COMMUNICATION STRATEGIES TO ACCOMPLISH EFFECTIVE HEALTH DIALOGUE IN ADULTS WITH CHRONIC DISEASES IN LOW AND MIDDLE INCOME COUNTRIES: AN INTEGRATIVE REVIEW

By

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DECLARATION

I hereby declare that the dissertation for the degree Magister Societatis Scientiae in Nursing at the University of the Free State is my own independent work and has not been previously submitted by me for a degree to another university or faculty. I further waiver my copyright of the dissertation in favour of the University of the Free State.

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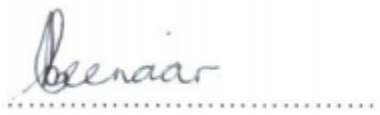

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ABSTRACT

Communication strategies are used to inform, influence and motivate individuals and communities about health. It is, however, imperative that health communication strategies suit the needs of the audience in order for the audience to comply with the health recommendations. In an era where chronic diseases in low- and middle-income countries (LMIC's) are reaching endemic proportions, using communication strategies that can accomplish effective health dialogue is crucial.

The purpose of the study was to provide a critical review and synthesis of the best available evidence of communication strategies used to accomplish effective health dialogue in adults with chronic diseases in low- and middle-income countries from the year 2000 to 2014. The methodology of an integrative review was used since it is the broadest type of research review and can include theoretical literature, empirical literature, or both. A focused review question based on the PICO format (*PICO = population, intervention, comparison intervention, outcome)* guided the review process. Multiple databases and search methods were used to identify studies relevant to the review question. The systematic search strategy identified 3464 records and after a filtering process, eight studies met the criteria and were selected for critical appraisal. Four researchers critically appraised the studies in a round table discussion using standardised critical appraisal tools. Seven out of the eight studies were found methodologically adequate and were used for analysis. The seven studies made up a heterogeneous sample of five randomised controlled trials, one case-study and one qualitative study, and consequently, a meta-analysis was not feasible.

After thematic analysis, the synthesis process led to the formulation of the following concluding statements related to *the review question*. The researcher also provided one example of the *recommendations* per concluding statement:

Which communication strategies are used during effective health dialogue with adults with chronic diseases in low and middle income countries in terms of:

1) How is communication conducted? A variety of strategies can be used to accomplish effective health dialogue in adults with chronic disease in low- and middle-income countries. *Recommendation*: Since healthcare providers mostly are involved in one-on-one and small-group health dialogue with adults affected by chronic diseases in low- and middle-income countries, a greater sensitivity needs to be created towards the benefits of tailoring such communication. This goes hand in hand with equipping these healthcare providers with the necessary skills to conduct such tailored communication. Skills training in tailored communication ideally should form part of undergraduate education, but also be included in in-service training of qualified healthcare providers.

2) When is communication conducted? Frequently scheduled communication strategies can be used to accomplish effective health dialogue in adults with chronic disease in low- and middle-income countries. *Recommendation*: Since the frequency of communication reported differs from study to study, the healthcare provider should take the information needs of the patient into consideration and plan communication sessions according to the information needs of the patients.

3) What is communicated? A communication strategy that provides focused and specific information to the individual or group can be used to accomplish effective health dialogue in adults with chronic disease in low- and middle-income countries. *Recommendation:* Since the focus of the communication was unique to each study reported, it is recommended that the healthcare providers who decide to make use of the strategy, should provide communication according to the condition and needs of the patient(s) involved. The healthcare provider should use a multi-strategy approach, for example, one-on-one communication augmented by brochures or mobile messages to re-enforce the message. A dedicated national and provincial health communication unit focusing on such a multi-strategy would strengthen healthcare providers' hands to implement such a strategy.

4) Where is communication conducted? A communication strategy that accomplishes effective health dialogue in adults with chronic disease in low- and middle-income countries, takes place in a convenient and private setting. *Recommendation*: The use of private rooms within nearby community facilities needs to be actively pursued by healthcare providers, especially in the light of the challenges faced by public healthcare facilities – space being one such a challenge. Involving community members when creating clinic committees could be an example of how to go about securing such facilities.

5) By whom is communication conducted? A communication strategy that accomplishes effective health dialogue in adults with chronic disease in low- and middle-income countries is provided by trained lay persons and/or healthcare professionals, as well as automated computer systems. *Recommendation:* Since 'trained' volunteers and peer leaders may not always be readily available, such individuals and groups should be purposefully involved in the health activities of the health facilities. The groups may be identified from patients, non-governmental organisations, or non-profit organisations in the community. Healthcare providers should become involved in the training of these groups. Training could involve disease management, but could also include communication skills.

The comprehensive synthesis of the literature has led to the creation of new knowledge and perspectives that might be of great value in developing and using communication strategies in patients with chronic disease in LMICs.

ABSTRAK

Kommunikasiestrategieë word gebruik om individue in gemeenskappe in te lig, te beïnvloed en te motiveer rakende gesondheid. Dit is egter uiters noodsaaklik dat gesondheidskommunikasiestrategieë by die behoeftes van die aanhoorders sal pas om te verseker dat hulle die gesondheidsaanbevelings sal volg. In ’n era waartydens chroniese siektes in lae- en middelinkomstelande endemiese proporsies aanneem, is die gebruik van kommunikasiestrategieë wat effektiewe gesondheidsdialoog sal verseker van kritiese belang.

Die doel van die studie was om ’n kritiese oorsig en sintese te verskaf van die beste beskikbare bewyse van kommunikasiestrategieë wat van die jaar 2000 tot 2014 gebruik is om effektiewe gesondheidsdialoog te voer met volwassenes met chroniese siektes in lae- en middelsinkomstelande. Die metodologie van ’n integrerende oorsig is gebruik aangesien dit die omvattendste tipe navorsingsoorsig is, en dit kan teoretiese literatuur, empiriese literatuur, of beide insluit. ’n Gefokusde oorsigvraag, gebaseer op die *PICO*-formaat (*PICO = population, intervention, comparison intervention, outcome)* het die oorsigproses gerig. Veelvoudige databasisse en soekmetodes is gebruik om studies wat op die oorsigvraag betrekking het, te identifiseer. Deur die sistematiese soekstrategie is 3464 aangetekende verslae geïdentifiseer, en ná ’n siftingsproses, het agt studies voldoen aan die vereistes en vir kritiese beoordeling geselekteer. Vier navorsers het die studies tydens ’n rondetafelgesprek krities beoordeel met behulp van gestandaardiseerde hulpmiddels vir kritiese beoordeling. Sewe van die agt studies is metodologies voldoende bevind en is vir die analise benut. Die sewe studies het ’n heterogene monster van vyf lukraak gekontroleerde proewe, een gevallestudie, en een kwalitatiewe studie gevorm, en gevolglik was ’n meta-analise nie uitvoerbaar nie.

Na tematiese analise, het die sintese proses tot die formulering van die volgende gevolgtrekkings ten opsigte van die *oorsigvraag* gelei. Die navorser verskaf ook een voorbeeld van die *aanbevelings* vir elke gevolgtrekking:

Watter kommunikasiestrategieë word benut tydens effektiewe gesondheidsdialoog met volwassenes met chroniese siektes in lae- en middelinkomstelande *met betrekking tot:*

1) Hoe word gekommunikeer? ’n Verskeidenheid strategieë kan benut word om effektiewe gesondheidsdialoog met volwassenes met chroniese siektes in lae- en middelinkomstelande teweeg te bring. *Aanbeveling:* Aangesien gesondheidsorg-verskaffers meestal betrokke is by een-tot-een- en kleingroepgesondheidsdialoog met volwassenes in lae- en middelinkomstelande wat aan chroniese siektes ly, moet groter sensitiwiteit aan die dag gelê word ten opsigte van die voordele daarvan om sodanige kommunikasie absoluut toepaslik te maak. Hiermee saam gaan die belangrikheid daarvan om die betrokke gesondheidsorgverskaffers toe te rus met die nodige vaardighede om toepaslik te kommunikeer. Vaardigheidsopleiding in toepaslike kommunikasie behoort eintlik deel te vorm van voorgraadse opleiding, maar moet ook ingesluit word by indiensopleiding van gekwalifiseerde gesondheidsorgverskaffers.

2) Wanneer vind die kommunikasie plaas? Gereelde geskeduleerde kommunikasiestrategieë kan gebruik word om effektiewe gesondheidsdialoog met volwassenes met chroniese siektes in lae- en middelinkomstelande te voer. *Aanbeveling:* Aangesien die reëlmaat van die kommunikasie waaroor verslag gedoen is, van studie tot studie verskil, moet die gesondheidsverskaffer die inligtingsbehoeftes van die pasiënt in ag neem en die kommunikasiesessies aan die hand daarvan beplan.

3) Wat word gekommunikeer? ’n Kommunikasiestrategie wat gefokusde en spesifieke inligting aan die individu of groep oordra, kan benut word om effektiewe gesondheidsdialoog teweeg te bring met volwassenes met chroniese siektes in lae- en middelinkomstelande. *Aanbeveling:* Aangesien die fokus van die kommunikasie uniek was in elke studie waaroor verslag gedoen is, word aanbeveel dat die gesondheidsorgverskaffers wat besluit om van die strategie gebruik te maak, hul kommunikasie sal aanpas by die toestand en behoeftes van die pasiënt(e) wat

betrokke is. Die gesondheidsorgverskaffer behoort ’n multistrategiebenadering te gebruik, byvoorbeeld een-tot-eenkommunikasie aangevul deur brosjures of selfoonboodskappe om gewig te verleen aan die boodskap. ’n Toegewyde nasionale en provinsiale gesondheidskommunikasie-eenheid wat op so ’n multistrategie fokus, sal die hande van gesondheidsorgverskaffers sterk om sodanige strategie te implementeer.

4) Waar vind kommunikasie plaas? ’n Kommunikasiestrategie wat suksesvolle gesondheidskommunikasie met volwassenes wat aan chroniese siektes ly in lae- en middelinkomstelande teweegbring, vind in ’n gerieflike en private opset plaas. *Aanbeveling:* Die gebruik van privaatkamers in nabygeleë gemeenskapsfasiliteite moet aktief nagestreef word deur gesondheidsorgverskaffers, veral in die lig van die uitdagings wat openbare gesondheidsorgfasiliteite in die gesig staar – spasie is een sodanige uitdaging. Om gemeenskapslede te betrek by die daarstelling van kliniekkomitees kan as voorbeeld dien van hoe daar te werk gegaan moet word om sulke fasiliteite te bekom.

5) Deur wie word die kommunikasie oorgedra? ’n Kommunikasiestrategie wat effektiewe gesondheidsdialoog met volwassenes met chroniese siektes in lae- en middelinkomstelande tot gevolg het, word verskaf deur opgeleide lekepersone en/of gesondheidsorgverskaffers, asook geoutomatiseerde rekenaarstelsels. *Aanbeveling:* Aangesien ‘opgeleide’ vrywilligers en eweknieleiers nie altyd geredelik beskikbaar mag wees nie, behoort sodanige indiwidue en groepe doelbewus betrek te word by die gesondheidsaktiwiteite van die gesondheidsfasiliteite. Die groepe kan uit pasiënte, nieregeringsorganisasies, of niewinsgerigte organisasies in die gemeenskap geïdentifiseer word. Gesondheidsorgverskaffers behoort betrokke te wees by die opleiding van hierdie groepe. Opleiding kan siektebestuur insluit, maar kan ook kommunikasievaardighede insluit.

Die omvattende sintese van die literatuur het gelei tot die daarstelling van nuwe kennis en perspektiewe wat van groot waarde kan wees in die ontwikkeling en gebruik van kommunikasiestrategieë vir pasiënte met chroniese siektes in lae- en middelinkomstelande.

ABBREVIATIONS

ART	Anti-retroviral treatment
COPD	Chronic obstructive pulmonary disease
GNI	Gross National Income
HCP	Healthcare provider
HICs	High income countries
HIV/AIDS	Human immune deficiency virus/acquired immune deficiency syndrome
ICT	Information and communication technology
LICs	Low income countries
LMICs	Low and middle income countries
MICs	Middle income countries
RCT	Randomised control trial
SMS	Short message service
WHO	World Health Organisation

CONCEPTUAL AND OPERATIONAL DEFINITIONS

Communication strategies: Communication strategies refer to the various approaches that are used to inform, influence and motivate individual and community decisions about health (USA Government Office of Disease Prevention and Health Promotion, 2004: *s.p*. on-line; Rensburg & Krige, 2011:77). In this study, the researcher will refer to such strategies within a health setting. The researcher has identified three contexts of health communication in this study, namely the interpersonal context, the mass-media context and the small-group context. Within the interpersonal context, patient-centred and tailored health communication strategies are used, within the mass-media context, traditional and interactive and social media communication strategies are implemented, and in the small-group context, targeted communication strategies are utilised.

Low- and middle-income countries: The World Bank classifies the economies of the world according to its gross national income (GNI) per capita. This allows countries to be classified as a low-income country when the annual GNI is $1,045 or less and classified as a middle-income country when the annual GNI is $4,126 to $12,745 (The World Bank, 2014: *s.p*. online). The researcher will use the World Bank definition as a guide.

Chronic diseases: Chronic diseases or non-communicable diseases are defined as diseases affecting people over an extended period and which cannot spread from one person to another. These conditions include diseases such as diabetes mellitus, cardiovascular disease, some cancers and chronic respiratory conditions (Daar, Singer, Persad, Pramming, Matthews, Beaglehole, Bernstein, Borysiewicz, Colagiuri, Ganguly, Glass, Finegood, Koplan, Nabel, Sarna, Sarrafzadegan, Smith, Yach & Bell, 2007:495; Smeltzer, Hinkler, Bare & Cheever, 2010:145). The researcher will be guided by this definition.

Patient: A patient refers to an individual who receives medical care (Smeltzer *et al*., 2010:5). In this study, a patient is seen as an individual receiving healthcare for a chronic disease within the interpersonal, small-group or mass-media communication context.

Health dialogue: Health dialogue refers to an equal and symbiotic health relationship between the patient and the healthcare provider with reciprocal health communication towards reaching an identified goal via a health message (Reid, 2015). Reference to health dialogue in this study is guided by Reid's understanding. Additionally, health dialogue refers to dialogue between a patient with a chronic disease and a health care provider within any given context.

Integrative review: An integrative review is the broadest type of research review and can include theoretical literature, empirical literature or both (Whittemore, 2005:57; De Souza, Da Silva, De Carvalho, 2010:103). In this study, the researcher made use of primary studies using any type of methodology, whether the studies were published or unpublished or presented as reports or guidelines. The researcher has selected the methodological approach of the systematic review as the best method to critically analyse and synthesise the existing literature to answer the review question.

Adult: The World Health Organisation classifies an adult as a person eighteen years and older (World Health Organisation, 2015: *s.p*. on-line). The researcher will use the same definition as a guide in the study.

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CHAPTER 1

Overview of the study

1.1 BACKGROUND

When choosing a health communication strategy, one must be cautious because *"one size does not fit all"* (Fernstrom, Reed, Rahavi & Dooher, 2012:302). It is important that health communication strategies are appropriate to the needs of the audience in order to encourage the audience to comply with the health recommendations. Health communication strategies may be implemented on a small scale such as in the interpersonal and small group contexts, or on a larger scale as in the mass media context (Lee, 2010:167; Rensburg & Krige, 2011:79).

In the interpersonal context, the healthcare provider (HCP) interacts with the patient on a one-on-one basis (Rensburg & Krige, 2011:81; Suresh, 2011:282). Kreps and Sivaram (2008:2333) indicate that information between the HCP and the patient is shared because the patient provides his/her personal information to the HCP, while the HCP provides information related to the health needs of the patient. Rensburg and Krige (2011:81) describe this as a transactional process characterised by giving, receiving and negotiating the meaning of the information. There are two health communication strategies that may be used in the interpersonal context, namely patient-centred strategy and tailored strategy.

The patient-centred strategy focuses on building a partnership with the patient, discovering a shared interest in terms of health and understanding how the patient experiences the illness (Barclay, Blackhall & Tulsky, 2007:957). The patient-centred strategy is also described as *"understanding the patient as a unique human being"* (Balint, 1969:269; Moore, 2008:18), and *"putting the patient at the centre of the consultation"* (Henbest & Fehrsen, 1992:311; Moore, 2008:18).

Although similar to the tailored strategy in terms of focusing on the patient, the patient-centred strategy is quite unique. The tailored health strategy is a data-based communication strategy, in other words, the individual must be assessed with regard to culture, language, social orientation, norms, values, physical and mental functioning, and then health communication is customised to meet the needs of the individual (Kreuter & Wray, 2003:S227; Kreuter & McClure, 2004:441; Raman & Shamanna, 2005:36). Tailored messages are described as *"more likely to be read and remembered, attention catching, saved and discussed with others and perceived as personally relevant"* (Kreuter & Wray, 2003:S229). Whereas tailored messages are customised to an individual, messages customised to a group are referred to as a targeted health strategy.

Targeted messages are customised to the unique characteristics and the realities of daily living of a group after a formal assessment (Kreps & Sivaram, 2008:2334; Rensburg & Krige, 2011:95). Targeted messages are described as particularly effective in older adult groups and in certain ethnic groups (Philis-Tsimikas, Walker, Rivard, Talavera, Reimann, Salmon & Araujo, 2004:113; Rensburg & Krige, 2011:95; Ho, Chesla & Chun, 2012:73). The ultimate aim of both the tailored and targeted strategy is to promote the relevance of the health message to the specific individual or audience (Rensburg & Krige, 2011:96). The mass media context focuses on a far greater audience.

In the mass media context, health communication is delivered to a large audience by the HCP (O'Sullivan, Yonkler, Morgan & Merritt, 2003:142; Lee, 2010:172). Two strategies can be used in the mass media context, namely traditional media and social and interactive media. In traditional media, television, radio, print media and the mail are used to spread health information and it is described as a well-known and trusted communication strategy (Rensburg & Krige, 2011:170). In social and interactive media, health information is disseminated through blogs, social networks, and mobile phones (Tanvatanakul, Amado & Saowakontha, 2007:177). Social and interactive media that deal with health matters are described as *"health information, support and services on demand"* and even provide customised information (Rensburg & Krige, 2011:96). Although the various communication strategies can be used separately to spread health messages, research advocates a multi-strategy

approach to improve efficiency (O'Sullivan *et al*., 2003:141; Centre for Review and Dissemination, 2009:88).

Literature supports the implementation of a multi-strategy approach, which entails the integration of two or more strategies during health communication (O'Sullivan *et al*., 2003:141; Centre for Review and Dissemination, 2009:88). A combination of interpersonal, small-group and/or mass-media communication strategies is incorporated in this way. One strategy often takes the lead and is supplemented by the others, for example, one-on-one counselling is provided as the primary health communication strategy for a newly diagnosed diabetic and the intervention is supplemented by a mass media strategy, namely a video session, to maximize the effect of the counselling. Attaining the desired change is more likely with the multi-strategy approach than with a single-strategy approach, since multiple strategies increase the effect and effectiveness of the message (Kreps & Sivaram, 2008:2334).

When health messages are strategically designed and delivered through appropriate communication strategies, significant effects have been noted, such as a reduction in the incidence of polio (Obregon, Chitnis, Morry, Feek, Bates, Galway & Ogden, 2009:625); reduction in multiple risk factors for colorectal cancer (Emmons, McBride, Puleo, Pollak, Clipp, Kuntz, Marcus, Napolitano, Onken, Farraye & Fletcher, 2005:1456); increased quality of life in breast cancer patients (Han, Hawkins, Shaw, Pingree, McTavish & Gustafson, 2009:127), and increased awareness of issues affecting women's health (Aja, Umahi & Allen-Alebiosu, 2011:7). Communication strategies are thus an integral part of health dialogue.

A concept analysis performed by Reid (2015) characterised health dialogue as an equal and symbiotic health relationship between the patient and HCP; with reciprocal health communications geared to reaching a recognised health objective via a health message. In other words, if health dialogue with the patient is effective, the patient becomes actively involved in his/her care and shares in the decision-making process leading to improved adherence to treatment, greater satisfaction and consequently improved health outcomes (Ferguson & Candib, 2002:353; Barclay *et al*., 2007:959; Shue, O'Hara, Marini, McKenzie & Schreiner, 2010:363). Ineffective health communication on the other hand, will have the direct opposite effect, and may lead

to frustration, non-adherence to treatment, increased incidence of complications, hospitalisation and even litigation (Barclay *et al*., 2007:959). The question that arises is: What communication strategies can HCPs use to ensure effective health dialogue? How can the HCP communicate effectively? Research has shown that in the battle against chronic diseases, a collaborative, interactive relationship is necessary between the patient and HCP in order to facilitate effective communication (Shue *et al*., 2010:362).

Having noticed the various communication strategies used in health communication, it rightfully may be asked: Which communication strategies would accomplish effective health dialogue in patients living in countries with poor resources?

1.2 PROBLEM STATEMENT

The World Bank classifies countries according to their gross national income; therefore they are classified into high-income, middle-income and low-income countries (The World Bank, 2014: *s.p*. on-line). As reflected by the classification, low- and middle-income countries (LMICs) have a very low gross national income compared to high-income countries. Consequently, one can expect that countries falling in the LMICs often have limited resources, personnel, infrastructure and technologies available (Kreps & Sivaram, 2008:2332). One therefore also can expect that the limited resources could have an impact on the communication strategies used during health dialogue.

Evidence reveals that high-income countries are utilising various communication strategies with a specific affinity for mass media, in particular, *"information, computing, and telecommunications technology and mobile technology to provide health related services, health promotion, and disease management across geographic, time, social and cultural barriers"* (Fotheringham, Owies, Leslie & Owen, 2000:114; Roblin, 2011:59; Ruston, Smith & Fernando, 2012:71). It is unclear which communication strategies would accomplish effective health dialogue in LMICs best, especially taking into consideration the lack of resources and infrastructure with

which these countries are faced. Furthermore, this uncertainty is magnified by the disproportional incidence of chronic disease in LMIC's.

Eighty percent of cardiovascular and diabetes deaths; 90% of chronic obstructive pulmonary disease and more than 67% of all cancer deaths occur in LMICs (World Health Organization, 2011:1). Chronic diseases place a tremendous social and financial burden on stakeholders globally and they constitute the cause of 60% of deaths world-wide (Daar, Singer, Persad, Pramming, Matthews, Beaglehole, Bernstein, Borysiewicz, Colagiuri, Ganguly, Glass, Finegood, Koplan, Nabel, Sarna, Sarrafzadegan, Smith, Yach & Bell, 2007:494; Ratzan, 2011:563; Fernstrom *et al.*, 2012:301). Chronic diseases are associated with lifestyle factors such as incorrect diet, lack of exercise, tobacco use and the misuse of alcohol. Chronic diseases can be prevented most of the time, yet 80% of deaths in LMIC occur due to chronic disease (Ratzan, 2011:563). Establishing which communication strategies will accomplish effective health dialogue in patients with chronic diseases in LMICs is therefore of utmost importance. Since lives can be saved and quality of life improved, it should be known which communication strategies are used during effective health dialogue in patients with chronic diseases staying in LMICs. No systematic review has been found on this topic.

1.3 RESEARCH QUESTION

The question that was set to be answered in this study was: *"Which communication strategies are used during effective health dialogue with adults with chronic diseases in LMICs in terms of: 1) how communication is conducted; 2) when communication is conducted; 3) what is communicated 4) where communication is conducted; and 5) by whom communication is conducted?"*

1.4 PURPOSE OF THE STUDY

The purpose of the study was to provide a critical review and synthesis of the best available evidence of communication strategies used to accomplish effective health dialogue in adults with chronic diseases in LMICs.

1.5 PARADIGMATIC PERSPECTIVE

A paradigm is associated with the perceived 'worldview' of the researcher (Polit & Beck, 2008:13) and as defined by Kuhn in 1977, is a set of beliefs and practices that guide the researcher in the day-to-day decisions that are made and the manner in which things are done (Johnson & Onwuegbuzie, 2004:24; Botma, Greeff, Mulaudzi & Wright, 2010:39; Welford, Murphy & Casey, 2011:38).

Although various paradigms exist, the researcher will be guided by a pragmatic perspective in this study. The Longman Active Study Dictionary (2010:691) defines pragmatism as *"dealing with problems in a sensible, practical way instead of following a set of ideas"*. Pragmatism is an explicitly value-orientated approach and consequently empirical and practical outcomes are considered when ideas are judged (Johnson & Onwuegbuzie, 2004:17; Welford *et al.*, 2011:41). The researcher has a high regard for the reality and what works in practice and what solves problems. Due to the problem-centredness of the approach, the researcher obtained justified evidence guided by the review question - ultimately leading to larger truths. The researcher further endorses pluralism because multiple methods are used to explain the problem. According to Weaver and Olson (2006:466), a pragmatic approach emphasises the critical analysis of data, applications and outcomes. The researcher, together with three senior researchers, critically evaluated the methodological rigour and quality of the selected studies. This was followed by a process of data extraction, analysis and synthesis in order to assist the researcher to judge the knowledge base and to determine whether it could be applied practically. Research paradigms are based on three philosophical assumptions, namely ontology, epistemology and methodology.

1.5.1 Ontology

Ontology is concerned with the nature of reality and how the researcher views the world (Botma *et al.,* 2010:40). The researcher acknowledges the reality of the physical world and the influences of the social and psychological world on human interaction; however, the focus remains on what works in reality. The researcher acknowledged studies where communication strategies between adults with chronic disease in LMICs and HCPs were conducted. These studies were focused on a specific reality, namely health dialogue, which took place within interpersonal, small-group or mass-media contexts. Criteria for inclusion of studies were very clear and specific.

1.5.2 Epistemology

Epistemology is concerned with the nature of knowledge (Botma *et al.,* 2010:40), in other words, how knowledge is *"created, acquired and communicated"* (Scotland, 2012:9). The researcher acquired information from literature of adults with chronic disease in LMICs during effective health dialogue and the information was collected using multiple sources. A review of the literature also provided further information and knowledge generation, particularly literature based on what worked in practice. Specific questions guided the review process.

1.5.3 Methodology

Methodology is concerned with the manner in which the researcher will go about gaining information in order to understand the phenomenon better (Polit & Beck, 2008:13). The researcher followed the seven steps of a systematic review explicitly as suggested by Higgins and Green (2006:16). Methodology also describes the methods that the researcher may use to obtain information. In the pragmatic perspective, the researcher is allowed to make use of the most appropriate method(s) in order to collect information to solve the research question (Welford *et al.*, 2011:42). The researcher believed that the systematic review was the most appropriate method to analyse the existing literature on communication strategies to

accomplish effective health dialogue in adults with chronic diseases in LMICs critically. As the research question is of critical importance to pragmatists, the researcher selected the systematic review as method to answer the research question. A systematic review involves an organised, explicit and meticulous process of identifying evidence from multiple sources, evaluating the methodological quality and rigour of each relevant study, analysing and synthesising the best available evidence relevant to the research question (Glasziou, Irwig, Bain & Colditz, 2001:3; Melnyk & Fineout-Overholt, 2005:115; Mayer, 2010:367; Gough, Oliver & Thomas, 2012:2).

1.6 RESEARCH DESIGN

The research design is the plan of the study. The research design used in this study was that of a systematic review which is descriptive in nature. In this way, a critical assessment of relevant research studies obtained through a comprehensive search strategy could be made and the comprehensive synthesis of research literature supported the creation of new knowledge/perspectives that might be of great value in developing and using communication strategies in patients with chronic disease in LMICs.

1.7 THE SYSTEMATIC REVIEW METHODOLOGY

In this study, the researcher was guided by the seven steps of a systematic review according to Higgins and Green (2006:16) as summarized in Table 1.1.

TABLE 1.1: Summary of steps of the systematic review process followed in the study (*cf.* Higgins & Green 2006:16)

Step 1	Identification and formulation of a focused review question
Step 2	Generation of a search strategy
Step 3	Execution of the search and selection of the relevant studies
Step 4	Performing the critical appraisal and evaluating the methodological quality of selected studies
Step 5	Extracting data
Step 6	Analysing and synthesising
Step 7	Formulating the concluding statements

1.8 RIGOUR

Rigour referred to the researcher's degree of accuracy during the research process (Burns & Grove, 2011:39). The study upheld the criteria of truth value, applicability, consistency and neutrality and the application of these criteria will be discussed in Chapter 3 and 4.

1.9 ETHICAL CONSIDERATIONS

The researcher maintained the ethical principles of respect, honesty, accuracy and integrity throughout the study and these principles will be discussed in Chapters 3 and 4.

1.10 DELINEATION OF THE STUDY REPORT

A layout of the study report is provided in Table 1.2.

TABLE 1.2: Layout of the study report

CHAPTER	BRIEF DESCRIPTION	ADDENDUMS
Chapter 1 Overview of the study	The chapter provides a brief overview of the study with regard to the: background of the study; problem statement; research question and purpose of the study. The paradigmatic perspectives are described and the research design and methodology are briefly explained. The chapter is concluded with the principles to be upheld for rigour and the ethical principles considered in the study.	None
Chapter 2 Communication strategies for effective health dialogue	The chapter provides a well-organised synthesis on the current literature available on: ● Communication strategies ● Effective health dialogue ● High-, middle- and low-income countries ● Chronic diseases	None
Chapter 3 Research methods and quality appraisal	In the chapter, the first four steps of the systematic review are described: Step 1: The identification and formulation of a focused review question Step 2: The generation of a search strategy Step 3: The execution of the search Step 4: Performing the critical appraisal and evaluating the methodological quality of selected studies	 Addendum A Addendum B Addendum C Addendum D Addendum E Addendum F
Chapter 4 Analysis, synthesis and summary of the findings	In the chapter, the next two steps of the systematic review are described: Step 5: Extracting data Step 6: Analysing, synthesising and summarising the findings	Addendum G
Chapter 5 Recommendations and limitations	This chapter describes Step 7: Formulating the conclusion statements and making recommendations.	None

1.11 SUMMARY

This chapter provided a brief overview of the study and a concise summary of the manner in which the research was conducted. The background sets the scene for the study, followed by the problem statement, purpose of the study and the research question. The researcher also shared her paradigmatic perspectives with the reader and provided a brief explanation about the choice of design and the methodology of a systematic review. Furthermore, the criteria that were upheld to ensure rigour are mentioned as well as the ethical principles that were maintained.

The literature review related to the communication strategies to accomplish effective health dialogue in adults with chronic diseases in LMICs, will be discussed in the next chapter.

CHAPTER 2

Communication strategies for effective health dialogue

2.1 INTRODUCTION

A brief overview of the study was provided in the previous chapter. This chapter focuses on a well-organised synthesis (*cf.* Polit & Beck, 2008:133) of the current literature available on communication strategies to accomplish effective health dialogue in adults with chronic diseases in LMIC's. This chapter outlines, unpacks and contextualises the following concepts: communication strategies; health dialogue; LMIC's, and chronic diseases. Figure 2.1 clearly indicates that these concepts are not isolated entities, but that the concepts are interconnected and each one affects another. As a point of departure, the communication strategies used to obtain effective health dialogue are considered, followed by the dynamics of health dialogue and a discussion of the interconnectedness of the two concepts, communication strategies and health dialogue. Furthermore, this chapter provides a clear picture of the infrastructure of low- and middle-income countries and how this affects the communication strategies used in these countries in their response to the growing burden of chronic diseases.

