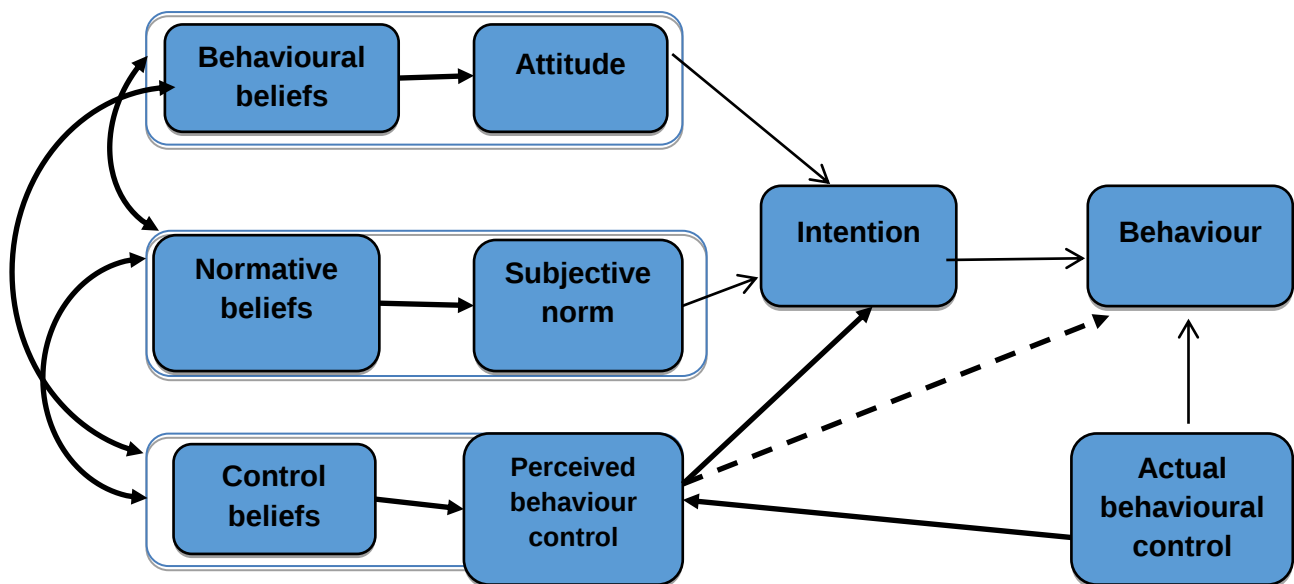


FIGURE 2.1: Theory of planned behaviour (Ajzen *et al.*, 2011)

An explanation of this theory was given in subsection 1.5 and is illustrated in Figure 1.1, namely how the theory of planned behaviour was applied to the current study.

2.4.2 Knowledge

According to Ajzen *et al.* (2011:105), the individual's intention to perform a behaviour is related to that individual's knowledge, and is determined by attitude towards a specific behaviour. Although usually defined as ability to acquire, retain and use information, in this study knowledge embodies beliefs that are behavioural, normative and subjective (Ajzen *et al.*, 2011:102).

2.4.2.1 Behavioural beliefs

Behavioural beliefs depict the link between a specific DM-related behaviour and a consequence that leads from this behaviour (Ajzen *et al.*, 2011:102). One's attitude is determined by one's beliefs about outcomes or attributes of performing the behaviour (Glanz, Rimer & Viswanath, 2015:97).

An example of behavioural beliefs was found by the Centers for Disease Control and Prevention (CDC) (2016: online), linking the risk of developing T2DM increases as one ages. Such facts about the disease have led to behavioural beliefs that diabetes is a normal development that occurs with age; hence, the delay in reporting symptoms in younger people (Dabalea, Mayer-Savis & Sayah, 2014:1779). However, in the United States, the incidence of T2DM in the youth has been on the increase by on average 2% per year between 2001 and 2004 as concluded in a prevalence study by Dabalea, *et al.* (2014:1779). The youth now accounts for 20% to 50% of all new T2DM cases in the United States (Dabalea *et al.*, 2014:1780). The author argues that the general behavioural beliefs within many communities have therefore not kept pace with the aforementioned developments in the evolution of T2DM.

Visceral adiposity (internal organ fat) due to obesity escalates the development of T2DM (Kahn, Cooper & Del Prato, 2014:1069). Felber and Golay (2002:39), in their analysis of several mechanisms causing obesity, concluded that reversing obesity by engaging in physical activity greatly reduces potential complications of T2DM. However, the absence of T2DM risk factors did not protect obese individuals from developing diabetes as seen in the study by Felbar and Golay (2002:39). The increase in incidence of T2DM amongst the youth has been attributed to the rise in childhood obesity (Slyper, 2013:618).

The effect of starch on glycaemic control has been a subject of research in past years, and most scholars posit that whole grains have a protective effect against T2DM, and these forms of starch help control blood sugar once T2DM sets in (Lappi, Kolehmainen, Mykkanen & Poutanen, 2013:635). Maize cereal is the most produced and consumed cereal in Lesotho (Ministry of Development and Planning, 2014:172). In Lesotho, milling companies generally produce a larger proportion of refined maize meal than unrefined, to promote a longer shelf life (Ministry of Development and Planning, 2014:172). This therefore means T2DM patients are more likely to eat foods prepared from refined maize cereal, as this the most widely available starch. Breen, McKenzie, Yoder, Ryan, Gibney and O'Shea (2016:147) posit that most T2DM patients have a low understanding of various forms of starch and their effect on glycaemic control, and focus especially on portion control as a means of dietary self-management.

There are many recognised effects of exercise on diabetics. Reduced cardiac perfusion due to microvascular dysfunction in T2DM is associated with low tolerance for exercise (Climie, Srikanth, Keith, Davies & Sharman, 2015:139). On the other hand, exercise is also good for stimulating metabolism and promoting health by preventing atherosclerosis, and therefore further damage in microvasculature of important organs. There is therefore a need for T2DM patients to strike a balance by engaging in moderate non-strenuous exercise.

2.4.2.2 Normative beliefs and subjective norms

Normative beliefs are beliefs about the degree to which the patient's significant others think he/she should or should not perform specific behaviours, while **subjective** norms are beliefs about whether or not one's peers accept a particular behaviour (Ajzen *et al.*, 2011:102). Subjective norms are determined by normative beliefs and are strong predictors of intention and actual behaviour (Ajzen *et al.*, 2011:102). Given the lifestyle nature of T2DM, patients tend to value the opinions of their significant others, peers and community members.

Besides predicting subjective norms, intention and behaviour, normative beliefs provide evidence about where intervention efforts should be focused (Ajzen & Madden, 1986:455).

The increase in T2DM in affluent countries and in developing countries has been attributed to reduced physical activity resulting in an increase in obesity and availability of refined foods. With the advent of technology, most tasks have been reduced to cellular phone applications that the user can perform by simple clicks of a button. The resulting obesity is thought to mediate T2DM through disruptions in fatty acids and adipose tissue, leading to insulin resistance (Forbes & Cooper, 2013:141).

A high proportion of T2DM patients believe in and use alternative herbal medicines. Some T2DM patients look for traditional medicines to escape the perceived side-effects and limited efficacy of currently available orthodox medicines (Rutebemberwa, Lubega, Katureebe, Oundo, Kiweewa & Mukanga, 2013:4). Over 1,200 flowering plants have

been cited to have antidiabetic potency, and close to a third of these have been studied scientifically as possible medicines for T2DM. Most studies of herbal medicines have been conducted in China and the rest of Asia (Chang, Lin, Bartolome, Chen, Chiu & Yang, 2013:15). Given the variability of flora across geographic regions, the limited studies conducted in Southern Africa do not provide enough evidence to prove or disprove the potency of herbal remedies insofar as T2DM is concerned. However, most societies in Southern Africa still believe in herbal remedies not only for diabetes, but also for other illnesses, and concurrent use of Western medicine and herbs remains a common phenomenon (Rutebemberwa *et al.*, 2013:6).

Diabetic foot is one of the recognised and devastating complications of T2DM (Hinkle & Cheever, 2013:1189). Several pathways have been proposed as a cause but in general, microvasculature dysfunction is accepted as the cause of diabetic foot. In most patients with T2DM who developed diabetic foot, this complication is most often erroneously acknowledged as a side-effect of medicines rather than as a sign of the progression of disease, since its onset happens after the initiation of diabetic medicines but with poor glycaemic control. Such misconception strengthens the normative and subjective norms of the patient and his/her significant others leading to undesirable diabetes-related behaviour (Al-Maskari, El-Sadig, Al-Kaabi, Afandi, Nagelkerke & Yeatts, 2013:5).

2.4.2.3 *Control beliefs and perceived behavioural control*

Control beliefs reflect an individual's reasoning regarding the ability to influence behaviour, status or outcomes while **perceived behavioural control** is theoretically an individual's belief that a certain behaviour is under his/her control (Lang, 2015). In practice, however, behavioural control is often assessed by the ease or difficulty of the behaviour (Glanz *et al.*, 2015:98). Behavioural control in T2DM means that a patient is able to manage his/her own condition. Self-management in diabetes is the process in which an individual develops an awareness of and learns to live with T2DM in the social context (Shrivastava *et al.*, 2013:2). Self-efficacy, on the other hand, is the extent to which individuals believe they are capable of performing specific behaviours to attain certain goals. Clark, Gong and Karicoti (2014:500) inferred that an individual's ability to

control T2DM through an effective therapeutic plan is influenced by social and behavioural factors such as healthy eating, physical activity, self-monitoring of blood glucose and diabetes self-care (Clark *et al.*, 2014:500). Such behavioural factors help to examine the predictive usefulness of the theory of planned behaviour, and when someone is able to control the disease, he/she becomes less vulnerable.

Al-Khawaldeh, Al-Hassan and Froelicher (2012:10) assert that diet self-efficacy and self-management behaviours predicted better glycaemic control while the use of insulin significantly predicted poor glycaemic control. Gao *et al.* (2013:3), however, in their cross-sectional study of Chinese adults with T2DM question whether diet self-efficacy and self-management behaviours rather only influence glycaemic control indirectly through self-care behaviours. Strategies to enhance self-efficacy therefore require behavioural counselling and skill building to enable the patients to manage T2DM effectively (Gao *et al.*, 2013:4).

Self-efficacy in T2DM has been linked to improved blood sugar levels as well as affect how people feel about the disease (Al-Khawaldeh *et al.*, 2012:12). The more a person believes that a behaviour can result in a desirable health outcome, the greater the likelihood of adopting the positive behaviour, and greater adherence to the correct increased perceived self-efficacy for that behaviour results in its adoption and adherence as seen in the study of self-efficacy and self-management of T2DM by (Al-Khawaldeh *et al.*, 2012:12).

2.4.3 Attitudes

An attitude is an evaluation of an object or an abstract idea. According to the theory of planned behaviour, the aforementioned evaluation may result in a favourable or an unfavourable perception of the object or idea. In T2DM, attitude is influenced largely by the subject's knowledge regarding T2DM, and the subject's perception of whether society evaluates the T2DM patients negatively.

Schabert, Browne, Mosely and Speight (2013:7) contend that society generally looks at T2DM sufferers as people who have failed to look after themselves, and who lack self-restraint. These negative perceptions coerce people with T2DM to remain private about their condition as disclosure would lead to perceived discrimination. This lack of disclosure has negative impact on T2DM self-management, as they may be prevented from exercising self-restraint at public gatherings, much to the detriment of their condition. Browne, Ventura, Mosely and Speight (2013:6) note that social occasions such as work dinners, funerals and parties, and holidays such as Christmas, are the most difficult for diabetics. These festivities often come with a standard menu that does not cater for special diets as those required for T2DM patients.

The negative attitude towards T2DM is not entirely externally generated as a result of what the subject perceives as the understanding of the society. T2DM requires patients to make drastic changes to their diet so that the condition can be controlled (Ajala, English & Pinkney, 2013:510). Whole grain, vegetables and fruits that are encouraged in T2DM are not as tasty as purified food with additives to adjust taste and the general appeal of food. More often, T2DM patients have to let go of their favourite foods in pursuit of better health, and this is frustrating to these patients who feel they have to be treated like children who are told what to eat and what to avoid. In addition, anxiety and stress about possible complications of T2DM further compounds the frustration of the patients (Smith, Beland, Clyde, Gariepy, Page, Badawi, Rabasa-Lhoret & Schmitz, 2013:95). All these internally generated perceptions bear negative attitude towards the condition, further hurting self-management and control.

Despite the aforementioned societal and individual circumstances that drive negative attitudes towards T2DM, other recent changes reinforce a positive attitude. Many public restaurants and caterers have started providing for special dietary requirements, realising that health implications of diets ought to be taken seriously (Okumus & Bilgihan, 2013:36). Long haul flights are now providing food options for travellers. Okumus and Bilgihan also note the availability of menu options and smart phone applications that help people living with T2DM to exercise self-control without being embarrassed that they are being burdensome on the restaurant, caterer or flight. In some instances, a mere diagnosis of T2DM has led to lifestyle changes for some patients, bringing about a positive attitude.

The world view of T2DM can be considered to be changing, but the self-held perceptions of T2DM sufferers may take longer to realise the change.

2.4.4 Practices

The Theory of Planned Behaviour summarises a “Practice” as the strength of a patient’s intention to engage in specific health behaviour and the motivation to undertake a specific behaviour (Ajzen *et al.*, 2011:103). According to Ajzen (1986:460) intention is the closest predictor of behaviour and behaviour is ultimately the variable that most health communication interventions aim to influence. Other scholars such as Saal and Kagee (2012:366) who used the theory to predict adherence to Anti-Retroviral Therapy in South Africa echo the same sentiments and lay the groundwork for the concept of practice to be investigated further. Poor practices have negative consequences on self-management of T2DM, and on the general health system as complications that cost more are likely to arise.

Healthcare workers need to first determine the degree to which one’s attitude, normative beliefs and perceived control influences his/her intentions. This helps to understand why a person holds a given intention and engages in a particular behaviour (Ajzen & Madden, 1986:455). For example, in T2DM intention to change diet or stop smoking may be strong but a low perceived behavioural control makes the link between intention and the actual practice weak and unreliable. Diabetes health education is then centered around ensuring that only beliefs leading to positive behavioural change are encouraged. Lorig, Ritter, Pifer and Werner (2014:97) in their study of chronic mentally ill patients in the United States of America assumed that when people are confident and knowledgeable they learn to take responsibility for managing their disease daily and show evidence of improved health outcomes. Patients with T2DM therefore are only able to practice self-management if the healthcare workers’ interventions are centered on correcting and adjusting the patients’ incorrect pre-existing beliefs about the disease.

2.5 CONCLUSION

This chapter was a discussion of the literature regarding the diabetes-related KAP of adults living with T2DM in Maseru. The discussion included important aspects of the Lesotho health system. Such aspects were the acts and policies as well as the different cadres of health professionals who make up the health system. Diabetes mellitus, particularly T2DM was also discussed in depth as well as its link to the KAP of the patients in line with the theory of planned behaviour. Chapter 3 will present the methodology of the study. [80]

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

Chapter 2 provided a critical discussion of different insights and arguments of relevant published work related to the aim of the study, which was to assess the diabetes-related KAP of adults living with T2DM in Maseru, Lesotho.

This chapter will describe in detail how the study was carried out using a quantitative descriptive design, as well as the strengths and limitations of this design. A questionnaire was used on a carefully selected population from which a smaller sample was proportionally and conveniently selected. This chapter reports on how the pilot study was carried out, how it formed part of the data collection plan as well as how it strengthened the validity and reliability of the data collected by way of the questionnaire. The data collection plan further describes step by step how the researcher and fieldworkers adhered to the ethical obligations. The chapter will conclude by describing in detail the way the data was analysed.

3.2 RESEARCH DESIGN

A research design is a plan of how the researcher intends to carry out the research (Brink, van der Walt & van Rensburg, 2012:10). This includes all the planning, collection, organisation and analysis of data that take place prior to seeing any results (Gerring, 2012:78; Mouton, 2013:55). In this study, the researcher used a quantitative descriptive design to plan, collect, organise and analyse data in the description of the diabetes-related KAP of adults with T2DM in Maseru.

A research design indicates which type of study will be undertaken while addressing the key question and providing answers to the research problem and keeping the researcher in control of his/her study (Polit & Beck, 2012:58). In the present study, the deliberation, compilation and analysis of data helped in answering the research question. The structure provided by the guideline to the questionnaire (Addendum E) aided the researcher to remain in control of the study.

Choosing a research design helps the researcher to identify ethical, theoretical and practical implications that will apply to the study (Botma, Greef, Mulaudzi & Wright, 2010:108). The quantitative descriptive design also helped to adhere to ethical principles, and to apply the theory of planned behaviour within the questionnaire.

3.2.1 Quantitative research

Quantitative research is a formal, objective, rigorous and logical process for generating numerical information to describe events and examine relationships among variables (Burns & Grove, 2012:34). The present study followed a formal process through which a research protocol was submitted for approval to the UFS Health Research Ethics Committee. After getting the necessary approval, the study was conducted using a pre-designed questionnaire to collect data, thereby limiting the researcher and fieldworkers' use of opinion, thus enhancing objectivity. Numerical information generated included participants' demographic characteristics. Variables such as diabetes-related KAP of adults with T2DM were collected in the study based on Ajzen's theory of planned behaviour (Ajzen *et al.*, 2011:101-111). The aforementioned variables were measured on a pre-defined scale and analysed with statistical procedures to determine associations among these variables (de Vos, Strydom, Fouché & Delport, 2013:64).

3.2.2 Descriptive research

The exploration and narration used in descriptive research helped the researcher to portray characteristics of an event accurately, discover new meanings, determine frequency with which something occurs as well as organise information (Burns & Grove, 2012:536). A descriptive method of inquiry was applied in this study in order to

determine the diabetes-related KAP of adult participants with T2DM in Maseru. The KAP survey was linked to Ajzen's theory of planned behaviour (Ajzen *et al.*, 2011:101-111). Descriptive research also helped the researcher to depict the characteristics of the adult participants with diabetes by describing their demographic and biographical information as stated in the objectives of the study.

3.2.4 Strengths of quantitative research

In this research, a number of strengths of the quantitative design made it a good design choice for this study, as can be seen from the points highlighted below.

Quantitative research is fundamentally about gathering numerical data to explain a particular phenomenon (Brink *et al.*, 2012:11). In this study, numerical information was captured in the questionnaire, depicting demographic information and the KAP of participants with T2DM.

Study findings can be generalised to a larger population about which information is required after completion (Botma *et al.*, 2010:83). The proportional sampling of PHCCs in this study enabled the findings about diabetes-related KAP to be generalised to all adult participants with T2DM attending PHCCs in Maseru.

The use of standardised concepts, variables and measurement methods, which remain constant, will allow replication of the study in different areas or over time with the production of comparable findings (de Vos *et al.*, 2013:62). In this study, the researcher defined the key concepts and clarified these within the theory of planned behaviour. The study findings are therefore comparable to other studies that used the same concepts as defined herein. Variables such as knowledge, attitudes and practices are also defined using theory, and a well-structured questionnaire grounded in the theory of planned behaviour (Ajzen *et al.*, 2011:102) was used as method of measurement.

Quantification of phenomena simplifies collection, comparison and summarisation of data making observation clear (Babbie, 2007:23). The present study was conducted using an easy-to-administer questionnaire, aided by the guidelines to the questionnaire (Addendum E) to complete the questionnaire. Initially, data was coded and then presented on an Excel spreadsheet, after which SAS® software was used in analysis of data.

Leedy and Ormrod (2010:95) state that there is more objectivity in quantitative than qualitative research since the researchers do not participate in the study and try as much as possible to detach themselves from the participants. The researcher and fieldworkers used a pre-designed questionnaire guideline (Addendum E) to guide them when asking the questions in the questionnaire. There was therefore no opportunity for them to intervene with personal feelings or opinions thereby eliminating possibility of bias.

3.2.5 Limitations of quantitative research

While quantitative methods have some notable advantages, they also have weaknesses as shown below.

The use of statistics to analyse the data in quantitative research may seem frightening to many researchers (Babbie, 2007:23). In the present research, a research assistant entered data, which was reviewed by the researcher and research assistant after data had been entered. Data analysis was conducted by a biostatistician within the Faculty of Health Sciences at the UFS, who also guided the researcher in interpreting data analysed.

Quantitative data has less depth about phenomena than qualitative data and may miss a desired response from the participant (de Vos *et al.*, 2013:65). In this study, the researcher provided space in the questionnaire for elaboration where a more in-depth response was needed, namely questions 2.6, 2.8 and 2.9 about biographical data, 3.7 about control beliefs and 3.8 and 3.9 about perceived behavioural control. By doing so,

the possible misinterpretation of responses by participants was minimised, even allowing more depth to data obtained.

Quantitative research methods are rigid because the instruments cannot be modified once the study begins (Gerring, 2012:67). In this study, changes to data collection instruments would not have been desirable. The researcher finalised the questionnaire after completion of the pilot study to stay true to the structure provided by a questionnaire, namely that it was not changed during data collected from participants. The same questionnaire was kept and so the same type of data was collected from all participants.

3.4 RESEARCH TECHNIQUE: STRUCTURED QUESTIONNAIRE

The research technique used in this study was that of a questionnaire. The questionnaire used in this study was adapted from the Diabetes Knowledge Scale (DKN), and the Psychological Adjustment to Diabetes Scale (The Euroqol Group, 2009), as well as a T2DM KAP questionnaire used in the Free State, South Africa (Le Roux, 2015).

A questionnaire is a printed form designed by the researcher to elicit information through written or verbal responses from a research participant (Cohen, Manion & Morrison, 2007:318). Questionnaires are sometimes referred to as 'surveys' and studies using a questionnaire may be referred to as a 'survey research' (Cohen *et al.*, 2007:379). Questionnaires are often used in descriptive studies to gather a broad spectrum of information from subjects about beliefs to knowledge, opinions or intentions (Burns & Grove, 2012:353). The primary purpose of a questionnaire is to acquire specific information from a group of people with a common interest (de Vos *et al.*, 2013:186). In this study, the researcher used a questionnaire (Addendum D2) to gather information from participants in selected clinics in Maseru.

Several **strengths** are associated with questionnaires. To begin with, questions are presented in a consistent manner to each subject and opportunity for bias is low (Burns & Grove, 2012:353). During the present study, the researcher and fieldworkers read out questions as they appeared on the questionnaire, hence presenting information

consistently to all study participants in accordance to the questionnaire guideline (Addendum E). Secondly, there was no opportunity to leave any questions unanswered as the researcher ensured completion. All the questionnaires were completed in full in this study. Lastly, the completion of the questionnaire allowed the researcher to control the response rate, catered for the less literate and had a low refusal rate (WHO, 1978:189). All 291 participants approached agreed to participate in the study and were able to complete the study interview with the researcher and fieldworkers successfully despite varying levels of literacy.

Notwithstanding the above-mentioned strengths, the technique had some **limitations** that included time consumption as only one participant could be interviewed at a time, and some bias as participants might have been shy to open up completely in the presence of an interviewer (WHO, 1978:189). The researcher established that one questionnaire took 10-20 minutes to complete, and planned to have that amount of time with each client. In addition, the researchers also visited busy clinics together to maximise on recruitment of study participants and reduce the risk of losing possible participants. During the training of fieldworkers, the researcher emphasised the importance of not wearing uniforms and being friendly to participants when conducting the study, strategies that were used to reduce possible bias in responses. Another challenge associated with structured questionnaires is that the subject is not permitted to elaborate on responses and also not asked for clarification. Furthermore, the data collector cannot use probing strategies (Burns & Grove, 2012:353). However, in this study, the questionnaire allowed for open-ended questions to explore certain aspects in a structured manner. Participants could clarify questions and the researcher and fieldworkers were guided by the questionnaire guideline (Addendum E) as to how to elaborate or explain aspects that were not clear to participants. During the pilot study, the questionnaire was modified regarding questions that needed clarification, and that significantly reduced the need to clarify any question. The researcher was sensitive towards the effect of possible limitations when using this technique. Since the literacy rate of the T2DM participants was considered to be the same as that of the general Basotho population, which was approximately 83% at the time of the study (Ministry of Development and Planning, 2014:34), the researcher argued that the literacy level of participants did not influence the data collection process negatively since the

questionnaire was completed by the researcher and trained fieldworkers to ensure that the participants were clear on the questions asked.

3.5 POPULATION

A population is the whole collection of individuals, objects or elements with similar characteristics, which meet certain criteria to be included in the study (Brink *et al.*, 2012:130; Gerring, 2012:75). In this study, the population consisted of all adult patients with T2DM attending PHCCs in Maseru. The DHMT and the Department of Statistics estimated that about 1 324 adult patients had been attended with T2DM in Maseru clinics in the last half of 2014 (Ministry of Development and Planning, 2014:303). Table 3.1 below shows the population.

TABLE 3.1: Population of study

Number of PHC clinics				
Government	Faith-based	Private	Public-private	Total
N=16	N=21	N=28	N=3	N=68
PHC clinics selected				
Government	Faith-based	Private	Public-private	Total
n=5	n=8	n=9	n=2	n=24

3.6 SAMPLING

“Sampling refers to the process of selecting a few individuals or objects to present a general picture of the population” (Polit & Beck, 2012:59). A sample is therefore a subset of the accessible population of which the results could be generalised to the entire population (Botma *et al.*, 2010:124). PHCCs were classified into government, faith-based, private and public-private, and proportional sampling was applied to identify clinics for the study. From the selected clinics, adult participants with T2DM were conveniently sampled on data collection days for the study. Proportional random sampling of the PHCCs (n=68) was done to sample half of the PHCCs (n=34). After a brief survey of the clinics, the researcher realised that some of the clinics in the sample did not offer care in T2DM, therefore sampling of the PHCCs was repeated and the new number of clinics became n=32. Convenience sampling was used to identify the participants in the study at each clinic and more participants were drawn from clinics with high volumes of patients.

Clinics namely Botshabelo, St Leo and Thaba Bosiu, did not have clients because of various reasons, such as a shortage of drugs or glucometers while Carewell premises were closed and the researcher and fieldworkers failed to go to St Rodrigues because it is in the highlands where a bigger vehicle was needed. Bophelong, Rosym and Beatitudes clinics were excluded from the study as the researchers failed to get permission from the owners. More participants than planned were drawn from clinics that had sufficient patients to achieve the study sample requirements. The table below reflects the above-mentioned information.

TABLE 3.2: Sampling of the clinics and participants

First sampling of number of PHC clinics				
Government	Faith-based	Private	Public-private	Total
N=8	N=11	N=14	N=2	N=35
Second sampling of PHC clinics				
N=6	N=11	N=14	N=2	N=32
Number of participants				
n=172	n=91	n=12	n=16	n=291

TABLE 3.3: Convenient sampling of the participants from the PHCCs

GOVERNMENT	FAITH-BASED		PRIVATE	
• Mohale (n=8) • Phatella (n=8) • Botsabelo (n=0) • Domiciliary (n=90) • Matsieng (n=61) • Likalaneng (n=5)	• St Josephs (n=1) • Loreto (n=28) • Thaba Bosiu (n=0) • Maseru SDA (n=15) • St Benedict (n=1) • Nazareth (n=40)	• St Rodrigues (n=0) • St Leo (n=0) • St Peter Claver (n=1) • Marakabei (n=4) • Korokoro (n=1)	• Bophelong (n=0) • Rosym (n=0) • Legele (n=1) • Caseline (n=1) • L&L Family Clinic (n=1) • Hapita (n=4)	• City clinic (n=1) • Bafokeng (n=1) • Carewell (n=0) • Masechaba (n=1) • Mahlompho (n=1) • Nelese (n=1)
Public-private			• Beatitudes (n=0)	• Mabatho (n=0)
• Qoaling (n=6)	• Likotsi (n=10)			

3.6.1 Inclusion criteria

The inclusion criteria applicable to the study indicated:

- adult participants who were 18 years and older diagnosed with T2DM and receiving services from a PHCC in Maseru district at the time of the study; and
- adult participants with T2DM who had signed informed consent to participate in the survey.

3.6.2 Exclusion criteria

The exclusion criteria applicable to the study included all participants with T2DM who:

- physically and mentally were not able to participate due to complications inhibiting them to speak and interact with comfort; and
- could not speak English or SeSotho.

3.7 PILOT STUDY

To determine the feasibility and affordability of the study a pilot study was done first. A pilot study refers to a small-scale version of the study, which tests the research techniques, such as the questionnaire to ensure usability, and this is done involving participants who meet the inclusion criteria (Polit & Beck, 2012:195). In the present study, the pilot study included all the types of clinics with one participant being chosen from one government, one faith-based, one private and one public-private partnership clinic. The participants involved in the pilot study met the inclusion criteria.

The researcher trained two fieldworkers regarding completion of the questionnaire prior to the pilot study. The training involved role plays where the fieldworkers had the opportunity to complete the questionnaire within a created scenario. The researcher was able to ensure their skills were such that they would be of value during data

collection. The fieldworkers were recruited from newly qualified registered nurses who were not yet practicing. The researcher and fieldworkers were guided by the questionnaire guideline (Addendum E) to ensure that all questionnaires were completed in the same manner.

The pilot study enabled the researcher to assess the participants' comprehension of the informed consent materials and clarity of the research questions. The pilot study also helped assess the proficiency of the fieldworkers. The fieldworkers were proficient enough and no further training was required. After the pilot study, the researcher had the opportunity to identify any practical obstacles that could be anticipated during data collection and coding of questionnaires. Initially, the researcher and fieldworkers translated the answers to the open-ended questions from SeSotho to English but after the pilot study, the researcher realised that there may be misinterpretation of the participants' answers and opted that the answers be written down verbatim in SeSotho to minimise bias. The participants at one private clinic, were a bit reluctant to participate with just the referral from the attending professional nurse so the researcher arrived early at the clinics and gave a health talk about T2DM. Anxiety was reduced as the participants asked questions and understood the value of their participation in the study. The twelve questionnaires administered in the pilot study were all completed in SeSotho. Data from the pilot study was not used in the study because question 2.9 of the questionnaire was not correctly interpreted by the fieldworkers.

3.8 DATA COLLECTION PLAN

Botma *et al.* (2010:130) define data collection as a methodical process of gathering and measuring information on variables to solve the research purpose. Data collection was done in the following sequence.

The researcher obtained permission from the UFS Health Research Ethics Committee (Addendum F1) and the Health Research and Ethics Committee of Lesotho (Addendum F2), as well as permission from the relevant management of clinics at which the research was conducted.