FIGURE 2.1: The layout of the literature review chapter

2.2 DEFINITION AND OBJECTIVES OF COMMUNICATION STRATEGIES

Healthcare providers (HCPs) use various communication strategies in order to disseminate health information to individuals and communities.

Health communication strategies refer to various approaches that are used to inform, influence and motivate individual and community decisions about health (USA Government Office of Disease Prevention and Health Promotion, 2004: *s.p*. on-line; Rensburg & Krige, 2011:77). The objectives of health communication strategies are well documented and are thus described:

Health communication encourages healthy behaviour (Suggs, 2006:62; Rensburg & Krige, 2011:93), because it provides relevant information that results in an increase in knowledge and awareness and an understanding of the health issue (Freimuth & Quinn, 2004:2052; Karan, 2008:85; Basu & Dutta, 2009:86). Health communication motivates the reduction of risky behaviour by raising health consciousness and risk perception, which in turn impact on the attitudes and behaviour of individuals and may influence the individual to comply with recommended behaviour (Suggs, 2006:62; Karan, 2008:85; Centre for Reviews and Dissemination, 2009:87; Ebina, Kawasaki, Taniguchi, Togari, Yamazaki & Sparks, 2009:6; Rensburg & Krige, 2011:93). The Polio Eradication Programme followed by India and Pakistan between 2000 and 2007, is a good example, since it resulted in high levels of polio immunity due to the various health communication interventions (Obregon *et al*., 2009:624).

Health communication can bring individuals with the same health-related problems together to support each other – affecting attitudes and strengthening relationships (Freimuth & Quinn, 2004:2053; Suggs, 2006:62; Tanvatanakul *et al.,* 2007:174; Ebina *et al*., 2010:6). An example of this is the Computerised Health Enhancement Support System, which provides on-line interactivity for individuals with the same health problem, such as having alcoholic parent(s), Human immune-deficiency virus/ acquired immune deficiency syndrome (HIV/AIDS) or breast cancer affected individuals and victims of sexual assault to connect and share experiences and to support each other (Lewis, 1999:278).

Myths, misconceptions and misunderstandings are corrected through health information as knowledge is improved and reinforced (Freimuth & Quinn, 2004:2053; Prilutski, 2010:56; Brink, Van der Walt & Van Rensburg, 2012:12). For example, in a study to investigate the possibility of linking cervical cancer screening in adult women and human papillomavirus vaccination in schoolgirls, cervical cancer-related knowledge was increased among the women after health information had been provided. The women demonstrated a positive attitude towards screening after improving their knowledge on cervical cancer (Snyman, Dreyer, Botha, van der Merwe & Becker, 2015:120).

Barriers to communication, such as language, culture, age, technology and many others, are broken down by implementing appropriate communication strategies, that suit the audience (Kreps, 2006:765). An example includes the culturally and linguistically appropriate health information pamphlets that were developed for a Latino immigrant community at Puentes Salud (Bridges of Health) in Philadelphia, United States of America. The health information pamphlets aimed to break down the culture and language barriers that existed and make the health information more relevant to the group in order to address the common health problems at the clinic (Harvey & O'Brien, 2011:182).

Communication strategies frequently lead to the development of new policies and guidelines which reinforce healthy behaviour (Neuhauser, Sparks, Villagran & Kreps, 2008:315). An example of this is the food-based dietary guidelines that were introduced in South Africa in 2008 in an attempt to encourage healthy eating in the prevention and control on chronic disease (Schaay & Sanders, 2008:80). Empirical data demonstrate that these health communication strategies ultimately promote patient satisfaction (Barclay *et al.*, 2007:968), and adherence to treatment regimes; and improve the self-management of the disease and patient involvement in decisions-making about health (Suggs, 2006:62; Schwartz, Lowe & Sinclair, 2010:2; Shue *et al.,* 2010:363). Various health communication strategies are used to obtain these objectives as discussed next.

2.3 HEALTH COMMUNICATION STRATEGIES

Health communication strategies are applied in various contexts, depending on the nature of the audience. These contexts are referred to as interpersonal communication, small-group communication and mass-media communication (Lee, 2010:167; Rensburg & Krige, 2011:79), and within these contexts, various communication strategies are applied, as reflected in Figure 2.2.

FIGURE 2.2: Schematic presentation of the various communication strategies within specific contexts

2.3.1 Interpersonal communication

Interpersonal communication refers to one-on-one or face-to-face communication between the HCP (doctor, nurse, healthcare worker or counsellor) and the patient (Suresh, 2011:282). The objectives of interpersonal communication are to share information, clarify uncertainties and to convince the patient to change behaviour or utilise available services (Suresh, 2011:282). The strengths of interpersonal communication are found in it being regarded as the primary means of health information sharing between the patient and the HCP, and it is the preferred source of health information amongst patients (Kreps & Sivaram, 2008:2333; Ishikawa & Kiuchi, 2010:1). Interpersonal communication is also more likely to bring about

behavioural change and it is often supplemented by mass media communication to increase awareness and the effectiveness of the health message (Darmstadt & Tarigopula, 2010:1; Shue *et al.,* 2010:361). Interpersonal communication creates the ideal context in which to share confidential information without reservations with the HCP on issues such as sexual matters, family planning, HIV/AIDS and any other sensitive issues (Suresh, 2011:282).

The main challenge or even weakness of interpersonal communication is that HCPs must be trained continuously in this context to ensure that their communication skills remain optimum (Sparks, Villagran, Parker-Raley & Cunningham, 2007:180; Wynia & Osborn, 2010:113; Helitzer, LaNoue, Wilson, Hernandez, de Urquieta; Warner & Roter, 2011:27). Suresh (2011:282) contends that the ability of the HCP to empathise, support and listen actively to the patient is crucial in this context. Part of this challenge is that HCPs continuously have to be aware of the significance of non-verbal communication and not focus on the spoken word alone. If the HCP projects a negative attitude, for example through showing impatience, disrespect and lack of interest, it could be detrimental to the trust relationship between the patient and the HCP.

In a qualitative study to establish the preferred channel of health information in older Asian adults, interpersonal communication with the HCP was identified as the preferred channel of communication through which they wished to receive health information (Lee, 2010:165). Similarly, in the United States of America, the National Cancer Institute's Health Information National Trends Survey confirmed that women with breast cancer, first consulted their HCP for information on breast cancer before any other information source (Nelson, Kreps, Hesse, Croyle, Willis, Arora, Rimer, Viswanath, Weinstein & Alden, 2004:449; Han *et al.*, 2009:113).

Within the interpersonal communication context, two communication strategies, namely a patient-centred strategy and a tailored health strategy are most commonly used, as outlined next.

2.3.1.1 Patient-centred strategy

In one-on-one communication between the HCP and the patient, the patient-centred strategy is used to promote equal power, collaboration and negotiation between the patient and the HCP (Rutten, Augutsten & Wanke, 2006:136; Shue *et al.,* 2010:361) by acknowledging the unique preferences, norms, values, culture and beliefs of the patient (Hornsten, Lindahl, Persson & Edvardsson, 2013:2). The goal of a patient-centred strategy is to empower the patient and to create patient self-awareness (Shue *et al.,* 2010:361). The strengths of the patient-centred strategy are that it promotes patient involvement, shared decision-making, greater satisfaction, adherence to treatment plans and ultimately, it improves health outcomes (Shue *et al*., 2010:363). Literature reveals that a patient-centred strategy is associated with positive health behaviour change and decreased healthcare costs, as well as more frequent use of healthcare facilities (Ekman, Wolf, Olsson, Taft, Dudas, Schaufelberger & Swedberg, 2012:1118). However, HCPs need to be trained rigorously in the patient-centred strategy (Robinson & Gilmartin, 2002:462; Rudd, Rosenfeld & Simonds, 2012:26; Hornsten *et al.,* 2013:2) as it is completely different from the traditional medical model in which health professionals are socialised and according to which the patient is not necessarily at the centre of the health relationship (Soderlund, Nilsen & Kristensson, 2008:103). Literature also reports on the time constraints related to the patient-centred strategy (Tveiten & Meyer, 2009:811; Shue *et al.,* 2010:361), since it increases consultation time with the patient significantly (Roach, Klindukhova, Saha, Hudson, Cantrell & Marrero, 2010:155). Furthermore, active participation by the patient may be a problem as the HCP is still seen as 'powerful and knowledgeable', creating a status difference and this may prevent the patient from speaking freely and openly (Shue *et al.,* 2010:363; Hornsten *et al.,* 2013:2). Kiragu and McLaughlin (2011:421) contend that to gain trust takes time and this may create a possible barrier in this context.

An example of a patient-centred strategy is found in a cross-sectional survey that was done to determine the preferences of Nepalese patients regarding doctor-patient communication. The findings showed that for the Nepalese patient participants, friendliness and being treated with respect were very important, as well

as being informed and having adequate consultation time. Sharing power with the HCP was not that important to this group of individuals (Moore, 2008:18). Another example is a literature review done by Ferguson and Candib (2002:359), that showed that minority groups were often disconnected from the HCP, unable to establish rapport with the HCP, did not get enough information and did not engage in health decisions taken because communication did not meet the group's language and cultural needs.

2.3.1.2 Tailored strategy

Although similar to a patient-centred strategy, a tailored health strategy is quite unique. In this type of one-on-one communication between the HCP and the patient, the health information disseminated is based on the characteristics of one specific individual and these characteristics are determined in a formal assessment (Kreuter & Wray, 2003:S228). The health message speaks to the specific demographic, cultural and psychographic perceptions of one specific patient (Kreps, 2006:766; Harvey & O'Brien, 2011:187). The tailored health strategy is used because it minimizes prejudice, demonstrates respect for the patient and fosters the development of a partnership between the patient and HCP (Kreps, 2006:767). The strength of this strategy lies in the health information being conveyed to the patient at his/her educational level; in the preferred language; within the cultural, economic and social context of the patient and through a trusted and familiar medium (Harvey & O'Brien, 2011:182). When tailored health information is disseminated, taking all these preferences into consideration, the patient is able to relate to the messages as they are relevant, individualised and personalised to his/her specific needs. There seems to be general consensus regarding the effectiveness of tailored health strategies throughout literature due to its relevance to the patient (Keller & Lehmann, 2008:118; Lee, 2010:165; Rentner, Dixon & Lengel, 2012:15; Song, Hamilton & Moore, 2012:545).

The main challenge of tailored health strategies is that it demands that a thorough assessment of the context be done initially in order to ensure that the health message suits the context (Rimer & Kreuter, 2006:195; Wanyonyi, Themessl-Huber, Humphris & Freeman, 2011:349). This assessment of the context relates to selecting credible information sources, choosing a message strategy and determining the most appropriate channels of communication for the specific individual (Kreuter & Wray, 2003:S227). Kreuter, Oswald, Bull and Clark (2000:312) proclaim that tailored programmes are *"neither cheap nor easy to build"*, in other words, the development and implementation of tailored programmes require resources, knowledge and skill. An example of a successfully implemented tailored strategy, is the Interactive Health Communication System, namely the comprehensive health enhancement support system, 'Living with Breast Cancer', which offers a range of services to the patient based on the individuals' needs, ranging from information, interactive or communication services (Han *et al.,* 2009:115-116). In another study, tailored and non-tailored weight loss material was conveyed to one hundred and ninety-five overweight individuals. The results indicated that tailored material appropriate to the individual, were more effective than those that were non-tailored (Kreuter *et al*., 2000:312).

2.3.1.3 Message manipulation tactics

Within the interpersonal, small groups and the mass-media communication contexts, various tactics can be implemented to persuade and strategically manipulate an audience. These manipulating tactics include using fear (Ho *et al*.*,* 2012:68), using positive messages (Frisby, 2002:501), and the credibility of the conveyors of the messages (Kreuter & McClure, 2004:443).

By appealing to the audience's emotions, such as fear or hope, the audience can be persuaded. Fear appeals emphasize the losses or harmful ramifications that may be expected through non-compliance (Airhihenbuwa & Obregon, 2000:6; Ho *et al.,* 2012:68), and it was used to draw attention and motivate compliance with the health message. Although fear can be a motivator for behavioural change (Alleyne, Basu & Stuckler, 2011:91), some researchers disagree on the effectiveness of fear appeal

and contended that if used incorrectly, it could totally misrepresent the message (Frisby, 2002:501; Price, Corwin, Friedman, Laditka, Colabianchi & Montgomery, 2011:22). An example of the use of the fear appeal and positive messages is a study that was conducted to understand African American women's attitude towards breast cancer screening. The results of the study emphasised the importance of using positive, hopeful messages, such as that many African American women have survived the breast cancer struggle and are leading normal lives, instead of fearful, scary messages of death and physical disfigurement. The latter message instilled fear and drove the patients away from screening (Frisby, 2002:500). Whereas fear emphasises the losses that may occur due to non-compliance, audiences can also be persuaded through other means, such as the credibility of the speaker.

During health communication, the credibility of the speaker is very important (Noar, 2012:486), and experts are commonly found to be more persuasive due to their knowledge base and experience (Kreuter & McClure, 2004:443; Ho *et al.*, 2012:68). Audiences also relate well to familiar persons and persons from a similar context as themselves (Kreuter & McClure, 2004:443; Ho *et al.*, 2012:68). An example of persuasion by a familiar person includes the Ghanaian 'Integrated Child Health Campaign' that used volunteers from the Ghanaian community itself. These volunteers were trained to provide health information to their community to create an awareness of malaria and bed-nets. Celebrity artists were used to sing the campaign song, which reinforced the use of bed-nets in the malaria campaign further (Prilutski, 2010:55).

2.3.2 Mass media communication

Whereas interpersonal communication focuses on individuals, the mass-media context refers to communication with a large audience. In mass media communication, health information is delivered to a large audience in a brief period of time via media (O'Sullivan *et al*., 2003:142; Lee, 2010:172; Yoo, Kwon & Pfeiffe, 2013:36). In the mass media-context, traditional media or social and interactive media may be used.

2.3.2.1 Traditional media

In traditional media, television, radio, print media, telephone and the postal mail are used to disseminate health information to a large audience (Tanvatanakul *et al*., 2007:177). A strength of traditional media is that individuals tend to use only the medium that they trust and with which audiences are familiar and have access to (Kreps, 2006:766; Ho *et al*., 2012:71). This means that if individuals have not learnt to trust the medium, they will not use it and the message will be lost, and this may be a weakness of traditional mass media.

An example of traditional mass media is the He-Ho-Ha home-based malaria campaign in Ghana that was aimed at increasing the awareness amongst mothers to recognise malaria and treat it amongst children. A theme song was developed for the campaign and aired on both television and radio in local languages. Although print media was used as a second means of communication, radio was regarded as the most effective mass-media communication medium (Prilutski, 2010:56).

In another study, a telephone-delivered health mentoring programme was delivered by trained community health nurses to patients with chronic obstructive pulmonary disease in Australia. The participants felt that the mentors helped them to manage their chronic obstructive pulmonary disease and general well-being. The results reflected changes in health behaviour such as 98% changes in physical activity; 74% reduction of smoking; 21% smoking cessation; 23% change in nutrition and 18% symptom management increase (Walters, Cameron-Tucker, Courtney-Pratt, Nelson, Robinson, Scott, Turner, Walters & Wood-Baker, 2012:3).

2.3.2.2 Social and interactive media

In social and interactive media, health information is disseminated to enormous numbers of individuals all over the world in seconds via social networks, blogs, mobile telephone messaging, health websites, wireless systems and satellite television (Tanvatanakul *et al*., 2007:177). The communication infrastructure generated by the internet exposes individuals to huge amounts of health information

and individuals have the opportunity to choose information based on their interests and preferences (Rensburg & Krige, 2011:96). Due to its interactive nature, computer tailored health information is customised to different individuals. Furthermore, individuals join on-line communities where experiences and advice are shared and they support each other (Keselman, Logan, Smith, Leroy & Zeng-Treitler, 2008:477; Moorhead, Hazlett, Harrison Irwing & Hoving, 2013:3) and even access various health-related services.

The strengths of social media such as easy accessibility, convenience, anonymity, capacity to customise information and exposure to extensive information are widely acknowledged (Bartlett & Coulson, 2011:117; Moorhead *et al.*, 2013:3; Yoo *et al.,* 2013:3). However, the weaknesses of social media are also recognised, such as being an *"informal and unregulated mechanism with varied quality and consistency"* (Moorhead *et al*., 2013:3). The internet, however, also creates communication inequalities and a 'digital divide' where certain groups, like *"racial and ethnic minorities, persons with disabilities, rural populations and individuals who are poorer, older and less educated"* do not have access to the internet and the related technologies (Kreps, 2006:766; De Jesus, 2013:525). An example of social and interactive media sources as a health communication strategy is the Interactive Health Communication Application that was found to be an effective manner to disseminate tailored health information about chronic lower back pain and self-management (Dirmaier, Harter & Weymann, 2013:7). An interactive health communication application was able to *"reach great numbers of patients at low financial cost and provide information and support at the time, place and learning speed patients prefer"* (Dirmaier *et al*., 2013:1). In another example of social and interactive media as a health communication strategy, text messaging via mobile phones was used in New Zealand and the Philippines to remind patients about appointment dates at healthcare facilities and the strategy turned out to be very successful (Pereira & Fife, 2011:36). While mass media focus on large groups, other kinds of communication strategies should be used for small groups and smaller clusters of people.

2.3.3 Small-group communication

Small-group communication refers to communication between the HCP and a smaller cluster of people with a common interest or desired behaviour change (Suresh, 2011:282). The effectiveness of communication in this context will be determined by a targeted health strategy (Freimuth & Quinn, 2004:2052; Lee, 2010:172), as outlined next.

2.3.3.1 Targeted health strategy

Targeted health strategy refers to health information that is *"conceptualised with specific knowledge of the cultural characteristics, media habits and language preferences"* of a group (Rensburg & Krige, 2011:95). The health information provided reflects the unique ideas, beliefs and current practices and lifestyles of the group (Suggs & McIntyre, 2009:279; Rentner, Dixon & Lengel, 2012:15). The reason why a targeted health strategy is used is to relate to the group in terms of language, culture, education, income level and other specific characteristics. The strength of targeted health strategy is the fact that the shared characteristics allow the message to be perceived as relevant to the group (Kreuter & Wray, 2003:S228; Rensburg & Krige, 2011:95). However, a thorough needs assessment has to be done on the targeted group to *"determine the audiences' preferred formats, channels and contexts"* (Rensburg & Krige, 2011:95).

An excellent example of a targeted health strategy is a literature review of best practices regarding health communication with Chinese Americans with type 2 diabetes (Ho *et al*., 2012:73). The study showed that the following characteristics of Chinese Americans' needed to be considered during health communication: Due to their respect for authority, Chinese Americans are unlikely to ask questions or disagree with diabetes educators, and dietary guidelines provided to Chinese Americans have to be sensitive to their food preferences of noodles and rice and the preference for cooked vegetables instead of raw vegetables. Chinese Americans also prefer family involvement in health education as the family is regarded as a

significant source of health information (Kreps & Sivaram, 2008:2333; Ho *et al.*, 2012:73). Another study investigated the effects of a health literacy approach to African American men's knowledge and understanding of prostate cancer. This study rendered the following results: The participants prefer accurate and straight-forward information to be provided to them by a HCP; the health information must motivate them to take action against the disease, must make accurate information available to peers, and encourage screening, prevention and care of prostate cancer (Friedman, Corwin, Dominick & Rose, 2009:449). It may thus be inferred that the targeted approach to making available health care information has positive results when applied correctly and taking into consideration the target audience's needs.

2.3.4 The significance of multiple strategies

This literature study leaves one with the impression that the use of multiple communication strategies is encouraged in the various contexts where health information needs to be disseminated. According to Kreps and Sivaram (2008:2334), the use of multiple strategies or a combination of strategies during health communication is essential because it allows a larger audience to be reached, increases the impact and efficiency of the message, and exposes all possible audiences to the message. However, it is of extreme importance that these messages should not be inconsistent and that the messages should support each other (O'Sullivan *et al*., 2003:149; Kreps, 2006:763; Centre for Reviews and Dissemination, 2009:88).

In an analysis of four public health campaigns in Ghana to assess the communication strategy used in each campaign, the 'Integrated Child Health Campaign', in which multiple strategies were used, was found the most successful. The campaign aimed at providing 2.1 million children under two years old with bed-nets, as well as immunizing children against measles and polio, and it succeeded in providing 96.4% Ghanaian children under two years old with these health services. A combination of communication strategies was used to disseminate health information: Volunteers from the village were trained and they provided interpersonal communication to the community (tailored strategy); 1.5 million leaflets about the

campaign were handed out at primary schools nationwide (print media), and radio and television (traditional media) were used widely in different languages to create an awareness of the campaign (Prilutski, 2010:55).

In Taiwan interactive multi-media digital video discs were used as an educational tool for patients with end-stage renal disease (interactive media). The patients were followed up with telephone interviews (traditional media) to check their progress and to address any possible concerns. This strategy resulted in a significant increase in knowledge and a decrease in uncertainties among the experimental group (Chiou & Chung, 2011:1227).

These examples all point to the importance of sensitive and adaptive communication strategies to be identified to respond to the needs of patients in order to achieve effective health dialogue.

2.4 HEALTH DIALOGUE

Throughout the literature, various other concepts are used interchangeably when reference is made to communication between the patient and the HCP. These other concepts that are used, include health education (Linn, 2008:457; Sanders Thompson, Cavazos-Rehg, Jupka, Caito, Gratzke, Tate, Deshpande & Kreuter, 2008:549), health information (Viswanath & Kreuter, 2007:S131; Hou & Shim, 2010:187; Wynia & Osborn, 2010:103), health promotion (Airhihenbuwa & Obregon, 2000:5; Elders, 2003:S200; Allegrante, Barry, Airhihenbuwa, Auld, Collins, Lamarre, Magnusson, McQueen & Mittelmark, 2009:478; Loescher, Crist, Cranmer, Androwski & Warneke, 2009:301), health counselling (Bradley, Hendriks, Lock, Whiting & Parr, 2011:68; Siminoff & Step, 2011:179; Gessler, Labhard, Stolt, Manga, Balo, Boffolo & Langewitz, 2012:343) and health dialogue (Bortree & Seltzer, 2009:317; Tveiten & Meyer, 2009:811). These concepts are explained in more detail in the following sections.

2.4.1 Interchangeable terminology used for the concept 'health dialogue'

Although different concepts are used when communication between the patient and the HCP is discussed, they are interconnected and related because these concepts all focus on improving the health outcomes of the patient. The five concepts mentioned warrant elucidation.

2.4.1.1 Health education

Health education refers to the sharing of information among people. Essential elements present in health education include active participation (Linn, 2008:457; Marks, Allegrante & Lorig, 2005:148); equal partnership between the patient and the HCP (Linn, 2008:457), culturally appropriate or customised information (Kreuter *et al*., 2000:312; Sanders Thompson *et al*., 2008:556), and familiar and trusted sources of information (Sanders Thompson *et al*., 2008:556).

The importance of culturally appropriate or customised information was proved in a study of Sanders Thompson *et al*. (2008:549) who reported on the significance of ethnic-specific statements and race-specific data in ensuring relevance to African Americans in colorectal cancer awareness campaigns. Television and printed media were recognised as trusted, familiar and accessible sources of information for African Americans in the study.

A literature review of online health-related support groups found that the internet was an important source of health education in cancer care and that males tended to use the internet more for informational support, while females found gratification in the social and emotional support provided by on-line support groups (Mo, Malik & Coulson, 2009:16).

The aim of health education is to improve the quality of life as demonstrated by the Nepal measles eradication health education programme that reduced the incidence of measles by 90% in one year. The great success of this health education programme was ensured by the participation of the community, culture-sensitive approaches and radio communication (Linn, 2008:455). The concept health education is commonly used in the context of health and communication between patients and HCPs in countries such as the United States of America (Kreuter *et al.*, 2000:305; Linn, 2008:455; Han *et al.,* 2009:113-117); the United Kingdom (Mo *et al*., 2009:17) and South Africa (Frantz, 2015:1).

2.4.1.2 Health information

Health information refers to the provision of information about health matters (McMullan, 2006:26). Essential elements in health information include sources of health information (McMillan, Avery & Macias, 2008:694; Goodall, Ward & Newman, 2010:31) and a patient-centred strategy (Hou & Shim, 2010:187). Hou and Shim (2010:194) claim that if the communication needs of the patient, such as a demand for openness, equal partnership and respect are perceivedly not satisfied at an interpersonal level with the HCP, the patient would consult other sources of information, especially the internet. In concurrence with this finding, McMullan (2006:25) also maintains that female patients with breast cancer readily turn to the internet if they are dissatisfied with information received from the HCP. It is important that HCPs acknowledge the active role that patients take in the management of their disease and that 'internet informed' patients must be referred to reliable and accurate sources of health information (McMullan, 2006:27).

The overall purpose of health information is to empower the patients to understand their conditions better and to enable them to make informed decisions (Goodall, Ward & Newman, 2010:28; Hou & Shim, 2010:188; Wynia & Osborn, 2010:103). A survey to explore the role of on-line health communication amongst older Americans shows that the group acknowledges the internet as very empowering in terms of providing health information (McMillan *et al.*, 2008:690). The older Americans really

embraced the internet as it assisted them to be active in their health care, to make decisions and to take greater responsibility for self-care.

Another ramification of internet usage is the social and emotional support provided by on-line support groups which enable individuals suffering from related conditions to share experiences and feelings. On-line support groups are widely used in health communication between patients and HCPs in countries such as Australia (Goodall *et al.*, 2010:28); the United States of America (McMillan *et al*., 2008:690; Hou & Shim, 2010:188; Wynia & Osborn, 2010:103), and the United Kingdom (McMullan, 2006:27).

2.4.1.3 Health promotion

Health promotion refers to methods that are used to promote and communicate health messages effectively (DuBenske, Gustafson, Shaw & Cleary, 2010:732; Graffigna, Gambetti & Bosio, 2011:669). Essential elements in health promotion include a two-way exchange of information (Loescher *et al*., 2009:301); active engagement (DuBenske *et al*., 2010:733); socio-cultural sensitivity (Airhihenbuwa & Obregon, 2000:13) and trained HCPs (Loescher *et al*., 2009:305). The objectives of health promotion include patient empowerment, active participation and taking greater responsibility in facilitating positive health outcomes (DuBenske *et al.*, 2010:733).

An example of an interactive health communication system employed for health promotion is the Comprehensive Health Enhancement Systems, used for advanced lung cancer patients and their families to provide information, communication and coaching services. The ‘discussion group’ and ‘personal stories’ options of the program enable users to discover other patients’ experiences and enable them to assess their own situation and make decisions. The instant library option of the program provides full text articles on lung cancer from peer reviewed journals on demanding issues (DuBenske *et al*., 2010:737).

In a qualitative study to explore at-risk families' perceived communication with HCPs, a participant mentioned that on consultation with the HCP about a spot on her skin after a previous melanoma, the HCP said that it was not necessary to remove it. On her insistence and because she played such an active role in her own care, it was tested and a second melanoma was diagnosed and removed. This example emphasises the undeniable importance of HCPs who are adequately trained in their area of expertise, to prevent serious and even fatal errors from occurring that may have detrimental effects on the trust relationship between the patient and the HCP (Loescher *et al*., 2009:305), as well as on the health of the patient.

Communication and health scholars (Airhihenbuwa & Obregon, 2000:5; Elders, 2003:S200), brand communication specialists (DuBenske *et al*., 2010:732), nurses (Kemppainen, Tossavainen & Turunen, 2012:490) and information technology specialists (Viswanath & Kreuter, 2007:S131) are some of the stakeholders promoting the concept of on-line health support in the United States of America (Loescher *et al*., 2009:301), Finland (Kemppainen *et al*., 2012:490) and Italy (Graffigna *et al*., 2011:669).

2.4.1.4 Health counselling

Health counselling refers to *"any assistance to an individual seeking to solve a health problem"* (Kurioka, Muto & Tarumi, 2001:427). Essential elements in health counselling include patient-centred communication (Gessler *et al*., 2012:348), sources of health counselling (Bradley *et al*., 2011:67) and trained providers (Gessler *et al*., 2012:344).

During a screening campaign for high blood pressure and raised blood glucose in rural Cameroon, Gessler *et al.* (2012:346) report on the importance of training staff to deal with hypertension and diabetes in order to improve their knowledge and skills. These authors reported that health counselling sessions were held between the participants and local staff with the aid of educational tools, which were sensitive to the culture and language of the group, enabling the group to relate to the tools better. In another example, Bradley *et al.* (2011:67) mentions that due to advanced

technology and the changing environment of communication, electronic mailing is considered an effective means of health counselling, provided *"that the counselor's ethical and legal responsibility ensures the welfare of the client and preserves professional boundaries".*

Health counselling aims to empower the patient through engagement, improve disease management and increase positive health outcomes for the patient (Ash, Reeves, Bauer, Dover, Vivanti, Leong, Sullivan, O'Moore & Capra, 2006:1558; Soderlund, Nilsen & Kristensson, 2008:103; Gessler *et al*., 2012:344). For example, health counselling improved the health decisions made by participants after screening for high blood pressure and high blood glucose since the newly diagnosed participants returned for their follow-up visits (Gessler *et al*., 2012:348), reflecting that they were taking greater responsibility for their health. The health counselling sessions not only improved the health care awareness amongst the rural population, but also motivated the staff. An array of professionals such as lawyers, counsellors, psychologists, social workers, nurses, nutritionists, pharmacists and physicians frequently use the concept in all parts of the world such as Cameroon (Gessler *et al*., 2012:343); the United States of America (Bradley *et al*., 2011:67; Siminoff & Step, 2011:178); Sweden (Soderlund *et al*., 2008:102) and Uganda (Wolff, Nyanzi, Katongole, Ssesanga, Ruberantwari & Whitworth, 2005:109).

2.4.1.5 Health dialogue

Health dialogue refers to a *"two-way conversation"* between people (Lebese, Davhana-Maselesele & Obi, 2010:35). Essential elements of health dialogue include a negotiated exchange of thoughts (Bortree & Seltzer, 2009:317); the patient is the principal person in the dialogue (Tveiten & Meyer, 2009:811); willingness to discuss matters openly (Lebese *et al*., 2010:34), working towards a shared understanding (Kiragu & McLaughlin, 2011:420; Keleman, Erdos, Csurke, Brettner & Molnar, 2012:36), sensitivity to the socio-cultural context (Lebese *et al*., 2010:35; Kiragu & McLaughlin, 2011:420), and building a trust relationship on respect and listening (Tveiten & Meyer, 2009:805; Kiragu & McLaughlin, 2011:421). During a focus group interview, that was conducted as part of a study (Hornsten, Lindahl, Persson &

Edvardsson, 2013:5), a health professional shared her experiences of health dialogue by commenting on the importance of focusing on the client and maintaining sensitivity to cultural, contextual and societal factors as these determined the level of engagement of the patient. She mentioned the change in focus from simply giving test results and health information to engaging with the patient on health matters, for example, by enquiring about the typical day in the life of the patient, instead of simply telling the patient what to do signals the difference between health dialogue and merely providing health information (Hornsten *et al.*, 2013:5).

The overall purpose of health dialogue is to increase the quality of life and health outcomes of the patient (Tveiten & Meyer, 2009:805). For example, in a cross-sectional study in the community of Habo in Sweden, a considerable reduction in fat intake, an increase in physical activity and a decrease in smoking habits were reported due to a health dialogue intervention that combined a community health programme with a health examination by a specially trained nurse (Lingfors, Lindstrom, Persson, Bengtsson & Lissner, 2003:249). While the nursing, mental health and social work arena in the Scandanavian countries such as Sweden (Lingfors *et al*., 2003:248; Hornsten *et al*., 2013:1), Norway (Tveiten & Meyer, 2009:804) and Hungary (Keleman *et al*., 2012:21) commonly uses the health dialogue concept, other countries use the concept to a lesser extent (Lebese *et al*., 2010:35; McMullan, 2006:27). It is clear, however, that specific characteristics occur over and over again in the various concepts. However, the available concept analysis by Reid (2015) provided the necessary structure to understand all the mentioned characteristics occurring within the discussed concepts.

2.4.2 Concept analysis of ‘health dialogue’

Reid’s concept analysis, according to Walker and Avant (2011), identified three defining characteristics of the concept ‘health dialogue’.

2.4.2.1 Characteristics

Defining characteristics refers to those features that allow one to distinguish one concept from another (Walker & Avant, 2011:167). The three defining characteristics of the concept 'health dialogue' are: 1) an equal, symbiotic health relationship between the patient and the HCP; 2) reciprocal health communication towards reaching 3) an identified goal via a health message (Reid, 2015). Besides defining characteristics, Walker and Avant (2011) recommend the identification of empirical referents, consequences and antecedents in their concept analysis method.

2.4.2.2 Empirical referents and consequences

Empirical referents refer to 'measurable ways to demonstrate the occurrence of the concept' (Walker & Avant, 2011:168); in other words, the presence of certain phenomena demonstrating that the concept has occurred. In Reid's concept analysis of health dialogue (Reid, 2015), the empirical referents included shared responsibility and decision-making, a health plan providing mutual benefit to the patient and HCP and context-sensitive communication strategies. It is also exactly these empirical referents that the researcher will use to measure whether 'effective health dialogue' did occur when measuring the outcome of identified articles included in the systematic review. Consequences refer to events that take place when the concept has occurred (Walker & Avant, 2011:168). According to Reid (2015), the consequence of health dialogue is an improved health status.

2.4.2.3 Antecedents

'Antecedents' refers to events that must transpire before the concept can occur (Walker & Avant, 2011:167). Reid identified the following three antecedents for health dialogue: 1) patient and HCP present a positive attitude towards health dialogue; 2) HCP displays sensitivity towards cultural, contextual and societal factors; and 3) HCP has received training on health matters and communication skills.

A positive attitude towards health dialogue implies that the patient and the HCP have an openness and willingness to share information (Wright & Frey, 2008:369), have a willingness to 'hear' each other (Loescher *et al*., 2009:306; Shue *et al*., 2010:363), and realise the need for consensus (Soderlund *et al*., 2008:103). Freire (1970:12) contends that when health dialogue occurs, people are able to *"unveil their word",* in other words, they are able to voice their problems, fears and concerns openly and freely. He emphasises that *"the heart of dialogue was open participation".* Soderlund *et al*. (2008:103) mention that it is important for the patient to display this state of readiness to enter into dialogue, or else, no lasting change will occur.

Sensitivity and mutual respect towards cultural, contextual and societal factors are imperative to ensure effective health dialogue. The HCP *"enters the patient's world"* and sees the illness through the eyes of the patient (Benzein & Saveman, 2008:443; Piccolo & Goss, 2012:146). The patient's own experiences and uniqueness, such as health literacy level, culture, language, technological skills, amongst others, must be taken into account in order to reflect respect and sensitivity (Sparks *et al*., 2007:181; Helitzer *et al*., 2011:22; Rodrigues, Bayliss, Alexander, Jeffreys, Olsen, Pollak, Garrigues, Tulsky & Arnold, 2011:940). Gestures, such as displaying active listening, non-judgement, engagement, confirmation and supporting the patient (Thorne, Harris, Mahoney, Con & McGuinness, 2004:305; Langer, 2008:390) are crucial in building a trust relationship with the patient. This develops into a symbiotic relationship (Degni, Suominen, Essen, Ansari & Vehvilainen-Julkunen, 2012:331; Eley, Young, Hunter, Baker, Hunter & Hannah, 2007:130) between the patient and the HCP, built on mutual trust and respect (Vivian & Wilcox, 2000:114; Benzein & Saveman, 2008:443), where there is a common, negotiated understanding and mutually agreed upon plan of action related to the health problem (Thorne *et al*., 2004:299; Heisler, Cole, Weir, Kerr & Hayward, 2007:1440; Benzein & Saveman, 2008:444; Kiragu & McLaughlin, 2011:421). Rensburg and Krige (2011:79) referred to this as an *"ongoing transactional process between communication partners where the one influences the other in order to attain mutual understanding".* It emphasises 'equal power, collaboration and negotiation' between the patient and the HCP.

It is essential that HCPs be trained rigorously in order to create an awareness and sensitivity to the cultural, contextual and societal needs of the patient (Sparks *et al.,* 2007:180; Redsell, Bedford, Siriwardena, Collier & Atkinson, 2010:59; Wynia & Osborn, 2010:113). The traditional medical paternistic model that medical staff members are socialised in - characterised by clinician-directed care and a submissive patient - needs to be replaced by a patient-centred approach, with a patient active in participation and decision-making (Soderlund *et al*., 2008:106). Literature consistently refers to HCPs that are unable to meet the health needs of the patient due to lack of effective communication skills, knowledge on health matters and cultural competence (Hausman, Hannon, Kresevic, Hanusa, Kwoh & Ibrahim, 2011:631; Helitzer *et al*., 2011:27). HCPs need to be empowered with the necessary knowledge and skills in order to promote health dialogue, and be sensitive to the unique needs of the patient. If the cultural, contextual and societal factors of the patient are not considered, effective health dialogue cannot take place as they pose barriers (Dearborn, Panzer, Burleson, Hornung, Waite & Into, 2006:640; Ishikawa & Kiuchi, 2010:1; Taylor, Nicolle & Maguire, 2013:43). It is important that health messages are individualised, tailored or targeted to the context to promote behaviour change (Sanders Thompson *et al*., 2008:558; Lee, 2010:169), and to create a better understanding of the problem (Gutheil & Heyman, 2005:108).

The interconnectedness of health dialogue and health communication strategies is clearly noted and are reflected in Figure 2.3. Effective health dialogue can be achieved by ensuring that the antecedents are in place and that the communication strategies are embedded within the antecedents.

In the next discussion, the health communication contexts (interpersonal, small-group and mass-media communication) are placed within specific environments. The uniqueness of the different environments implies that countries within an environment would be influenced by the structure of that enviroment.

2.5 THE SPECIFIC ENVIRONMENTS IN WHICH HEALTH COMMUNICATION OCCURS

The World Bank classified countries of the world according to their gross national income (GNI) per capita – in other words, the dollar value of the country's income in a year, divided by its population. Using the World Bank Atlas Method, the countries are then divided into various income groups, namely high income countries (HICs), upper middle income countries, lower middle income countries (MICs) and low income countries (LICs) (The World Bank, 2014: *s.p.* online). An elucidation of high, middle and low income countries needs to be provided.

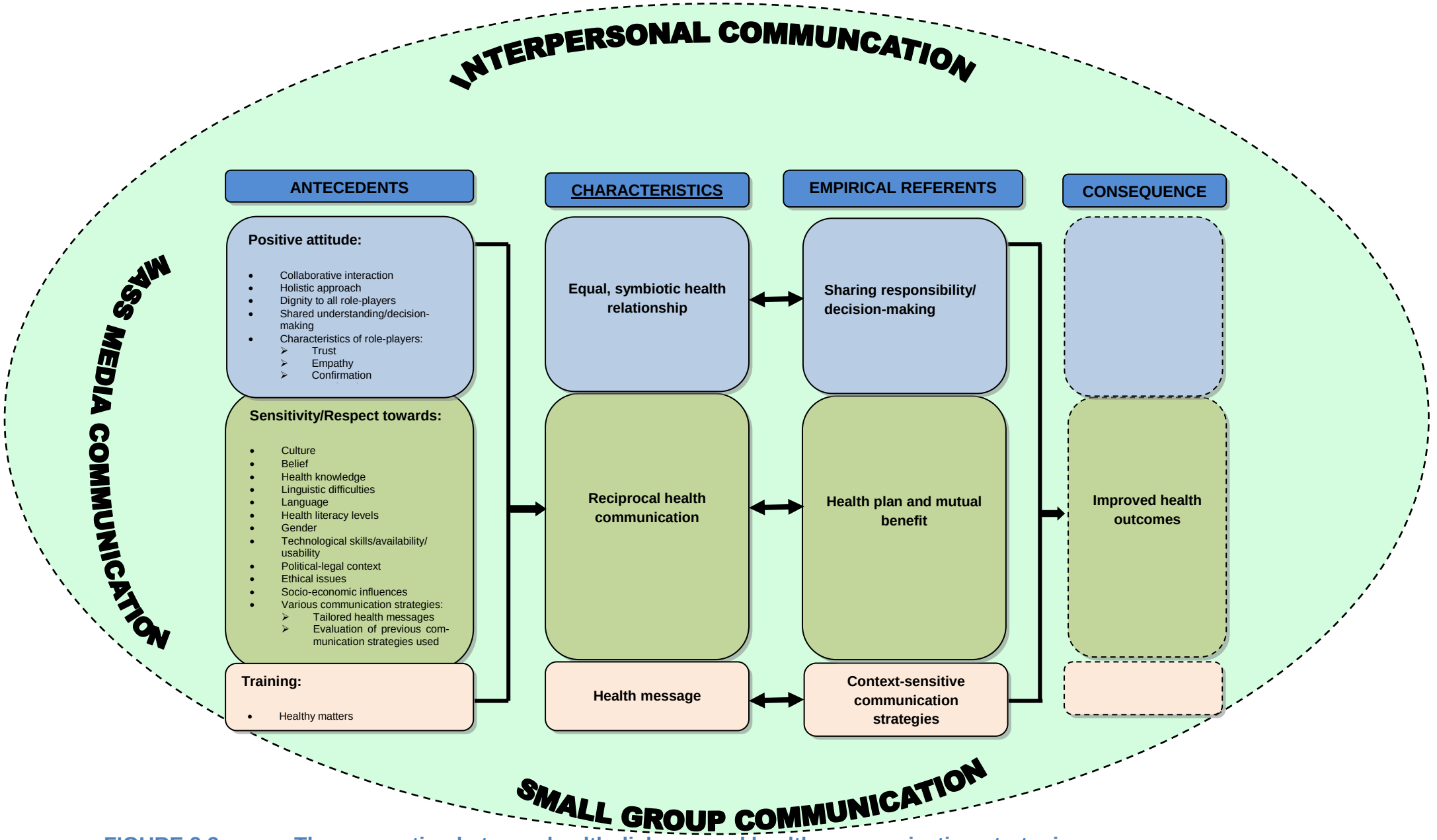

FIGURE 2.3: The connection between health dialogue and health communication strategies

2.5.1 High income countries (HICs)

According to the The World Bank Group (2014: *s.p.* online), HICs have a GNI per capita of $12.746 or more. HICs are often referred to as developed countries, and are the richest and most industrialised countries of the world. These countries' populations constitute a mere 15% of the world's population and include countries such as the United States of America, the United Kingdom and Japan (Henslin, 2010:245). These countries are home to the richest nations of the world and they have the highest standard and quality of living, which can be related to access to education and healthcare, employment opportunities, a safe environment and a competitive income. HICs are leaders in industry, have sound capital investments and utilize advanced technology and communication systems (Henslin, 2010:257).

The World Bank Group (2004:3) mentions that 85% of global research and development expenses are focused in HICs, resulting in the creation of new knowledge in these countries. DuBenske *et al*. (2010:732) report on the use of a web-based interactive health communication system in HICs which allows patients, families and clinicians to engage actively in cancer care and shared decision-making. Countries such as England and Finland have structured screening programmes for cervical cancer and the United States of America and Canada have random cervical cancer screening programmes. These programmes require extensive human and financial resources, as well as monitoring and evaluation systems; all of which are available in these countries (World Health Organization, 2011:4).

Due to their infrastructure and resources, HICs thus are able to make use of various communication strategies such as patient-centredness and social and interactive media to reinforce health messages and enable effective health dialogue (Tveiten & Meyer, 2009:804; Bortree & Seltzer, 2009:317; Hornsten *et al*., 2013:1).

2.5.2 Middle income countries (MICs)

According to the The World Bank Group (2014: *s.p.* online), MICs are divided into two groups, namely upper middle income countries and low middle income countries. Upper middle income countries have a GNI per capita of $4.126 to $12.745 and their inhabitants constitute 16% of the world's population. Upper middle income countries include countries such as Turkey, South Africa, China, Brazil and Botswana.

Low middle income countries have a GNI per capita of $1.046 to $4.125. Low middle income countries' inhabitants constitute 39% of the world's population; these are countries such as Zambia, India, Pakistan, Lesotho and Sudan (The World Bank Group, 2013: *s.p.* online).

The MICs thus make up 55% of the world's population and constitute the largest income group of the world (The World Bank Group, 2014: *s.p.* online). They are referred to as developing countries. The middle income countries are characterised by a low to average income and standard of living. Challenges of these countries relate to access to clean water, electricity, sanitation, lack of housing, fragmented health care systems, low education levels and poor communication systems (Henslin, 2010:248; Mills, 2014:552). South Africa, for example, has an out-dated infrastructure, high unemployment rate, lack of economic empowerment amongst disadvantaged groups and a public transport shortage (Maredza, Hofman, Preet, Kahn, Bangha & Kinsman, 2012:13). Unlike developed countries that have mechanisms for capturing and evaluating data concerning the population, many developing countries do not have these mechanisms in place and the number of deaths and specific causes of death have to be inferred from incomplete data (Fleischmann, Bertolote, De Leo, Botega, Phillips, Sisask, Vijayakumar, Malakouti, Schlebusch, Da Silva, Nguyen & Wasserman, 2005:1467; World Health Organization, 2011:2). Consequently, the communication strategies used in MICs will be different from those utilised in HICs due to the lack of infrastructure and resources.

2.5.3 Low income countries (LICs)

According to the The World Bank Group (2014: *s.p.* online), LICs have a GNI per capita of $1.045 or less and are also referred to as developing countries. These countries are home to 30% of the world's population. They include the poorest countries of the world, such as Afghanistan, Ethiopia, Mozambique, Uganda and Zimbabwe (The World Bank Group, 2013a: *s.p.* online).

These countries are characterised by a very low standard of living, in terms of access to trained professionals in healthcare and education; access to electricity, availability of clean and safe drinking water and other critical services. LICs experience widespread poverty (Henslin, 2010:249). LICs have severely weak and fragmented health systems and one of the worst effects of these systems is that they struggle to produce, recruit and retain health professionals in the country and the health sector. Gross lack of resources, such as low wages; poor working conditions; lack of supervision, equipment and infrastructure, results in an exodus of HCPs from LICs in search of better working conditions (Lehmann, Dieleman & Martineau, 2008:2). Thus, the communication strategies used in LICs will be different from those utilised in HICs due to the lack of infrastructure and resources in LICs.

It is therefore clear that the LMICs are a unique group of countries with a typical infrastructure and consequently these characteristics will impact on the management of diseases such as chronic diseases.

2.6 CHRONIC DISEASES

Chronic diseases, commonly referred to as non-communicable diseases or lifestyle-related diseases, are the leading cause of death worldwide (World Health Organization, 2008:5; World Health Organization, 2011:ii; Bloom, Cafiero, Jane-Llopis, Abrahams-Gessel, Bloom, Fathima, Feigl, Gaziano, Mowafi, Pandya, Prettner, Rosenberg, Seligman, Stein & Weinstein, 2011:i). In 2008, chronic diseases were responsible for 36 million deaths globally and it is estimated that by 2030 it will claim the lives of 52 million people per annum (World Health

Organization, 2011:5). The following aspects of chronic diseases will now be dealt with: definition; epidemiology; the global response to chronic disease and the challenges of LMICs in response to chronic disease.

2.6.1 Definition of chronic diseases

Chronic diseases refer to diseases of long duration and generally slow progression that cannot be passed from one person to the other. The four main types of chronic diseases are cardiovascular disease, cancers, chronic respiratory diseases and diabetes (Daar *et al*., 2007:495; World Health Organization, 2011a).

2.6.2 Epidemiology

Chronic diseases occur in people of all ages, socio-economic groups and cultures (Smeltzer *et al.*, 2010:145), despite common belief that chronic diseases afflict only the affluent and elderly (Anderson & Chu, 2007:211; Bloom *et al*., 2011:6). Chronic diseases are *"fuelled by a combination of rising risk factors",* namely tobacco use, an unhealthy diet, lack of physical activity and the harmful use of alcohol (United Nations General Assembly, 2011:2). The aging population, increased urbanization and the process of globalization are some of the reasons for the rise in the risk factors of chronic disease (Beaglehole & Yach, 2003:903; Bloom *et al*., 2011:4). However, the burden and nature of chronic diseases in LMICs exceeds that of HICs.

The lower resourced LMICs are disproportionately affected by chronic diseases, to the extent that 80% of cardiovascular and diabetes deaths; 90% of chronic obstructive pulmonary disease and more than 67% of all cancer deaths occur in LMICs (World Health Organization, 2011:1). According to the United Nations General Assembly Resolution on the prevention and control of non-communicable diseases (2010:2), *"the conditions in which people live influence their health and quality of life and the most prominent non-communicable diseases are linked to common risk factors, namely tobacco use, alcohol use, unhealthy diet, physical inactivity and environmental carcinogenics".* Furthermore, there is a distinct relationship between socio-economic inequalities, such as in education, income,

occupation, gender and ethnicity; chronic disease and its risk factors (United Nations General Assembly, 2011:8). Chronic disease and its risk factors worsen poverty by demanding money from the pocket for treatment, and poverty, in turn, results in growing rates of chronic disease, thereby creating a vicious cycle.

Yach, Hawkes, Gould and Hofman (2004:2620) report that individuals affected by chronic diseases are often at the prime of their lives and chronic disease results in a large number of premature deaths (as reflected in Figure 2.4), disability and enormous human suffering. Chronic diseases impact on the ability of the individual to be productive at work due to poor physical capacity, increase absenteeism and thus affect the generation of a household income for the family (World Health Organization, 2011:34). This also has a negative effect on the economy and places an enormous strain on already overwhelmed health systems in developing countries. Bloom *et al*. (2011:27) confirm that even in HICs such as the United States of America, hundreds of billions of dollars are spent annually on the prevention and control of chronic disease.

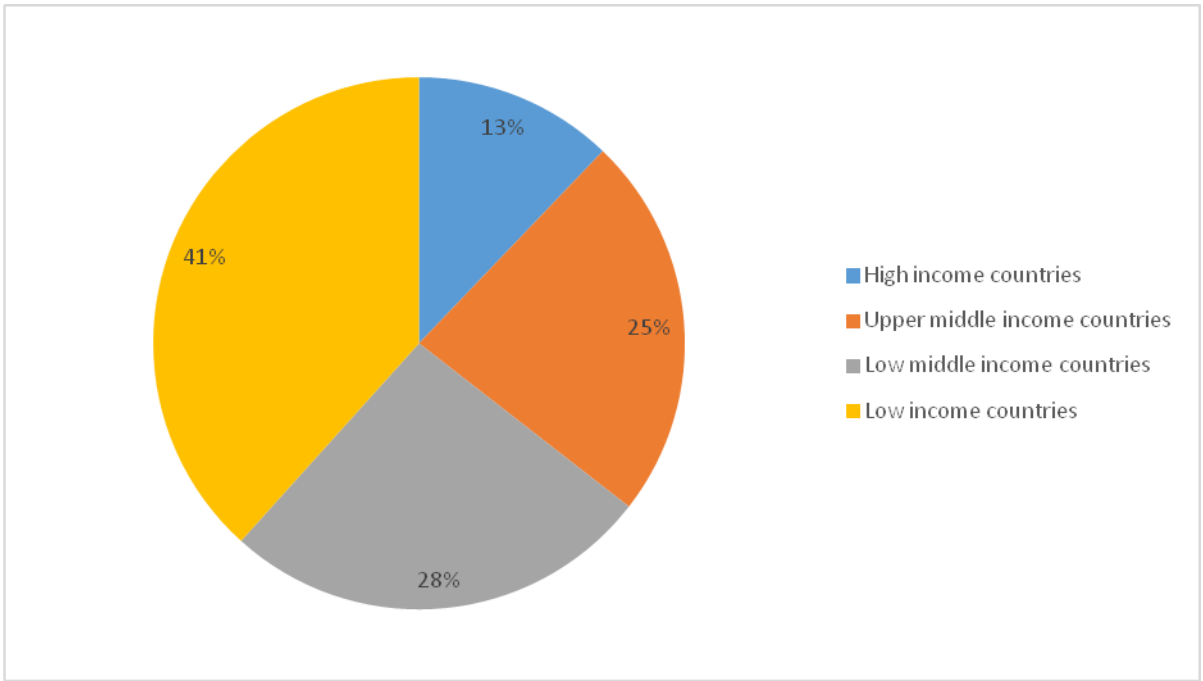

FIGURE 2.4: **Percentage of premature deaths under the age of sixty due to chronic disease according to income groups. Adapted from World Health Organisation (2011b:6)**

2.6.3 Global response to chronic disease

Global initiatives in the battle against chronic diseases started in the year 2000 when the World Health Organization (WHO), the primary specialised agency for health, endorsed a Global Strategy for the Prevention and Control of Non-communicable Disease. The global strategy gradually has led to the adoption of several resolutions in the battle against chronic diseases. These population-wide strategies addressed the risk factors of tobacco use, unhealthy diet, lack of physical activity and harmful use of alcohol: The WHO Framework Convention on Tobacco Control in 2003; The WHO Global Strategy on Diet, Physical Activity and Health with its suggested dietary guide-lines followed in 2004; The WHO Health Promotion and Healthy Lifestyles (2004); Strengthening Active and Healthy Aging (2005); Cancer Prevention and Control (2005); The Global Strategy on Harmful Alcohol Use in 2010 and the Action Plan for the Global Strategy for the Prevention and Control of Non-communicable Disease (2008-2013) (World Health Organization, 2008:6; World Health Organization, 2011:47). These resolutions emphasised the seriousness of the epidemic and the fact that member states and the international community have declared the chronic diseases epidemic, a priority.

Although the enormity of chronic disease is understood and strategies are suggested, lack of political commitment; inadequate involvement of non-health sectors; lack of resources and poor involvement of crucial stakeholders prevail (United Nations General Assembly, 2011:12). Many governments feel that chronic disease is an individual problem, not a governmental problem and therefore it needs individual management (Beaglehole, Ebrahim, Reddy, Voute & Leeder, 2007:2152). However, this global health problem requires multi-sectorial commitment, closer international collaboration and partnerships between heads of state and governments, the private sector, civil society, United Nations agencies and international organizations (United Nations General Assembly, 2011:15).

According to the WHO (2011:14), a study conducted between the years 2000 and 2010 acknowledges that the prevention and control of chronic disease are visible in HICs only, where health care systems have been strengthened and population-wide strategies are applied. Initiatives from HICs are recognized and 'best buys' are documented (Lee, 2007:42; Shilton, 2009:43), such as salt reduction through voluntary agreements with the food industry, control of and restrictions on use of alcohol and taxation of tobacco products (Strong, Mathers, Epping-Jordan & Beaglehole, 2006:493).

2.6.4 Challenges of LMICs in response to chronic disease

According to United Nations General Assembly (2011:13), chronic disease management requires a comprehensive health system; a knowledgeable and skilled workforce; cost-effective technologies; a trustworthy supply of medicine; a referral system, and people empowered for self-care. Ironically, the list above identifies some of the short-comings within LMICs (Beaglehole & Yach, 2003:903; United Nations General Assembly, 2010:2; United Nations General Assembly, 2011:12), and consequently there is a growing concern about the burden of chronic disease in the LMICs (Daar *et al*., 2007:494; Allegrante *et al*., 2009:477).

Sankaranarayanan, Budukh and Rajkumar (2001:960) reported on the absence of resources and capacity for health services in LMICs, especially with regard to effective screening programmes for cervical cancer. The United Nations General Assembly (2011:14) concurs that cancer patients face the reality of poor or no access to care, bringing about late diagnosis. There is a lack of trained oncologists and specialised nursing staff, the absence of diagnostic facilities such as pathology services and equipment and the limitation of oral morphine. Furthermore, there still is a lack of essential primary health care services in LMICs (United Nations General Assembly, 2011:13), despite the Alma Ata vision of Health for All (World Health Organization, 1978: *s.p*. online). LMICs have to move away from the hospital-centred focus in order to deal with the rising burden of chronic diseases and start focusing on comprehensive primary health care (United Nations General Assembly, 2011:13).

Stenberg and Chisholm (2012:57) report that LMICs have significant underinvestment in health services and revealed that these countries make do with 9,5 healthcare workers per 10,000 compared to the critical minimum of 22,8 per 10,000. This concurs with the findings of Lehmann *et al*. (2008:1), who reported severe staff shortages and mal-distribution of staff in LMICs, particularly in remote rural areas. Balabanova, McKee, Mills, Walt and Haines (2010:2) maintain that migration of staff and low skill levels are challenges in this incapacitated systems which can be addressed by *"initial training, life-long learning, skill mix and career progression".*

Communication and information systems in LMICs are very weak. Data capturing and surveillance mechanisms for screening, investigating, treating and follow-up are poor and/or non-existent (Sankaranarayanan *et al*., 2001:954; Fleischmann *et al*., 2005:1467). These are imperative systems for building research infrastructure into health systems.

Balabanova *et al*. (2010:2), proclaim that in many LMICs the health sector is the most corrupt sector, failing miserably due to poor governance. Ravinetto (2014:171) reports on the poor quality of medicines to which LICs in particular are exposed to, due to fabricated products (without regulatory approval); sub-standard products (with regulatory approval but not adherent to quality specifications) and degraded products (stored and transported inappropriately). The supply of drugs is adversely affected by poor procurement and distribution processes, as well as by counterfeiting and corruption (Balabanova *et al*., 2010:2). Travis, Bennett, Haines, Pang, Bhutta, Hyder, Pielemeier, Mills and Evans (2004:901) mention that environmental constraints such as the political instability, policy frameworks and poor governance often are more restrictive than the scarce resources in these countries.

It therefore becomes very clear that LMICs are poorly resourced and lack the infrastructure to combat chronic disease by themselves and that multi-sectorial commitment and focused action are essential in order to assist LMICs in the battle against chronic diseases.

2.7 SUMMARY

This chapter provided a discussion of the objectives of health communication strategies, as well as the various health communication strategies used within the interpersonal, small-group and mass-media communication contexts. The dynamics of health dialogue were considered, as well as the interchangeable use of other concepts such as health education, health information, health counselling and health promotion instead of the concept health dialogue. The interconnectedness of health dialogue and health communication strategies was made clear. The infrastructure of the various income groups was discussed in order to show that there is a difference in the infrastructure and resources available in LMICs which affects the management the growing burden of disease, especially that of chronic disease in terms of the implementation of communication strategies for effective health dialogue.

In the next chapter, the systematic review as research method will be discussed.

CHAPTER 3

Research methods and quality appraisal

3.1 INTRODUCTION

In the previous chapter, a detailed discussion of the literature on communication strategies to accomplish effective health dialogue in patients with chronic diseases in LMICs was provided. This chapter provides a description and grounding of the research method used in the study. First, the systematic review as research method is discussed, followed by the first four steps of the systematic review which relate to the identification and formulation of a focused review question; the generation of a search strategy, the execution of the search and the selection of relevant studies and, lastly, the critical appraisal of the selected studies. The measures taken to ensure rigour in these steps, as well as the ethical principles maintained in these steps are also described.

3.2 SYSTEMATIC REVIEW AS RESEARCH METHOD

The transfer of research evidence to practice and the need to keep HCPs *on par* with the latest research are no easy task. One reason for this is the over-abundance of health-related research over the past few decades. Fineout-Overholt, O' Mathuna and Kent (2008:45) contend that twenty to thirty thousand healthcare journals publish about two million scientific journals annually which leads to thousands of citations being added to databases. But, not all research is of high quality in terms of appropriate research methods, adequate sample size and good statistical analysis. It clearly becomes very difficult for HCPs who may not have the time, and in many cases access to the skill, to seek evidence to inform decisions (The Joanna Briggs Institute for Evidence Based Nursing and Midwifery, 2001:1; Sutherland, 2004:47; Fineout-Overholt *et al*., 2008:45). This is where the need for systematic reviews emerged as a systematic review is the first step to translate research evidence into practice.

Systematic reviews provide comprehensive, critical and unbiased summaries of existing evidence, where individual studies on a specific topic and of high methodological quality are brought together in one document after a rigorous means of searching, critical appraisal and synthesis (The Joanna Briggs Institute For Evidence Based Nursing And Midwifery, 2000:2; Akobeng, 2005:845). Traditional reviews have, however, always been around in healthcare literature.

Traditional reviews are used to collate existing knowledge and publish summaries on specific topics, and they are referred to as narrative reviews, literature reviews, critical reviews or commentaries. However, as from the 1980s, researchers criticised traditional reviews as unscientific and biased in terms of: 1) the absence of a peer-reviewed protocol; 2) an unclear search process; 3) unclear criteria for including and excluding studies, and 4) unclear criteria for judging the quality of included studies (The Joanna Briggs Institute for Evidence Based Nursing and Midwifery, 2001:3; Akobeng, 2005:1; Hemingway & Brereton, 2009:2). In this respect, Dr Archie Cochrane is known as the pioneer of systematic reviews due to his official introduction of the Cochrane Centre in the United Kingdom in 1992, which laid down the gold standard for systematic reviews (Sutherland, 2004:48; Fineout-Overholt *et al.*, 2008:46). The rigorous and systematic approach of systematic reviews sets it apart from traditional reviews as principles and rigour similar to those used in primary research are used. (The Joanna Briggs Institute For Evidence Based Nursing And Midwifery, 2000:2; Kitchenham, 2004:7; Centre For Evidence-Based Conservation, 2006:2; Centre for Review and Dissemination, 2009:v). Literature recognises systematic reviews as the *"highest level of evidence for medical decision-making"* (Badr, 2007:79; Wieseler & McGauran, 2010:1240).

➢ *Characteristics of systematic reviews*

Systematic reviews possess the following distinct characteristics, namely a:

- peer-reviewed protocol;
- clearly focused review question in the research plan;
- well-defined, exhaustive search strategy;
- meticulously recorded search strategy;
- clearly specified inclusion and exclusion criteria; and
- clearly defined guidelines on the extraction and assessment criteria of each study (Kitchenham, 2004:2; Akobeng, 2005:845; Whittemore, 2005:58; Hemingway & Brereton, 2009:3-4; De Souza *et al*., 2010:102).