Upon getting permission from the respective committees and management, the researcher set up meetings with staff at the identified clinics. In the meetings, the researcher explained the purpose of the research and how the research was to be conducted. The role of fellow professional nurses in identifying participants meeting the inclusion criteria for the study was clarified, and also the way such participants would be linked to the researcher and the fieldworkers without compromising service delivery.

During the data collection, professional nurses identified participants as had been explained during staff meetings. Once eligible participants had been identified, the professional nurses explained the purpose of the study to selected participants and referred to the researcher or fieldworker those who agreed to participate in the study. The researcher or fieldworkers then took the participants to a private room for the interview. The researcher and fieldworkers obtained consent from study participants using a consent form (Addendums A1 and A2) and an information leaflet (Addendums B1 and B2). The documents briefly explained the purpose of the study, the patient's right to withdraw from the study at any time with no compromise to his/her care, and basic information about how the study was to be conducted. The researcher and fieldworkers read out the consent form and interpreted its contents to participants who were unable to read or write. In such cases, an X was used instead of a signature as is acceptable in Lesotho.

The researcher and fieldworkers collected data using structured questionnaires, which were in English or SeSotho (Addendums D1 and D2) as chosen by the patient. The researcher and fieldworkers also measured the patient's weight, height and waist circumference, ensuring that the participant had removed his/her shoes and had no extra layers of clothing on to enhance accuracy of the body mass index (BMI) that was to be calculated by the biostatistician. Each interview took approximately ten to twenty minutes, and the completed questionnaires were quickly double-checked on site before the participant left to ensure that all questions had been answered. The fieldworkers assisted in entering coding of the questionnaire on the data spreadsheet and the researcher checked with the fieldworker the accuracy of data reflected on the spreadsheet. Two spreadsheets were used to ensure consistency of the data entered. The data was then locked away for safe storage in a cabinet to which only the researcher had access.

3.9 VALIDITY

Validity is defined as the extent to which the instrument measures what it is intended to measure within the sample population and the degree to which the findings can be generalised to the study population (WHO, 1978:28). In this study, face and content validity were enhanced and are explained as follows.

3.9.1 Face validity

Polit and Beck (2012:336) define face validity as the instrument appearing like it is measuring the intended concept. Face validity of the KAP questionnaire was enhanced by input from research experts serving on the Evaluation Committee of the School of Nursing at the UFS. The KAP questionnaire was further presented according to T2DM-related KAP aspects, as well as the theory of planned behaviour (Ajzen *et al.*, 2011:103) that formed the theoretical underpinning of the study. The technical layout of the questionnaire and the coding of answers were done according to guidance received from study leaders and the biostatistician.

3.9.2 Content validity

Content validity refers to the degree to which the items in an instrument sufficiently represent the universe of content for the concept being measured (Polit & Beck, 2012:723).

In this study, the researcher used a KAP questionnaire adapted from the Diabetes Knowledge Scale (DKN), and the Psychological Adjustment to Diabetes Scale (The Euroqol Group, 2009), as well as a T2DM KAP questionnaire used in the Free State, South Africa (Le Roux, 2015). Again, the content of the questions in the questionnaire reflected the aspects forming part of the theory of planned behaviour.

3.10 RELIABILITY

Reliability is defined by Leedy and Ormrod (2010:29) as the consistency with which the measuring instrument yields a certain result when the entity being measured has not changed. The KAP questionnaire, which was the measuring instrument, was completed by the researcher and trained fieldworkers. The use of trained fieldworkers minimised measurement error, as they were trained professionals in the health profession, therefore minimising possible different interpretations or recording of questions, increasing the reliability of results. The researcher and fieldworkers were further guided by the guideline to complete questionnaires (Addendum E), strengthening reliability of the results. The structured interview was a good tool for the data collection in this study as it also catered for the participants who were unable to read and write since the researcher or fieldworker read out the questions to these participants.

3.11 ETHICAL ISSUES

Ethics is a branch of philosophy, which deals with the dynamics of deciding what is right or wrong (Pera & van Tonder, 2005:6). The researcher obtained ethical approval from the UFS Health Research Ethics Committee (Addendum F1) and the National Health Research and Ethics Committee Lesotho (Addendum F2), before commencing the data collection. Participants in the study had the choice to be interviewed in either English or SeSotho. The researcher also obtained permission and consent of the management of the PHCCs that were selected for the study (Addendums G1, G2, G3). This study was guided by the principles of beneficence, respect for human dignity, and justice as expressed in the Belmont report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978:12). A brief explanation of how the researcher upheld these principles is provided in sections 3.11.1-3.11.4.

3.11.1 Principle of beneficence

The principle of beneficence refers to the researcher's responsibility to maximise benefits for the respondents as much as possible (Polit & Beck, 2012:152). This principle covers the right to freedom from harm and discomfort and the right to protection from exploitation (Cohen *et al.*, 2007:60). In this study, the researcher prevented physical harm by ensuring that the survey was conducted in accordance with the inclusion and exclusion criteria referred to above, and by ensuring that participants were medically fit to partake in the survey and not pose them any discomfort during participation. Emotional harm was minimised by explaining the purpose of the research and by issuing the information leaflet (Addendums B1 and B2). The researcher read out the information leaflet to the participants who were unable to read. Appropriate referral was made for any person who became anxious or afraid due to emotional distress. During the pilot study, two participants who were symptomatic of tuberculosis were referred for screening and HIV testing and counselling before they left the clinic as they had just come in for a routine refill of their diabetes medication. The researcher prevented exploitation by keeping to the agreed-upon duration of the interview as well as other aspects addressed in the information leaflet and consent form.

3.11.2 Confidentiality

Confidentiality refers to the actions taken to ensure that a participant's responses in a study are not divulged to anyone who is not part of the research team without the permission of the participant concerned (Botma *et al.*, 2010:17). In this study, only the researcher, fieldworkers and the supervisor had access to research information. The questionnaires were also numbered and collected in a confidential manner, making it impossible to link a questionnaire to a specific participant. The data analysed from participants was not linked to individuals and the professional nurses at the clinics. Identified participants who were willing to become part of the study were not exposed to the researchers without them being willing to do so. The questionnaires are kept in a locked cabinet to which only the researcher has access.

3.11.3 Respect for human dignity

Respect for human dignity encompasses the right to self-determination and means that participants must be treated as independent beings who can make their own decisions regarding whether to participate or withdraw from a study (Polit & Beck, 2012:158). In this study, the researcher provided an information pamphlet (Addendum B2) and a consent form (Addendum A2) for the participants to read and decide whether they wanted to participate. The researcher respected the participants' decision to decline, and participants were not discriminated against for deciding not to partake in the study. To avoid delays in accessing services, the researcher and fieldworkers administered the questionnaires after the participants had been consulted and were waiting to collect their drugs at the pharmacy.

3.11.4 Justice

The principle of justice is upheld when the researcher treats all the participants equally and fairly and honours their right to privacy (Polit & Beck, 2012:158). In this study, the participants meeting the inclusion criteria were conveniently selected with no bias towards vulnerable populations such as illiterate or elderly participants. The researcher also emphasised that there would be no compromise or negative consequences in service to the participants who declined to participate. The participants' right to privacy was maintained throughout the study by ensuring that the questionnaires were not linked to any names. The researcher also kept all the documents in a locked cabinet that could be accessed by authorised personnel only.

3.12 DATA ANALYSIS

Information obtained by the structured questionnaires was analysed by a biostatistician at the Department of Biostatistics at the UFS. Descriptive statistics, namely frequencies and percentages for categorical data, means, standard deviations or medians and percentiles for continuous data were calculated. The analysis was generated using SAS® software.

3.14 CONCLUSION

This chapter provided a detailed discussion of how the research was carried out using the quantitative descriptive design. The researcher also showed how the strengths of this design enriched the research and how the limitations were overcome. Structured questionnaires were used as a research technique, and as with the design, the strengths of the questionnaire were used to augment the study whilst the effect of the limitations inherent to this technique was minimised. Population and sampling of the study were described. The chapter also explained in detail how the pilot study and the following data collection were conducted. The researcher also showed how content and face validity were enhanced as well as how reliability of the questionnaire was ensured. The researcher upheld ethical principles and described how the collected data was analysed using computer technology. The next chapter will describe the results in the form of an academic article.

CHAPTER 4

Results of the study and data analysis

This chapter was written as an academic article for the *South African Family Practice Journal*. Please refer to Addendum G for the journal author guidelines.

Diabetes-related knowledge, attitudes and practices of adult patients living with type 2 diabetes mellitus in Maseru, Lesotho

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ABSTRACT

Background

Type 2 diabetes mellitus (T2DM) is a major public health concern in Lesotho and the fourth-ranking cause of death in that country. A steady increase in the proportion of patients admitted into hospitals with diabetes-related complications has been observed and may be attributed to poor diabetes-related knowledge, attitudes and practices of adults living with T2DM.

Methods

The study followed a quantitative, descriptive design. Convenient selection of clinics and of participants was used. Participants were interviewed using a pre-designed questionnaire. Descriptive statistics for continuous data were calculated.

Results

The majority of the participants were elderly, obese black females with fewer than four years' secondary education completed. The study found median percentage behavioural, normative and control beliefs implying that most participants had a positive attitude towards diabetes, which would positively influence the intention to act out certain positive diabetes health-related behaviour. The subjective norms and perceived behavioural control median were 50%. The participants had very strong intentions to act out certain diabetes-related behaviour.

Conclusion

Behavioural, normative and control beliefs were found to be high, while normative beliefs and perceived behavioural control were low. Healthcare providers in Maseru should therefore focus on interventions to change society's perception about T2DM as well as T2DM patients' perceived behavioural control through programmes such as skills counselling.

Keywords: knowledge, attitudes, practices, type 2 diabetes mellitus, theory of planned behaviour.

INTRODUCTION

Diabetes mellitus (DM) is a major public health concern in Lesotho, accounting for almost 3% of all deaths and ranking fourth as a major cause of death in that country.¹ In 2010, an estimated 31 000 people in Lesotho were diagnosed with type 2 diabetes mellitus (T2DM)² and this number is expected to rise to about 42 000 by 2030.³ Lesotho is also experiencing a steady increase in T2DM-related complications. According to the *Lesotho Annual Joint Review Report* of 2010,⁴ there was an approximate 5% rise in the number of people being hospitalised in the only tertiary hospital, Queen Elizabeth II Hospital, the then only referral hospital, due to diabetes-related complications, with about 67% of them being admitted for hyperglycaemia.⁴ The chronic nature of the condition means that people living with T2DM need to visit a healthcare professional for follow-up care regularly until the blood glucose levels are well controlled.⁵ In Lesotho, patients with T2DM attend follow-up care at hospitals and PHC clinics. The follow-up care of T2DM as a chronic condition at the above-mentioned facilities needs to take into account the knowledge, attitudes and practices (KAP) of the patients, since self-management plays a central role in the overall control of T2DM. Successful self-management of this lifestyle condition is determined by the patients' cultural beliefs, attitude and behaviour towards the disease.⁶ Kaliyaperumal⁷ posits that a diagnostic tool such as a KAP survey is needed to understand the community's comprehension of beliefs towards and the way in which they live with a disease. Once the service provider has an appreciation of how the patients live, health interventions can be developed to improve any gaps that might have been identified to strengthen self-management of patients diagnosed with T2DM further. This study was conducted in Maseru, the capital city of Lesotho, and aimed to determine the KAP of T2DM patients.

THEORETICAL FRAMEWORK

The KAP survey was based on the theory of planned behaviour (TPB).⁸ According to this theory, a person's intention to act out a specific behaviour originates with an informational foundation that closely links with the knowledge component.⁸ The knowledge component does not necessarily reflect the degree of knowledge the patients show towards a disease such as diabetes, but rather a set of beliefs that informs their knowledge about the disease. Azjen Joyce, Sheikh and Cole⁸ identify three groups of beliefs: behavioural, normative and control beliefs. Behavioural beliefs depict the link between a specific disease, in this case, diabetes-related behaviour, and a consequence that leads from this behaviour. Normative beliefs reflect the link between a specific DM-related behaviour and an expectation the patient may have due to the enacted behaviour. Flowing from the normative beliefs are subjective norms. Subjective norms provide a link between the specific DM-related behaviour, and links the patient's expectations to those of significant others in the patient's life. Control beliefs portray factors the patient perceives could either assist or hamper him or her in being in control of DM-related issues. Lastly, the patient's perceived behavioural control reflects the link between a specific DM-related behaviour and the patient's perception of his or her ability to perform the specific behaviour. Figure 1 illustrates the application of the TPB to the KAP in this study.

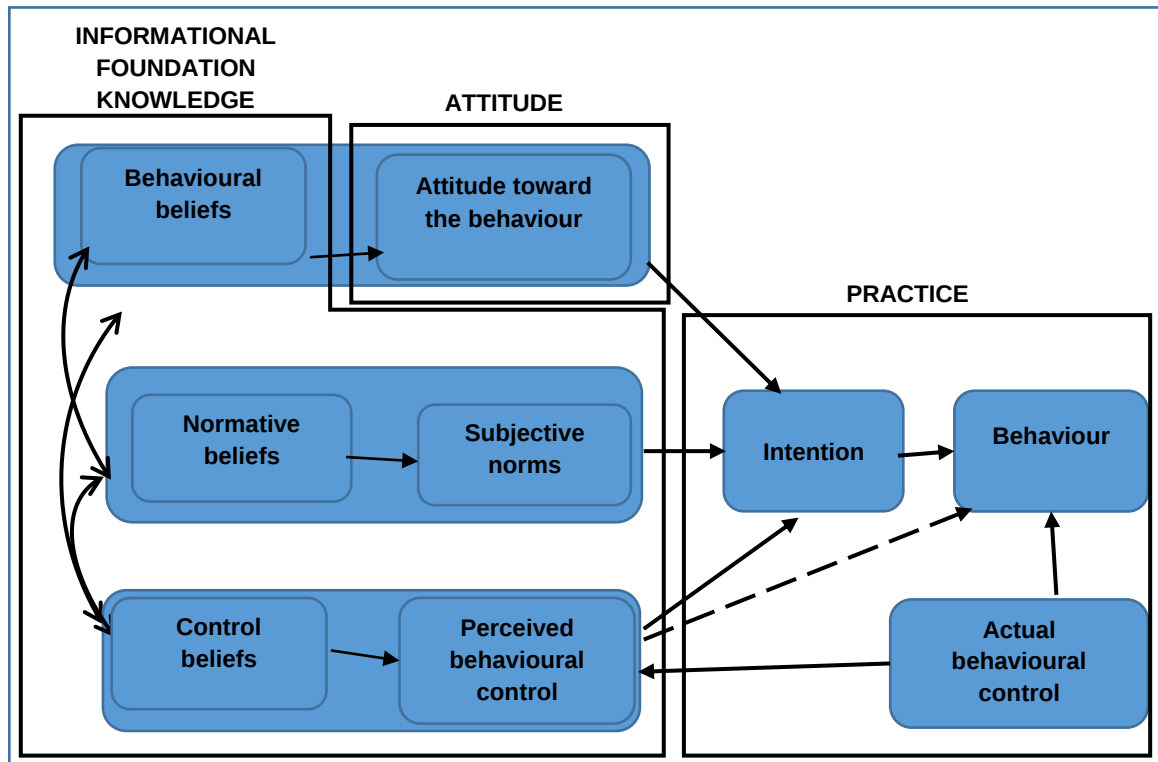


Figure 1: The theory of planned behaviour applied to a KAP study⁸

METHODS

Design

A quantitative descriptive design using a questionnaire was used to assess the KAP of adult patients in Maseru living with T2DM.