This study also complies with all of these characteristics.

A systematic review was chosen as research method for this study as it is built on a rigorous process of identifying evidence from multiple sources, evaluating the methodological quality of each relevant study, synthesising and summarising the best available evidence relevant to the research question (Glasziou *et al*., 2001:3; Melnyk & Fineout-Overholt, 2005:115; Mayer, 2010:367; Gough *et al*., 2012:2). The steps taken by the researcher to collect and analyse evidence and, ultimately, to answer the research question are described to such an extent that if somebody wanted to repeat the study, he or she could do precisely what the researcher did. This method will provide the best available evidence on communication strategies to accomplish effective health dialogue in patients with chronic diseases in LMICs. Having been aware of the strengths of this method, the researcher capitalised on these strengths.

➢ *Strengths of systematic reviews*

Systematic reviews have the ability to summarise research in an unbiased way due to the explicit steps within the method (The Joanna Briggs Institute for Evidence Based Nursing and Midwifery, 2001:2; Sutherland, 2004:49). Consequently, the researcher followed the pre-determined protocol meticulously to prevent methodological flaws that may create bias and compromise the quality of the review.

Large amounts of information related to the review question are filtered according to quality and then synthesised (Sutherland, 2004:47; Akobeng, 2005:845; Whiting, 2009:35). The researcher was able to execute a comprehensive and transparent literature search that filtered studies down to a final sample that was finally critically evaluated in terms of the methodological quality by four reviewers.

Through systematic reviews, research is appraised for consistency, generalisability and accuracy using an explicit, rigorous and reproducible approach (The Joanna Briggs Institute for Evidence Based Nursing and Midwifery, 2001:2; Sutherland, 2004:49), with rigour being the most important aspect. The nature of the literature search was very explicit and thus, the researcher was guided by a review question that includes a population of interest, the intervention, the comparison and outcomes to be measured, the determined search strings and data sources, as well as the inclusion and exclusion criteria. Furthermore, the focused and systematic search will allow it to be reproduced if needed.

Lastly, systematic reviews are valuable because they inform future research agendas (Noordzij, Hooft; Dekker, Zoccali & Jager, 2009:1131; Hamunen, 2012:68). Any gaps in literature identified by the researcher in this study can set the stage for future research.

➢ *Overview of methodological steps of the systematic review*

This review followed the methodological steps of the systematic review as recommended by Higgins and Green (2006:16). These steps are similar to that of an integrative review. A succinct description of each step follows:

STEP 1: Identification and formulation of a focused review question

In this step, a focused review question based on the PICO format must be formulated to guide the review process (Melnyk & Fineout-Overholt, 2005:29-30; Whittemore & Knafl, 2005:548; Mayer, 2010:15-16; American Dietetic Association, 2012:17). Step 1 is followed by the generation of a search plan.

STEP 2: Generating a search strategy

This step is characterised by the development of a comprehensive search strategy that is an essential part of the review process (Whittemore & Knafl, 2005:548; Centre for Review and Dissemination, 2009:16; American Dietetic Association, 2012:21). The purpose of the search strategy is to identify the best available evidence relevant to the review question. The actual search is implemented in the next step.

STEP 3: Executing the search and selecting the relevant studies

The search strategy is executed and the large sample of literature generated by the search is filtered to create the final list of studies for critical appraisal. Meticulous record-keeping throughout the whole search process is essential to ensure an audit trail, transparency and repeatability (Noordzij *et al*., 2009:1131). Critical appraisal of each study follows.

STEP 4: Performing the critical appraisal and evaluating the methodological quality of selected studies

The methodological quality of the included studies will be critically assessed during this process and will include the use of appropriate assessment instruments such as those developed by the Critical Appraisal Skills Programme (CASP) (American Dietetic Association, 2012:38). Critical appraisal was carried out by four reviewers in a round table consensus discussion as expertise in various methodologies is essential to perform critical appraisals. The end product of the critical appraisal stage determined the studies to be included in following steps, namely the data extraction and synthesis steps.

STEP 5: Extracting data

Detailed information of each study, regarding its characteristics and findings, is retrieved from the included studies and summarised in an organised manner in a data extraction table. To increase the credibility and transparency of this review, the data extraction was carried out by four researchers (*cf.* Centre for Review and Dissemination, 2009:76). This step leads to the analysis and synthesis step.

STEP 6: Analysing and synthesising

Thematic analysis is the most common form of analysis used in synthesis in a systematic review. This brings about the identification of themes and sub-themes from the findings (American Dietetic Association, 2012:65). The researcher is now able to draw conclusions (or concluding statements) based on the findings.

STEP 7: Formulating the concluding statements

Conclusions of the findings of the reviewed literature are then formulated based on the analysis and synthesis steps and serve as bottom-line answers of the review question. Conclusions of the findings are presented in an organised manner. All limitations are clearly stated and recommendations are described. A concluding

statement to answer the review question is also formulated (American Dietetic Association, 2012:67-70).

The first four steps of a systematic review followed by the researcher in the study will be discussed in more detail next and the other three steps will follow in the next chapter.

3.3 STEPS 1-4 OF A SYSTEMATIC REVIEW

This section focused on the first four steps of the systematic review only, which starts off with the identification and formulation of a focused review question. Table 3.1 represents the methodological steps of the systematic review as recommended by Higgins and Green (2006:16).

TABLE 3.1: Steps of the systematic review according to Higgins and Green (2006:16) – discussion of steps 1-4

Step 1	Identification and formulation of a focused review question
Step 2	Generation of a search strategy
Step 3	Execution of the search and selection of the relevant studies
Step 4	Performing the critical appraisal and evaluating the methodological quality of selected studies
Step 5	Extracting data
Step 6	Analysing and synthesising
Step 7	Formulating the concluding statements

3.3.1 Step 1: Identification and formulation of a focused review question

A focused review question is necessary to guide and lead the whole process of the systematic review (Melnyk & Fineout-Overholt, 2005:40; Whittemore, 2005:58; De Souza *et al*., 2010:104; Gough et al., 2012:58). A focused review question means that specific variables, such as the population of interest; the intervention of interest; the comparison or control of the intervention and the outcome(s) of interest, are discussed. These variables constitute the acronym PICO which is recognised as the standard in guiding the structure of any review question (Melnyk & Fineout-Overholt, 2005:29-30; American Dietetic Association, 2012:15-16). The researcher has applied

the specific variables, referred to as PICO, to guide the review question covering the time period 1 January 2000 to 31 December 2014 and it is represented in Table 3.2. After application of the PICO standard, the review question was formulated.

TABLE 3.2: Variables that constitute the review question for the study

VARIABLES	CLARIFICATION OF VARIABLES
Population	Adults with chronic diseases in low- and middle-income countries
Intervention	Communication strategies
Comparison interventions	Routine communication strategies
Outcome of interest	Effective health dialogue as evidenced by a shared understanding of responsibility, development of a mutually agreed upon plan of care, the implementation of health communication strategies appropriate to the context and the acknowledgement of a mutually beneficial relationship.
The subsequent review question of the study:	
Which communication strategies (**I**) are used during effective health dialogue (**O**) with adults with chronic diseases in low- and-middle income countries (**P**) in terms of: 1) How communication is conducted, 2) when communication is conducted, 3) what is communicated, 4) where communication is conducted, and 5) by whom communication is conducted?	

3.3.2 Step 2: Generation of a search strategy

It is essential to develop a pre-determined, transparent and systematic search strategy. This enables the identification of as much potentially relevant evidence as possible, minimises bias in the study and improves the reliability of the study (Akobeng, 2005:845; Higgins & Green, 2006:65; Noordzij *et al*., 2009:1131). Furthermore, search strategies are designed to increase the sensitivity and specificity of the relevant studies (Centre for Review and Dissemination, 2009:19).

The search strategy consists of the following components: **search words, data sources, and inclusion and exclusion criteria,** and **a period of publication** to be regarded as relevant and recent. Each of these concepts are explained as they were addressed, starting off with the **search words.**

3.3.2.1 Search words

The researcher broke the review question down into separate divisions, namely, the population, the intervention, the comparison and the outcome (PICO). A group of synonyms and related concepts were created for each division which were used in the literature search as search words (*cf.* Kitchenham, 2004:8; Rew, 2011:66). The combination of search words that were used, is illustrated in Table 3.3.

To establish the availability of studies relevant to the research question, a rapid appraisal of the evidence was performed by running a wide search of the electronic databases with the assistance of an experienced librarian. The rapid evidence appraisal identified 2534 studies and informed the researcher that evidence related to the research question was available. This step further clarified the appropriate search terms and provided information on the most cited publications.

A second, more specific search string was run that excluded the search words referring to minority groups, such as Afro-American, Latino or immigrant groups, however, even more studies (n=5 600) were identified. After consultation with both supervisors, a decision was taken to use the first search string (n= 2534) and that studies referring to ‘minority groups’ would be excluded manually. This led to the next component of the search strategy, namely the selection of data sources.

TABLE 3.3: Search words created according to the PICO of the study

VARIABLES	SEARCH WORDS
Population: Studies of adults with chronic diseases in low- and middle-income countries	*(Diseas* or illness* or condition* or medical*) And ("Developing country*" or "Developing world*" or "low income country*" or "middle income country*" or afro-American* or "African American*" or latino* or aborigin* or minor* or immigrant* or disadvantaged* or blacks)*
Intervention: Communication strategies	*And (Communication or "Communication strategy*" or "Communication technique*" or "Communication method*" or "method* of communicat*" or "technique* of communicat*" or "strategy* of communicat*")*
Comparison interventions	*Routine communication strategies*
Outcome of interest: Effective health dialogue	*("Health dialog*" or "Health communication*" or "Health educat*" or "Health promot*" or "Health counsel*" or "health information*")*

3.3.2.2 Data sources

The researcher utilized multiple sources of data, such as **electronic data bases, reference list checking and contact with the authors of studies** to identify relevant evidence. In this study, only primary studies were used although the study was open to primary studies of any type of methodology whether published or unpublished studies.

➢ *Electronic data bases*

An electronic search of the data bases was performed to obtain primary data relevant to the study (Higgins & Green, 2006:65). EBSCOhost served as a platform to search for electronic evidence in a number of databases (n=2534). Various other platforms were also added to the initial search. These platforms included ProQuest, Scopex, Nexus and Google Scholar, which added an additional (n= 912) studies. Table 3.4 provides a breakdown of the total number of electronic platforms and data bases used to identify the data which accumulated. These platforms, data bases or a combination of databases were chosen purposively based on accessibility and comprehensiveness. A combination of search words using the 'OR' and 'AND' operators, as depicted in Table 3.3, were used to retrieve published and unpublished

literature from various data bases. After the electronic data bases were searched, the manual checking of reference lists occurred.

TABLE 3.4: Electronic platforms and data bases used to identify data

PLATFORM	DATA BASES	NUMBER OF ABSTRACTS OBTAINED
EBSCOhost **National and international journal articles**	Academic Search Complete	900
	PsycINFO	338
	Health Source: Nursing/Academic Edition	333
	Communication & Mass Media Complete	207
	CINAHL with full text	161
	SOCINDEX with full text	134
	Master FILE Premier	85
	Africa-Wide Information	84
	Business Source Complete	74
	SPORTDiscuss with full text	70
	Library, Information Science & Technology Abstracts	44
	ERIC	26
	Teacher Reference Center	19
	Humanities Source	16
	Health Source – Consumer Edition	13
	Legal Source	11
	Political Science Complete	6
	PsycARTICLES	6
	ECONLIT with full text	4
	Green File	2
	Art Source	1
ProQuest **International database of dissertations and theses**		195
Scopus **International database of abstracts of peer-reviewed journals, dissertations, theses and citations**		704
Nexus **National database of dissertations, theses, completed and current research in South Africa**		10
Google Scholar **International search engine of journal articles and grey literature, for example conference proceedings and unpublished theses**		3
Total		3446

➢ Reference list checking

All studies related to the review question were identified and the reference lists of these studies were checked for additional studies and potential relevance to the search (Centre for Review and Dissemination, 2009:17; Gough *et al*., 2012:125). The manual search of these reference lists led to the identification of fifteen relevant studies. Authors of studies were the final data source utilised in the study.

➢ *Contacting the authors of studies*

In cases where the publications could not be found or was in a language the researcher could not understand, authors of studies were contacted (*cf.* Centre for Review and Dissemination, 2009:18; Gough *et al.,* 2012:124-125). Three authors of studies were contacted by electronic mail during the review. The author of the first article was contacted as the relevant study did not report on the findings of the study and the researcher had to establish whether the findings of the study was available since that specific study was included for the critical appraisal. The author of the article was Mash and he was very helpful and provided a copy of the newly published article that included the findings of that study. In this study, it looks as if these two publications are separate, but they are considered as one because the one publication describes the intervention and the other publication, the findings. The author of the second article was contacted as the researcher was unable to make a decision about the study based on the abstract without the full article. He gladly provided the researcher with an electronic copy of the article and based on the article, the study was excluded. The author of the third article, however, did not respond to various electronic mails and despite other search methods such as inter-lending library options and electronic searches, the article could not be traced and this search was aborted. The article thus fell out.

3.3.2.3 Inclusion and exclusion criteria

The following criteria were considered imperative for inclusion in the study:

- literature in English, as well as studies written in other languages with an English abstract;
- adults living with chronic diseases;
- literature that reflect health dialogue between the patient and HCP, irrespective of the context;
- literature from low- and middle-income countries; and
- literature from 1 January 2000 to 31 December 2014.

The following criteria excluded studies from becoming part of the study:

- literature in languages other than English with no English abstract available;
- literature from studies conducted in HIC's;
- literature from minority or disadvantaged groups conducted in HIC's;
- studies conducted on participants younger than 18 years;
- literature before the year 2000;
- literature in the form of editorials and letters to the editor; and
- literature focusing on prevention of chronic diseases.

The actual search and its findings are discussed in Step 3.

3.3.3 Step 3: Execution of the search and selection of the relevant studies

The search process, as well as the filtering process leading to the study selection, has been reflected in Figure 3.1. The implementation of the search strategy led to the identification of a huge number of studies (n= 3464). The abstracts of all these studies were retrieved from the library with the assistance of an experienced librarian. Guided by the supervisor, a decision was then taken to analyse each abstract manually according to the specifications of the review question, namely 1) how communication is conducted; 2) when communication is conducted; 3) what is communicated; 4) where communication is conducted and; 5) by whom communication is conducted. This was a very strenuous and time-consuming exercise, but it allowed the reviewer to analyse the abstracts according to the questions immediately and exclude studies not related to communication strategies used to accomplish effective health dialogue in adults with chronic diseases in LMICs**.** The researcher had to have a very clear understanding of the variables included in the search in order to do this exercise. To identify the relevant studies from the total hits found in the search (n=3464), the actual selection of relevant studies occurred in four phases.

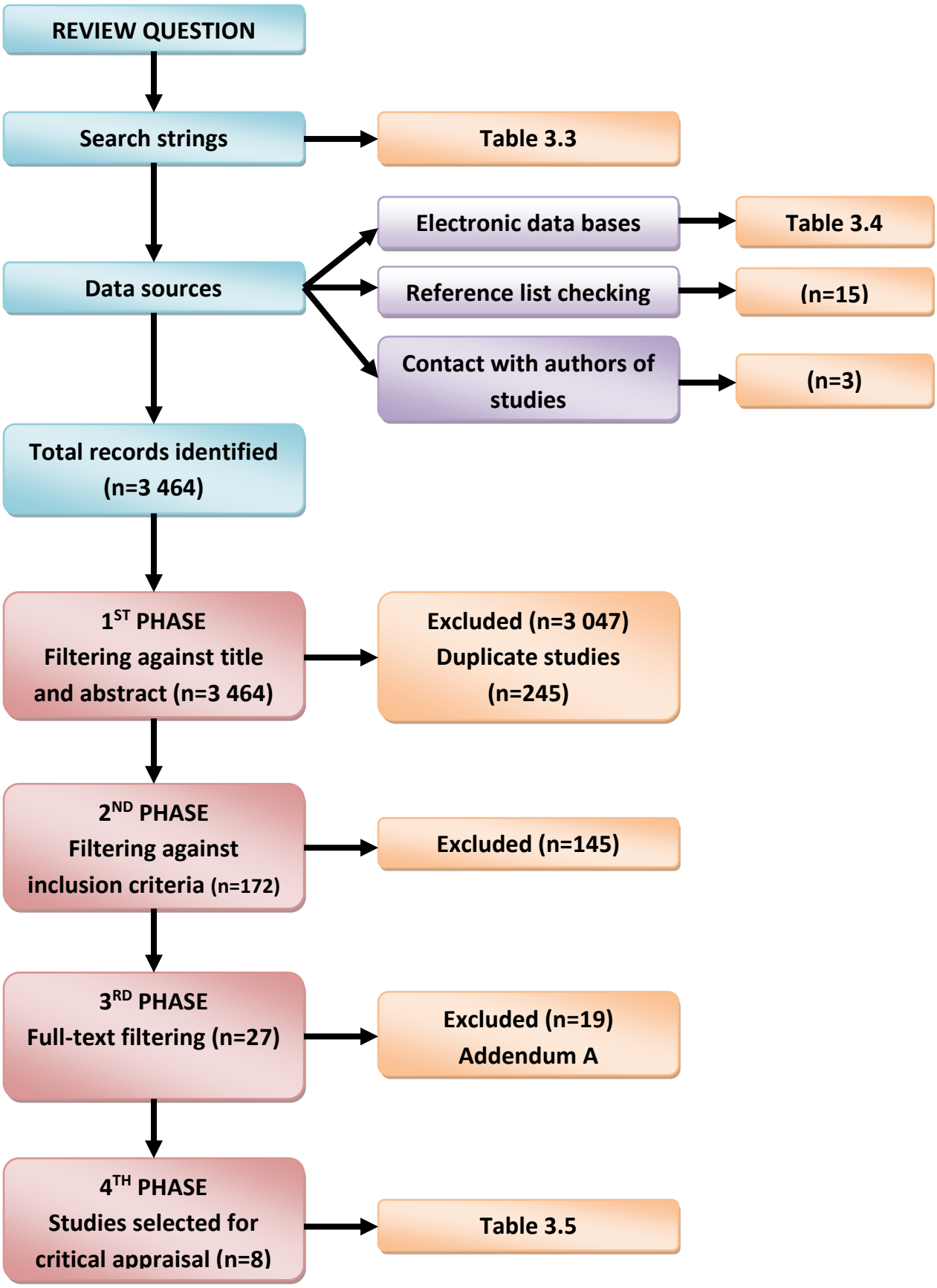

FIGURE 3.1: The search process followed in the study as well as the process of filtering studies

During the first phase, all studies (n=3464) were filtered against the well-defined review question based on their titles and abstracts by the researcher (*cf.* Centre for Review and Dissemination, 2009:23; American Dietetic Association, 2012:22). A huge amount of studies were excluded in this respect (n=3047). Duplicate studies (n= 245) were furthermore identified and excluded to prevent them from being regarded as 'separate studies' (*cf.* Centre for Review and Dissemination, 2009:25), as duplicate studies referred to the exact same study that was found in a different database in this study. It was not possible to remove the duplicate studies electronically because the various platforms did not allow the 'cross function'.

During the second phase, the abstracts of the remaining studies (n= 172) were filtered against the clearly defined inclusion and exclusion criteria by the researcher. If the study was excluded (n=145), it was either completely irrelevant to the study or it did not meet one or more of the criteria.

During the third phase, the full text of the remaining studies (n=27) were retrieved and thorough filtering against the inclusion and exclusion criteria occurred by four reviewers. This phase further excluded nineteen studies. Addendum A (page 151-159) provides a table of the articles excluded after filtering the full text. The various levels mentioned in this section, constituted a filtering process that reduced the number of studies to those specific to the review question and led to a final group of studies for critical appraisal (*cf.* Centre for Review and Dissemination, 2009:23; American Dietetic Association, 2012:22).

During the fourth and final phase, the final list of studies (n=8) was agreed upon by the researcher and the independent reviewers to ensure methodological quality. An updated literature search was conducted three months after the initial search to ensure that no studies had been missed; however, the search did not yield any new studies. By updating the search, the rigour of the study was strengthened (*cf.* Centre for Review and Dissemination, 2009:20).The final list of studies selected for critical appraisal follows in Table 3.5.

TABLE 3.5: Studies selected for critical appraisal (n=8)

BIBLIOGRAPHIC DETAILS AND CONTEXT	DESIGN
1. Mash, B; Levitt, N.; Steyn, K; Zwarenstein, M; Rollnick, S. 2012. Effectiveness of a group diabetes education program in underserved communities in South Africa: Pragmatic cluster randomised control trial. *Biomed Central (BMC) Family Practice*, 13(1):126-132. South Africa (Cape Town). **[1]Mash, RJ; Rhode, H; Zwarenstein, M; Rollnick, S; Lombard, C; Steyn, K; Levitt, N. 2014. Effectiveness of a group diabetes education program in underserved communities in South Africa: a pragmatic cluster randomised controlled trial. *Diabetic Medicine*, 31(8):987-993. South Africa (Cape Town).**	Pragmatic cluster randomised controlled trial
2. Pop-Eleches, C; Thirumurthy, H; Habyarimana, JP; Zivin, JG; Goldstein, MP; de Walque, D; Mackeen, L; Haberer, J; Kimaiyo, S; Sidle, J; Ngare, D; Bangsberg DR. 2011. Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: A randomised controlled trial of text message reminders. *AIDS,* 25(6):825-834. Kenya.	A randomised controlled trial
3. Kim, S; Kim, H. 2008. Effectiveness of mobile and internet intervention in patients with obese type 2 diabetes. *International Journal of Medical Informatics*, 77(6):399-404. South Korea.	Quasi-experimental design with pre. and follow-up tests for twelve months
4. Piette, JD; Datwani, H; Gaudioso, Sofia; Foster SM; Westphal, J; Perry, W; Rodriquez-Saldana, J; Mendoza-Avelares, MO; Marinec, N. 2012. Hypertension Management Using Mobile Technology and Home Blood Pressure Monitoring: Results of a Randomises Trial in two Low- / Middle-Income Countries. *Telemedicine and e-Health*, 18(8):613-620. Honduras and Mexico.	Randomised trial with a six-week follow-up
5. Lester, RT; Ritvo, P; Mills, EJ; Kariri, A; Karanja, S; Chung, MH; Jack, W; Habyarimana, J; Sadatsafavi, M; Najafzadeh, M; Marra, CA; Estambale, B; Ngugi, E; Blake Ball, T; Thabane, L; Gelmon, LJ; Kimani, J; Ackers, M; Plummer, FA. 2010. Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): A randomised trial. *The Lancet*, 376:1838-1845. Kenya.	An individually randomised, parallel, multisite controlled trial.
6. Siedner, MJ; Haberer, JE; Bosco Bwana, M; Ware, NC; Bangsberg, DR. 2012. High acceptability for cell phone text messages to improve communication of laboratory results with HIV-infected patients in rural Uganda: a cross-sectional survey study*. BMC Medical Informatics and Decision Making*, 12(1):56-62. Uganda.	Cross-sectional survey
7. Kasikci, MK. 2011. Using self-efficacy theory to educate a patient with chronic obstructive pulmonary disease: A case-study of 1-year follow-up. *International Journal of Nursing Practice*, 17(1):1-8. Turkey.	A single patient case-study.
8. Curioso, WH; Kurth, AE. 2007. Access, use and perceptions regarding Internet, cell phones and PDAs as a means for health promotion for people living with HIV in Peru. *BMC Medical Informatics and Decision Making*, 7(24):1-7. Peru.	A qualitative study

[1] Mash *et al*., 2014.is a newly published article that included the findings of Mash *et al*., 2012. In this study, it looks as if these two publications are separate, but they are considered as one because the one publication describes the intervention and the other publication, the findings.

3.3.4 Step 4: Performing the critical appraisal and evaluating the methodological quality of selected studies

Critical appraisal involves the evaluation of the methodological quality and validity of the selected studies by two or more reviewers using a critical appraisal instrument. The studies that were included for critical appraisal as reflected in Table 3.5, constituted a methodologically heterogenous sample since it consisted of five randomised controlled studies (RCTs), one case-study, one qualitative study and a cross-sectional survey. The one quasi-experimental design was also classified as a RCT since it met the criteria of a RCT during critical appraisal. The fact that five RCTs were included for critical appraisal strengthened the quality of the review despite their diversity in terms of aims, strategies, interventions and focuses. The case-study and qualitative study brought along their own unique strength to the review since it provided in-depth information that RCTs could not provide.

Four reviewers conducted the critical appraisal of the study to ensure the validity and to increase the reliability of the process (inter-assessor reliability) (*cf.* Centre for Review and Dissemination, 2009:29). The researcher and three senior researchers with experience in systematic reviews conducted the critical appraisal and a round table consensus discussion was held.

Researchers acknowledge there was no ‘gold standard’ in the evaluation and interpretation of research in reviews (Whittemore, 2005:59; De Souza *et al*., 2010:104). However, critical appraisal instruments were designed to assist researchers in evaluating the methodological quality of studies and include questions on scientific validity and applicability to practice (American Dietetic Association, 2012:48). The following critical appraisal instruments were used in the study, based on their appropriateness to the research design of the selected studies:

- Critical appraisal tool for randomised controlled trial (Critical Appraisal Skills Programme, 2006: online (Addendum B, page 160);

- Critical appraisal tool for qualitative research (Critical Appraisal Skills Programme , 2006a: online) (Addendum C, page 166);

- Critical appraisal guidelines for single case study research (Atkins & Sampson, 2002:107) (Addendum D, page 173) and

- Critical appraisal tool for descriptive / cross-sectional studies (Guyatt, Sackett & Cook, 1994:1) (Addendum E, page 184)

Table 3.6 reflects the critical appraisal process that was followed for each selected study. The information captured during critical appraisal included bibliographic details and context; methodology; intervention and outcomes and critical appraisal and level of evidence. Furthermore, a hierarchy of methodological design or classification system scored the value of the studies in terms of their methodological rigour as reflected in Addendum F (page 189). Studies were thus weighed according to their level of evidence and this is also reflected in Table 3.6. It goes without saying that studies of poor methodological quality will influence the integrity of the review (Centre For Evidence-Based Conservation, 2009:8) and are usually excluded at this stage with explicit reasons. This process ensures only the best possible evidence based on the research design.

TABLE 3.6: Critical appraisal of selected studies (n=8)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
1. Mash, B; Levitt, N; Steyn, K; Zwarenstein, M; Rollnick, S. 2012. Effectiveness of a group diabetes education program in underserved communities in South Africa: Pragmatic cluster randomised control trial. *Biomed Central (BMC) Family Practice,* 13(1):126-132. South Africa (Cape Town). **Mash, RJ; Rhode, H; Zwarenstein, M; Rollnick, S; Lombard, C; Steyn, K; Levitt, N. 2014. Effectiveness of a group diabetes education program in underserved communities in South Africa: a pragmatic cluster randomised controlled trial. *Diabetic Medicine*, 31(8):987-993. South Africa (Cape Town).**	**Aim:** To evaluate the effectiveness of group diabetes education in under-served communities in South Africa. **Design:** Pragmatic cluster randomised controlled trial **Setting:** 34 public sector community health centres in Cape Town Metropolis **Sample:** 1 570 participants: 710 type II diabetic patients randomly assigned to intervention arm, and 860 type II diabetic patients, to control arm. Randomly allocated by computer-generated random numbers. Patients, health promoters and research assistant could not be blinded to the health centre's allocation. Both groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	**Primary outcome:** Improved diabetes self-care **Secondary outcome:** Improved locus of control, self-efficacy, mean weight loss, blood pressure, waist circumference, glycosylated haemoglobin (HbA1c), cholesterol and quality of life **Questionnaires** were used to measure self-care activities, locus of control, self-efficacy and diabetes quality of life. **Data collection:** Data were collected at base-line and 12 months later: 1) physical measurements of all patients (weight, waist circumference and blood pressure); 2) laboratory HbA1c and total cholesterol; 3) personal data, and 4) medication use and new diagnoses were recorded at follow-up. **Intervention group** received four sessions of group diabetes education lasting 20-60 minutes on scheduled visits. The group consisted of 10-15 people. The following information was provided by health promoters in a guiding style of communication: Session 1: Understanding diabetes Session 2: Living a healthy lifestyle Session 3: Understanding the medication Session 4: Preventing complications The **health promoters** received four day's training on communication skills and diabetes knowledge prior to the study. A further 2-day training session was held two months later to reinforce initial training and to discuss the contents of the last two sessions.	**Critical appraisal instrument used:** Critical Appraisal Skills Programme randomised controlled trial study tool. A clearly focused issue was addressed and an appropriate design was applied. All patients who entered the trial were accounted for at the end of the study. Patients, health promoters and research assistant could not be blinded to the health centre's allocation. The intervention and control groups were similar at base-line. Data collection was done and the results were clearly and precisely presented. Possible application to the context only if interventions are adapted to the infrastructure limitations. **Included** **Level of evidence:** A

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
		The researcher visited the sites and gave feedback to the health promoters after the sessions. **Control group** received routine education at the health centre such as random health talks in the waiting area or club room, or individual counselling if the health promoters had time. **Data analysis:** Intent-to-treat analysis evaluated the primary and secondary outcomes.	
2. Pop-Eleches, C; Thirumurthy, H; Habyarimana, JP; Zivin, JG; Goldstein, MP; de Walque, D; Mackeen L; Haberer, J; Kimaiyo, S; Sidle, J; Ngare, D; Bangsberg. 2011. Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: A randomised controlled trial of text message reminders. *AIDS*, 25(6):825-834. Kenya	**Aim:** To test the efficacy of short message service (SMS) reminders on the adherence of antiretroviral therapy (ART) amongst patients attending a rural clinic in Kenya. **Design:** A randomised controlled trial of four SMS reminder interventions with 48 weeks of follow-up **Setting:** The study was conducted at a government facility Chulaimbo Rural Health Centre (CRHC) in Kenya. The participants were recruited at the HIV clinic at the centre.	**Primary outcome:** Whether adherence to ART exceeded 90% during each 12-week period of analysis and the 48-week study period. **Secondary outcome:** Whether there were treatment interruptions lasting at least 48 hours. Outcomes were captured and measured by the medication event monitoring system cap in the antiretroviral medication bottle. All participants received a mobile phone; some would receive daily or weekly text messages encouraging adherence to ART. Participants were sent to the pharmacy, where one of the antiretroviral medications was transferred to a bottle with a medication event monitoring system cap by the pharmacy staff. The phone number and medication event monitoring system cap numbers of participants were recorded by the study staff. Basic training was given on correct phone use and comprehension of the message in English, Dholou or Kiswahili.	**Critical appraisal instrument used:** Critical Appraisal Skills Programme randomised controlled trial study tool. A clearly focused question was stated and an appropriate design was applied. Participants were randomly allocated to intervention groups and a control group. All participants who entered the trial were accounted for till the end of the study. The patients and health workers were blinded to treatment. The participants complied with follow-up visits. Results were clearly described and presented in tables. The results can be applied to the local population. **Included** **Level of evidence:** A

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
	Sample: 735 patients were approached and 720 enrolled. However, 431 participants made up the analytical sample and three were excluded (faulty medication event monitoring system caps), resulting in 428 participants. **R**andom assignment to 1 of 4 intervention groups or to a control group. The patients and health workers were blinded but the randomisation schedule was arranged before enrolment by the investigators. Both groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	**For the intervention group**, short messages provided simple reminders to take medications, long messages provided additional support, daily messages were close to medication frequency and weekly messages intended to prevent reliance on text messages. Messages were sent out at 12:00 daily or weekly. The message content was developed after extensive consultation with clinic staff. Messages were sent out automatically initially by a commercial service provider (Zunguka) based in Nairobi and later from Cardboard-Fish.com. The service sent 'one-way' messages and respondents could not respond. **Control group:** The control group did not receive any text messages. **Follow-up:** The participants returned to the clinic once a month. 1) MEMS caps were scanned monthly in the pharmacy; 2) the participants produced their study-provided phone to the study staff during clinic visits; 3) the functionality of each phone was checked during each visit, and 4) lost phones were not replaced. To check the fidelity of interventions, a separate phone kept by the study supervisor received all messages sent out daily or weekly to ensure server functioning.	