Population and sampling

The study population comprised all the adult patients living with T2DM, attending healthcare services in PHC clinics in Maseru. Although the PHC clinics were initially stratified into government (20), public-private (3), private (16) and faith-based (6) clinics, due to practical considerations, convenient selection of clinics identified 24 PHC clinics to participate in the study, followed by convenience sampling for the individual participants (291) attending healthcare services at said clinics. All adults aged 18 years and older diagnosed with T2DM who were receiving healthcare services at the selected clinics and who could speak English or SeSotho were invited to participate in the study. Patients who were not physically and mentally able to participate due to complications inhibiting them to speak and interact with comfort were excluded from the study.

Data collection

Data was collected using a questionnaire that the researcher and two fieldworkers administered to participants. The researchers explained the purpose of the study and obtained consent before completing the questionnaires.

Ethics

The study was approved by the University of the Free State (UFS) Health Research Ethics Committee, reference number: ECUFS 64/2015, and the Health Research and Ethics Committee of Lesotho, reference number: ID49-2015. The relevant management of each PHC clinic also approved the study before data collection. Participants were reassured that their responses would be anonymous and treated with utmost confidence.

Data analysis

The Department of Biostatistics at the UFS did the data analysis. Descriptive statistics, namely frequencies and percentages for categorical data, medians and percentiles for continuous data were calculated.

The KAP shown by patients were analysed in terms of the TPB predicting positive health-related behaviours. Categories depicting high, average and low scores were used, with high denoting scores above 70%, average ranging from 50% to 69% and low ranging from 0% to 49% in each of the categories.

RESULTS

The study information was analysed on demographic, knowledge, attitudes and practice characteristics as described below.

Demographics

Table I below summarizes the demographic characteristics of the study participants.

TABLE I: Demographic characteristics of participants (n=291)

ITEM	ATTRIBUTE	FREQUENCY	PERCENTAGE
Gender	Male	108	37.1
	Female	183	62.9
Home language	English	4	1.4
	SeSotho	287	98.6
Highest level of education	No schooling	5	1.7
	Some primary (< 6 years)	43	14.8
	Completed primary (7 years)	56	19.2
	Some secondary (< 4 years)	79	27.2
	Completed secondary (5 years)	57	19.6
	Diploma/degree	36	12.4
	Other (specify)*	15	5.2

Female participants constituted 63% of the study sample population, while the rest were males. The age of the participants ranged from 30 to 86 years, with a median age of 61 years, and more than 87% of the participants were 50 years of age and older. The majority (98.6%) of the participants were SeSotho-speaking. The median level of education of the study participants was some secondary education (less than four years of secondary education). Only 1.7% of the population had not attended any school. Study participants had been living with diabetes over a period that ranged from less than one year to 44 years, with a median of six years. Around 55% were diagnosed with diabetes after they had presented with diabetes-related symptoms, while the rest were diagnosed at routine clinic visits. Most participants (65.6%) were obese (body mass index [BMI] of over 30), with a median waist circumference of 100 cm (range 55 cm to 220 cm).

Knowledge

General diabetes-related knowledge was measured using four variables, namely behavioural, normative, subjective and control beliefs. Each variable had a series of questions in which the participants answered 1=yes, 2=no and 3=unsure. Table II shows the health-related knowledge predicting positive diabetes-related behaviour, presented as the participants' behavioural beliefs, normative beliefs and control beliefs. Subjective norms and perceived behavioural control are also presented.

* 'Other' means honours, master's or PhD degrees

TABLE II: Health-related knowledge predicting positive diabetes-related behaviours (n=291)

ELEMENTS/RANGE	RANGE (min–max) %	25 percentile %	MEDIAN %	75 percentile %	PERCENTAGE
Behavioural beliefs	0–100	50	75	75	
Normative beliefs	11.1–88.9	66.7	77.8	77.8	
Subjective norms	0–70	40	50	60	
Control beliefs	16.8–100	42.6	73.9	96.9	83.9
Perceived behavioural control	0–75	25	50	50	

	Frequency	Percentage
Control beliefs	244	83.9
Perceived behavioural control – prevent	126	43.3
Perceived behavioural control – not prevent	199	68.4

Table II reflects the participants' health-related knowledge predicting positive diabetes-related behaviours. Strong behavioural beliefs (75%) result in an increased positive attitude and the likely acting out of specific diabetes-related behaviour.⁸

Strong normative beliefs (77.8%) imply that influence from the patient's social interaction will likely result in positive diabetes-related behaviour while an average score in the subjective norms (60%) may have a negative effect on the desired diabetes-related behaviour. The average subjective norms imply that most participants came from families that had negative impressions about T2DM, negatively affecting the participants' intention to act out DM-specific behaviours. A high score in control beliefs (96.9%) implies an individual's perception of control over DM-related issues. This belief does not reinforce positive DM-related behaviour as management of the condition is associated with diet modification, exercise and treatment.

The subjective norms and perceived behavioural control median was 50%. The average perceived behavioural control indicated that most participants (68.4%) believed they had no control over (or could not prevent) most of the complications of T2DM.

Attitudes

In Table III, the attitude of a participant, which could influence the intended diabetes-related behaviour in a positive manner, was reflected.

TABLE III: Attitudes predicting positive diabetes-related behaviour (n=291)

QUESTIONS FROM STUDY QUESTIONNAIRE	n	%
I dislike being referred to as “A Diabetic” just because I’m getting older	49	16.8
All overweight people are diabetics	194	66.7
I often feel guilty when I eat pap [†]	231	79.4
Living with diabetes makes it impossible to also exercise	239	82.1
A person diagnosed with diabetes should be assisted immediately at a clinic	279	95.9
If I did not have diabetes I think I would be quite a different person	57	19.6
Diabetes is the worst thing that has ever happened to me	44	15.1
Most people would find it difficult to adjust to having diabetes	40	13.8
I often feel embarrassed about having diabetes	225	77.3
There is not much I seem to be able to do to control my diabetes	196	67.4
There is little hope of leading a normal life with diabetes	128	44.0
The proper control of diabetes involves a lot of sacrifice and inconvenience	207	71.3
I avoid telling people I have diabetes	243	83.5
Being told you have diabetes is like being sentenced to a lifetime of illness	177	60.8
My diabetic diet does not really spoil my social life	161	55.3
Having diabetes over a long period changes the personality	139	47.8
I often find it difficult to decide whether I feel sick or well	208	71.5
There is really nothing you can do if you have diabetes	237	81.4
There is really no-one I feel I can talk to openly about my diabetes	237	81.4
I believe I have adjusted well to having diabetes	234	80.4
I often think it is unfair that I should have diabetes when other people are so healthy	155	53.3

The results can be summarised as the median percentage of intended attitude (range: 28.6%-90.5%) leading to a specific behaviour. This implies that most (85.2%) of the participants had a positive attitude towards diabetes, which again would positively influence the intention to act out certain positive diabetes health-related behaviour.

Practices

Table IV below depicts the practices of the study participants.

TABLE IV: Practices predicting positive diabetes-related behaviour (n=291)

ELEMENTS	FREQUENCY	PERCENTAGE
Intention/actual behaviour		
Lose weight if I become overweight	218	74.9%
Rather eat organ meat instead of sweets	243	83.5%
Do activities that make me sweat as exercise	279	95.9%
Find out how I can adjust my lifestyle to living with diabetes	284	97.6%
Check my blood pressure monthly	287	98.6%
Use my medication as prescribed	288	99.0%
Check my feet for injuries regularly	280	96.2%
Have my eyes tested regularly	270	92.8%
Actual behavioural control		
Lose weight if I become overweight	221	75.9%
Rather eat organ meat instead of sweets	238	81.8%
Do activities that make me sweat as exercise	275	94.5%
Find out how I can adjust my lifestyle to living with diabetes	287	98.6%
Check my blood pressure monthly	282	96.9%
Use my medication as prescribed	290	99.7%
Check my feet for injuries regularly	288	99.0%
Have my eyes tested regularly	253	86.9%

[†] ‘pap’ is a traditional Lesotho dish prepared from maize meal

The median percentage intention leading to behaviour is 100% (range: 12.5%-100%). The participants (95.2%) had very strong intentions to act out certain diabetes-related behaviour.

KAP of participants and the theory of planned behaviour

Figure 2 below contextualises the KAP results of the current study in terms of the TPB. The results seem to indicate that high behavioural beliefs (75%) translate into a positive attitude towards diabetes. However, high normative (77.8%) and control beliefs did not translate to a high percentage subjective norms and perceived behavioural control, but was rather linked with average percentages. The average percentage reflected amongst subjective norms implies that the significant others of the participants in this study had a negative influence on the participants' knowledge about T2DM, while the average perceived behavioural control (50%) implied that the participants perceived that they had less power to act out positive diabetes-related behaviours. The intention to act out specific positive DM-related behaviour was high (100%). According to the TPB, the intention to perform certain behaviours is influenced by attitude, subjective norms and perceived behavioural control. In this study, the aforementioned factors seemed to have an additive effect, namely contributing to high intention even though subjective norms and perceived behavioural control were average.

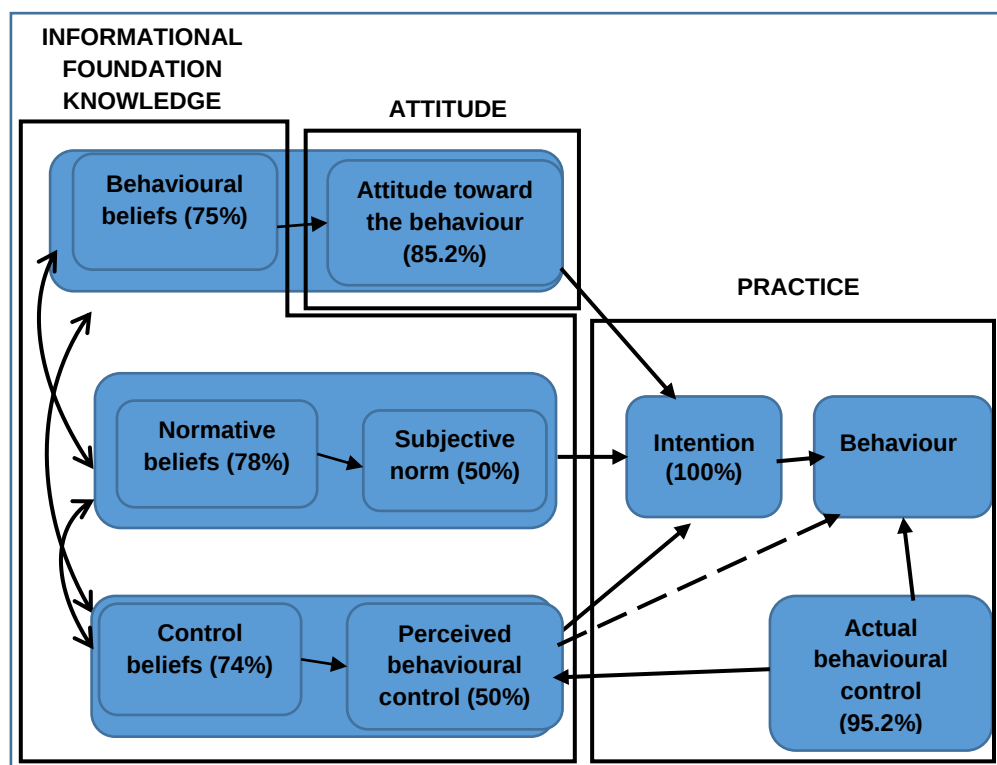


Figure 2: KAP results explained in the context of the theory of planned behaviour

DISCUSSION

Profile of respondents

More women (63%) than males participated in this study, reinforcing the belief that women generally seek medical help quicker and more than men.⁹ Although the participants were conveniently sampled, the current study seemed to point to diabetes being more prevalent in women than in men, as opposed to many studies that indicated a higher risk and prevalence in men.³ The apparent paradox may be attributed to the fact that approximately 24%-63% of diabetes cases remain undiagnosed and untreated.³ In Lesotho, most diagnoses are made on routine visits to the clinic, tipping the scale towards more women being diagnosed because men tend to visit the clinics less frequently than women.⁹ The demographics of the participants in this study established an age range of 30 to 86 years. This age range differed from those established in other studies, which confirmed age ranges 20 to 86 years.^{10,11} The difference between the other studies and the current study may be attributed to the fact that those studies were carried out in

predominantly developed countries where screening programmes are common, resulting in early diagnosis of the disease.¹⁰

It is not surprising that almost all participants communicated well in their home language only because almost 99% of the population of Lesotho is of Basotho origin and SeSotho-speaking.¹² The median level of education of participants in this study was on typically four years of secondary level education. The educational profile of diabetics in developing countries tends to be lower than that of diabetics in developed countries.¹³ However, Ahmad, Ramli, Islahudin and Paraidathathu¹⁴ argue that completion of some formal education at primary level is adequate to impart problem-solving skills necessary for the diabetic patient to comprehend diabetes education. The author therefore argues that the study participants had the necessary education to comprehend self-management, since almost 80% had completed primary school.

Knowledge

The knowledge of participants in this study was average to high. Al-Maskari *et al.*¹⁵ noted that several studies found low knowledge amongst T2DM patients. However, various instruments have been used to assess knowledge in these studies, making it difficult to compare the results of the current study to those in literature since knowledge in this study was defined in terms of behavioural, normative and control beliefs as per the TPB. Notwithstanding the foregoing challenge, the current study seemed to have similar findings as a study conducted in the United Arab Emirates where over 70% of the participants had fair to good knowledge about T2DM.¹⁵ The risk of developing T2DM increases as one ages leading to behavioural beliefs that diabetes is a normal development that occurs with age;¹⁶ hence, the delay in reporting symptoms in younger people.¹⁷ Breen *et al.*¹⁸ posit that most T2DM patients have a low understanding of various forms of starch and their effect on glycaemic control, and focus rather on portion control as a means of dietary self-management. This fact may hold true for Lesotho, where milling companies generally produce a large proportion of refined maize meal to promote a longer shelf life. The average scores (median 50%) for subjective norms indicate that the perceptions of significant others had a negative impact on T2DM-related behaviour since in lifestyle diseases, patients tend to value the opinions of their significant others, peers and community members.¹⁵ For example, most societies in Southern Africa still believe in herbal remedies not only for diabetes, but also for other illnesses, and concurrent use of Western medicine and herbs remains common.¹⁹

The average (50%) perceived behavioural control in the study seemed to resonate with similar findings in other KAPs of chronic diseases, where low scores would predict poor motivation to self-manage.²⁰

Attitudes

As noted in the results section, 82% of the participants showed a positive attitude towards diabetes.