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
		Due to poor access to electricity and financial constraints, participants received eighty Kenya shillings during the monthly clinic visit to charge their phones at fee-based *"charging stations"* at market centres. Additionally, fifty Kenya shillings' phone credit was provided to participants' phones every two months. **Data analysis:** Intention-to-treat analysis was used as primary analysis. The secondary analysis was per-protocol. All analyses were conducted with the STATA version 10.0 (StataCorp, College Station, Texas, USA).	
3. Kim, S; Kim H. 2008. Effectiveness of mobile and internet intervention in patients with obese type 2 diabetes. *International Journal of Medical Informatics,* 77(6):399-404. South Korea.	**Aim:** To evaluate the effectiveness of SMS by personal cellular phone and internet in improving levels of plasma glucose in obese type 2 diabetes at 3, 6, 9 and 12 months. **Design:** Quasi-experimental design with pre and follow-up tests for twelve months. **Setting:** Participants were recruited from the endocrinology outpatient department of a tertiary care hospital in South Korea. **Sample:** 40 patients commenced the trial, 20 assigned randomly by	**Outcome:** To decrease body weight and maintain blood glucose levels (HbA1c value <7%) within a normal range. The variables glycosylated haemoglobin (HbA1c), fasting plasma glucose (FPG) and 2- hour post-prandial test (2HPPT**)**) were measured at 3, 6, 9 and 12 months follow-up. **Data collection:** Before the intervention, the variables were measured as pre-test data. Before the intervention, each participant was trained on loading data onto the website. Patients had to load their blood glucose level in a weekly diary on the website by personal cellular phone or computer internet. **Intervention group:** Participants could log on at their convenience and load their self-monitored blood glucose levels and drug information. These data were transferred to the Internet server system that automatically displayed information on the homepage.	**Critical appraisal instrument used:** Critical Appraisal Skills Programme randomised controlled trial study tool A clearly focused question was stated and an appropriate design was applied. Participants were randomised by random permuted block design using a random number table and assigned to a control group and an intervention group. The researcher could not tell whether blinding was applied or not. The groups were similar at the start of the trial. All participants who entered the trial were accounted for till the end of the study. Results were clearly described and presented in tables; however, body weight was not reported on.

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
	random permuted block design using a random number table to the control group and 20 to the intervention group. However, 6 participants fell out along the way. Consequently, 34 patients agreed to participate and completed the study, 18 patients in the intervention group and 16 in the control group. The groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	After analysing all data available on the patient, the researcher, who is a diabetic educator and a professor of nursing, would send optimal recommendations to each patient, by both cellular phone and internet, weekly. The intervention continued for twelve months and consisted of continuous education and reinforcement of diet, exercise, medication adjustment, as well as frequent self-monitoring of blood glucose levels. If a patient did not forward any data for more than one week, a warning message was sent out. If, despite the warning message, the participant continued the behaviour for more than four weeks, the participant was withdrawn from the intervention group. **Control group:** Received routine information from the endocrinologist specialist in the four or five visits during the year. **Data analysis:** The data were analysed using the SAS (version 8.12, SAS institute, Cary, North Carolina) program.	Application to the context could have been a problem due to accessibility of internet. **Included** **Level of evidence:** A

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
4. Piette, JD; Datwani, H; Gaudioso, Sofia; Foster SM; Westphal, J; Perry, W; Rodriquez-Saldana, J; Mendoza-Avelares, MO; Marinec, N. 2012. Hypertension Management Using Mobile Technology and Home Blood Pressure Monitoring: Results of a Randomised Trial in Two Low- / Middle-Income Countries. *Telemedicine and e-Health*, 18(8):613-620. Honduras and Mexico	**Aim:** To evaluate the efficacy of a cloud computing model using automated self-management calls plus home blood pressure monitoring as a strategy to improve systolic blood pressure and other outcomes of hypertensive patients in two low- and middle-income countries (LMICs) **Design:** Randomised trial with a 6-week follow-up **Setting:** 1) Patients in the rural and semi-rural areas of Cortes, Honduras, and 2) patients living in and around Real del Monte, Mexico, were recruited. **Sample:** 416 patients were screened; 213 patients were eligible, only 200 were enrolled (100 Honduras and 100 Mexico) – 13 either refused.	**Primary outcome:** Systolic blood pressure was examined for all patients in addition to a pre-planned subgroup with low literacy and high hypertension information needs. **Secondary outcomes:** Patients' perceived health status and medication-related problems. Patients reported their perceived general health and medication-related problems on surveys. **Data collection:** At baseline, all participants received written information about hypertension. Blood pressure, height, weight and body mass index were measured at baseline by trained associates. Patients reported their age and their years of education. Monthly family income from all sources was self-reported. **Intervention group:** Received electronic home blood pressure monitors and instructions for checking blood pressure at home. Research associates showed them how to use the monitor. Patients had to measure their blood pressure several times a week and keep a written record of the results. They would receive weekly automated monitoring and behaviour-change calls. The telecommunications infrastructure for the automated calls was maintained on a United States server and interfaced with local telephone systems.	**Critical appraisal instrument used:** Critical Appraisal Skills Programme randomised controlled trial study tool. A clearly focused question was stated and an appropriate design was applied. Participants were randomized by computer-generated series of numbers into a control and an intervention group. It was not possible to blind the patients or their clinicians to their experimental assignment. All participants who entered the trial were accounted for till the end of the study. Results were clearly described and presented in tables. **Included** **Level of evidence: A**

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
	enrolment or did not complete baseline survey Participants were randomised to the intervention or usual care group based on a computer-generated series of numbers to ensure balance between experimental groups within each country. It was not possible to blind the patients or their clinicians to their experimental assignment. The groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	Automated calls gathered information about the patient's blood pressure, blood pressure self-monitoring, medication adherence and diet in order to provide tailored advice based on the patient's inputs. The automated calling system had three functions: 1) Patients were reminded to monitor their blood pressure regularly and asked about recent abnormalities. Based on their inputs, they received advice and were encouraged to seek medical assistance for abnormal blood pressure readings. 2) E-mail alerts were automatically generated to health workers for abnormal readings and when patients rarely took their medication and 3) a family member or friend could be enrolled to receive brief automated telephone updates regarding the patients' self-reported health status each week. Call scripts were translated into Spanish by a professional firm and reviewed by native Spanish-speaking clinicians in Honduras and Mexico. The final script was professionally recorded by a native speaker **Control group** received usual care. **Data analysis:** Intervention effects were evaluated with regression models and the effects on Likert-type variables (perceived general health and satisfaction with care) were analysed with logistic regression models.	

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
5. Lester, RT; Ritvo, P; Mills, EJ; Kariri, A; Karanja, S; Chung, MH; Jack, W; Habyarimana, J; Sadatsafavi, M; Najafzadeh, M; Marra, CA; Estambale, B; Ngugi, E; Blake Ball, T; Thabane, L; Gelmon, LJ; Kimani, J; Ackers, M; Plummer, FA. 2010. Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): a randomised trial. *The Lancet,* 376:1838-1845.	**Aim:** To assess whether mobile phone communication between healthcare workers and patients starting ART in Kenya improved drug adherence and suppression of plasma HIV-1 RNA load **Design:** An individually randomised, parallel, multisite controlled trial. **Setting:** Three HIV clinics in Kenya, namely the University of Nairobi Pumwani Clinic; Coptic Hope Center for Infectious Diseases and the Kajiado Clinic.	**Primary outcome:** Self-reported ART adherence (>95% of prescribed doses in the past 30 days at both six and 12 months' follow-up visits) and plasma HIV-1 viral RNA load suppression (<400 copies per ml) at 12 months. **Secondary outcomes:** The rate of attrition. Self-reported adherence to ART was assessed by questionnaire at six and 12 months' follow-up. Plasma was taken and measured at 12 months for HIV-1 viral RNA load. All mobile phone communications between healthcare workers and patients were recorded in a study register. **Intervention group:** Were trained for use of the SMS intervention by the study clinicians. They were told that SMS support service did not replace existing counselling or emergency services. The site nurse sent a text message Monday morning of each week, to ascertain the condition of patients in the intervention group and remind them about the availability of phone-based support. Bulk messaging involved the slogan 'Mambo', which meant, 'How are you?' Patients in the intervention group had to respond within 48 hours that they were doing well	**Critical appraisal instrument used:** Critical Appraisal Skills Programme randomised controlled trial study tool A clearly focused issue was addressed. Participants were randomly assigned by simple randomisation to the SMS intervention group or to the standard care group. Randomisation, laboratory assays and analyses were done by investigators masked to treatment allocation; however, study participants and clinic staff could not be masked because the intervention required overt participation. The groups were similar at the start of the trial and all participants were accounted for at its conclusion. Results were clearly described and presented in tables.

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

CROSS SECTIONAL SURVEY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
	Sample: 581 participants enrolled but 39 were excluded because of inadequate phone access and four declined participation. 538 patients were randomly assigned by simple randomisation to intervention group (n=273) and usual care group (n=265). Written allocation was sealed in envelopes marked with study identification numbers, which were distributed to clinics. 10 participants withdrew from the study for personal reasons after random allocation. Study participants and clinic staff were not masked because intervention required overt participation but investigators were masked to treatment allocation. The groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	*'Sawa'* or that they had a problem '*Shida*'. The clinician called patients with problems or failing to respond within two days. Healthcare workers were accessible during clinic hours only. **Control group** received usual care. **Data analysis:** The primary analysis was by intention-to-treat.	**Included** **Level of evidence:** A

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

CROSS SECTIONAL SURVEY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
6. Siedner, MJ; Haberer, JE; Bosco Bwana, M; Ware, NC; Bangsberg, DR. 2012. High acceptability for cell phone text messages to improve communication of laboratory results with HIV-infected patients in rural Uganda: a cross-sectional survey study. *BMC Medical Informatics and Decision Making,* 12(1):56-62. Uganda.	**Aim:** To assess the acceptability of, perceptions about disclosure and confidentiality and preferences for cell phone communication of health communication in Mbarara **Design:** Cross-sectional survey **Setting:** Patients were recruited at the Immune Suppression Syndrome (ISS) clinic at Mbarara Regional Referral Hospital in Uganda. **Sample:** 50 patients were enrolled in the study. 22 participants were from the Mbarara district and the rest were from 10 other districts in Uganda. However, the sample was not representative of a defined population.	**Outcomes:** To assess four domains of health-related communication: 1) cell phone use practices and literacy; 2) preferences for laboratory results communication; 3) privacy and confidentiality, and 4) acceptability and preferences for texting messaging to notify patients of abnormal test results. **Structured interviews** covered the four domains of health-related communication. **Data collection:** A trained research assistant conducted the interview in a private room for 30-60 minutes using a voice recorder. The interview was conducted in Runyankole, the native language. Responses were back-translated into English and entered into an online REDCap electronic database. A study coordinator reviewed data entry for all fifty surveys for quality assurance. **Data analysis:** Data were extracted and analysed using Strata version 11, 2 (StataCorp, College Station, TX).	**Critical appraisal instrument used:** Tool for descriptive/ cross-sectional studies The study addressed a clearly focused issue and the authors used an appropriate method to answer the research question. However, 1) the subjects were not recruited in an acceptable way; 2) the data collection process was poorly described, and 3) the sample was small leading to poor internal and external validity. 4) Furthermore, the data analysis process was not rigorous enough, and 5) the findings were poorly stated. 6) Consequently, the results cannot be applied to the local population. The research is not valuable due to poor internal and external validity. **Excluded**

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

SINGLE CASE STUDY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
7. Kasikci, MK. 2011. Using self-efficacy theory to educate a patient with chronic obstructive pulmonary disease: A case-study of 1-year follow-up. *International Journal of Nursing Practice,* 17(1):1-8. Turkey	**Aim:** To explore the use of a structured education programme on strengthening self-efficacy in an older adult with chronic obstructive pulmonary disease (COPD). **Design:** A single patient case-study. **Setting:** Respiratory Disease Clinic, Aziziye Hospital, Turkey **Sample:** A physician was asked to refer an eligible patient who met the following criteria: 1) was at least two weeks post-recovery from acute exacerbation of COPD; 2) had mild or moderate (forced expiratory volume in 1 second FEV1) <85%, FEV1/ forced vital capacity < 70%);	**Outcomes:** The long term self-efficacy expectations in a single patient with COPD. **A combined qualitative and quantitative approach was used:** Qualitative data were collected following the interview guide and quantitative data were collected by means of a demographic data sheet and the COPD self-efficacy scale (CSES) at the pre- and post-programme stage (one, three, six and 12 months). The programme was implemented over eight weeks and involved one-on-one classes for one hour twice a week for four weeks, followed by stage two, involving a four-week education programme via telephone interviews, lasting 10-15 minutes each. The patient could call the researcher anytime if he wanted to discuss any concerns. The researcher repeated information based on the needs of the patient. The classes had an educational and physical training component. The educational component focused on the pathophysiology and management of COPD; self-care instruction and social support. The educational component was followed by training and workout sessions that focused on breathing retraining; respiratory muscle training; aerobic and anaerobic exercises and relaxation exercises. A patient brochure was developed by the researcher to reinforce verbal information provided during the study. Education was individualized to the needs of the patient. **Data analysis:** The qualitative data was subjected to a content analysis.	**Critical appraisal instrument used:** Sampson and Atkins critical appraisal guidelines for single case study research Criteria for selection are clearly described, as well as the conceptual framework for the research. A credible argument is not provided for why a case study was appropriate. The philosophical stance and perspective of the author were not explicitly stated. No evidence that bias was taken into account during data analysis. The data collection and analysis processes were clearly described. **Included** **Level of evidence:** D

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

SINGLE CASE STUDY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
	3) had no evidence of ischaemic heart disease, musculoskeletal disorders or other disabling disease that could restrict exercise, and 4) was 45 years of age or older, literate, coherent and willing to volunteer. A 55 year old male patient with COPD, participated in the study. He has health insurance and was retired at the time. He has been living with COPD for 15 years. He smoked for 35 years and gave it up two years earlier. He lived with his wife and had five children, all of whom lived away from home	In the analysis of quantitative data, repeated measures approach was conducted to compare average pre-programme CSES scores with combined CSES scores at just post-programme and at one, three, six and 12 months after completion of the programme.	

TABLE 3.6: Critical appraisal of selected studies (n=8) (to be continued)

QUALITATIVE STUDY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Critical appraisal and level of evidence**
8. Curioso, WH; Kurth, AE. 2007. Access, use and perceptions regarding Internet, cell phones and personal digital assistants (PDAs) as a means for health promotion for people living with HIV in Peru. *BMC Medical Informatics and Decision Making*, 7(24):1-7. Peru	**Aim:** To assess access, use and perceptions of people living with HIV regarding Internet, cell phones and personal digital assistants as a means for health promotion to support treatment adherence and HIV transmission risk reduction. **Design:** A qualitative study **Setting:** Two community-based clinics (Impacta and Via Libre) in Lima, Peru. **Sample:** Sampling was performed by convenience in the two clinics with HIV positive adults receiving ART. Both clinics primarily serve male clients (100% at Impacta and approximately 80% at Via Libre). Thirty one patients were interviewed.	**Outcome:** To report on perceptions towards use of information and communication technologies as a means to support ART adherence and HIV transmission risk reduction. **In-depth interviews** were conducted by an experienced and trained psychologist in each of the clinics. **Data collection:** In-depth interviews were conducted in Spanish, following an interview guide, in a private room, and the interview was tape-recorded. Audio files were transcribed and transcripts were reviewed by a Spanish-speaking investigator for initial text element and key word coding; these codes and categorizations were then reviewed by a second investigator for final consensus. The interview related specifically to information and communication technologies such as computers, internet, cell phones and personal assisting devices. **Data analysis:** Data were entered into Atlas.ti qualitative software for theme identification using a content analysis approach.	**Critical appraisal instrument used:** Critical Appraisal Skills Programme qualitative tool The study addressed a clear statement. The research design was appropriate and an appropriate method of data collection was used. The data analysis was sufficient to answer the research question and the statement of findings was clear. Ethical issues were taken into consideration. **Included** **Level of evidence:** D

3.4 MEASURES TAKEN TO ENSURE RIGOUR: STEPS 1-4

Rigour relates to the meticulousness and the detail with which research is carried out in order to ensure excellence (Burns & Grove, 2011:39). The criteria of truth value, consistency, neutrality and applicability were maintained in the study. The following specific measures were taken to ensure rigour in the initial steps of the systematic review:

STEP 1 - **Identification and formulation of a focused review question:** The systematic review uses a rigorous process on its own, however, rigour was evidenced by the development of a protocol to limit the threat of changing the process midway and bringing bias into the review (*cf.* Centre for Review and Dissemination, 2009:6; Mayer, 2010:369). Furthermore, a clear review question was formulated using the PICO format, which is regarded as the gold standard in systematic reviews.

STEP 2 and 3 – Generation of a search strategy and the execution of the search, and selection of the relevant studies. Rigour was ensured by the following:

The use of multiple sources of data by the researcher such as electronic data sources, reference list checking and contact with the authors of studies to ensure a comprehensive search.

An experienced librarian was consulted for guidance in the choice of electronic databases and platforms which were chosen purposively, based on accessibility and comprehensiveness. The librarian further assisted in the running of the search strings.

The researcher was aware of selection, publication and language bias in the extensive search of the literature (*cf.* The Joanna Briggs Institute for Evidence Based Nursing and Midwifery, 2001:3; Bettany-Saltikov, 2010:48). Selection bias was minimised as the researcher used electronic data bases, reference list checking and

contact with authors to be representative of the research. Publication bias was minimised as the researcher sought published, as well as unpublished studies during the literature search. Language bias was overcome in the study as literature in English, as well as studies in languages other than English with an English abstract were included in the study.

Clearly defined inclusion and exclusion criteria were very specific and provided clear guidance on the selection of studies.

An updated literature search was conducted three months after the initial search to ensure that no studies had been missed for the period 2000-2014.

STEP 4 – Performing the critical appraisal and evaluating the methodological quality of selected studies: Rigour was further evidenced by four reviewers that were involved in the full text screening of studies and the final selection of studies before critical appraisal. Additional, critical appraisal was carried out by the same four reviewers in a round table discussion. The use of a tape-recorder by the researcher during the process enabled those sessions to be played back by the researcher for consensus. Meticulous record-keeping throughout the process ensured the repeatability, transparency and auditability of the study (*cf.* Centre for Review and Dissemination, 2009:25; American Dietetic Association, 2012:22).

3.5 ETHICAL CONSIDERATIONS: STEPS 1-4

Ethical considerations must to be applied in all phases of the research process (Botma *et al.*, 2010:4). In this study, the following ethical principles were maintained:

- As this study formed part of a larger study, permission to conduct the research was requested from the Free State Department of Health and ethical approval was obtained from the Health Sciences Research Ethics Committee of the University of Free State.

- The researcher has also guarded against **disrespect** of intellectual property (plagiarism) by giving accurate and complete references at all times (*cf.* Polit & Beck, 2008:633; Burns & Grove, 2011:645).

- For academic purposes, the researcher was guided by two supervisors who are experts in the research field, thus ensuring that the research process is followed **meticulously.** Furthermore, the final selection, critical appraisal and data extraction processes were carried out by four reviewers to enhance the quality of the study.

- Meticulous reports were kept regarding the selection process and the decision to include and exclude studies. All data utilized are **traceable, available and sound,** and a paper-trail is available as is required for auditing purposes (*cf.* Centre for Review and Dissemination, 2009:25; American Dietetic Association, 2012:22; Steenkamp, Scrooby & Van der Walt, 2012:12). All information retrieved from databases and other sources was handled with responsibility and confidentiality (*cf.* Burns & Grove, 2011:203).

3.6 SUMMARY

This chapter was aimed at providing a clear picture of the systematic review as research method, reflecting on its background as well as the strengths and characteristics of the research method. The first step of the systematic review, namely, the identification and formulation of a focused review question was identified as an essential component in steering the systematic review. The significance of a search strategy is realised in step 2 of the systematic review with its relevant search words, data sources and inclusion and exclusion criteria. Step 3 of the systematic review explained how the planned search strategy was implemented and how relevant studies were selected. Step 4 relates to the critical appraisal and assessment of the methodological quality of the selected studies. Seven studies were found methodologically adequate and constituted a heterogenous sample of: five randomised controlled trials (Kim & Kim, 2008:399-404; Lester *et al*., 2010:1838-1845; Pop-Eleches *et al*., 2011:825-834; Mash *et al*., 2012:126-321; Piette *et al*.,

2012:613-620; Mash *et al*., 2014:1-7); one case study (Kasikci, 2011:1-8), and one qualitative study (Curioso & Kurth, 2007:1-7). One study, Siedner *et al*. (2012:1-7), was excluded during critical appraisal, due to poor internal and external validity. The specific measures taken to ensure the rigour of the study, were described, as well as the ethical principles maintained in the study.

The realisation of the last three steps of the systematic review will be described in the next chapter.

CHAPTER 4

Analysis, synthesis and summary of the findings

4.1 INTRODUCTION

This study strived to critically review and synthesise the best available evidence on communication strategies used to accomplish effective health dialogue. The review question that guided the study design was: Which communication strategies are used during effective health dialogue with adults with chronic diseases in low- and middle-income countries in terms of: 1) how communication is conducted; 2) when communication is conducted; 3) what is communicated; 4) where communication is conducted; and 5) by whom communication is conducted. The previous chapter provided a detailed discussion of the first four steps of the systematic review and ended off with the critical appraisal of eight studies to determine their methodological rigour. This chapter describes the next three steps of the systematic review as reflected in Table 4.1, namely data extraction, analysis and synthesis, and lastly, formulating concluding statements.

TABLE 4.1: Steps of the systematic review according to Higgins and Green (2006:16) – discussion of steps 5-7

Step 1	Identification and formulation of a focused review question
Step 2	Generation of a search strategy
Step 3	Execution of the search and selection of the relevant studies
Step 4	Performing the critical appraisal and evaluating the methodological quality of selected studies
Step 5	Extracting data
Step 6	Analysing and synthesising
Step 7	Formulating the concluding statements

4.2 STEP 5: EXTRACTING DATA

After critical appraisal of the eight studies, seven studies were found methodologically adequate and were used for data extraction. During the data extraction process, specific information is extracted from the primary studies and the data are presented in the form of a table for subsequent analysis (Whittemore, 2005:59; Centre for Evidence-Based Conservation, 2006:11). Table 4.2 reflects the specific information extracted during this study. The information includes bibliographic references and context, methodology, intervention and outcomes and findings of the study.

TABLE 4.2: Data extraction from the primary studies

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
1. Mash, B; Levitt, N; Steyn, K; Zwarenstein, M; Rollnick, S. 2012. Effectiveness of a group diabetes education program in underserved communities in South Africa: Pragmatic cluster randomised control trial. Biomed Central (BMC*) Family Practice,* 13(1):126-132. South Africa (Cape Town). **Mash, RJ; Rhode, H; Zwarenstein, M; Rollnick, S; Lombard, C; Steyn, K; Levitt, N. 2014. Effectiveness of a group diabetes education program in underserved communities in South Africa: a pragmatic cluster randomised controlled trial. *Diabetic Medicine*, 31(8):987-993. South Africa (Cape Town).**	**Aim:** To evaluate the effectiveness of group diabetes education in under-served communities in South Africa. **Design:** Pragmatic cluster randomised controlled trial **Setting:** 34 Public sector community health centres in Cape Town Metropolis **Sample:** 1 570 participants: 710 type II diabetic patients randomly assigned to intervention arm and 860 type II diabetic patients, to control arm. Randomly allocated by computer-generated random numbers. Patients, health promoters and research assistant could not be blinded to the health centre's allocation.	**Primary outcome:** Improved diabetes self-care **Secondary outcome:** Improved locus of control, self-efficacy, mean weight loss, blood pressure, waist circumference, HbA1c, cholesterol and quality of life **Questionnaires** were used to measure self-care activities, locus of control, self-efficacy and diabetes quality of life. **Data collection:** Data were collected at base-line and twelve months later: 1) physical measurements of all patients (weight, waist circumference and blood pressure); 2) laboratory HbA1c and total cholesterol; 3) personal data, and 4) medication use and new diagnoses were recorded at follow-up. **Intervention group** attended four sessions of group diabetes education lasting 20-60 minutes on days of scheduled visits in a suitable room or local venue. The group consisted of 10-15 people. The following information was provided by health promoters in a guiding style of communication: Session 1: Understanding diabetes Session 2: Living a healthy lifestyle Session 3: Understanding the medication Session 4: Preventing complications	59, 4% of the participants in the intervention group did not attend any education sessions. Diabetes group education had no effect on primary or secondary outcomes. Mean systolic (-4,65mmHg, 95% CI 9, 18 to - 0, 12; P = 0, 04) and diastolic blood pressure (-3,30 mmHg, 95% CI -5, 35 to -1, 26; P=0,002) reduced significantly. On evaluation, the process showed the following challenges: 1. accommodation of health promoters for group education was a problem at the centres; 2. arranging meeting dates with the patients posed a problem, and 3. the less qualified health promoters could have posed a problem for the intervention.

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
	The two groups were similar at the start of the trial in terms of inclusion and exclusion criteria.	**The health promoters** attended a four-day training session on communication styles and skills and diabetes knowledge prior to the study. A further two-day training session was held two months later to reinforce initial training and to discuss the contents of the last two sessions. The researcher visited the sites and gave feedback to the health promoters after the sessions. **Control group** received routine education at the health centre such as random health talks in the waiting area or club room or individual counselling if the health promoters had time. **Data analysis:** Intent-to-treat analysis evaluated the primary and secondary outcomes.	**Recommendations**: 1) Although the findings are disappointing, group diabetes education should be further evaluated in developing countries. 2) Future interventions should be adapted for the infrastructure limitation and logistical barriers to patient retention. **Limitations of the study:** 1) High drop-out rate in both groups, 2) poor attendance and thus poor exposure to the intervention; 3) limited funding led to an incomplete lipogram; and 4) the questionnaires measured self-reported self-care activities. **Level of evidence:** A
2. Pop-Eleches, C; Thirumurthy, H; Habyarimana, JP; Zivin, JG; Goldstein, MP; de Walque, D; Mackeen L; Haberer, J; Kimaiyo, S; Sidle, J; Ngare, D; Bangsberg. 2011. Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting:	**Aim:** To test the efficacy of short message service (SMS) reminders on the adherence to ART amongst patients attending a rural clinic in Kenya. **Design:** A randomised controlled trial of four SMS reminder interventions with 48 weeks of follow-up	**Primary outcome:** Whether adherence exceeded 90% during each 12-week period of analysis and the 48-week study period. **Secondary outcome:** Whether there were treatment interruptions lasting at least 48 hours. **Outcomes were captured** and measured by the medication event-monitoring system cap in the antiretroviral medication bottle. All participants would receive a mobile phone and some would receive daily or weekly text messages encouraging adherence to ART. Participants were sent	53% of the participants receiving weekly SMS reminders achieved adherence of at least 90%, compared to the 40% of the participants in the control group (P = 0,03). Participants in groups receiving weekly reminders were less likely to experience treatment interruptions exceeding 48 hours during the 48-week follow-up period than participants in the control group (81 vs. 90%, P = 0,03).

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
A randomised controlled trial of text message reminders. *AIDS*, 25(6): 825-834. Kenya	**Setting:** The study was conducted at a government facility Chulaimbo Rural Health Centre (CRHC) in Kenya. The participants were recruited at the HIV clinic at the centre. **Sample:** 735 patients were approached and 720 enrolled. However, the analytical sample comprised 431 participants and three were excluded, resulting in 428 participants. Random assignment to one of four intervention groups or to a control group. The patients and health workers were blinded but the randomisation schedule was arranged before enrolment by the investigators. The two groups were similar at the start of the trial as inclusion (especially the commencement of ART less than three months ago) and exclusion criteria were applied.	to the pharmacy, where one of the antiretroviral medications was transferred to a bottle with a medication event-monitoring system cap by the pharmacy staff. The phone number and medication event-monitoring system cap numbers of participants were recorded by the study staff. Basic training was given on correct phone use and comprehension of the message in English, Dholou or Kiswahili. **For the intervention group**, short messages provided a simple reminder to take medications, long messages provided additional support, daily messages were close to medication frequency and weekly messages intended to prevent reliance on text messages. Messages were sent out at 12:00 daily or weekly. The message content was developed after extensive consultation with clinic staff. Messages initially were sent out automatically by a commercial service provider (Zunguka) based in Nairobi and later from Cardboard-Fish.com. The service sent 'one-way' messages and participants not respond. **Control group:** The control group did not receive any text messages. **Follow-up:** The participants returned to the clinic once a month: 1) MEMS caps were scanned monthly in the pharmacy; 2) the participants produced their study-provided phone to the study staff during clinic visits; 3) the functionality of each phone was checked during each visit, and 4) lost phones were not replaced.	Results suggest that an SMS intervention could be an effective strategy to supporting optimum ART response. The following must be considered when SMS reminders are used: 1) the sharing of mobile phones is common practice and 2) individuals have the potential to change phone numbers. **Recommendation:** Further research is needed to determine the reproducibility and generalisability of the findings. **Limitations of the study:** 1) It is difficult to distinguish whether the intervention improved dose-taking behaviour or simply improved use of the electronic medication monitor. 2) Individuals may remove several doses from the MEMS bottle at one time or simply stop using the monitor. 3) However, there is no strong reason to believe that several doses were taken at different rates by the groups.