The TPB⁸ predicts that these findings result in a favourable perception of the idea, in this case T2DM. The positive attitude towards diabetes may be attributed to a changing world view on T2DM. Diabetics are often catered for in public restaurants, on long-haul flights, at public gatherings and social events to the extent that society is now generally accepting and knowledgeable about health implications of diets of people with T2DM.²¹ This social acceptance has improved T2DM sufferers' self-esteem, driving positive attitude.²¹

Although the world view of T2DM is changing, some components of society still look at T2DM sufferers as people who have failed to look after themselves, and who lack self-restraint.²² Some internally generated causes of negative attitude towards T2DM include the requirement to make drastic changes to diet²³ and anxiety about possible complications of T2DM.²⁴

Practices

All participants in the study showed a high degree of intention to carry out the T2DM-related practice. Most participants (95%) also exhibited high perceived behavioural control. These findings are consistent with the TPB, which postulates "practice" as the strength of a patient's intention to engage in specific health behaviour and the motivation to undertake a specific behaviour.⁸ Saal and Kagee²⁵ used the TPB to predict adherence to anti-retroviral therapy in South Africa, and arrived at similar conclusions: higher intentions translated into better adherence (actual behaviour). Other scholars measured "practice" of patients as the self-reported habits regarding self-management of T2DM, making it difficult to compare the findings of the current study to such studies. Although Al-Maskari *et al.*¹⁵ were able to elicit positive practices through self-reporting of patient habits, none of these positive practices were correlated with good glycaemic control as measured by HbA1c within normal limits.

Poor practices have negative consequences on self-management of T2DM, and on the general health system, as complications that cost more are likely to arise.²⁶

Recommendations

Several recommendations may be drawn from the current study. To begin with, the TPB is a useful instrument in exploring the knowledge, attitudes and practices of T2DM patients. If the tool is used in more patients than in the current study, a more inclusive and representative conclusion may be reached. Furthermore, the study identified the challenges in KAP of T2DM as the beliefs of the society in which people with T2DM live, and their own perceived control over specific behaviours that would, according to the TPB, strengthen their intention to commit themselves to specific diabetes-related behaviour. There is therefore a need to change the current efforts that tend to concentrate on educating the patient about T2DM to developing educational programmes aimed at changing the perceptions and beliefs of society regarding T2DM. This could be addressed by further research, but also a sensitivity of healthcare workers when communicating with these patients. Maseru service providers also need to adopt strategies to enhance self-efficacy, such as behavioural counselling and skill building to enable patients to manage T2DM effectively.²⁷

Limitations

The study had some limitations, which the researcher had to keep in mind. The planned proportional sampling of clinics was modified during the study, as some of the clinics included in the initial sampling frame had no T2DM patients. Due to other operational challenges, convenience sampling was used for both clinics and patients. However, the researcher posits that the sample of patients obtained was large enough to mitigate the bias that might have resulted from convenience sampling.

Conclusion

The study explored the knowledge, attitudes and practices (KAP) of T2DM patients in Maseru using the theory of planned behaviour (TPB). In the study population, behavioural, normative and control beliefs were found to be high, while normative beliefs and perceived behavioural control were low. With this understanding, healthcare providers in Maseru should focus their energy on changing the community's perception about T2DM, as well as T2DM patients' perceived behavioural control through diabetes health education. Further research should explore whether the high intention and perceived behavioural control to act out T2DM-related behaviours translate into better glycaemic control over the long term.

Acknowledgement

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Competing interests

I declare that I have no financial or personal relationship(s), which may have inappropriately influenced me in writing this article.

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CHAPTER 5

Recommendations, limitations and value of the study

5.1 INTRODUCTION

Chapter 4 comprised an academic article for the *South African Family Practice Journal* and it reported on the methods used in the study as well as the results as aligned to the theory of planned behaviour. Chapter 5 reports on the recommendations, limitations and the value of the study, which sought to address the diabetes-related KAP of adult patients with T2DM in Maseru.

5.2 RECOMMENDATIONS RELATED TO KNOWLEDGE, ATTITUDE, PRACTICE OF ADULT PATIENTS WITH DIABETES

The recommendations regarding KAP are presented in Tables 5.1 to 5.3. The corresponding link to the theory of planned behaviour will also be highlighted in the tables.

5.2.1 Recommendations related to knowledge

Recommendations related to knowledge are discussed in Table 5.1.

TABLE 5.1: Recommendations related to knowledge of adult patients diagnosed with diabetes, with knowledge component linked to theory of planned behaviour

RECOMMENDATION	LINK TO THEORY OF PLANNED BEHAVIOUR
Behavioural and normative beliefs	Creating the opportunity of providing written diabetes education material would strengthen the current healthy behavioural and normative beliefs, whereas the diabetes classes would create a platform for communication between the nurse and patient regarding aspects that could possibly have a negative influence on their behavioural and normative beliefs. An example of such a fruitful discussion would be the role of starch in the patient's wellbeing.
To strengthen behavioural and normative beliefs that would positively influence diabetes practice, it is recommended that diabetes health-related pamphlets be compiled by the doctors and professional nurses during scheduled District Health Management Team in meetings.	
Scheduled diabetes classes facilitated by nurses during the diabetes-specific days at the clinics to form part of routine follow-up visits.	
Subjective norms	Promotion of the diabetes-related behaviour linked to the expectations of the patients' significant other and the community through creating a social gathering between the patients, their relatives as well as the healthcare professionals.
Mobilisation of buddy or caregiver support groups in the community by the village health workers.	
Control beliefs	Factors that the patient perceives could either assist or hamper him/her in being in control over DM-related issues could be addressed in a social interaction between the patient and social worker or psychologist.
The professional nurses teach the patient some coping skills at every contact. The patient is referred to the social workers or psychologist by the professional nurses for assistance with aspects over which he/she may not have control.	

TABLE 5.2: Recommendation related to attitudes of adult patients diagnosed with diabetes, with attitude component linked to theory of planned behaviour

RECOMMENDATION	LINK TO THEORY OF PLANNED BEHAVIOUR
Diabetes support groups facilitated by the professional nurses during the diabetes specific days at the clinic before the patients are seen for their monthly check up.	Social interaction with others with the same diagnosis such as in a diabetes support group will improve the patient's attitudes towards DM-related issues while enhancing his/her subjective norms and perceived behavioural control.

TABLE 5.3: Recommendations related to practices of adult patients diagnosed with diabetes, with practices component linked to theory of planned behaviour

RECOMMENDATION	LINK TO THEORY OF PLANNED BEHAVIOUR
Intention The professional nurses from the clinics could mobilise patients who are managing their blood glucose levels well to act as role models and to be available to discuss practical obstacles experienced in living with diabetes.	Community outreach by individuals who live with T2DM and who have overcome the obstacles involved with the condition will strengthen the patients' intention to act out a certain DM-related behaviour.
Actual behavioural control Improve access to screening for complications in the community by arranging initially focused screening for diabetes in clinics assisted village health workers as a first round of screening, followed by further screening by professional nurses.	

5.3 LIMITATIONS OF THE STUDY

The study had some limitations which the researcher had to keep in mind. To begin with, the population size of adults with T2DM in Maseru was unknown. Given the estimated 31,000 people living with diabetes in Maseru, IDF (2015:71) it can be estimated that around 5,000 of them live in Maseru if these patients are proportionally distributed across the country. However, most T2DM patients remain undiagnosed in African settings (IDF, 2015:71). T2DM patients in Maseru are seen monthly at the clinics, and the 1,324 patients seen during the last half of 2014 are the estimated number currently diagnosed. The researcher managed to interview about 22% of these patients (translating to 6% of people living with diabetes in Maseru) and posit that the large sample size mitigated against the limitation of unknown population size.

Another limitation was that the planned proportional sampling of clinics was modified during the study, as some of the clinics included in the initial sampling frame had no T2DM patients. More patients were sampled from the clinics that had patients, and it was hoped that this might have mitigated the foregoing limitation.

Lastly, the distance to other selected clinics made it difficult for the researcher to visit such clinics, and ultimately, convenience sampling was used for both clinics and patients. However, the researcher posits that the sample of patients obtained was large enough to mitigate the bias that might have resulted from convenience sampling.

Although the adapted KAP questionnaire to be used has not been validated, the questionnaire was aligned to the theory of planned behaviour, strengthening the validity of data collected.

5.4 VALUE OF THE STUDY

The results of the study will be communicated with various stakeholders, such as the Lesotho Nursing Council, the DHMT as well as the patients living with T2DM. Data obtained from the assessment of the patients' KAP will give the professional nurses a better understanding of the profile of patients living with T2DM, who will then be able to provide appropriate care accordingly. The DHMT, being the administrative and clinical form of support to the PHC clinics will be able to benefit from findings and recommendations of the study in addressing the alarming increase in the incidence of DM and diabetes-related complications. The results from the study could further assist patients diagnosed with T2DM to become self-aware of possible misconceptions that may lead to the detriment of their own health. The study will also create a new platform for new research.

5.5 RESEARCHER'S REFLECTIONS ABOUT THE STUDY

This section relates to the researcher's experiences, memories and opinions regarding the study. Before the study, the researcher only had theoretical knowledge about health research. Each chapter was a phase in the researcher's growth in the field of nursing research.

Chapter 1 helped the researcher to think critically and come up with a researchable topic. A similar study was done in the Free State, which made it even harder because this study had to be unique. The initial months were most challenging as this was the first time the researcher had been exposed to academic writing. After attending a few contact sessions on academic writing and use of online library, it became manageable and this made chapter two much easier. Chapter two involved reviewing of literature surrounding the study which meant typing a lot of pages and this was useful as it improved the researcher's typing skills. Other skills that the researcher gained during the study are face to face interviewing done during data collection. Data collection was part of the methodology Chapter 3 and it was emotionally involving as the researcher put into action the research plan written in chapter one. The researcher also gained experience in managing a small portfolio with two field workers as well as communicating with professionals working at the primary health care clinics. After data collection, the researcher was required to enter data from the questionnaires onto an excel spreadsheet and this further challenged her computer literacy and this was chapter four. Working together with the biostatistician also helped to conquer my fears of the computer and with much practice the computer skills improved. Although the results were not ideal, they showed a similar pattern to those from studies done in similar settings which meant that the surely the researcher did the study correctly. On a personal level, the researcher learned how to strike a balance between school, work and family. Overall, the researcher enjoyed the bumpy road of doing a Master's degree and would like to be a mentor to upcoming nursing researchers.

5.6 CONCLUSION

Chapter 5 provided a discussion of the recommendations, limitations and the value of the study, which answered the question "What are the diabetes-related knowledge, attitudes and practices of adult patients with T2DM in Maseru?". Chapter 5 also included the researcher's personal journey from the beginning to the end of the study.

*Knowledge is important,
attitude is essential
but performance is what counts*

[illegible]

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ADDENDUM A1

Consent form (English)

CONSENT TO PARTICIPATE IN RESEARCH

I have been asked to participate in a research study titled: Diabetes related knowledge, attitude and practices of adults with type 2 diabetes in Maseru, Lesotho.

I have been informed about the study by

My participation in this research is voluntary, and I will not be penalised or lose benefits if I refuse to participate or decide to terminate participation. If I agree to participate, I will be given the participant information sheet, which is a written summary of the research. I understand that I will not receive remuneration for participation in this study and it will not cost me anything.

The research study, including the above information has been verbally described to me. I understand what my involvement in the study means and I voluntarily agree to participate. I have received the Information sheet and understand the content.

Signature of participant

Date

Signature of witness

Date

ADDENDUM A2

Consent form (SeSotho)

TUMELLO EA HO NKA KAROLO LIPHUPUTSONG

Ke kopuoe ho nka karolo liphuputsong ka sehloho sena: TSEBO, BOITŠOARO, LITLOAELO KA LEFU LA TSOEKERE HO BATHO BA BAHOLO FOREISETATA AFORIKA BOROA.

Ke tsebisitsoe ka boithuto ke.....

Ho nka karolo hoaka liphuputsong tsena ke boithaopo, hap eke tla fumana kotlo kebe ke amohuoe melemo ha ke hana ho nka karolo ka hake khetha ho khaotsa ho nka karolo. Haeba ke lumela ho nka karolo, ke tla fua pampiri ea tlhahiso leseling ea banka karolo, eleng kakaretso ea ea liphuputso. Kea utloisisa hore hakena pataloa ho nka karolo boithutong bona le hore ha kena patala letho.

Boithuto ba liphuputso ho kenyeletsa le tlhahiso leseling eka holimo li hlakikisitsoe ka puisano ho 'na. Ke utloisisa seo ho kena hoa ka boithutong bona ho se bolelang hapeke lumela ka boithaopo ho nka karolo. Ke fumane pampiri ea tlhahiso leseling ebile ke utloisisa tse ngotsoeng.

Tekenop ea motho ea nkang karolo

Letsatsi

Tekenop ea paki

Letsatsi

ADDENDUM B1

Information leaflet (English)

TITLE OF RESEARCH: DIABETES RELATED KNOWLEDGE, ATTITUDE AND PRACTICES OF ADULTS WITH TYPE 2 DIABETES IN MASERU, LESOTHO

Good day

I, Faith Chiwungwe, am doing research on the knowledge, attitude and practices of diabetic patients. Research is just the process to learn the answer to a question. In this study, we want to learn about diabetic practices in Maseru to inform decision makers on what the current situation is and to develop better care for patients.

Invitation to participate: We are asking/inviting you to participate in a research study.

What is involved in the study – You will be asked questions by the researcher regarding yourself, what you know, how you feel about and what you do about diabetes. The interview will last about 30 minutes.

There are No Risks involved in participating in the study.

Benefits of being in the study are that your voice will be heard. Your opinions will be put together with others and this information may lead to better future care for patients with diabetes.

The participant will be given pertinent information on the study while involved in the project and after the results are available.

Participation is by choice, and refusal to participate will involve no punishment or loss of benefits to which the participant is otherwise entitled; the participant may discontinue participation at any time without penalty or loss of benefits to which the participant is otherwise entitled. No costs will be payable by you as participant and you will also not be paid for your participation in the research.

Confidentiality: Efforts will be made to keep personal information confidential. Results of the group may be presented at conferences and in publications.

Absolute confidentiality cannot be guaranteed. Personal information may be disclosed if required by law.

Contact details of researcher – for further information

Faith Chiwungwe Tel: 0723431723

Contact details of Research Ethics Committee Secretariat and Chair – for reporting of complaints/problems.

(051) 4017794/5 OR write to PO Box 339, Bloemfontein 9300, South Africa.

ADDENDUM B2

Information leaflet (SeSotho)

TOKOMANE EA TLHAHISO LESELING: BAKULI BA LEFU LA TSOEKERE

Sehloho sa liphuputso: TSEBO, BOITŠOARO, LIKETRSAHALO KA LEFU LA TSOEKERE HO BATHO BA BAHOLO FOREISETATA AFORIKA BOROA.

Lumelang

‘Na, Faith Chiwungwe, ke etsa liphuputsoka tsebo, boitšoro le litloaelo tsa bakuli ba lefu la tsoekere. Liphuputso empa ele methati ea ho ea ho ithuta ho araba potso. Boithutong bona re batla ho ithuta ka liketsahalo tsa lefu la tsoekere ka hara Foreisetata ho tsebisa batho ba etsang liqeto ka se etsahalang le ho qala litšebeletso tse ntlafetseng bakeng sa bakuli.