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
		To check the fidelity of interventions, a separate phone kept by the study supervisor received all messages sent out daily or weekly, to ensure server functioning. Due to poor access to electricity and financial constraints, participants received eighty Kenya Shillings during the monthly clinic visit to charge their phones at fee-based 'charging stations' at market centres. Additionally, fifty Kenya Shillings of phone credit was provided to participants' phones every two months. **Data analysis:** Intention-to-treat analysis was used as primary analysis. The secondary analysis was per protocol. All analyses were conducted with the STATA version 10.0 (StataCorp, College Station, Texas, USA).	4) We do not have HIV-RNA determinations and therefore cannot corroborate that the differences in adherence were associated with differences in viral suppression. 5) Finally, the study measured adherence for only one tablet and assumed that this reflected adherence to the entire regime. **Level of evidence:** A

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
3. Kim, S; Kim H. 2008. Effectiveness of mobile and internet intervention in patients with obese type 2 diabetes. *International Journal of Medical Informatics*, 77(6):399-404. South Korea.	**Aim:** To evaluate the effectiveness of SMS by personal cellular phone and internet in improving levels of plasma glucose in obese type 2 diabetes at three, six, nine and 12 months. **Design:** Quasi-experimental design with pre- and follow-up tests for twelve months. **Setting:** Participants were recruited from the endocrinology outpatient department of a tertiary care hospital in an urban city of South Korea. **Sample:** 40 patients initially commenced the trial: 20 assigned randomly by random permuted block design using a random number table to the control group and 20 to the intervention group.	**Outcome:** To decrease body weight and maintain blood glucose levels (HbA1c value <7%) within a normal range. The variables glycosylated haemoglobin (HbA1c), fasting plasma glucose (FPG) and 2- hour post-prandial test [2HPPT**]**) were measured at three, six, nine and 12 months' follow-up. **Data collection:** Before the intervention, the variables were measured as pre-test data. Before the intervention, each participant was trained on loading data onto the website. Patients had to load their blood glucose level in a weekly diary on the website by personal cellular phone or computer internet. **Intervention group:** Participants could log on at their convenience and load their self-monitored blood glucose levels and drug information. These data were transferred to the Internet server system that automatically displayed information on the homepage. After analysing all data available on the patient, the researcher, who is a diabetic educator and a professor of nursing, weekly sent optimal recommendations to each patient, by both cellular phone and internet. The intervention continued for twelve months and consisted of continuous education and reinforcement of diet, exercise, medication adjustment, as well as frequent self-monitoring of blood glucose levels	The intervention group showed a marked decrease in HbA1c levels after 12 months of follow-up, whereas the control group showed slightly increased HbA1c levels after the same period. Glycosylated haemoglobin (HbA1c) decreased 1, 22% at 3 months; 1, 09% at 6 months; 1, 47% at 9 months and 1, 49% at 12 months compared with baseline in the intervention group (p<0, 05). The percentage change in the control group was not significant. Patients in the intervention group had a decrease of 2-hour post-prandial test (2HPPT) of 120,1mg/dl at 3 months; 58,9mg.dl at 6 months; 62,0mg/dl at 9 months and 102,9mg/dl at 12 months compared with the base-line (p<0,05). The mean change in the control group was not significant. **Recommendations**: No recommendations reported.

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
	However, six participants dropped out before conclusion of the study. Consequently, 34 participated and completed the study - 18 patients in the intervention group and 16 in the control group. The two groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	If a patient did not forward any data for more than one week, a warning message was sent out. If, despite the warning message, the participant continued the behaviour for more than four weeks, the participant was withdrawn from the intervention group. **Control group:** Received routine information from the endocrinologist specialist during the four or five visits during the year. **Data analysis:** The data was analysed using the SAS (version 8.12, SAS institute, Cary, North Carolina) program.	**Limitations of the study:** 1) Data were not loaded on to the website by the participant regularly. 2) Participants should have been able to perform blood glucose self-testing and self-injection of medication in case of insulin prescribed by entering data on the website and by owning cellular phones. 3) Some patients might not have been able to use the cell phone or did not have computer access. 4) Participants were not restricted in accessing other websites while they participated in this study. 5) Lastly, serum lipids were not checked during the 9 and 12 months' study. **Level of evidence:** A

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
4. Piette, JD; Datwani, H; Gaudioso, Sofia; Foster SM; Westphal, J; Perry, W; Rodriquez-Saldana, J; Mendoza-Avelares, MO; Marinec, N. 2012. Hypertension Management Using Mobile Technology and Home Blood-Pressure Monitoring: Results of a Randomised Trial in Two Low- / Middle-Income Countries. *Telemedicine and e-Health*, 18(8):613-620. Honduras and Mexico	**Aim:** To evaluate the efficacy of a cloud computing model using automated self-management calls plus home blood-pressure monitoring as a strategy to improve systolic blood pressure and other outcomes of hypertensive patients in two low- and middle income countries (LMICs) **Design:** Randomised trial with a 6-week follow-up **Setting:** 1) Patients in the rural and semi-rural areas of Cortes, Honduras, and 2) Patients living in and around Real del Monte, Mexico, were recruited. **Sample:** 416 patients were screened, 213 patients eligible, only 200 enrolled (100 Honduras and 100 Mexico) – 13 refused enrolment or did not complete baseline survey. Participants were randomised to intervention or usual care group based on a computer-generated	**Primary outcome:** Systolic blood pressure was examined for all patients in addition to a pre-planned subgroup with low literacy and high hypertension information needs. **Secondary outcomes:** Patients' perceived health status and medication-related problems Trained research associates measured blood pressure at baseline and at the 6-week follow-up. Patients reported their perceived general health and medication-related problems in surveys. **Data collection:** At baseline, all participants received written information about hypertension. Blood pressure, height, weight and body mass index were measured at baseline. Patients reported their age and their years of education. Monthly family income from all sources was self-reported. **Special interventions:** The intervention group received electronic home blood-pressure monitors and instructions for checking blood pressure at home. Research associates showed them how to use the monitor. Patients had to measure their blood pressure several times a week and keep a written record of the results. They would receive weekly automated monitoring and behaviour-change calls. The telecommunications infrastructure for the automated calls was maintained on a United States server and interfaced with local telephone systems. Automated calls gathered information about the patients' blood pressure, blood pressure self-monitoring, medication adherence, and diet in order to provide tailored advice based on the patients' inputs.	At follow-up intervention patients' systolic blood pressure decreased 4,2mmHg relative to controls (95% confidence interval – 9,1; 0,7; p=0, 09). In the subgroup with high information needs intervention patients' average systolic blood pressure decreased 8,8mmHg (-14,2 – 3,4; p=0, 002). Compared with controls, intervention patients at follow-up reported fewer depressive symptoms (p=0,004), fewer medication problems (p=0,0001), better general health ($p \leq 0,0001$) and greater satisfaction with care (p<0,004). **Recommendations:** Further research should confirm these findings with larger samples and longer follow-up periods. **Limitations of the study:** The study had: 1) A short follow-up period and small sample size. 2) It measured the joint effect of automated self-care support telephone calls and home blood-pressure monitoring, and therefore the benefit of individual interventions could not be isolated.

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
	series of numbers to ensure balance between experimental groups within each country. Not possible to blind the patients or their clinicians to their experimental assignment. The two groups were similar at the start of the trial as inclusion and exclusion criteria were applied.	The automated calling system had 3 functions: 1) Patients were reminded to monitor their blood pressure regularly and asked about recent abnormalities. Based on their inputs, they received advice and were encouraged to seek medical assistance for abnormal blood pressure readings. 2) E-mail alerts were automatically generated to health workers for abnormal readings and when patients rarely took their medication, and 3) a family member or friend could be enrolled to receive brief automated telephone updates regarding the patient's self-reported health status each week. Call scripts were translated into Spanish by a professional firm and reviewed by native Spanish-speaking clinicians in Honduras and Mexico. The final script was professionally recorded by a native speaker. **Data analysis:** Intervention effects were evaluated with regression models and the effects on Likert-type variables (perceived general health and satisfaction with care) was analysed with logistic regression models	3) There also was little interaction with the patients' clinical teams. **Level of evidence:** A

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
5. Lester, RT; Ritvo, P; Mills, EJ; Kariri, A; Karanja, S; Chung, MH; Jack, W; Habyarimana, J; Sadatsafavi, M; Najafzadeh, M; Marra, CA; Estambale, B; Ngugi, E; Blake Ball, T; Thabane, L; Gelmon, LJ; Kimani, J; Ackers, M; Plummer, FA. 2010. Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): A randomised trial. *The Lancet*, 376:1838-1845. Kenya	**Aim:** To assess whether mobile phone communication between healthcare workers and patients starting antiretroviral therapy in Kenya improved drug adherence and suppression of plasma HIV-1 RNA load **Design:** An individually randomised, parallel, multi-site controlled trial. **Setting:** Three HIV clinics in Kenya, namely the University of Nairobi Pumwani Clinic; Coptic Hope Center for Infectious Diseases and the Kajiado Clinic. **Sample:** 581 participants enrolled but 39 were excluded because of inadequate phone access and four declined participation. 538 patients were randomly assigned by simple randomisation to intervention group (n=273) and standard care group (n=265). Written allocation was sealed in envelopes marked with study	**Primary outcome:** Self-reported ART adherence (>95% of prescribed doses in the past 30 days at both six and 12 months follow-up visits) and plasma HIV-1 viral RNA load suppression (<400 copies per ml) at 12 months. **Secondary outcomes:** The rate of attrition. Self-reported adherence to ART was assessed by **questionnaire** at six and 12 month follow-up. Plasma was taken and measured at 12 months for HIV-1 viral RNA load. All mobile phone communications between healthcare workers and patients were recorded in a study register. **Intervention participants** were trained for use of the SMS intervention by the study clinicians. Participants were told that SMS support service did not replace existing counselling or emergency services. The site nurse sent a text message Monday morning of each week to ascertain the condition of patients in the intervention group and remind them about the availability of phone-based support. Bulk messaging involved the slogan *'Mambo?',* which means *'How are you?'*. Patients in the intervention group had to respond within 48 hours that they were doing well, *'Sawa',* or that they had a problem, *'Shida'.* The clinician called patients with problems or failing to respond within two days. Healthcare workers were accessible during clinic hours only. **Data analysis:** The primary analysis was by intention-to-treat.	Adherence to ART was reported in 168 of 273 patients receiving the SMS intervention compared to the 132 of 265 in the control group (relative risk for non-adherence 0,81; 95% CI 0, 69-0, 94; p=0,006). Suppressed viral loads were reported in 156 of 273 patients in the SMS group and 128 of 265 in the control group (relative risk for virologic failure 0, 84; 95% CI 0, 71-0, 99; p=0,04). The number needed to treat to achieve greater than 95% adherence was nine (95% CI 5, 0-29, 5) and the number needed to treat to achieve viral load suppression was eleven (5, 8-227, 3). **Recommendations:** None reported **Limitations of the study:** None reported. **Level of evidence:** A

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
	identification numbers, which were distributed to clinics. Ten participants withdrew from the study after random allocation for personal reasons. Study participants and clinic staff were not masked because intervention required overt participation, but investigators were masked to treatment allocation. The two groups were similar at the start of the trial as inclusion and exclusion criteria were applied		

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE SINGLE CASE STUDY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
6. Kasikci, MK. 2011. Using self-efficacy theory to educate a patient with chronic obstructive pulmonary disease: A case-study of 1-year follow-up. *International Journal of Nursing Practice*, 17(1):1-8. Turkey	**Aim:** To explore the use of a structured education programme on strengthening self-efficacy in an older adult with chronic obstructive pulmonary disease (COPD). **Design:** A single-patient case study. **Setting:** Respiratory Disease Clinic, Aziziye Hospital, Turkey **Sample:** A physician was asked to refer an eligible patient who met the following criteria: 1) was at least two weeks post-recovery from acute exacerbation of COPD; 2) had mild or moderate (forced expiratory volume in one second FEV1) <85%, FEV1/ forced vital capacity < 70%);	**Outcomes:** The long term self-efficacy expectations in a single patient with COPD. **A combined qualitative and quantitative approach was used:** Qualitative data were collected following the interview guide and quantitative data were collected by means of a demographic data sheet and the COPD self-efficacy scale at the pre- and post-programme stage (one, three, six and 12 months). The programme was implemented over eight weeks and involved one-on-one classes for one hour twice a week for four weeks followed by stage two: involving a four week education programme via telephone interviews lasting 10-15 minutes each. The patient could call the researcher anytime if he wanted to discuss any concerns. The researcher repeated information based on the needs of the patient. The classes had an educational and physical training component. The educational component focused on the pathophysiology and management of COPD; self-care instruction and social support. The educational component was followed by training and workout sessions that focused on breathing retraining; respiratory muscle training; aerobic and anaerobic exercises and relaxation exercises. A patient brochure was developed by the researcher to reinforce verbal information provided during the study. Education was individualized to the needs of the patient.	The quantitative results revealed that there were increases between the pre-programme and post-programme total scores of the COPD self-efficacy scale. The qualitative data were identified as *'difficulties'* and *'facilities'*. This result indicated that self-judgement of efficacy determined the activities or situations the patient would attempt and those he would avoid. **Recommendation:** Replication of the study using different populations is recommended. **Limitations to the study:** The patient filled in the same questionnaire six times; it might have become monotonous. The results cannot be generalized to other patients with COPD in other populations. The generalisability to other patients with COPD in other geographical areas cannot be assured. **Level of evidence:** D

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE RANDOMISED CONTROL TRIALS (n = 5)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
	3) had no evidence of ischaemic heart disease, musculoskeletal disorders or other disabling disease that could restrict exercise and 4) ≥ 45 years of age, literate, coherent and willing to volunteer. A 55-year old male patient with COPD participated in the study. He had health insurance and was retired. He had been living with COPD for 15 years. He smoked for 35 years and gave it up two years previously. He lived with his wife, and had five children that lived away from home.	**Data analysis:** The qualitative data were subjected to a content analysis. The data was reviewed by the researcher and coded into categories.	

TABLE 4.2: Data extraction from the primary studies (to be continued)

DATA EXTRACTION TABLE QUALITATIVE STUDY (n = 1)			
Bibliographic details and context	**Methodology**	**Intervention and outcomes**	**Study findings + Level of evidence**
7. Curioso, WH; Kurth, AE. 2007. Access, use and perceptions regarding Internet, cell phones and personal digital assistants as a means for health promotion for people living with HIV in Peru. *BMC Medical Informatics and Decision Making*, 7(24):1-7. Peru	**Aim:** To assess access, use and perceptions of people living with HIV regarding Internet, cell phones and personal digital assistants as a means for health promotion to support treatment adherence and HIV transmission risk reduction. **Design:** A qualitative study **Setting:** Two community-based clinics (Impacta and Via Libre) in Lima, Peru. **Sample:** Use was made of convenience sampling in the 2 clinics with HIV positive adults receiving ART. Both clinics primarily served male clients (100% at Impacta and approximately 80% at Via Libre). Thirty one patients were interviewed.	**Outcome:** To report on perceptions of people living with HIV towards use of information and communication technologies as a means to support ART adherence and HIV transmission risk reduction. **In-depth interviews** were conducted by an experienced and trained psychologist in each of the clinics. **Data collection:** In-depth interviews were conducted in a private room in Spanish following an interview guide, and the interview was tape-recorded. Audio files were transcribed and transcripts were reviewed by a Spanish-speaking investigator for initial text element and key-word coding; these codes and categorizations were then reviewed by a second investigator for final consensus. The interview related specifically to information and communication technologies such as computers, internet, cell phones and personal assistance devices. **Data analysis:** Data were entered into Atlas.ti qualitative software for theme identification using a content analysis approach.	Many individuals living with HIV in Peru are positive about using the Internet, cell phones and personal digital assistants for HIV promotion interventions. Clear advantages also were identified such as greater confidentiality than face-to-face interactions and the wide range of sources of information and support from different websites and forums. The participants felt that HIV information was important for their health. **Recommendation:** This was the first study to examine the perceptions regarding Internet, cell phones and PDAs as a means for health promotion for people living with HIV in Peru. The study findings, therefore, require replication. **Limitations to the study:** This study was limited due to its use of a convenience sample of patients living with HIV/AIDS in an urban population in Lima. The participants thus were not representative of patients living with HIV/AIDS in Peru. This assessment also used self-reported access and use of Internet, cell phones and PDAs. **Level of evidence:** D

4.3 STEP 6: ANALYSIS AND SYNTHESIS

Due to the heterogeneity of the studies, a meta-analysis was not feasible and data analysis was carried out by means of thematic summaries (Gough *et al.,* 2012:190; Snilstveist, Oliver & Vojtkova, 2012:419). Consequently, the data were analysed qualitatively and coded in terms of an analytical framework based on the review question and sub-questions. Furthermore, the health dialogue concept analysis evidence-based framework of Reid (2015) was used to identify the elements of effective dialogue in each study. Data were consequently organised according to this thematic framework structured in line with the review sub-questions as reflected in Table 4.3, in terms of: (1) how communication is conducted, (2) when communication is conducted, (3) what is communicated, (4) where communication is conducted, (5) by whom communication is conducted, as well as (6) evidence of the elements of effective health dialogue in each study. The health dialogue concept analysis diagram in Figure 4.1 serves as a cross-reference to the elements of effective dialogue that were isolated in each study included and Figure 4.1 is placed directly below Table 4.3.

The health dialogue concept analysis diagram adapted from Reid (2015), in Figure 4.1, reflects the cross-referencing of the elements of effective dialogue that were isolated in each study included.

TABLE 4.3: Summary of the review question in selected studies

COMMUNICATION STRATEGIES USED DURING EFFECTIVE HEALTH DIALOGUE WITH ADULTS WITH CHRONIC DISEASES IN LOW- AND MIDDLE-INCOME COUNTRIES						
Reference and level of evidence	**How is communication conducted**	**When is communication conducted**	**What is communicated**	**Where communication is conducted**	**By whom is communication conducted**	**Evidence of elements of effective health dialogue**
Mash *et al.* 2012 and Mash *et al. 2014* (A)	Group education in a guiding style:	Scheduled clinic visits	Understanding diabetes and its medication, how to live a healthy lifestyle and preventing complications	A suitable room or local venue to provide group education at the health centres.	Trained health promoters	Guiding communication style was used Key words supporting evidence in the study:- Collaboration, empathy, understanding
Pop *et al.* (A)	By SMS reminders:	Daily or weekly text messages were sent to the intervention group at 12:00	Short messages provided simple reminder to take ART medications and long messages provided additional support.	Wherever participant could access her/his SMSs.	Via an automated management system	Shared responsibility and supportive messages Key words supporting evidence in the study: Participants initiated ART less than three months ago and they received supportive messages.
Kim and Kim (A)	SMS by personal cellular phone and internet:	Weekly via cellular phone and internet.	Optimal recommendations tailored to the needs of each patient.	Participants could log on to the website at their convenience where internet was possible via cellular phone or wired internet	The researcher, who is a diabetic educator and a professor of nursing	Tailored interventions Key words supporting evidence in the study: Optimum recommendations were sent to each patient
Piette *et al.* (A)	A cloud computing model using automated self-management calls plus home blood pressure monitoring:	Participants would receive weekly automated monitoring and behaviour-change calls that directed them.	Reminded to check blood pressure regularly; asked about blood pressure readings, medication adherence and diet; additional self-care information was given based on their report and they were	Wherever the participant could access his or her cell phone or on the landline telephone.	Via an automated management system	Interactivity and special needs were attended to Key words supporting the evidence in the study: Participants collaborated, self-monitored blood pressure and recorded it since they received weekly automated

TABLE 4.3: Summary of the review question in selected studies (to be continued)

COMMUNICATION STRATEGIES USED DURING EFFECTIVE HEALTH DIALOGUE WITH ADULTS WITH CHRONIC DISEASES IN LOW- AND MIDDLE-INCOME COUNTRIES						
Reference and level of evidence	**How is communication conducted**	**When is communication conducted**	**What is communicated**	**Where communication is conducted**	**By whom is communication conducted**	**Evidence of elements of effective health dialogue**
			encouraged to seek medical help for abnormal readings			monitoring calls.
Lester *et al.* (A)	Mobile phone short messages:	Monday morning of each week.	To ascertain the condition of patients in the intervention group and remind them about the availability of phone-based support.	Wherever the participant could access her/his text messages.	The clinicians sent messages and followed up on the messages received.	Interactivity Key words supporting the evidence in the study: Patients had to respond within 48 hours
Kasikci (D)	A structured education programme:	Programme implemented over eight weeks - involved one-on-one classes for one hour twice a week for four weeks followed by a four-week education programme via telephone interviews lasting 10-15 minutes each. The patient could call the researcher anytime if he/she wanted to discuss any concerns.	The pathophysiology and management of COPD; self-care instruction, social support and physical training and workout sessions. A patient brochure reinforced verbal information. Education was individualised to the needs of the patient.	In a room at the Respiratory Disease Clinic, Aziziye Hospital, Turkey.	The researcher provided the communication.	Tailored to needs of the patient Key words supporting the evidence in the study: Individualised to the needs of the patient

TABLE 4.3: Summary of the review question in selected studies (to be continued)

COMMUNICATION STRATEGIES USED DURING EFFECTIVE HEALTH DIALOGUE WITH ADULTS WITH CHRONIC DISEASES IN LOW- AND MIDDLE-INCOME COUNTRIES						
Reference and level of evidence	**How is communication conducted**	**When is communication conducted**	**What is communicated**	**Where communication is conducted**	**By whom is communication conducted**	**Evidence of elements of effective health dialogue**
Curioso and Kurth (D)	Internet, cell phones and personal digital assistants (PDAs):	Not addressed	The perceptions of people living with HIV regarding Internet, cell phones and personal digital assistants as a means of health promotion to support treatment adherence and HIV transmission risk reduction	Not addressed	Not addressed	Tailored communication Key words supporting the evidence in the study: HIV positive people

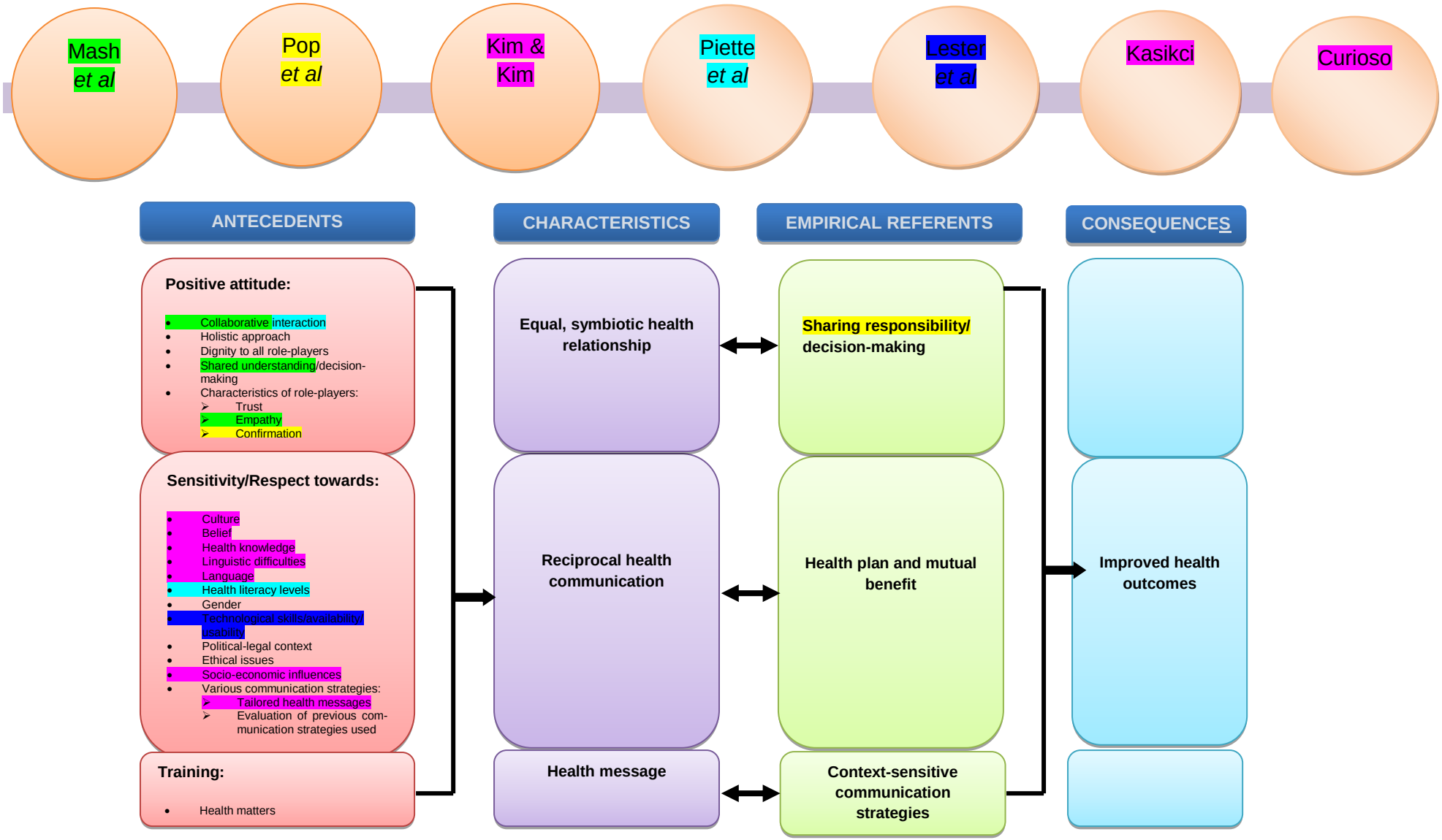

Figure 4.1: Health dialogue elements identified in the included studies

4.3.1 Summary of the findings of the study leading to concluding statements

The analysis and synthesis process enabled the researcher to summarise the findings of the study according to the sub-headings of the review question which consequently lead to the formulation of concluding statements. Furthermore, a discussion of the sub-question is provided.

4.3.1.1 How is communication conducted?

Finding 1: Communication is conducted by means of:

a) **small-group targeted communication** (Mash *et al.,* 2012:4; Mash *et al.,* 2014:1);
b) **one-on-one tailored communication** (Curioso & Kurth, 2007:2; Kasikci, 2011:3);
c) **mobile cellular communication** (Kim & Kim, 2008:400; Lester *et al*., 2010:1839; Pop-Eleches *et al*., 2011:3); and
d) **computed communication** (Kim & Kim, 2008:400; Piette *et al.,* 2012:3).

Concluding statement 1: A variety of communication strategies such as small group, one-on-one, mobile cellular and/or computed communication can be used to accomplish effective health dialogue in adults with chronic disease in LMICs.

Four communication strategies were used to accomplish effective health dialogue in the included studies, namely small-group targeted communication, one-on-one tailored communication, mobile communication and computed communication.

Structured group education is a recommended communication strategy particularly in diabetes, since it is related to improved clinical, lifestyle and psychosocial outcomes. A population with a common interest is brought together to share, discuss and even learn from each other and at the same time, the strategy is efficient and cost-effective (Rickheim, Weaver, Flader & Kendall, 2002:273; Ash *et al*., 2006:1562;

Deakin, Cade, Williams & Greenwood, 2006:6; Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012:2).

Mash *et al*. (2012:4) conducted communication in a guiding style by means of a **structured group education programme** and the key words relating to effective health dialogue were collaboration, empathy and demonstrating understanding towards the participants. Figure 4.1 is used as a cross-reference of the elements identified in each study and the concept analysis of health dialogue according to Reid (2015).

Similarly, Kasikci (2011:1), in a case-study, made use of a **structured education programme** in chronic obstructive pulmonary disease (COPD). The study focuses on one individual patient and demonstrates that a planned education programme improves the short- and long-term self-efficacy of the patient with COPD. Obviously, due to the **tailored approach** of the case-study to the patient's needs, as depicted in Figure 4.1, the results of the study cannot be generalized and the study needs to be replicated using a larger population (Kasikci, 2011:7). Nevertheless, Kreuter and Wray (2003:S228) report that participants relate well to information targeted at a specific group or individualised to an individual and experience it as relevant since it responds to the specific needs of the group or person.

Mobile phone technology can be effective in healthcare delivery, for example, the mobile phone intervention in Zanzibar that increased skilled delivery attendance amongst women, saving lives of women and babies (Lund, Hemed, Nielsen, Said, Said, Makungu, Rasch, 2012:1256). In another example, text message reminders of appointments reduced missed attendance by 25-28% at four community mental health clinics in London (Sims, Sanghara, Hayes, Wandiembe, Finch, Jakobsen, Tsakanikos, Okocha and Kravariti, 2012:161). Currently, there are more than seven billion mobile cellular subscribers globally, relating to a penetration rate of 97%. This was brought about by an increase in the mobile cellular network coverage from 58% in 2001 to 95% in 2015, as well as the increased affordability of devices (Chib, Wilkin, Ling, Hoefman and Van Biejma, 2012:147; Lewis *et al.,* 2012:1; International Telecommunication Union, 2015:2). However, there are still vital differences in urban and rural areas of network coverage, for example in Africa, 88% of the overall

population has network coverage but only 79% of the rural part of Africa has network coverage (International Telecommunications Union, 2015:4).

Two studies in the systematic review used the same form of social and interactive media to conduct communication: Pop-Eleches *et al*. (2011:3) used communication by **mobile phone, employing SMS reminders** for participants who had started ART less than three months previously, to remind them to take their ART and to support them in this way. In this study, effective health dialogue was evidenced by the initiation of ART by the participant and thus, taking responsibility for health as depicted in Figure 4.1. Similarly, Lester *et al*. (2010:1839) used mobile phone **SMSs** to enquire about the condition of participants on ART, and followed up with calls from clinicians if there were problems. Effective dialogue was evidenced by participants that were interactive and responded via mobile phone within forty-eight hours as reflected in Figure 4.1.

Social and interactive media were utilised in the following two studies as well: Kim and Kim (2008:400) conducted communication via **SMSs by cellular phone or wired internet.** Participants demonstrated interactivity and collaboration by loading their self-monitored blood glucose levels and other personalised information on the website and the researcher provided individualised recommendations based on the information. Piette *et al*. (2012:614), in turn, conducted communication by means of **automated monitoring and behavioural change calls** in order to manage abnormalities in blood pressure. This study demonstrated that effective health dialogue was tailored to the participants' needs because their unique literacy levels were taken into consideration as reflected in Figure 4.1. These studies took full advantage of the benefits of social and interactive media as described by other researchers, such as the media's ability to overcome geographical, distance and climatic obstacles (Pereira & Fife, 2011:35; Curioso & Mechael, 2010:264). Other benefits of social and interactive media include improved communication with the HCP and the patient leading to improved treatment and diagnosis; media facilitate interactivity and the ability to provide tailored health information; and the media allow for convenience and flexibility in terms of logging on to the internet when able to (Fotheringham *et a*l., 2000:115; Lewis *et al*., 2012:4). A study by Cudney and Weinert (2012:111) found that a computer intervention program for rural women was

rated positively as a means of providing social support and health information about chronic disease management. Similarly, the Web-based interactive health communication system for patients with advanced lung cancer in the United States of America is described as a method of improving information, communication and coaching resources for patients and their caregivers (DuBenske *et al*., 2010:732).