Memo bakeng sa ho nka karolo:Re u kopa/ mema ho nka karolo boithutong ba liphuputso

Se kenyelelitsoeng ka hara boithuto- u tla botsoa lipotso ke mofuputsi ka uena, seo use tsebang, kamoo u ikutloang le seo use etsang ka lefu la tsoekere. Lipotso li tla nka metsotso e mashome a mararo (30)

Haho likotsi tse kenyelelitsoeng ka hara boithuto

Melemo ea hoba boithutong bona ke hore lentsoe la hau le tla utluoa. Maikutlo ahau a tla beoa ‘moho le amang ebe tlhahiso leseling ena etla lebisa ntlafatsong ea litšebeletso ka moso bakeng sa bakuli ba tsoekere.

Thuto ena ho tla nahanoa leho buisana ka eona ka hara boithuto leho kenyeletsoa ka hara tšebetso ka mor’a ho fumanoa ha sephetho.

Ho nka karolo ke boithaopo, ho hana ho nka karolo ha hona kenyeletsa kotlo kapa ho lahlehelo ke melemo eo thuto e e kenyeletsang; thuto eka khaotsa ho nka karolo nako e ‘ngoe le e ‘ngoe ka ntle ho kotlo kapa ho lahlehelo ke melemo eo thuto e ekabeng

e e kenyelelitse. Ha hona litjeo tse tla patloa ho uena ha u nka karolo hape ukeke ua patalloa ho nka karolo liphuputsong.

Lekunutu: matsapa a tla etsoa ho boloka tlhahiso leseling ea motho ele lekunutu. Liphetho li tla phatlalatsoa libokeng leka liphatlalatso.

Ha ho tiisetso ea lekunutu e netefatsoang. Tlhahiso leseling ea motho eka phatlalatsoa haho hlokahala ke lekhottla la molao.

Lintlha ka botlalo ka mofuputsi – bakeng sa tlhahiso leseling

Faith Chiwungwe mohala:00266 63494582

Lintlha ka botlalo tsa Molula-setulo le Mongoli oa komiti ea Liphuputso le Boitšoarō – ho tlaleha litle-tlebo/mathata.

(051) 4012812. Lebokose la poso 339 Bloemfontein 9300 South Africa Mohala +27(0) 51 401 9111

ADDENDUM C1

Letter to Ethics Committee

BOX 12256
Maseru 100
Lesotho

07 April 2015

The Chairperson of Ethics Committee
University of Free State
Free State

Dear Sir/Madam

**Re: DIABETES RELATED KNOWLEDGE, ATTITUDE(S) AND PRACTICES (KAP) OF
ADULT PATIENTS WITH TYPE 2 DIABETES MELLITUS IN MASERU, LESOTHO.**

This letter serves as an application for the study protocol to be reviewed. The aim of the study is to describe KAP of adult patients with Type 2 Diabetes Mellitus in Maseru, Lesotho at primary healthcare clinics. The objectives are: Compile a profile of demographic and associated factors of and determine diabetes related knowledge, attitudes and practices (KAP) of adult patients with T2DM in Maseru.

The study findings will be submitted to the University of Free State, Faculty of Health Sciences for my Masters of Social Science requirement and to the Ministry of Health, Lesotho to inform the policy, strategic and annual plans.

Herein please find the attached copy of the study protocol.

Yours sincerely

Faith Chiwungwe

ADDENDUM C2

Letters to all institutions

BOX 12256
Maseru 100
Lesotho

07 April 2015

Name of clinic
The clinic manager

Re: REQUEST TO CONDUCT STUDY AT YOUR CLINIC

The aim of the study is to describe Knowledge, attitudes and practices of adult patients with Type 2 Diabetes Mellitus in Maseru, Lesotho at primary health care clinics. The objectives are: Compile a profile of demographic and associated factors of and determine diabetes related knowledge, attitudes and practices (KAP) of adult patients with T2DM in Maseru.

The study findings will be submitted to the University of Free State, Faculty of Health Sciences as a requirement for my Masters of Social Science (Nursing), the Ministry of Health, Lesotho and your institution to inform the policy, strategic and annual plans.

Herein please find the attached copy of the study protocol.

Yours sincerely

Faith Chiwungwe

ADDENDUM D1

KAP questionnaire (English)

ADULT DIABETIC PATIENT QUESTIONNAIRE 18 years and older

Only interview patients:

**Consent document signed
Older than 18 years
Type II Diabetes**

For office use

Instructions – Circle the appropriate number or write your answer in the space provided.

- 1.1 **Name of facility**
- 1.2 **Date questionnaire is completed** / /(dd/mm/yy)

1-3	Interview number
4-5	
6-11	
D	D
M	M
Y	Y

PART I: RESPONDENT PROFILE

DEMOGRAPHIC INFORMATION

In the following section I will be asking you some general information

- 2.1 **Note respondent's gender**

1	Male
2	Female

12

- 2.2 **How old are you in years?**

13-14

- 2.3 **What is your home language?**

1	English
2	Sotho
3	Other (Specify)

15-16

- 2.4 **What is your highest level of education?**

1	No schooling
2	Some primary school
3	Completed primary school
4	Some secondary school
5	Completed secondary school
6	Diploma/Degree
7	Other (Specify)

17

18-19

BIOGRAPHICAL INFORMATION

In the following section I will be asking you GENERAL state of health

- 2.5 **Do you consider yourself CURRENTLY ill?**

1	No
2	Yes
3	Unsure

20

- 2.6 **If yes, what is wrong with you?**

.....

.....

.....

.....

.....

21
22
23
24
25

- 2.7 **HOW LONG AGO were you diagnosed with diabetes?**

..... Years

18-19

- 2.8 **How did it happen that you were diagnosed?**

.....

.....

.....

.....

.....

28-29
30-31
32-33
34-35
36-37

- 2.9 **Indicate which medication/herbs you currently use?**

.....

.....

.....

38-39
40-41
42-43

.....

.....

.....

		44-45
		46-47
		48-49

In the following section you will be asked about your general state of health. Please indicate which statement best describes your own state of health today.

For office use

2.10 Do you have any problems walking about?

1	Yes
2	No

	50
--	----

2.11 Do you have problems with self-care such as dressing and washing?

1	Yes
2	No

	51
--	----

2.12 Do you have problems with usual activities such as work, study, housework, family or leisure activities?

1	Yes
2	No

	52
--	----

2.13 Do you have serious worries?

1	Yes
2	No
3	Unsure

	53
--	----

2.14 Do you feel depressed?

1	Yes
2	No
3	Unsure

	54
--	----

May I now enter and measure you?

Measure and weight the participant

2.15 Weight (kg)

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--	--

Height (cm)

--	--	--	--

 .

--	--

BMI:

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					kg	55-59
					cm	60-64
						65-66

2.16 Waist circumference: (cm)

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 .

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					cm	67-71
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PART II: KNOWLEDGE REGARDING DIABETES

During the following questions, I will be asking you how you understand diabetes. There is no right or wrong answer, only knowledge and understanding of diabetes.

Behavioural beliefs

3.1 Indicate if the following statements are true, false or if you are unsure.

	1	2	3
1	T	F	U
2	T	F	U
3	T	F	U
4	T	F	U

	72
	73
	74
	75

Normative beliefs

The following questions are about what you believe other people believe about diabetes:

3.2 Say if the statement is true, false or you are not sure.

	1	2	3
1	T	F	U
2	T	F	U
3	T	F	U

The richer people become, the more likely it is for them to develop diabetes

The more overweight a person becomes, the more likely it would be for them to develop diabetes

A person develops diabetes by inheriting diabetes from his/her parents

	76
	77
	78

3.3 Persons living with diabetes

	1	2	3
1	T	F	U
2	T	F	U

.....who are overweight can be healthier if they lose weight

.....will most often also have high blood pressure

	79
	80

3.4 Say if the statement is true, false or you are not sure.

	1	2	3
1	T	F	U

Using herbs makes a person living with diabetes healthier than if they should use medication"

	1
--	---

- 2

T	F	U
---	---	---

 Using any type of medication can cure a person from diabetes
- 3

T	F	U
---	---	---

 Diabetic medication may cause swelling of the feet

- | |
|--|
| |
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 2
- | |
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 3

Subjective norms

The following questions are about what **your family's** believes about diabetes:

Say if the following statements are true, false or if you are unsure.

3.5 In our family we believe that

- | | 1 | 2 | 3 | |
|---|---|---|---|---|
| 1 | T | F | U | only rich people will develop diabetes. |
| 2 | T | F | U | it is better to advise persons living with diabetes to use herbs and not medication. |
| 3 | T | F | U | the more overweight a person becomes, the more likely it would be for them to develop diabetes. |
| 4 | T | F | U | a person develops diabetes by inheriting diabetes from his/her parents. |
| 5 | T | F | U | diabetic medication may cause swelling of the feet. |

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 7
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| |
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 8

3.6 Persons living with diabetes

- | | 1 | 2 | 3 | |
|---|---|---|---|--|
| 1 | T | F | U | who are overweight can be healthier if they lose weight. |
| 2 | T | F | U | will often have high blood pressure also. |
| 3 | T | F | U | using herbs makes that person healthier than if they use *western medication |
| 4 | T | F | U | using any type of medication can be cured from diabetes. |
| 5 | T | F | U | using diabetic medication may cause swelling of the feet. |

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 10
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 11
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 12
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 13

Control beliefs

3.7 What health complications are usually associated with diabetes?

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.....

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 14
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 17
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 18

3.8 Which health complications usually associated with diabetes can a person prevent/control?

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 22
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 23
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 24

3.9 Which health complications usually associated with diabetes can a person *not* prevent/control?

.....

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.....

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 25
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 26
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 28
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 29
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 30

Perceived behaviour control

Indicate if the following statements are true, false or if you are not sure:

- | | 1 | 2 | 3 | |
|---|---|---|---|---|
| 1 | T | F | U | use herbs |
| 2 | T | F | U | eat cold pap |
| 3 | T | F | U | eat pap made from sorghum |
| 4 | T | F | U | eat salty foods |
| 5 | T | F | U | do movements that make them sweat |

- | |
|--|
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 31
- | |
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 32
- | |
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 33
- | |
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 34
- | |
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| |
|--|

 35

PART III: ATTITUDES

Attitude towards behaviour

4. Tell me if you think the sentences I am saying are true, false or if you are unsure:

For office use

	1	2	3	
1	T	F	U	I dislike being referred to as "A Diabetic" just, because I'm getting older
2	T	F	U	All overweight people are diabetes
3	T	F	U	I often feel guilty when I eat <i>pap</i>
4	T	F	U	Living with diabetes makes it impossible to also exercise
5	T	F	U	A person diagnosed with diabetes should be assisted immediately at a clinic
6	T	F	U	If I did not have diabetes I think I would be quite a different person
7	T	F	U	Diabetes is the worst thing that has ever happened to me
8	T	F	U	Most people would find it difficult to adjust to having diabetes
9	T	F	U	I often feel embarrassed about having diabetes
10	T	F	U	There is not much I seem to be able to do to control my diabetes
11	T	F	U	There is little hope of leading a normal life with diabetes
12	T	F	U	The proper control of diabetes involves a lot of sacrifice and inconvenience
13	T	F	U	I avoid telling people I have diabetes
14	T	F	U	Being told you have diabetes is like being sentenced to a lifetime of illness
15	T	F	U	My diabetic diet does not really spoil my social life
16	T	F	U	Having diabetes over a long period changes the personality
17	T	F	U	I often find it difficult to decide whether I feel sick or well
18	T	F	U	Diabetes can be controlled
19	T	F	U	There is really nothing you can do if you have diabetes
20	T	F	U	There is really no-one I feel I can talk to openly about my diabetes
21	T	F	U	I believe I have adjusted well to having diabetes
22	T	F	U	I often think it is unfair that I should have diabetes when other people are so healthy

☐	36
☐	37
☐	38
☐	39
☐	40
☐	41
☐	42
☐	43
☐	44
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☐	46
☐	47
☐	48
☐	49
☐	50
☐	51
☐	52
☐	53
☐	54
☐	55
☐	56
☐	57

PART IV: PRACTISES

Intension

5.1 Tell me if you think the sentences I am saying are true, false or if you are unsure:

	1	2	3	
1	T	F	U	Lose weight if I become overweight
2	T	F	U	Rather eat organ meat instead of sweets
3	T	F	U	Do activities that make me sweat as exercise
4	T	F	U	Find out how I can still adjust my lifestyle to living with diabetes
5	T	F	U	Check my blood pressure monthly
6	T	F	U	Use my medication as prescribed
7	T	F	U	Check my feet for injuries regularly
8	T	F	U	Have my eyes tested regularly

☐	58
☐	59
☐	60
☐	61
☐	62
☐	63
☐	64
☐	65

Actual behaviour

I have the practical means to:

5.2 Tell me if you think the sentences I am saying are true, false or if you are unsure:

	1	2	3	
1	T	F	U	Lose weight if I become overweight
2	T	F	U	Rather eat organ meat instead of sweets
3	T	F	U	Do activities that make me sweat as exercise
4	T	F	U	Find out how I can still adjust my lifestyle to living with diabetes
5	T	F	U	Check my blood pressure monthly
6	T	F	U	Use my medication as prescribed
7	T	F	U	Check my feet for injuries regularly
8	T	F	U	Have my eyes tested regularly

☐	66
☐	67
☐	68
☐	69
☐	70
☐	71
☐	72
☐	73

Behaviour

5.3 I have:

	1	2	3	
1	T	F	U	Lose weight if I become overweight
2	T	F	U	Rather eat organ meat instead of sweets
3	T	F	U	Do activities that make me sweat as exercise
4	T	F	U	Find out how I can still adjust my lifestyle to living with diabetes
5	T	F	U	Check my blood pressure monthly
6	T	F	U	Use my medication as prescribed
7	T	F	U	Check my feet for injuries regularly
8	T	F	U	Have my eyes tested regularly

☐	74
☐	75
☐	76
☐	77
☐	78
☐	79
☐	80
☐	1

ADDENDUM D2

KAP Questionnaire (SeSotho)

**LIPOTSO TSA BAKULI BA LEFU LA TSOEKERE
BA LILEMO LI 18 HO EA HOLIMO**

O botse feela bakuli ba:

**Ba faneng ka tumello
Lilemo tse 18 ho ea holimo
Ba noang lipilsi tsa lefu la tsoekere**

Bakeng sa tshebeliso ea kantoro

Litaelo – Etsa selikalikoe nomorong e nepahetseng kappa ngola karabo ea hau sebakeng sefanoeng

1.1 **Lebitso la sebaka**

1.2 **Letsatsi leo lipotso litlasitsoeng ka lona** / / **(letsatsi/khoeli/selemo)**

1-3 Nomoro ea lipuisane

4-5

6-11

D D M M Y Y

LIPALOPALO TSA SECHABA

Leqepheng lena ketlo botsa lipotso tse akaretsang

2.1 **Tlokomela boleng ba motho**

- ☐ 1 Motana
- ☐ 2 Motsehalali

2.2 **Ona le lilemo tse kae?**

2.3 **O bua leleme le feng?**

- ☐ 1 Sekhooa
- ☐ 2 SeSotho
- ☐ 3 Tse ling (Tlalosa)

2.4 **Maemo a hau a thuto ke a feng?**

- ☐ 1 Ha oa ea kena sekolo ho hang
- ☐ 2 Ha oa qeta sekolo sa primary
- ☐ 3 O qetile sekolo sa primary
- ☐ 4 Ha oa qeta sekolo se phahameng
- ☐ 5 O qetile sekolo se phahameng
- ☐ 6 Diploma/Dikgarate
- ☐ 7 Seseng (Specify)

12

13-14

15-16

17

18-19

BOLENG BA BOPHELO

In the following section I will be asking you GENERAL state of health

2.5 **Na u linka u kula?**

- ☐ 1 Che
- ☐ 2 Ee
- ☐ 3 Ha ke tsebe hantle

2.6 **Haeba karabo ke ee, bothatha keng?**

.....
.....
.....
.....
.....

21
 22
 23
 24
 25

2.7 **Ke nako e kae u tsebile hore u na le lefu la tsoekere?**

..... Lilemo

18-19

2.8 **Ho etsahetse joang ha u tla tseba hore u na le lefu lee?**

.....
.....
.....
.....
.....

28-29
 30-31
 32-33
 34-35
 36-37

2.9 **Bont'sa lithare tseo u li sebelisang haa joale?**

.....
.....
.....
.....

38-39
 40-41
 42-43
 44-45

Mona u tlo botsoa ka maemo a hau a bobhelo. Araba hore na kajeno maemo a hau a bophelo a joang

2.10 U na le mathata a ho tsamaea?

1	Ee
2	Che

	50
--	----

2.11 Na una le bothata ba ho ithokomela joalo ka ho tena leho hlapa?

1	Ee
2	Che

	51
--	----

2.12 U na le bothata ba ho etsa lintho tse u neng u ntse u khona ho li etsa joalo ka mosebetsi, ho ithuta, mosebetsi oa lelapa, lelapa kappa boikhathollo?

1	Ee
2	Che

	52
--	----

2.13 U na le metouto?

1	Ee
2	Che
3	Ha ke tsebe hantle

	53
--	----

2.14 Na u ikutloa u sithabetse maikutlo?

1	Ee
2	Che
3	Ha ke tsebe hantle

	54
--	----

Kekopaho u nka boima le botelele?

Metha boima ba moarabeli

2.15	Boima (kg)				.		
	Height (cm)				.		
	BMI:						

				.			kg	55-59
							cm	60-64
								65-66

2.16	Leteka: (cm)				.		
------	--------------	----------------------	----------------------	----------------------	---	----------------------	----------------------

						cm	67-71
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Mona ketlo botsoa lipotso mabapi le kutloisiso ea hau ea lefu la tsoekere. Ha ho karabo e fosahetseng kappa e nepahetseng, tsebo ea hau le karabo.

Litumelo tsa hau

3.1 Bont'sa na lintlha tse latelang li nepahetse, fosahetse kappa ha u tsebe handle

	1	2	3	
1	T	F	U	Ho hola ho beha motho kotsing ea hoba le lefu la tsoekere
2	T	F	U	Batho bohle ba nonneng ba kotsing ea hoba le lefu la tsoekere ho feta bas a nonang
3	T	F	U	Bakuli ba lefu la tsoekere ba qobe ho ja limatlafatsi ntle le papa hore ba phele hantle
4	T	F	U	Ho phomola haholo ho nepahetse bakeng sa mokuli oa tsoekere

	72
	73
	74
	75

Litumelo tsa sesto sa hau

Lipotso tse latelang li botsoa ka tumelo ea hauho na le seo batho ba se lumelang ka lefu la tsoekere:

3.2 Bolela na polelo ke nete, ho fosahetse kappa hau tsebe hantle

	1	2	3	
1	T	F	U	Batho ba barui ba monyetleng o mongata oa hoba le lefu lena
2	T	F	U	Ha motho a ntse a nona o ba monyetleng oa hoba le lefu la tsoekere
3	T	F	U	Motho o ba le feu la tsoeker ha a le futsa ho batsoali ba hae

	76
	77
	78

3.3 Batho ba phelang le lefu la tsoekere

	1	2	3	
1	T	F	U	 Batho ba batenya ba ka phela hantle ha ba ka theola 'mele
2	T	F	U	 Hangata ba ba le phallo e phahameng ea mali

	79
	80

3.4 Na ntlha ee ke 'nete, ifosahetse kappa hau tsebe hantle

	1	2	3	
1	T	F	U	Ho sebelisa lithare tsa setso ho etsa hore mokuli a phele hantle ho feta ho sebelisa lithare tsa sekhoaa
2	T	F	U	Ho sebelisa meriana efe le efe ho ka folisa lefu la tsoekere
3	T	F	U	Ho sebelisa lithare tsa tsoekere ho ka baka ho ruhua ha maoto

	1
	2
	3

Litumelo tsa lelapa la hau

Lipotso tse latelang li bota ka litumelo tsa lelapa la hau ka lefu la tsoekere:

Bont'sa na lintlha tse latelang li nepahetse, fosahetse kappa hau tsebe hantle

3.5 Lelapeng la rona re lumela hore

	1	2	3	
1	T	F	U	 Barui feela ba ka ba le lefu la tsoekere
2	T	F	U	 Ho nepahetse ho bapatsa hore batho ba nang le lefu la tsoekere ba noe lithare tsa setso
3	T	F	U	 H a motho a ntse a nona o eketsa menyetla ea hoba le lefu la tsoekere
4	T	F	U	 Motho o ba le lefu la tsoekere ka hole futsa batsoaling
5	T	F	U	 Lithare tsa lefu la tsoekere li ka etsa maoto a ruruhileng

3.6 Batho ba phelang le lefu la tsoekere

	1	2	3	
1	T	F	U	 Batho ba nonneng ba ka phela hantle ha ba ka theola 'mele
2	T	F	U	 Hangata ba ba le phallo e phahameng ea mali
3	T	F	U	 Ho sebelisa meriana ea setso ho etsa bophelo bo bottle ho sebelisa lithare tsa sekhoaa
4	T	F	U	 Ho sebelisa moriana ofe kappa ofe ho ka folisa lefu la tsoekere
5	T	F	U	 Ho sebelisa lithare tsa lefu la tsoekere ho ka etsa maoto a ruruhileng

Bakeng sa tshebeliso ea kantoro

☐	4
☐	5
☐	6
☐	7
☐	8

☐	9
☐	10
☐	11
☐	12
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Litumelo tsa ho laola lefu lena

3.7 Ke litlamorao life tsa bophelo tse tlang ha mokuli a na le lefu la tsoekere?

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3.8 Ke litlamorao life tse amanang le lefu la tsoekere tseo re kekeng ra li thibela kappa ho li laola?

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3.9 Bont'sa hore na lintlha tse latelang ke 'nete, li fosahetse kappa hau tsebe hantle

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Perceived behaviour control

Bont'sa hore na lintlha tse latelang ke 'nete, li fosahetse kappa hau tsebe hantle.

3.10 Haeba motho ea phelang le lefu la tsoekere a battle ho laola tsoekere hantle o tsoanetse ho....:

	1	2	3	
1	T	F	U	 sebelisa meriana ea setso
2	T	F	U	 ja papa e batang
3	T	F	U	 ja papa ea mabele
4	T	F	U	 ja lijo tse letsoai
5	T	F	U	 Sebetisa hore a fufuleloe

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Maltshoaro ho latela tumelo

4. Bolela na lipolelo tse latelang ke 'nete, fosahetse kappa ha u tsebe hantle.

Bakeng sa tshebeliso ea kantoro

	1	2	3	
1	T	F	U	Ha ke battle ho bitsoa mokuli oa tsoekere hobane kea tsotfala
2	T	F	U	Batho bohle ba nonneng ban a le lefu la tsoekere
3	T	F	U	Kea ngongoretha hangata ha ke ja papa
4	T	F	U	Ho phela le lefu lena ho etsa hore ke sitoe ho ikoetlisa
5	T	F	U	Motho ea phelang lefu la tsoekere o tsoanetse ho thusoa hang hang setsing sa bophelo
6	T	F	U	Haeba ke ne ke sena lefu la tsoekere nkaba kele motho fapeneng
7	T	F	U	Lefu lena ke ntho e mpe kahofetisisa e keleng ea mthihahela
8	T	F	U	Batho ba bangata ba ba le bothatha ba ho phela le lefu lena
9	T	F	U	Hangata kea soaba ho bane ke phela le lefu la tsoekere
10	T	F	U	Ha ke khone ho laola tsoekere eaka hangata
11	T	F	U	Ha hona tsepo e ngata ea ho phela bophelo bo tloahelehile lefu la tsoekere
12	T	F	U	Ho laoleha ho nepahetseng hoa lefu la tsoekere ho batla lithofatso le ho hloka boikettlo
13	T	F	U	Ke qoba ho joetsa batho hore ken a le lefu la tsoekere
14	T	F	U	Ho bolelloa hore u nale lefu la tsoekere ho tsoana le ho hlaheloa bokoling bophelo bohle
15	T	F	U	Lijo tsa ka tse laolang tsoekere ha li senye bophelo baka ha kena le batho babang
16	T	F	U	Ho ba le lefu la tsoekere nako etelele ho fetola boleng ba ka
17	T	F	U	Hangata ke thatafalloa hore na kea kula kappa ke folile
19	T	F	U	Ha ho letho leo u ka le etsang ha u na le lefu lena
20	T	F	U	Ha ho metho eo ke utloang hore nka bua le eena ka lefu lena
21	T	F	U	Ke tsepa hore ke ikamohetse hore ken a le lefu la tsoekere
22	T	F	U	Hangata ke utloa ho sena toka hore ebe ken a le lefu la tsoekere batho ba bang hamonate
23	T	F	U	I often think it is unfair that I should have diabetes when other people are so healthy

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Maikemisetso

5.1 Bont'sa na lipolelo tsena ke 'nete, li fosahetse kappa ha u tsebe hantle.

	1	2	3	
1	T	F	U	Theola 'mele haeba nka nona
2	T	F	U	Ho ja nama bakeng sa li pong-pong
3	T	F	U	Ho ikoetlisa ka mokhoa oo ke tla fufuleloa
4	T	F	U	Fumana ho lokisa mokhoa oa ka oa ho phela le lefu la tsoekere
5	T	F	U	Hlahoba phallo eaka ea mali khoeli le khoeli
6	T	F	U	Ho sebelisa lithlare tsa ka joalo kaha ke
7	T	F	U	Hlahloba maoto khafetsa bakeng sa maqeb
8	T	F	U	Hlahloba mahlo a ka khfetsa

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Laolo ea maitshoara hona joale

5.2 Ke na le mekhoea ea ho:

	1	2	3	
1	T	F	U	Theola 'mele haeba nka nona
2	T	F	U	Ho ja nama bakeng sa li pong-pong
3	T	F	U	Ho ikoetlisa ka mokhoa oo ke tla fufuleloa
4	T	F	U	Fumana ho lokisa mokhoa oa ka oa ho phela le lefu la tsoekere
5	T	F	U	Hlahoba phallo eaka ea mali khoeli le khoeli
6	T	F	U	Ho sebelisa lithlare tsa ka joalo kaha ke
7	T	F	U	Hlahloba maoto khafetsa bakeng sa maqeb
8	T	F	U	Hlahloba mahlo a ka khfetsa

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Maitshoaro pele

5.3 Pele ke khone ho:

	1	2	3	
1	T	F	U	Theola 'mele haeba nka nona
2	T	F	U	Ho ja nama bakeng sa li pong-pong
3	T	F	U	Ho ikoetlisa ka mokhoa oo ke tla fufuleloa
4	T	F	U	Fumana ho lokisa mokhoa oa ka oa ho phela le lefu la tsoekere
5	T	F	U	Hlahoba phallo eaka ea mali khoeli le khoeli
6	T	F	U	Ho sebelisa lithlare tsa ka joalo kaha ke
7	T	F	U	Hlahloba maoto khafetsa bakeng sa maqeb
8	T	F	U	Hlahloba mahlo a ka khfetsa

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ADDENDUM E

Guideline to completion of questionnaire

ADULT DIABETIC PATIENT GUIDELINE

1. Before the interview starts, explain to the patient that the information he or she will be giving will assist in improving the management of patients with Type 2 Diabetes Mellitus and that the questionnaire will take about 30-40 minutes to complete.
2. Make sure the patient has signed the Informed Consent form and has received the Information document before you start the interview.
3. Make sure that all questions are answered.
4. If any problem arises that you are not sure how to handle, please contact Faith Chiwungwe at 00266 63494582 immediately.

Question-by- question guide:

Instructions: Below in boldface type are the questions found in the Adult Diabetic Patient Questionnaire.

These instructions are not to be read to the patient. Before interviewing be sure to be thoroughly familiar with this question-by-question guide, so that you understand what each question is asking.

Ensure that the questionnaire has an interview number.

- 1.1 Write the name of the PHC clinic
- 1.2 Write the date questionnaire is completed

PART I: DEMOGRAPHIC INFORMATION

- 2.1 Note patients gender: Make a tick in the block indicating MALE or FEMALE.
- 2.2 *How old are you in years?* Ask the patient what is his or her current age in years.
- 2.3 *What is your home language?* Ask the patient which language they are speaking mostly at home. If they speak more than one language, tick both.

- 2.4 *What is your highest level of education?* Ask the patient which grade did he or she completed at school. If he or she has completed high school, ask whether he or she has any diplomas or degrees. Make a tick in the appropriate block.

QUALITY OF LIFE

- 2.5 *Do you consider yourself currently ill?* We would like to know if the patient has any health problems that make him or her feel ill. If there is any problem that the patient mentions, tick YES. Only tick Yes or No. If YES proceed to 2.6, if NO continue to 2.7.
- 2.6 *What is wrong with you?* Here we would like to know what the patient think is wrong with him or her. Probe for more information from the patient about his or her illness and write everything the patient says.
- 2.7 *Do you have any problems walking about?* We would like to know if the patient can walk around without any problems, if he or she has some problems the answer is YES.
- 2.8 *Do you have problems with self-care such as dressing and washing?* Here we would like to know if the patient has any problems with dressing or washing himself or herself. If somebody needs to assist the patient, tick YES, if the patient does not need any support at all, tick NO.
- 2.9 *Do you have problems with usual activities such as work, study, housework, family or leisure activities?* We would like to know if the patient is still capable of doing these daily activities without any help from somebody else. If the patients cannot do these usual daily activities without any help, tick YES.
- 2.10 *Do you have stress or anxiety?* Determine here if the patient has any stress or if he or she feels anxious. If the answer is positive to stress or anxiety, tick YES.
- 2.11 *Do you feel depressed?* Determine whether the patient is depressed or is the patient just stressed. Tick YES if patient indicates that he or she is depressed.

HISTORY OF DIABETES DIAGNOSIS

- 2.12 *How long ago were you diagnosed with diabetes?* Here we would like to know how long the patient has been diabetic. If the patient has been diagnosed long

ago, write the number of years in the space provided. If the patient is not sure, try and probe from the patient how long ago he or she was diagnosed. If the patient was diagnosed only a few months ago, write less than one year in the space.

- 2.13 *How did it happen that you were diagnosed?* Ask the patient to tell you about the day when he or she was diagnosed with diabetes. Ask what circumstances led to the diagnosis.
- 2.14 *Indicate which medication/therapy you are currently using.* Ask the patient to give you the names of all the chronic medication he or she is currently using. This also includes medication not applicable for diabetes management e.g. high blood pressure, high cholesterol etc.

PART II: KNOWLEDGE REGARDING DIABETES

- 3.1 *Indicate whether the following statements are true, false or if you are unsure.* The patient must indicate for each statement if he or she thinks this statement is true or false. If the patient is not sure about the answer, tick unsure. Ask one question at a time and allow the patient to make up his or her mind before proceeding to the next question. Also, ask the patient to stop at any point in the interview if he/she does not understand any question.