The study conducted by Curioso and Kurth (2007:2) added another dimension to this study by reflecting on the perceptions of people living with Human Immunodeficiency Virus (HIV) in Peru of **information and communication technology (ICT)** as a means of supporting ART adherence and HIV management. Through in-depth interviews that were conducted specifically with people living with HIV, the study identifies positive perceptions with regard to the use of ICT which concur with findings of other literature, such as greater confidentiality and a wide range of information and support (Keselman *et al*., 2008:473; Bartlett & Coulson, 2011:117). However, one cannot be blinded to the disadvantages associated with ICT, such as its highly unregulated and informal nature in terms quality, consistency and accuracy of information (Bartlett & Coulson, 2011:117; Moorhead *et al*., 2013:15), as well as the digital divide that has been created between groups that do not have access to the internet and the related technologies and those who do have (Kreps, 2006:766; De Jesus, 2013:525). Another reality is that currently, only 34% of households in developing countries have access to the internet compared to the 80% in developed countries (International Telecommunication Union, 2015:3).

4.3.1.2 When is communication conducted?

Finding 2: The frequency of communication varies from:

a) **daily** (Pop-Eleches *et al*., 2011:3);
b) **bi-weekly** (Kasikci, 2011:3);
c) **weekly** (Kim & Kim, 2008:400; Lester *et al*., 2010:1839; Pop-Eleches *et al*., 2011:3; Piette *et al.,* 2012:3;); or
d) **monthly** (Mash *et al.,* 2012:4; Mash *et al.,* 2014:1).

Concluding statement 2: Frequently scheduled communication strategies, for example, weekly sessions, can be used to accomplish effective health dialogue in adults with chronic disease in LMICs.

The frequency of communication differs from study to study. In the study of Mash *et al*. (2012:4) communication was conducted **monthly** at scheduled clinic visits, whereas the studies of Kim and Kim (2008:400); Lester *et al*. (2010:1839); and Piette *et al.* (2012:3) reported that communication was conducted **weekly** for one year, and one year and three months respectively. Pop-Eleches *et al*. (2011:3) reported that in their study communication was conducted **weekly or daily** with two respective intervention groups for forty-eight weeks, while Kasikci (2011:3) conducted communication with the individual in the case-study **twice a week initially, and thereafter, weekly.** Literature is very diverse in terms of the frequency of communication, for example, Deakin *et al*. (2006:2) conducted **weekly** diabetic communication sessions lasting two hours each, for six sessions. Furthermore, the researchers are of the opinion that the success of the intervention might have been due to the duration of contact time with the participants. Similarly, Ash *et al.* (2006:1562) found that conducting **weekly** communication of one and a half hours for eight weeks on lifestyle behaviour management, reduced weight and improved self-efficacy in overweight and obese men and women. Rickheim *et al*. (2002:273) found that conducting group communication on diabetes for **three hours** at base-line, followed **up two weeks later by a two-hour** session and then a **one-hour** session at three and six months was effective in terms of improving clinical, behavioural and learning outcomes. Nilsson *et al*. (2010:261), on the other hand, conducted communication **two to four times a week** with patients suffering from severe chronic diseases.

4.3.1.3 What is communicated?

Finding 3: The focus of communication ranged:

a) **from general diabetic information for a group** (Mash *et al.,* 2012:4; Mash et al., 2014:1), **to**

b) **individualised diabetic information specific to one person** (Kim & Kim, 2008:400);

c) **from general SMSs to adhere to ART treatment** (Pop-Eleches *et al*., 2011:3), **to**

d) **individualised information related to ART** (Lester *et al*., 2010:1839);

e) **from individualised education for COPD** (Kasikci, 2011:3), **to**

f) **individualised advice based on blood pressure readings** (Piette *et al.,* 2012:3).

Concluding statement 3: A communication strategy that provides focused and specific information to the individual or group can be used to accomplish effective health dialogue in adults with chronic disease in LMICs.

The focus of communication differs from study to study and ranges from group **diabetic information** that helps to understand the condition and its medication, living a healthy live, and preventing complications of the condition (Mash *et al.,* 2012:4) to specific diabetic information based on the unique parameters received from the patient (Kim & Kim, 2008:400).

In the same way, Kasikci (2011:3) discusses the pathophysiology, management, self-care and social support of **COPD** with the patient. In this study (Kasikci 2011) information on physical and training workouts was provided in addition to a patient brochure. All information was individualised to the patient's unique needs.

Addressing HIV, Pop-Eleches *et al.* (2011:3) reminded participants to take **ART medication** and also provided support to the participants via text messaging. Likewise, Lester *et al*. (2010:1839) used SMSs to determine the condition of participants **taking ARTs** and reminded them of the phone-based support. Curioso

and Kurth (2007:3) explored the **perceptions of HIV positive people regarding ICT** use to support HIV treatment and care.

In the plight against cardiovascular disease, Piette *et al*. (2012:3) reminded participants to **check their blood pressures regularly,** and enquired about blood pressure readings, diet and medication adherence. Based on their reply, additional self-care information was given. Participants were encouraged to seek medical help for abnormal readings.

The focus of communication relates to the health needs of the audience, for example, a study conducted in Honduras improved the understanding of the need of Pap smears and the risk of age-related dysplagia in women. The communication strategy was successful in improving cervical cancer knowledge and screening behaviour in older and under-screened women (Perkins, Langrish, Stern, Simon, 2007:187). Lund *et al.* (2012:1258), on the other hand, communicated the significance of antenatal care, skilled delivery attendance and postnatal care, and this improved the skilled delivery attendance.

4.3.1.4 Where is communication conducted?

Finding 4: Communication is conducted wherever:

a) **it is convenient** for the participant to access his/her mobile phone or log on to the internet (Kim & Kim, 2008:400; Lester *et al*., 2010:1839; Pop-Eleches *et al*., 2011:3; Piette *et al.,* 2012:3), or

b) **in a private room** at the community facility (Curioso & Kurth, 2007:2; Kasikci, 2011:3; Mash *et al.,* 2012:4; Mash *et al.,* 2014:1).

Concluding statement 4: A communication strategy that accomplishes effective health dialogue in adults with chronic disease in LMICs, takes place in a convenient and private setting.

The setting in which the communication took place varied among the studies and ranged from a **private room** at the specific facilities (Curioso & Kurth, 2007:2; Kasikci, 2011:3; Mash *et al.,* 2012:4), to wherever the participant could **access his or her cell phone, internet or at the landline telephone** (Kim & Kim 2008:400; Lester *et al.,* 2010:1839; Pop-Eleches *et al.,* 2011:3; Piette *et al.,* 2012:3). Various studies concur that communication can be conducted at community venues such as classrooms, churches, senior citizen centres and health facilities (Lorig *et al.,* 2001:1218; Rickheim *et al.,* 2002:270; Deakin *et al.,* 2006:6). Furthermore, literature acknowledges that the convience of mobile technology and the Internet allows users to log on whenever it is convenient to do so and mobile technology is accessible (DuBenske *et al.,* 2010:732; Lund *et al.,* 2012:1259).

4.3.1.5 By whom is communication conducted?

Finding 5: Communication was conducted by:

a) **trained healthcare promoters such as peer leaders or volunteers** (Mash *et al.,* 2012:4; Mash *et al.,* 2014:1);

b) **experts in the field such as a diabetic educators, dieticians or professional nurses** (Curioso & Kurth, 2007:2; Kim & Kim, 2008:400; Lester *et al*., 2010:1839; Kasikci, 2011:3), or

c) **via automated computer systems** (Pop-Eleches *et al*., 2011:3; Piette *et al.,* 2012:3).

Concluding statement 5: A communication strategy that accomplishes effective health dialogue in adults with chronic disease in LMICs, is provided by trained lay persons and/or healthcare professionals as well as automated computer systems.

When one-on-one and small-group communication takes place, educators range from trained health promoters to experts in the field. In Mash *et al.* (2012:4) trained **health promoters** provided the communication; while in Kasikci (2011:3), **the researcher** provided the communication. In Curioso and Kurth (2007:3), information was retrieved by an **experienced psychologist** at the clinics, and in Kim and Kim (2008:400), **the researcher**, who is a diabetic educator and professor of nursing,

provided the communication. Other literature confirmed that educators may range from trained health promoters to experts in the field, for example, a chronic disease self-management programme conducted by Lorig *et al.,* (2001:1218) had **trained peer leaders** that offered the programme and they were guided by a teaching manual. In Deakin *et a*l. (2006:2) and Rickheim *et al.* (2002:270) **diabetic specialists** provided the communication. Furthermore, a literature review conducted by Foster, Taylor, Eldridge, Ramsay and Griffith (2009:14) suggests that self-management interventions led by **lay leaders** are just as effective as professional-led self-management interventions in chronic disease.

Automated managements systems are commonly used in social and interactive mass media to communicate about health issues (DuBenske *et al.,* 2010:732; Nilsson *et al.*, 2010:261; Lund *et al.,* 2012:1258). Piette *et al.* (2012:3) and Pop-Eleches *et al.* (2011:3) conducted **communication via an automated management system**; while in the Lester *et al*. study (2010:1839) **the clinicians** sent the SMSs and followed up on the responses by the participants.

4.4 STEP 7: FORMULATING THE CONCLUDING STATEMENTS

Concluding statements are based on the findings of the synthesis process (Davies & Crombie, 2001: *s.p.* online) and are formulated through inductive reasoning, in other words, the statements are based on the studies themselves (Gough *et al.,* 2012:183). In addition, the concluding statements are graded according to the strength of evidence according to American Dietetic Association (2012:104) as reflected in Addendum G (page 192). The concluding statements formulated by the researcher were:

- **Concluding statement 1:** A variety of communication strategies such as small group, one-on-one, mobile cellular and/or computed communication can be used to accomplish effective health dialogue in adults with chronic disease in LMICs. **Grading:** Good

- **Concluding statement 2**: Frequently scheduled communication strategies, for example, weekly sessions can be used to accomplish effective health dialogue in adults with chronic disease in LMICs. **Grading:** Good

- **Concluding statement 3:** A communication strategy that provides focused and specific information to the individual or group can be used to accomplish effective health dialogue in adults with chronic disease in LMICs. **Grading:** Good

- **Concluding statement 4**: A communication strategy that accomplishes effective health dialogue in adults with chronic disease in LMICs, takes place in a convenient and private setting. **Grading:** Good

- **Concluding statement 5:** A communication strategy that accomplishes effective health dialogue in adults with chronic disease in LMICs, is provided by trained lay persons and/or healthcare professionals as well as automated computer systems. **Grading:** Good

After the concluding statements, the researcher described the specific measures taken to ensure rigour in steps 5-7 of this systematic review.

4.5 MEASURES TO ENSURE RIGOUR: STEPS 5-7

The researcher maintained the criteria of truth value, consistency, neutrality and applicability throughout the study:

Step 5: **Data extraction:** Data extraction was carried out by four researchers (the researcher and three experienced senior researchers), in a round table discussion. Meticulous record-keeping occurred throughout the process, to ensure that the study was repeatable, transparent and auditable (refer to Table 4.2).

Step 6: Analysis and synthesis: The data were analysed qualitatively and coded in terms of an analytical framework based on the review question and sub-questions. Furthermore, the health dialogue concept analysis evidence-based framework was used to identify the elements of effective dialogue in each study (refer to Figure 4.1 and Table 4.2).

Step 7: Formulating concluding statements: Concluding statements were ultimately made based on cross referencing to articles of high methodological rigour as determined by the critical appraisal process (refer to Table 3.6).

4.6 ETHICAL CONSIDERATIONS: STEPS 5-7

Ethical considerations must be applied in all phases of the research process (Botma *et al.,* 2010:4). In this study, the following ethical principles were maintained:

Accurate and complete references were given at all times since the researcher guarded against **disrespect** of intellectual property (plagiarism) (*cf.* Polit & Beck, 2008:633; Burns & Grove, 2011:645).

The data extraction process was carried out by four reviewers to enhance the quality and **reliability** of the study**.** This prevented bias by balancing personal values that could have played a role in the analysis process.

All literature is **traceable, available and sound** as is required for auditing purposes (*cf.* Centre for Review and Dissemination, 2009:25; American Dietetic Association., 2012:22; Steenkamp, Scrooby & Van der Walt, 2012:12). The researcher has therefore ensured that accurate referencing has been made to acknowledge the work of authors and to confirm its authenticity. Furthermore, all information retrieved from databases and other sources was handled with responsibility and confidentiality (*cf.* Burns & Grove, 2011: 203).

4.7 SUMMARY

This chapter dealt with analysis and synthesis. Data relevant to the review question was extracted from the primary studies and information was presented in table format for subsequent analysis. Data was then organised according to a thematic framework, structured to address the review question and a summary of the findings of the study led the researcher to the formulation of concluding statements. The specific measures that were taken to ensure rigour in steps 5-7 of the systematic review, as well as the ethical principles maintained in steps 5-7 of the systematic review were then described by the researcher. In Chapter 5, the recommendations and limitations of the study will be discussed.

CHAPTER 5

Recommendations and limitations

5.1 INTRODUCTION

The purpose of the review was to critically synthesise the best available evidence of communication strategies used to accomplish effective health dialogue in adults with chronic diseases in LMICs. In the previous chapter the last three steps of the systematic review were discussed, namely, data extraction, the analysis and synthesis process and the formulation of concluding statements. This chapter concludes the study by discussing the recommendations and limitations of the study as well as providing a reflection of the researcher after conclusion.

5.2 RECOMMENDATIONS

Recommendations based on the findings of the study are made in terms of each concluding statement:

Conclusion 1: A variety of strategies such as small group, one-on-one, mobile cellular and/or computed communication can be used to accomplish effective health dialogue in adults with chronic disease in LMICs.

- During scheduled in-service training sessions or scheduled discussions on the latest research publications, HCPs should keep up to date with the best available evidence regarding communication strategies that accomplish effective dialogue in adults with chronic diseases. A dedicated person acting as health dialogue champion within a health facility could be tasked with compiling guidelines on the best available evidence and be responsible to disseminate this information.

- Since HCPs mostly are involved in one-on-one and small-group health dialogue with adults affected by chronic diseases in LMICs, a greater sensitivity needs to be created towards the benefits of tailoring such communication. This goes hand in hand with equipping these HCPs with the necessary skills to conduct such tailored communication. Skills training in tailored communication ideally should form part of undergraduate education, but also be included in in-service training of qualified HCPs.

- Follow-up research investigating the ways in which communication is conducted should be commissioned within a tertiary environment in a dedicated niche area addressing health communication between HCPs and patients.

- Since computed and mobile cellular communication proved to be a strategy employed for health dialogue in LMICs, the development and strengthening of the necessary infrastructure for this type of communication are essential in the battle against chronic disease. HCPs need to advocate such a focus at national and provincial levels, whilst actively involving stakeholders outside the health profession.

Conclusion 2: Frequently scheduled communication strategies, for example, weekly sessions can be used to accomplish effective health dialogue in adults with chronic disease in LMICs.

- Since the frequency of communication reported differs from study to study, the HCP should take the information needs of the patient into consideration and plan communication sessions according to the information needs of the patients and family members.

Conclusion 3: A communication strategy that provides focused and specific information to the individual or group can be used to accomplish effective health dialogue in adults with chronic disease in LMICs.

- Since the focus of the communication was unique to each study reported, it is recommended that the HCP who decides to make use of the strategy should provide communication according to the condition and needs of the patient(s) involved. The HCP should use a multi-strategy approach, for example, one-on-one communication augmented by brochures or mobile messages to re-enforce the message. A dedicated national and provincial health communication unit focusing on such a multi-strategy would strengthen HCPs' hands to implement such a strategy.

Conclusion 4: A communication strategy that accomplishes effective health dialogue in adults with chronic disease in LMICs, takes place in a convenient and private setting.

- Since health dialogue with adults with chronic diseases in LMICs takes place wherever they can access their mobile phones or log on to the internet, the infrastructure to make use of such services needs to be optimal. Therefore, HCPs need to form part of the task teams addressing local information technology issues.

- The use of private rooms within nearby community facilities need to be actively pursued by HCPs, especially in the light of the challenges faced by public healthcare facilities – space being one such a challenge. Involving community members when creating clinic committees could be an example of how to go about securing such facilities.

Conclusion 5: A communication strategy that accomplishes effective health dialogue in adults with chronic disease in LMICs, is provided by trained lay persons and/or healthcare professionals as well as automated computer systems.

- Since ‘trained’ volunteers and peer leaders may not always be readily available, such individuals and/or groups should be purposefully involved in the health activities of the health facilities. The individuals and/or groups may be identified from patients, non-governmental organisations, or non-profit organisations in the community. HCPs should become involved in the training of these groups. Training could involve disease management, but could also include communication skills.

5.3 LIMITATIONS

The **inexperience of the researcher** in the methodology could have influenced the quality of the study. However, the impact of this limitation was reduced by the guidance and support of the supervisor and co-supervisor that are experts in the research field and by using expert researchers as independent reviewers.

Health dialogue is a very new concept under investigation and, therefore, this study used the evidence-based concept analysis framework of Reid (2015) as a point of departure in identifying studies that reflect elements of effective health dialogue. Effective health dialogue was deemed to be the presence of the health dialogue element(s) within the identified concept analysis. None of the studies complied with all identified elements deemed to constitute health dialogue. However, it is important to note that any completed concept analysis’ outcome is always tentative, originating from the dynamic nature of scientific knowledge. It is therefore possible that the identified elements of effective health dialogue used in this study, could change in the future when repeating the concept analysis of health dialogue.

The **researchers were not blinded** during the selection of studies and during the critical appraisal process. However, neither the studies, nor the authors of the studies were known to the researchers; therefore, a conflict of interest did not exist. The impact of the limitation was reduced by four reviewers conducting the critical appraisal.

In a study, **the researcher is restricted** to what is being reported on in the studies and the studies did not necessarily reflect whether the information conveyed during health dialogue was evidence-based. However, the limitation is mitigated by the critical appraisal process that acknowledged the studies as methodologically sound.

5.4 REFLECTIONS AFTER CONCLUSION

This was an incredible journey that the researcher had the privilege to embark on. It was filled with so many highs and even more lows that moulded and shaped the researcher. The researcher has experienced tremendous professional and personal growth during this study and hopes that this could be the start of great things both personally and professionally. The journey has also reflected on the level of commitment, endurance and perseverance that the researcher has.

The hours spent reading and re-reading literature gave the researcher an in-depth understanding of the methodology and an appreciation for research.

The researcher realized that the study would not have been possible without the assistance of a team: the supervisor and co-supervisor that guided and supported her through the whole process and the proficient librarian that answered each and every e-mail and enquiry with so much patience and diligence. A remarkable and formidable team! An expert in the methodology once said, that a systematic review is only as good as its team.

5.5 CONCLUSION OF THE STUDY

The purpose of the study was to critically synthesise the best available evidence on communication strategies used to accomplish effective health dialogue in adults with chronic diseases in LMICs. This goal was achieved by conducting a systematic review according to the seven steps of Higgins and Green (2006:16). The systematic and rigorous search process of the systematic review, lead to the selection of eight final studies for critical appraisal. Seven of these studies were of adequate methodological quality and was included in the data extraction process. The analysis

and synthesis process of the study eventually led to five concluding statements related to the five sub-questions of the review question. The comprehensive synthesis of the literature has led to the creation of new knowledge and perspectives that might be of great value in developing and using communication strategies in patients with chronic diseases in LMICs.

> ***"What lies ahead of you and what lies behind you is nothing compared to what lies within you"*** **Mahatma Gandhi**

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ADDENDUM A

Studies excluded after full-text filtering

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
1	Effectiveness of Peer Education Interventions for HIV Prevention in Developing Countries: A systematic review and meta-analysis. By: Medley, Amy; Kennedy, Caitlin; O'Reilly, Kevin; Sweat, Michael. *AIDS Education & Prevention.* 2009, Vol. 21 Issue 3, p181-206	Systematic review and meta-analysis	Effectiveness of peer education interventions for HIV prevention in developing countries	Peer education	Specific to each study	HIV prevention	Specific to each study	Trained peer educators	Irrelevant, focused on prevention of HIV in using peer education
2	Reaching Rural Women: Breast Cancer Prevention Information Seeking Behaviors and Interest in Internet, Cell Phone, and Text Use. By: Kratzke, Cynthia; Wilson, Susan; Vilchis, Hugo. *Journal of Community Health*. 2013, Vol. 38 Issue 1, p54-61	Descriptive qualitative cross-sectional study	To examine breast cancer prevention information-seeking behaviour with regard to internet, cell and text messaging	Not addressed	Not addressed	Breast cancer prevention information	Not addressed	Not addressed	Irrelevant, focused on preventative measures for breast cancer

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
3	Evaluation of community-based interventions for non-communicable diseases: Experiences from India and Indonesia. By: Krishnan, A.; Ekowati, R.; Baridalyne, N.; Kusumawardani, N.; Suhardi; Kapoor, S. K.; Leowski, J. *Health Promotion International*. 2011, Vol. 26 Issue 3, p276-289	Non research study	To evaluate two programmes for integrated non-communicable disease prevention and control	Group meetings, mass media and interpersonal contexts	Not addressed	Not addressed	Not addressed	Trained community volunteers	Irrelevant, focused on a health system intervention
4	Community Empowerment – A Successful Model for Prevention of Non-communicable Diseases in India. The Chennai Urban Population Study (CUPS -17). By Mohan, V.; Shanthirani, C. S.; Deepa, M.; Datta, M.; Williams, O. D. and Deepa, R. 2006. *Journal of Association of Physicians of India*, 54, 858–862	Randomised clinical trial	To demonstrate that non-communicable diseases can be prevented by increasing physical activity	Public lectures, pamphlets and video clippings, and interpersonal sessions	Weekly health education lectures.	Community was taught the benefits of physical activity	At the two residential colonies	Research team	Irrelevant, focused on prevention of a non-communi-cable disease through physical activity

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
5	You Have an Important Message! Evaluating the Effectiveness of a Text Message HIV/AIDS Campaign in Northwest Uganda. By: Chib, Arul; Wilkin, Holley; Ling, Leow Xue; Hoefman, Bas; Van Biejma, Hajo. *Journal of Health Communication*, 2012 Supplement, Vol. 17, p146-157	Explorative design	To explore the effectiveness of a SMS-based HIV/AIDS information dissemination programme in Uganda	Short message service	Not clearly stated	Increasing HIV/-AIDS awareness and HIV Counsel-ling and Testing Services	Wherever messages are accessed	Members of Text to Change	Irrelevant, focused on prevention of HIV/AIDS via sms's.
6	A community-based education program about cervical cancer improves knowledge and screening behavior in Honduran women. By: Perkins, Rebecca B.; Langrish, Sarah; Stern, Linda Jo; Simon, Carol J. Revista Panamericana de Salud Publica. *American Journal of Public Health*. 2007, Vol. 22 Issue 3, p187-193	A cross-sectional design	To examine changes in knowledge and behaviour after a community-based cervical cancer education programme	Radio broad-casts	Twice a day for an hour	The importance of cervical cancer screening and the risks of non-compliance	At two regional radio stations	Trained health care providers	Irrelevant, focused on the prevention of cervical cancer after a community program.

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
7	Developing an innovative cross-cultural strategy to promote HIV/AIDS prevention in different ethnic cultural groups of China. By Wang S; Keats D. *AIDS Care,* 2005; 17 (7): 874-891.	A pre-test post-test design	To examine the cultural appropriateness and effective-ness of peer-led health message diffusion regarding HIV/AIDS prevention	Peer-led health communication	Group A: after pre-test. Group B: after pre-test. Group C: no intervention	Prevention of HIV/AIDS	1) Direct training group used a drop-in centre 2) Familiar venues were used by indirect intervention group	Group A by directly trained peers and Group B by peers in diffusion group	Irrelevant, focused on prevention of HIV/AIDS through peer-led intervention
8	Effect of TB behaviour change communication (BCC) intervention in Enugu state, south-east Nigeria. Onyeonoro, Ugochukwu Uchenna; Chukwu, Joseph Ngozi; Nwafor, Charles C; Meka, Anthony O; Oshi, Daniel C. *Health Education*, Vol 113 (6). 2013. pp. 536-545.	Descriptive qualitative cross sectional study	To evaluate the effect of tuberculosis behaviour change communication on knowledge and perception of tuberculosis	Not applicable	Not applicable	The effect of behaviour change communication on knowledge and perception of tuberculosis	Not applicable	Not applicable	Irrelevant, focused on the prevention of tuberculosis.
9	Global and Local Networking for HIV/ AIDS Prevention: The Case of the Saathii E-Forum. By: De Souza, Rebecca; Dutta, Mohan Jyoti. *Journal of Health Communication*, 2008, Vol. 13 Issue 4, p326-344,	Thematic analysis	Explore the role of the Internet in networking civil society organisations working with HIV/AIDS-related issues	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Irrelevant, focused on prevention of HIV/AIDS and the internet

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
10	Newspaper Articles as a Tool for Cardiovascular Prevention Programs in a Developing Country. By: Nishtar, Sania; Mirza, Yasir Abbas; Jehan, Saulat; Hadi, Yasmin; Badar, Asma; Yusuf, Shazia; Shahab, Saqib. *Journal of Health Communication*. 2004, Vol. 9 Issue 4, p355-369	Qualitative design	To evaluate changes in knowledge and attitudes of a health education programme using newspaper articles	Print media	Articles were posted on a weekly basis in the newspaper	Cardio-vascular disease prevention and health promotion	'The News', a daily English news-paper	National heart organisation	Irrelevant, focused on the prevention of cardiovascular disease using print media
11	Application of information and communication technology [ICT] in combating human immuno-deficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) in South Africa. By: Peltzer, K. *African Journal for Physical, Health Education, Recreation and Dance,* 14(2): pp. 143-162; 2008.	Literature review	Review of Information and Communicatio n Technology and its applications to HIV/AIDS in South Africa	Information and communication technology	Not addressed	Not addressed	Not addressed	Not addressed	Irrelevant, focused on prevention of HIV/AIDS

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
12	Media interventions to increase cervical screening uptake in South Africa: An evaluation study of effectiveness. By: Risi, L; Bindman, J P; Campbell, O M R; Imrie, J; Everett, K; Bradley, J; Denny, L. *Health Education Research*, 2004. 19(4): pp. 457-468	Randomised controlled trial	To evaluate the effectiveness of two media interventions in increasing cervical screening uptake	Photo-comic and radio-drama	1. Photo comic was received after the baseline survey. 2. One month later, radio drama was broadcast on community radio, ten times a month	The significance of cervical cancer screening and follow-up	Comic was received at the screening facility.	Khayelitha Cervical Cancer Screening Project members	Irrelevant, focused on the prevention of cervical cancer through increased screening
13	Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviours in developing countries, by: Bertrand, Jane T; O'Reilly, Kevin; Denison, Julie; Anhang, Rebecca; Sweat, M. *Health Education Research.* 2006. Vol. 21 (4) p567-597.	Systematic review	To examine the effectiveness of 24 mass media interventions on changing HIV-related knowledge, attitudes and behaviours	Mass media communication programmes	Specific to each study	Messages to produce awareness or behaviour change with regard to HIV/AIDS	Specific to each study	Specific to each study	Irrelevant, focused on prevention of HIV/AIDS through mass media interventions.

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
14	Educating Women for HIV Prevention: Does Exposure to Mass Media Make Them More Knowledgeable? By: Jesmin, Syeda S.; Chaudhuri, Sanjukta; Abdullah, Shahnaz. *Health Care for Women International*. 2013. Vol. 34 Issue 3/4, p303-331	Descriptive qualitative cross-sectional study	To examine if mass-media campaigns will have beneficial effects on women's knowledge of HIV/AIDS	Not addressed	Not addressed	Information was gathered regarding know-ledge of HIV/AIDS and exposure to mass media	Not addressed	Not addressed	Irrelevant, focused on prevention of HIV/AIDS in women
15	Reaching the Underserved: Measuring the Impact of a Community Media Intervention, Uttar Pradesh, India, by Sood, Suruchi Singh, Pramod Kumar Sarwal, Rakesh. *International Quarterly of Community Health Education,* Vol 23(2), 2004. pp. 117-138.	Non-research study	Non-research study	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Irrelevant, focused on the prevention of a non-communi-cable disease

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
16	Forman, A. (2003). Theme discussion: HIV/AIDS communication and communication in South Africa. Retrieved from www.dotforce.org, 22 March 2007	Non-research study	Non-research study	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Irrelevant, focused on the prevention of HIV/AIDS
17	Molefi, M., Kachienga M. & Wynchank, S. (2004) Using a health broadcast channel as a means of disseminating information about HIV/AIDS in South Africa. Paper presented at XV International AIDS Conference – Bangkok Thailand, July 11-16, 2004	Conference Paper	Unknown	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Irrelevant, focused on the prevention of HIV/AIDS

NUMBER	ARTICLE AND JOURNAL DETAILS	METHOD	OUTCOMES	HOW IS COMMUNI-CATION CON-DUCTED	WHEN COMMUNIC ATION IS CON-DUCTED	WHAT IS COM-MUNICATED	WHERE COMMUNIC ATION IS CON-DUCTED	BY WHOM COMMUNIC ATION IS CON-DUCTED	REASON FOR EXCLU-SION FROM THE STUDY
18	Pappas-DeLuca, K. A., Koppenhaver, T., Tembo, P.,Galavotti, C., Mooki, M., Roels, T., *et al*. (2003, December). Reach and acceptability of an innovative program for HIV prevention: Makgabaneng Listenership. Paper presented at the First National HIV/AIDS/STI/ Other Related Infectious Diseases Research Conference (NHASORC), Gaborone, Botswana	Conference Paper	Unknown	Serial drama	Not addressed	Not addressed	Not addressed	Not addressed	Irrelevant, focused on the prevention of HIV/AIDS
19	Riber, J. (2004). Journey to Mopani Junction: The making of Mopani Junction. Harare, Zimbabwe: Media for Development	Unknown	Unknown	Entertainment education	Not addressed	Not addressed	Not addressed	Not addressed	Irrelevant, focused on the prevention of a non-communi-cable disease

ADDENDUM B

11 questions to help you make sense of a trial

11 questions to help you make sense of a trial

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of a randomised controlled trial:

- **Are the results of the trial valid?** **(Section A)**
- **What are the results?** **(Section B)**
- **Will the results help locally?** **(Section C)**

The 11 questions on the following pages are designed to help you think about these issues systematically.
The first three questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions.

There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of prompts are given after each questions. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

There will not be time in the small groups to answer them all in detail!

(A) Are the results of the review valid?

Screening Questions

1. Did the trial address a clearly focused use? ❒ Yes ❒ Can't Tell ❒ No

HINT: An issue can be 'focused' in terms of

- The population studied
- The intervention given
- The comparator given
- The outcomes considered

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2. Was the assignment of patients to treatment randomised? ❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- How was this carried out?
- Was the allocation sequence concealed from researchers and patients?

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3. Were all of the patients who entered the trial properly accounted for at its conclusion? ❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- Was the trial stopped early?
- Were patients analysed in the groups to which they were randomised?

Is it worth continuing?

Detailed questions

4. Were patients, health workers and study personnel 'blind' to treatment?

❒ Yes ❒ Can't Tell ❒ No

HINT: Think about

- **Patients?**
- **Health workers?**
- **Study personnel?**

---

5. Were the groups similar at the start of the trial?

❒ Yes ❒ Can't Tell ❒ No

HINT: Look at

- **Other factors that might affect the outcome such as age, sex, social class**

6. Aside from the experimental intervention, were the groups treated equally?

❒ Yes ❒ Can't Tell ❒ No

(B) What are the results?

7. How large was the treatment effect?

HINT: Consider

- What outcomes were measured?
- Is the primary outcome clearly specified?
- What results were found for each outcome?

---

8. How precise was the estimate of the treatment effect?

HINT: Consider

- What are the confidence limits?

(C) Will the results help locally?

9. Can the results be applied in your context? (or to the local population?)

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider whether

- Do you think that the patients covered by the trial are similar enough to the patients to whom you will apply this?, if not how to they differ?

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10. Were all clinically important outcomes considered?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- Is there other information you would like to have seen?
- If not, does this affect the decision?

---

11. Are the benefits worth the harms and costs?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- Even if this is not addressed by the review, what do you think?

ADDENDUM C

10 questions to help you make sense of qualitative research

10 questions to help you make sense of qualitative research

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of a qualitative research:

- **Are the results of the review valid?**
- **What are the results?**
- **Will the results help locally?**

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions.

There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

There will not be time in the small groups to answer them all in detail!

Screening Questions

1. Was there a clear statement of the aims of the research?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- What was the goal of the research?
- Why it was thought important?
- Its relevance

---

2. Is a qualitative methodology appropriate?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal?

Is it worth continuing?

Detailed questions

3. Was the research design appropriate to address the aims of the research?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If the researcher has justified the research design (e.g. have they discussed how they decided which method to use)?

---

4. Was the recruitment strategy appropriate to the aims of the research?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

5. Was the data collected in a way that addressed the research issue?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If the setting for data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted, or did they use a topic guide)?
- If methods were modified during the study. If so, has the researcher explained how and why?
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

---

6. Has the relationship between researcher and participants been adequately considered?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If the researcher critically examined their own role, potential bias and influence during
  (a) Formulation of the research questions
  (b) Data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

7. Have ethical issues been taken into consideration?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

---

8. Was the data analysis sufficiently rigorous?

❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

9. Is there a clear statement of findings? ❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- **If the findings are explicit**
- **If there is adequate discussion of the evidence both for and against the researchers arguments**
- **If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)**
- **If the findings are discussed in relation to the original research question**

---

10. How valuable is the researcher? ❒ Yes ❒ Can't Tell ❒ No

HINT: Consider

- **If the researcher discusses the contribution the study makes to existing knowledge or understanding e.g. do they consider the findings in relation to current practice or policy?, or relevant research-based literature?**
- **If they identify new areas where research is necessary**
- **If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used**

ADDENDUM D

Critical appraisal guidelines for single case study research

CRITICAL APPRAISAL GUIDELINES FOR SINGLE CASE STUDY RESEARCH

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ABSTRACT

The use of critical appraisal guidelines to access the validity of research findings has become an established technique in those disciplines, such as healthcare and medicine, that encourage the use of evidence-based practice. Critical appraisal guidelines provide a rigorous set of criteria, often in the form of a checklist, against which a piece of research, such as clinical trials and cohort studies, qualitative research is less well served. Through a synthesis of existing best practices in interpretative research this paper provides comprehensive guidelines for the conduct of single case study research and extrapolates from them a set of critical appraisal guidelines to assist in the evaluation of such work.

1. INTRODUCTION

The use of critical appraisal guidelines for assessing the relevance and rigour of research findings has become an established technique in those disciplines which encourage the use of evidence-based practice (Crombie, 1996). Partly because the principles of evidence based practice began in the medical field and partly because the nature of the research methods lend themselves to careful measurement, critical appraisal guidelines for surveys, cohort studies, clinical trials and case-control studies are well established (Crombie, 1996). As the application of evidence-based thinking has been considered in areas such as nursing (Blomfield & Harvey, 2000), education (Hammersley, 2000), social work (Trinder, 2000), information systems (Atkins & Louw, 2000) and human resource management (Briner, 2000), the crucial need for a similar measures for qualitative research methods has been recognised. Klein and Myers (1999) for example, comment that as "the interest in interpretative research has increased…researchers, reviewers and editors have raised questions about how interpretive field research should be conducted and how its quality can be assessed" (p.67). Critical appraisal guidelines, specific to a research method, provide an easily accessible and comprehensive checklist of questions that can be used to evaluate the quality of a particular piece of research, undertaken according to that method, and thus an indication of the reliability of the findings.

Through the work of researchers such as Benbasat *et al.* (1987) and Yin (1984) case studies, particularly those designed to be consistent with positivist criteria, are accepted as a legitimate and useful method of IS research (Klein and Myers, 1999). Their purpose is to try to understand, or

Interpret, phenomena in terms of the subjective meanings people bring to them (Denzin, 1994). However, as Walsham (1995) suggest "the most appropriate4 method for conducting empirical research in the interpretative tradition is the in-depth case study" and as Klein and Myers (1999) point out "positivist criteria…are inappropriate for interpretive research" (p.68). While recognising that cases studies are not necessarily qualitative, (Stake, 1994) the guidelines we present are focused on qualitative studies.

Evidence based practice in other areas has highlighted the importance of providing an agreed protocol for both the conduct and presentation of specific research approaches, particularly as an aid to determining the reliability of the 'evidence' embodied in research findings. Although there is a body of writing describing good practice in case study research, we noted that an agreed set of comprehensive and practical guidelines were not offered and the focus of the work described here was thus to synthesise information from the relevant literature to guide both researchers and reviewers. This pape4r then draws together related work both from different disciplines (particularly, Greenhalgh, 1997; Miles and Huberman, 1994) and from within Information Systems (IS) on other qualitative methods, (e.g. Walsham, 1995; McKay and Marshall, 2000, Carroll and Swatman, 2000; Klein and Myers, 1999) to construct a set of critical appraisal guidelines to assist in both undertaking and appraising single case study research.

2. CONDUCT OF THE RESEARCH

The research described here was undertaken in five stages. Firstly, relevant literature was consulted and suggestions for ensuring high quality research were extracted. Secondly, a conceptual framework in which the suggestions could be organised was adopted and this was then instantiated with the guidelines taken from the literature and from the experience of the researchers themselves. Guidelines for the appraisal of such research were then extrapolated from these and compared with those of McKay and Marshall (2000). Differences were noted and a final set of critical appraisal guidelines was constructed and later trialled (Wheeler, 2000).

3. THE LITERATURE

A number of authors have provided guidance on the conduct of high quality interpretative research (e.g. Miles and Huberman (1994); Klein and Myers, 1999; McKay and Marshall, 2000) and case studies, in particular (e.g. Yin, 1984; Walsham, 1995; Darke *et al.*, 1998) although some are often either focused on specific problems or on specific aspects. For example, Darke *et al.* (1998) address five specific difficulties; selecting appropriate research, designing, shaping, and scoping a case study research project, obtaining the participation of organisations, collecting case study data from case participants and establishing rigour in writing up case study research. In contrast, Carroll and Swatman (2000) provide a framework to assist in undertaking and assessing the theory building aspects of interpretive IS research. Yin (1984) describes a protocol for case studies, which, as he suggests, "contains the instrument but also contains the procedures and the general rules that should be followed in using the instrument," (p.63) and McKay and Marshall (2000) provide a set of guidelines for the conduct and appraisal of action research. Greenhalgh (1997) has proposed nine questions for evaluating pape4rs that describe qualitative research in general based on her own research and from the research of Denzin and Lincoln (1994), Mays and Pope (1996) and Britten *et al.* (1995). These guidelines which are illustrated at Table 1.

1	Did the paper describe an important clinical problem addressed via a clearly formulated question?
2	Was a qualitative approach appropriate?
3	How were the setting and the subjects selected?
4	What was the researcher's perspective, and has this been taken into account?
5	What methods did the researcher use for collecting data, and are these described in enough detail?
6	What methods were used to analyse the data, what quality control measures were implemented?
7	Are the results credible, and if so, are they clinically important?
8	What conclusions were drawn, and are they justified by the results?
9	Are the findings of the study transferable t6o other clinical settings?

Table 1: Nine guidelines for evaluating qualitative papers (Greenhalgh, 1997)

4. CONCEPTUAL FRAMEWORK

To assist in organising the guidelines, a framework was utilised for classifying the process of case study research. Bronts *et al.* (1995) proposed a framework for investigating IS development methods, which suggested five classification elements that were useful to us: *way of thinking*, *way of working*, *way of controlling*, *way of supporting* and *way of communicating.* The *way of thinking* describes the assumptions and viewpoints of the researcher in the context of the current research and thus makes explicit the philosophical context in which the research is conducted. The *way of working* defines and orders the tasks and sub-tasks that are to be performed in the research exercise, and also provides guidelines and heuristics on how these tasks should be carried out. The *way of controlling* sets out how the research exercise should be managed while the *way of supporting* details how tools can be used to support the research exercise. The *way of communicating* describes the form in which the research is to be presented. The framework thus covers both the research approach which is "a way of going about one's research, embodying a particular style and employing different methods" and the research method which is "a way to systemise observation, describing ways of collecting evidence and indicating the type of tools and techniques to be used during data collection" (Cavaye, 1996, p.227).

5. PRACTICAL GUIDELINES FOR UNDERTAKING CASE STUDY RESEARCH

Table 2 contains the list of guidelines that were developed classified according to the framework described above. The guidelines have emerged through a synthesis of the work of: Carroll and Swatman (2000), Darke *et al.* (1998), Greenhalgh (1997), Klein and Myers (1999), Maxwell (1996), Miles and Huberman (1994), Patton (1990), Richards (1997), Walsham (1995) and Yin (1984).

WAY OF THINKING

1. Provide an argument for why a case study is appropriate.

This guideline requires the researcher to provide an explanation of case study research and also a justification for choosing the approach. This should involve defining the strengths and weaknesses of case studies (see Yin 1984; Cavaye 1992) and also indicate whether the approach was successful or not.

2. State philosophical stance and perspective, take any bias into account in the analysis.

It is important that the researcher reflects on her/his philosophical stance and states it clearly when writing up their work. The main reason for this is because it affects every aspect of the research process, from how the evidence is collected to how the results are interpreted. There are a number of papers and research discussing the positivist and interpretivist philosophical traditions (e.g., Hirschheim *et al.* 1995, Darke *et al.* 1998; Klein and Myers 1999; Travis 1999; Walsham 1995). As it is unreasonable to suggest that research of this type can be conducted in a total objective manner, it is imperative that the researche4r describes in detail the basis for their thinking and reasoning so that the

results can be interpreted accordingly (Greenhalgh, 1997). This 'principle of suspicion' as described by Klein and Myers (1999) "requires sensitivity to possible 'biases' and systematic "distortions" in the narratives collected from the participants".

Element	Guideline	Authors
Way of thinking	Provide an argument for why a case study is appropriate.	Greenhalgh (1997), Darke *et al.* (1998)
	State philosophical stance and perspective. Take account of bias when performing data analysis.	Walsham (1995); Klein & Myers (1999)
Way of controlling	Define and use some form of quality control measures.	Greenhalgh, Miles & Huberman (1994), Yin (1984)
	Ensure that the results are credible.	Greenhalgh, Moody & Buist (1999), Mays & Pope (1996)
	Determine how to draw conclusions and justify the results through the appropriate use of theory.	Walsham (1995), Carroll & Swatman (2000)
Way of working	Construct a clearly formulated question that describes an important IS issue or problem of interest.	Greenhalgh, Yin, Darke *et al.* (1998)
	Create a first cut conceptual framework.	Miles & Huberman, Carroll & Swatman
	Devise first cut case study questions.	
	Make explicit the research approach.	Shanks *et al.* (1997)
	Perform a pilot case study	Yin
	Determine criteria for selecting the appropriate case and participants.	Greenhalgh, Patton (1990) Maxwell (1996)
	Refine the case study questions based on lessons learnt from the pilot study.	
	Revisit the research purpose/question and modify the conceptual framework as necessary.	Greenhalgh, Klein & Myers, Miles & Huberman, Carroll & Swatman
Way of supporting	Choose appropriate methods for collecting data. Ensure that these are described in enough detail.	Greenhalgh, Walsham
	Employ a systematic way to analyse the data. Ensure that these are described in enough detail.	Greenhalgh, Richards (1997), Miles & Huberman
Way of communicating	Create a plan for the final report.	Yin, Walsham
	Determine how the case study findings might be transferable to other settings.	Greenhalgh, Miles & Huberman
	Determine how to present the findings to the academic and practitioner communities.	Darke *et al.*, Miles & Huberman

WAY OF CONTROLLING

3. Define and use some form of quality control measures.

Quality control methods as described by Greenhalgh (1997) are concerned with ensuring that the data has been analysed by more than one researcher "to confirm that they are both assigning the same meaning to them". Triangulation too, is an accepted means of reducing bias by providing multiple instances of evidence from different sources (Miles and Huberman, 1994). Indead, Yin (1984) suggests that evidence for case studies should come from at least six sources such as documentation, archival records, interviews, direct observations, participant-observation and physical artefacts (*ibid.* pp.78-99).

Other quality control methods, such as the creation and maintenance of a case study 'database', are recommended by Yin (1984) who also highlights the importance of demonstrating a 'chain of evidence' to increase the reliability of information in a case study. This may be achieved by cross-referencing documents during the data collection and data analysis phases, and creating an annotated bibliography of documents (Darke *et al.* 1988).

4. Determine how to draw conclusions and justify results by the appropriate use of theory.

The researcher should determine the type of generalisation relevant to their research goal and research strategy. For example, case studies may be used to develop concepts, or to generate a theory by integrating several concepts, propositions and world-views. However, the type of generalisation is likely to be dictated by the number of cases to be studied. As Darke *et al.* (1998) suggest, "single cases provide for in-depth investigation and rich description. Multiple case-designs allow literal or theoretical replication and cross-case comparison". Walsham (1995) illustrates the roles of theory with examples but warns of the danger of using theory to guide data collection and analysis commenting that, "a researcher should have an analytic framework, but should retain a degree of scepticism concerning its value…a theory is a way of seeing and a way of not-seeing, since the use of a particular theory excludes other ways of viewing the same events" (p.70).

5. Ensure that the results are credible.

The aim of this guideline is to ensure results obtained from case study research are both credible and practical. (Greenhalgh (1997) discusses the issue of assessing credibility in qualitative research, "It often takes little more than plain common sense to determine whether the results are sensible and believable and whether they matter in practice" (p.160). She emphasises that the researcher must cite actual data and ensure that the results are "independently and objectively verifiable" by indexing all quotes and examples so they can be "traced back to an identifiable subject and setting" (*ibid.* p.160). An automated qualitative data analysis tool can provide this.

WAY OF WORKING

6. Construct a clearly formulated question that describes an important IS issue.

The aim of this guideline is to remind the researcher that not only is it important to formulate a precise research question, but to also research issue that has important to the Information Systems community. Darke *et al.* (1998) support this saying, "it is important to ensure that the questions are appropriate in terms of their interest, significance and value for both the research and practitioner information system communities" (p.280). They also suggest that the research question should be one that can be answered in a useful way. Therefore, the research question should state what is to be discovered, whereas hypotheses should provide the initial answer(s) to the question. Miles and Huberman (1994) suggest that many researchers explicitly state their ideas as part of the process of theorising and data analysis. They refer to this as generating propositions rather than hypotheses. In qualitative research, hypotheses are usually developed after the researcher has begun the study, as Maxwell (1996) comments, "hypotheses in qualitative research…are grounded in the data and are developed and tested in interaction with it, rather than being prior ideas that are simply tested against data" (p.53).

7. Create a first cut conceptual framework.

A conceptual framework explains, "either graphically or in narrative form, the main things to be studied – the key factors, constructs or variables – and the presumed relationships among them" (Miles and Huberman, 1994, p.18). One of the main motivations for developing a preliminary conceptual framework is to help focus the research and avoid 'information overload'. The initial conceptual framework is revised many times until the point of closure, and in some cases may change significantly. The final conceptual framework should be included in any presentation of the research.

8. Devise first cut case study questions.

It is important to start devising interview questions early on, as they help to focus the research. The questions may be fairly broad, and may remain so until the pilot case study is completed. Once the participants have been determined, a useful guide is to group questions according to their role and care must be taken to ensure that only relevant questions are asked of each participant. Another technique is to devise questions based on the conceptual framework.

9. Make explicit the research approach.

As defined earlier, the research approach is the particular style and methods used for undertaken the research (Cavaye, 1996). The purpose of this guideline is to make sure the approach and techniques for data collection and analysis are described in detail, including the rationale for their selection. For example, Shanks *et al.* (1997) described their approach pictorially (see p.351) and explicitly defined each component.

10. Perform a pilot case study.

A pilot case study can be viewed as the 'dress-rehearsal' of the final case study. Performing a pilot case study can be a very useful method to ensure, for example, that interview questions are appropriate and useful for the purpose of extracting the required information.

11. Determine criteria for selecting an appropriate case study and stakeholders.

This guideline emerged from the work of Patton (1990), Greenhalgh (1997) and from a particular research experience of determining appropriate criteria for selecting data warehousing projects. The researcher should conduct an intentional selection process to choose specific settings, persons or events (Patton, 1990). Likewise, Greenhalgh (1997) remarks that to gain an in-depth understanding of the participants experience we should, "deliberately seek out individuals or groups who fit the bill" (p.157).

12. Refine the case study questions based on lessons learnt from the pilot study.

The interview questions are refined after the pilot case study and other changes may also be required; for example, a different type of participant may need to be interviewed. This amendment process is the formalisation of the case study questions and logically leads onto the next guideline, 'revisit the research question'. Pilot case studies may also necessitate a change in the order of certain key questions, and the timing of discussion about the setting.

13. Revisit the research purpose/question and modify the conceptual framework as necessary.

Undertaking a pilot case study is a useful technique for refining the research question. Greenhalgh (1997) legitimises modifying the research question as these types of changes show sensitivity to the richness and variability of the subject matter. Elsewhere, Klein and Myers (1999) discuss the importance of dialogical reasoning. This principle "requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research and design and actual findings with subsequent cycles for revision". They also stress that the researcher should make the historical intellectual basis of the research as clear as possible by not only refining the research question but also by explaining the reasons for these changes.

WAY OF SUPPORTING

13. Choose methods for collecting data. Ensure that these are described in sufficient detail.

Walsham (1995) suggests that interviews should be the primary data source for interpretive case studies, "since it is through this method that researcher can best access the interpretations that the participants have regarding the actions and events which have or are taking place" (p.78). However, Yin (1984) says that at least six sources for collecting data should be accessed, including documentation, archival records, interviews, direct observations, participant-observation and physical artefacts. Useful factual information can be obtained through examining annual reports or by obtaining written answers to structured questions (Darke *et al.* 1998). Internal magazines and organisational

bulletins may be used to supplement information gained through other sources (*ibid*. p.282). Preparing for data collection is also vitally important when undertaking case study research. Sufficient background information about a case study site should be collected and analysed. Also all names and positions of all potential case participants should be obtained and interview time should only be used to obtain information that cannot be obtained in any other way (Darke *et al.* 1998). A researcher should provide a detailed account of the data analysis methods to allow for some measure of replication. Indeed, describing the chosen data collection methods is also important because, "it may have to be lengthy and discursive since it is telling a unique story without which the results cannot be interpreted" (Greenhalgh 1997, p.159).

14. Employ a systematic way to analyse the data.

Richards (1997) comments that the main reason for using an automated qualitative data analysis tool is to enable access to large quantities of unstructured qualitative data. However, a prerequisite for using such a tool is the need for a 'thinking' researcher who has a sense for what they are trying to do. Such tools are useful for managing and presenting qualitative data but the researcher still requires an understanding of coding methods and codes should relate to one another in coherent, study-important ways; they should be part of a governing structure" (Miles and Huberman, 1994 p.62). From this it can be deduced that, the coding structure must relate and be based upon the developing conceptual framework and research question. Other useful techniques are content analysis, conversation analysis and discourse analysis (Darke *et al.*, 1998; Miles and Huberman, 1994).

WAY OF COMMUNICATING

15. Create a plan for the final report.

Throughout the conduct of the case study the researcher must dedicate some time to focusing on the design of the final report. As Yin (1984, p.73) points out this is because there is no uniformly acceptable outline for the formatting of case study reports, unlike other research strategies. Of course, there are those principles of good research presentation that are relevant to all approaches: providing a clear description of the aims and objectives of the research, the limitations of the study, the contribution that it is making to research and possibly practice and questions or issues that are raised by the work that could become the basis for further research. However, there are other aspects specific to qualitative research in general and perhaps case study research in particular that need also need to be considered.

Walsham (1995) suggests that details of the chosen research sites, the reasons for this choice, the number of people who were interviewed, what hierarchical or professional positions they occupied, what other data sources were used, and over what period the research was conducted, how the field interviews and other data were recorded, how they were analysed and how the iterative process between field data and theory took place and evolved over time, should all be included.

To increase the reliability of information, it is important to demonstrate a chain of evidence which should also be clear in the structure of the report. A circular linkage between the sections describing the research questions, methodology, data collection and interim analysis (Mike and Huberman, 1994, p.298) which also provides history and context by referring to the research purpose can help to achieve this.

16. Determine how the case study findings might be transferable to other settings.

Greenhalgh (1997) points out that one of the most common criticisms of qualitative research is that the findings are only applicable to the limited setting in which they were obtained. On occasions this is acceptable but in some situations it may be possible to transfer the conclusions of a study to other contexts. Miles and Huberman (1994) provide a list of twelve queries for a researcher to usefully ask when considering external validity and transferability.

17. Determine how to present the case findings to the academic and practitioner communities.

The case study should be reported in a useful and accessible form to academics and practitioners which may require the generation of more than one type of paper depending on the intended audience.

6. CRITICAL APPRAISAL GUIDELINES

The guidelines described above were initially created to support the work described in Sampson and Atkins (2002). However, it was clear that an appraisal checklist could be extrapolated from them, as McKay and Marshall (2000) had done for action research. Consequently, an initial checklist was created and then refined following comparison with McKay and Marshall's (2000) work. A number of the criteria were, unsurprisingly, similar although there were certain aspects specific to the final presentation of the research that we had not explicitly addressed. The final checklist is illustrated at Table 3 and those criteria taken directly from Marshall and McKay are denoted by an asterisk.

Element	Evaluation criteria
Why of thinking	1. Is a credible argument given for why a case study is appropriate? 2. Are the philosophical stance and perspective of the authors stated? 3. Is there evidence that any bias is taken into account when performing data analysis?
Way of controlling	4. Have the criteria for analysis been confirmed by an independent researcher? 5. Have any opportunities for various forms of triangulation been exploited? 6. Is the research process auditable? 7. Has relevant literature been used to support the selection of an appropriate theoretical framework to guide the research? 8. Does the study use appropriate theory to support the findings? 9. Does the study describe how the conclusions were arrived at and how they are justified by the results? 10. Are assertions/conclusions made well grounded in the data?
Way of working	11. Are the criteria used to select the appropriate case and participants clearly described? 12. Does the study provide a clearly formulated question describing an important IS issue? 13. Are the approaches and techniques for data collection and analysis described in detail? 14. Is the conceptual framework for the research explicitly described?
Way of supporting	15. Does the study describe an orderly process for the collection of data? 16. Does the study describe and employ a systematic way to analyse the data? 17. Is the history and context of the research clearly described?
Way of communicating	18. Are the aims and objectives of the study clearly stated? 19. Are limitations to the study acknowledged and described? 20. Does the study suggest if and how the findings might be transferable to other settings? 21. Is sufficient detail given to allow readers to evaluate the potential transferability of the research to other contexts? 22. Does the report identify questions or issues for future research? 23. Is the presentation of the research appropriate to the intended audience? 24. *Could this research potentially make a contribution to the work of IS practitioners? 25. *Does the research provide new insights into some aspect of IS work? 26. *Is the research presented in such a way that there is evidence of logical rigour throughout the study? 27. *Does the study place the finding in the context of IS practice? 28. *Does the study place the finding in the context of IS research? 29. *Is the research process open to scrutiny?

Table 3 Critical Appraisal Guidelines for Single Case Studies

This checklist was subsequently used to assist in establishing the credibility of over a hundred published single case studies in both academic and research journals as part of a pilot study to trial the use of a 'systematic review of evidence' methodology for Information Systems research (Wheeler 2000). The results of this trial will be the subject of a future paper.

7. SUMMARY

This paper has presented a comprehensive set of critical appraisal guidelines for assessing single case study research. The set of guidelines was developed by identifying 'best practices' in interpretative case study research and combining them with work that had already been completed by McKay and Marshall (2000). The guidelines are intended to assist readers of case study papers and also to assist other researchers undertaking similar research. The guidelines were constructed specifically for in-depth single case studies but it is clear, as common sense would suggest, from comparing this work with that of McKay and Marshall (2000) that the construction of a generic list appropriate for all types of interpretative research would be both possible and useful. Such a list might also provide a useful template for the reporting of interpretative research as has become common for other forms of research in the medical literature. Finally, if interpretative methods are to continue to gain credibility in IS research it is essential that we, as a community, have recognised means of evaluating the reliability of the evidence that it produces. The existence of an agreed set of critical appraisal guidelines for such evaluation is an important first step towards this goal.

8. REFERENCES

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ADDENDUM E

11 questions to help you make sense of descriptive/cross-sectional studies

11 questions to help you make sense of descriptive/cross-sectional studies

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of a descriptive/ cross-sectional study (e.g., a study that collects data on individuals at one time point using a survey or review of medical charts):

- Are the results of the study valid?
- What are the results?
- Will the results help locally?

The 11 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. You are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicized prompts are given after each questions. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided. These questions are adapted from Guyatt GH, Sackett DL, and Cook DJ, Users' guides to the medical literature. II. How to use an article about therapy or prevention. *JAMA* 1993; 270(21): 2598-2601 and *JAMA* 1994; 271(1): 59-63

Screening Questions

1. Did the study address a clearly focused issue? Yes Can't tell No

HINT: A question can be focused in terms of:
– the population(s) studied
– the health measure(s) studied (e.g., risk factor, preventive behaviour, outcome)

2. Did the authors use an appropriate method To answer their question? Yes Can't tell No

HINT: Consider
– Is a descriptive/cross-sectional study an appropriate way of answering the question?
– Did it address the study question?

Detailed Questions

3. Were the subjects recruited in an acceptable way? Yes Can't tell No

HINT: We are looking for selection bias which might compromise the generalizability of the findings:
– Was the sample representative of a defined population?
– Was e4verybody included who should have been included?

4. Were the measures accurately measured to reduce bias? Yes Can't tell No

HINT: We are looking for measurement or classification bias:
– Did they use subjective or objective measurements?
– Do the measures truly reflect what you want them to (have they been validated)?

5. Were the data collected in way that addressed the research issue? Yes Can't tell No

Consider:
– if the setting for data collection was justified
– if it is clear how data were collected (e.g., interview, questionnaire, chart review)
– if the researcher has justified the methods chosen
– if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted?)

6. Did the study have enough participants to minimize the play of chance? Yes Can't tell No

Consider:
– if the result is pre4cise enough to make a decision
– if there is a power calculation. This will estimate how many subjects are needed to produce a reliable estimate of the measure(s) of interest.

7. How are the results presented and what is The main result? Yes Can't tell No

Consider:
- *if, for example, the results are presented as a proportion of people experiencing an outcome, such as risks, or as a measurement, such as mean or median differences, or as survival curves and hazards*
- *how large this size of result is and how meaningful it is*
- *how you would sum up the bottom-line result of the trial in one sentence*

8. Was the data analysis sufficiently rigorous? Yes Can't tell No

Consider:
- *if there is an in-depth description of the analysis process*
- *if sufficient data are presented to support the findings*

9. Is there a clear statement of findings: Yes Can't tell No

Consider:
- *if the findings are explicit*
- *if there is adequate discussion of the evidence both for and against the researchers' arguments*
- *if the researcher have discussed the credibility of their findings*
- *if the findings are discussed in relation to the original research questions*

10. Can the results be applied to the local population? Yes Can't tell No

HINT: Consider whether
- *The subjects covered in the study could be sufficiently different from your population to cause concern.*
- *Your local setting is likely to differ much from that of the study.*

11. How valuable is the research? write comments here

Consider:

– *if the researcher discusses the contribution the study makes to existing knowledge (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature?)*

– *if the researchers have discussed whether or how the findings can be transferred to other populations*

ADDENDUM F

Hierarchy of evidence according to American Dietetic Association[2] (2012:81)

[2] Adapted from American Dietetic Association. 2012. Evidence Analysis Manual: Steps in the Academy Evidence Analysis Process. [Online] http://www.adaevidencelibrary.com/category.cfm?cid=7&cat=0

LEVEL OF EVIDENCE	TYPE OF STUDY
Primary Reports	
A	**Randomized Controlled Trial** **Cluster Randomized Trial** **Randomized Crossover Trial**
B	**Prospective Cohort Study** **Retrospective Cohort Study**
C	**Non-Randomized Controlled Trial** **Non-Randomized Crossover Trial** **Case-Control Study** **Time-Series Study** **Diagnostic, Validity or Reliability Study**
D	**Non-Controlled Trial** **Case-Study or Case Series** **Other Descriptive Study** **Cross-Sectional Study** **Trend Study** **Before-After Study**

LEVEL OF EVIDENCE	TYPE OF STUDY
Secondary Reports	
M	**Meta-analysis or Systematic review** **Decision analysis** **Cost-benefit analysis** **Cost-effectiveness study**
R	**Narrative review (Review article)** **Consensus statement** **Consensus report**
X	**Medical opinion**

ADDENDUM G

Conclusion grading system according to American Dietetic Association[3] (2012:104)

[3] Adapted from American Dietetic Association. 2012. Evidence Analysis Manual: Steps in the Academy Evidence Analysis Process. [Online] http://www.adaevidencelibrary.com/category.cfm?cid=7&cat=0

GRADE	DESCRIPTION
Grade I: Good	The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of serious doubts about generalizability, bias and flaws in research design. Studies with negative results have sufficiently large sample sizes to have adequate statistical power.
Grade II: Fair	The evidence consists of results from studies of strong design answering the question addressed, but there is uncertainty attached to the conclusion because of inconsistencies amongst the results from different studies or because of doubts about generalizability, bias, research design flaws or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the questions addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.
Grade III: Limited	The evidence consists of results from a limited number of studies of weak design for answering the question addressed. Evidence from studies of strong design is either unavailable because no studies of strong design have been done or because the studies that have been done are inconclusive due to lack of generalizability, bias, design flaws or inadequate sample sizes.

GRADE	DESCRIPTION
Grade IV: Expert Opinion Only	The support of the conclusion consists solely of the statement of informed medical commentators based on their clinical experience, unsubstantiated by the results of any research studies.
Grade V: Not Assignable *	There is no evidence available that directly supports or refutes the conclusion.

ADDENDUM H

Declaration of editor

6 November 2015

TO WHOM IT MAY CONCERN

I herewith declare that I did the language editing of the dissertation, *Communication strategies to accomplish effective health dialogue in adults with chronic diseases in low- and middle-income countries: An integrative review* by Melanie Pienaar (2003062094).

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