BEHAVIOURAL BELIEFS

- 1 Aging poses a great risk to develop diabetes. Here we would like to know what the patient's understanding of the relationship between aging and diabetes onset is.
- 2 All overweight persons are at greater risk to develop diabetes than persons who are not overweight. Here we would like to know the patient's understanding of the relationship between being overweight and developing diabetes.
- 3 Diabetics should avoid eating any other starch except pap, for their wellbeing. Here we would like to know the patient's understanding of starch as a food group.

- 4 Resting a lot is good for a person with diabetes. Here we would like know the patients understanding of the importance of rest in diabetes management.

NORMATIVE BELIEFS

3.2 *The following questions are about what you believe other people believe about diabetes. Say if the statement is true, false or you are not sure.*

1. The richer people become, the more likely it is for them to develop diabetes. Here we would like to know whether the patient believes that a high social status poses a risk of developing diabetes.
2. The more overweight a person becomes, the more likely it would be for them to develop diabetes. Here we would like to know if the patient believes that being overweight increases the risk of developing diabetes.
3. A person develops diabetes by inheriting diabetes from his/her parents. Here we would like to know the patient's understanding of the genetic influence on the development of diabetes.

3.3 *Persons living with diabetes ...*

1. *Who are overweight can be healthier if they lose weight.* Here we would like to understand the patient's understanding of the importance of weight loss in the management of diabetes.
2. Will most often also have high blood pressure? Here we would like to know the patient's understanding of the relationship between diabetes and hypertension.

3.4 *Say if the statement is true false or you are not sure.* The patient must indicate for each statement if he or she thinks this statement is true or false. If the patient is not sure about the answer, tick unsure. In the following 3 statements, we would like to know if the patient is knowledgeable about the use of medication.

1. Using herbs makes a person living with diabetes healthier than if they should use western medication. In this question, western medication refers to the drugs that are prescribed at the primary healthcare clinic.
2. Using any type of medication can cure a person from diabetes. In this question, any medication refers to either traditionally brewed or that prescribed at the primary healthcare clinic.

3. Diabetic medication may cause swelling of the feet.

SUBJECTIVE NORMS

The following questions are about your family's beliefs about diabetes. Say if the following statements are true, false or if you are unsure.

3.5 In our family we believe that ...

1. Only rich people will develop diabetes. Here we would like to know if the patient's family understands the link between diabetes and social status.
2. It is better to advise persons living with diabetes to use herbs and not medication. Here we would like to know if the patient's family believes in herbs over medication.
3. The more overweight a person becomes, the more likely it would be for them to develop diabetes. Here we would like to know if the patient's family understand the relationship between being overweight and diabetes
4. A person develops diabetes by inheriting diabetes from his/her parents. Here we would like to know if the patient's family understand genes as a predisposing factor of diabetes.
5. Diabetic medication may cause swelling of the feet. Here we would like to know if the patient's family is aware of the effect of blood sugar on a patient with diabetes.

3.6 *Persons living with diabetes* ...

1. Who are overweight can be healthier if they lose weight. Here we would like to know if the patient's family understands weight loss as a way of controlling blood glucose level.
2. Will often have high blood pressure also. Here we want to know if the patient's family understand hypertension as a complication of diabetes.
3. Using herbs makes that person healthier than if they use *western medication. Here we would like to know which therapy the patient's family believes in. In this question, western medication refers to the drugs that are prescribed at the primary healthcare clinic

4. Using any type of medication can be cured from diabetes. Here we would like to know if the patient's family are knowledgeable about diabetes medications. . In this question, any medication refers to either traditionally brewed or that prescribed at the primary health care clinic.
 5. Using diabetic medication may cause swelling of the feet. Here we would like to know if the patient's family understand the effect of blood sugar in a person with diabetes.
- 3.7 *What health complications are usually associated with diabetes?* Here we would like to know from the patient if he or she knows what the health complications are that are usually associated with diabetes. Write everything the patient says, whether it is right or wrong. If the patient does not know, write "do not know" in the available space.
 - 3.8 *Which health complications usually associated with diabetes can a person prevent/control?* Here we would like to know if the patient knows what health complications that he or she can be prevent or control that are associated with diabetes.
 - 3.9 *Which health complications usually associated with diabetes can a person not prevent/control?* Here we would like to know if the patient knows what health complications associated with diabetes that he or she cannot prevent or control.

PERCEIVED BEHAVIOURAL CONTROL

Indicate if the following statements are true, false or if you are not sure. Here we would like to know how the patient believes he/ she can control his/her blood glucose.

- 3.10 If a person living with diabetes wants to have a better blood sugar, he or she must ...
 1. use herbs
 2. eat cold pap
 3. eat pap made from sorghum
 4. eat salty foods
 5. do movements that make them sweat

PART III: ATTITUDE REGARDING DIABETES

Tell me if you think the sentences I am saying are true, false or if you are unsure. In the following 22 statements the patient must indicate how he or she feels about diabetes and how it is affecting his or her life. It is important to stress to the patient that there is no right or wrong answers. Every patient's opinion is important.

1. I dislike being referred to as "A Diabetic" just because I'm getting older. Here we would like to know if the patient feels stigmatised by being a "DIABETIC"
2. All overweight people are diabetics. Here we would like to know about how the patient feels being overweight as a cause of diabetes.
3. I often feel guilty when I eat pap. Here we would like to know how the patient feels about eating pap even though he or she is aware of the consequences.
4. Living with diabetes makes it impossible to also exercise. Here we would like to know how the patient feels about the need for exercise in diabetes.
5. A person diagnosed with diabetes should be assisted immediately at a clinic. Here we would like to know if the patient feels about preferential treatment at the clinic.
6. If I did not have diabetes I think I would be quite a different person. Here we would like to know how the patient feels about his or her diagnosis with diabetes.
7. Diabetes is the worst thing that has ever happened to me. We would like to know if the patient's experience of being a diabetic was positive or negative.
8. Most people would find it difficult to adjust to having diabetes. Here we would like to know what the experience is of the patient, not only of him or herself, but also in general.
9. I often feel embarrassed about having diabetes. Here we would like to find out if the patient has accepted the fact that he or she has diabetes.
10. There is not much I seem to be able to do to control my diabetes. Here we would like to know if the patient is knowledgeable about the management of diabetes.
11. There is little hope of leading a normal life with diabetes. Here we would like to know if the patient is positive about living with diabetes.
12. The proper control of diabetes involves a lot of sacrifice and inconvenience. Here we would like to find out if the patient is struggling with his or her diabetes control.

13. I avoid telling people I have diabetes. Here we would like to know if the patient has accepted his or her diagnosis and if he or she feels ashamed of being a diabetic.
14. Being told you have diabetes is like being sentenced to a lifetime of illness. Here we would like to find out how the patient feels about being a diabetic and if he or she struggles with the management.
15. My diabetic diet does not really spoil my social life. Here we would like to know if the patient enjoys his or her new lifestyle with a diabetic diet.
16. Having diabetes over a long period changes the personality. Here we would like to find out if the patient feels his or her personality has changed since he or she became diabetic.
17. I often find it difficult to decide whether I feel sick or well. Here we would like to find out if the patient feels sick or well most of the time.
18. Diabetes can be controlled. Here we would like to find out if the patient is confident that diabetes can be controlled.
19. There is really nothing you can do if you have diabetes. Here we would like to find out if the patient is aware that diabetes can be managed and patients with diabetes can live a healthy life.
20. There is really no-one I feel I can talk to openly about my diabetes. Here we would like to know if the patient has emotional support for his condition.
21. I believe I have adjusted well to having diabetes. Here we would like to know whether the patient is positive about being a diabetic.
22. I often think it is unfair that I should have diabetes when other people are so healthy. Here we would like to find out if the patient feels disadvantaged because of his or her diabetes.

PART IV: PRACTICES REGARDING DIABETES

INTENSION

Tell me if you think the sentences I am saying is True, False or if you are not sure. Here we would like to know what the patient intends to do in order to control his/her blood glucose. The patient must respond with true, false or unsure.

I plan to

1. Lose weight if I become overweight
2. Rather eat organ meat instead of sweets
3. Do activities that make me sweat as exercise?
4. Find out how I can still adjust my lifestyle to living with diabetes
5. Check my blood pressure monthly
6. Use my medication as prescribed
7. Check my feet for injuries regularly
8. Have my eyes tested regularly

ACTUAL BEHAVIOUR

Here we would like to know the definite behaviour that you will put into action. In this question, practical, refers to what the patient knows he or she will be able to afford in reality. The patient must answer true, false or unsure.

I have the practical means to:

1. Lose weight if I become overweight
2. Rather eat organ meat instead of sweets
3. Do activities that make me sweat as exercise?
4. Find out how I can still adjust my lifestyle to living with diabetes
5. Check my blood pressure monthly
6. Use my medication as prescribed
7. Check my feet for injuries regularly
8. Have my eyes tested regularly

BEHAVIOUR

Here we would like to know what you have been able to do in the past. The patient must answer true, false or unsure.

I have in the past been able to:

1. Lose weight if I become overweight

2. Rather eat organ meat instead of sweets
3. Do activities that make me sweat as exercise?
4. Find out how I can still adjust my lifestyle to living with diabetes
5. Check my blood pressure monthly
6. Use my medication as prescribed
7. Check my feet for injuries regularly
8. Have my eyes tested regularly

ADDENDUM F1

UFS Health Research Ethics Committee



IRB nr 00006240
REC Reference nr 230408-011
IORG0005187
FWA00012784

22 July 2015

Ms F Chiwungwe
School of Nursing
UFS

Dear Ms F Chiwungwe

ECUFS 64/2015

PROJECT TITLE: KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO DIABETES OF ADULT PATIENTS WITH TYPE 2 DIABETES MELLITUS IN MASERU, LESOTHO

1. You are hereby kindly informed that, at the meeting held on 21 July 2015, the Ethics Committee approved the above project after all conditions were met.
2. Any amendment, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.
3. A progress report should be submitted within one year of approval of long term studies and a final report at completion of both short term and long term studies.
4. Kindly use the ECUFS NR as reference in correspondence to the Ethics Committee Secretariat.
5. The Ethics Committee functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the Ethics Committee of the Faculty of Health Sciences.

Yours faithfully


DR SM LE GRANGE
CHAIR: ETHICS COMMITTEE



ADDENDUM F2

Health Research and Ethics Committee, Lesotho



Ministry of Health
PO Box 514
Maseru 100

19th June 2015

Faith Chiwungwe
Dept. of Nursing
Master of social science candidate
University of Free State

Dear Ms. Faithie ,

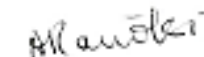
Re: Knowledge, Attitudes and Practices related to diabetes of adult patients with type 2 diabetes mellitus in Maseru, Lesotho (ID49-2015)

Thank you for submitting the above mentioned proposal. The Ministry of Health, Research and Ethics Committee having reviewed your modified protocol hereby authorizes you to conduct this study among the specified population. The study is authorized with the understanding that the protocol will be followed as stated. Departure from the stipulated protocol will constitute a breach of the permission.

We are looking forward to have a progress report and final report at the end of your study.

Sincerely,


Dr. Piet McPherson
Director General Health Services


Dr. Amelia Ranotsi
Chairperson
National Health Research and
Ethics Committee

ADDENDUM G

South Africa Family Practice Journal

SOUTH AFRICA FAMILY PRACTICE JOURNAL

Author Guidelines

Submissions can only be made online at www.editorialmanager.com/safpj. Authors need to register online with the journal prior to submitting a manuscript. Once registered, simply log in and begin an easy 5 step process to upload your manuscript. All manuscripts must be submitted in MS Word®, Open Office, or RTF format using Times New Roman font size 10 and single-spacing. Headings must be in Bold.

The author must always retain a copy. All the named authors must have approved the final manuscript. Pages should be numbered consecutively in the lower right corner. Please note that the Original Research section will follow a "print-short, web-long"; policy, which means that only the abstracts will be published in print, with the full article published on the web. Some review articles may also be published under these provisions.

The following contributions are accepted (word counts exclude abstracts, tables and references):

1. *Original research* (Between 1000 and 3500 words):
2. *Letters to the Editor* (Up to 400 words):
3. *Scientific Letters* (Less than 600 words): A short abstract is required (125-150 words) and should be structured under the following headings: background, methods, results and conclusion. One table or graph and not more than 5 references.
4. *Review/CPD articles* (Up to 1800 words): Most review articles are published as part of the continuous professional development (CPD) programme of SAFP. A scientific editor is appointed to approve topics, invite authors and to review the articles before they are independently peer-reviewed. All articles are reviewed by a family physician as well a topic specialist. Review articles outside the CPD programme are welcomed. Once accepted they may be published in full in the printed journal OR a 250 word abstract will be published in print with the full article available online.
5. *Opinions (Open Forum)* (Between 1000 and 3500 words).
6. *Editorials* (Between 600 - 800 words): Scientific editorials can be used to highlight progress in any scientific field related to family medicine.

Please consult the [Section Policies](#) for more details regarding CPD articles.

Format

Title page: All articles must have a title page with the following information and in this particular order: Title of the article; surname, initials, qualifications and affiliation of each author; The name, postal address, e-mail address and telephonic contact details of the corresponding author; at least 5 keywords. Please do not use capital letters only for headings and names, but stick to the normal use of capital letters.

Abstract. All articles should include an abstract. The structured abstract for an Original Research article should be between 200 and 250 words and should consist of four paragraphs labelled "Background, Methods, Results, and Conclusions".

Only the abstract of Original Research articles will be published in print, and the abstract with the full article will be published online. It should briefly describe the problem or issue being addressed in the study, how the study was performed, the major results, and what the authors conclude from these results.

The abstracts for other types of articles should also be no longer than 250 words and need not follow the structured abstract format.

Keywords. All articles should include keywords. Up to five words or short phrases should be used. Use terms from the Medical Subject Headings (MeSH) of Index Medicus when available and appropriate. Key words are used to index the article and may be published with the abstract.

Acknowledgements. In a separate section, acknowledge any financial support received or possible conflict of interest. This section may also be used to acknowledge substantial contributions to the research or preparation of the manuscript made by persons other than the authors.

References. Cite references in numerical order in the text, in **superscript** format. Do not use brackets. In the References section, references must be numbered consecutively in the order in which they are cited, not alphabetically.

The style for references should follow the format set forth in the “Uniform Requirements for Manuscripts Submitted to Biomedical Journals”; prepared by the International Committee of Medical Journal Editors.

Abbreviations for **journal titles** should follow *Index Medicus* format. Authors are responsible for the accuracy of all references. Personal communications and unpublished data should not be referenced. If essential, such material should be incorporated in the appropriate place in the text. List all authors when there are six or fewer; when there are seven or more, list the first three, then “;et al.”;

When citing URLs to web documents, place in the reference list, and use following format: Authors of document (if available). Title of document (if available). URL. (Accessed [date]).

The following are sample references:

1. London L, Baillie R. Notification of Pesticide Poisoning: Knowledge, Attitudes and Practices of Doctors in the Rural Western Cape. S A Fam Pract 1999;20(1):117-20.
2. FDA Talk Paper: <http://www.fda.gov/bbs/topics/ANSWERS/2002/ANS01151.html> (Accessed 04/10/2002).

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