UNIVERSITY OF THE WESTERN CAPE

Faculty of Community and Health Sciences

DEVELOPMENT OF A HEALTH EDUCATION PROGRAMME FOR SELF-MANAGEMENT OF TYPE 2 DIABETES IN EDO STATE, NIGERIA

BY

JULIANA AYAFEGBEH AFEMIKHE

3315140

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SUPERVISOR: A/PROF. J. CHIPPS
## CO-SUPERVISOR: PROF. K. JOOSTE

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ABSTRACT

Diabetes is a chronic, metabolic disease that requires lifelong medical management, health education and self-management. According to a World Health Organisation report, there is a global increase in the prevalence of diabetes and even more so in the low-and middle-income countries, specifically Nigeria, which has the highest number of people with diabetes in the African region of the World Health Organisation. As a global issue, the positive health outcomes of diabetes are tied to health education and self-management of the disease and using the health resources of nations. However, in the context of limited resources in Nigeria, there is a need for improvement of health education in self-management of Type 2 diabetes. Health education that is provided in some Nigerian health facilities is reported to be unstructured, without patients' active participation, not tailored to the needs and the interests of the patients and limited collaboration between multi-disciplinary professionals.

In this context, the aim of the study was to develop a structured health education programme for self-management of patients with Type 2 diabetes, to facilitate the quality of the lives of these patients.

An adapted intervention mapping framework provided a structured process for development of an evidenced based programme. A mixed method approach was followed. In the *first phase* of the study an exploratory descriptive qualitative research design was followed. A purposive sampling approach was used in selecting (i) participants, who were patients with Type 2 diabetes and (ii) health-care professionals working in two health-care institutions in Benin City, Edo State, Nigeria. In phase 1, Step1 of the research was a situation analysis, which consisted of conducting 30 semi-structured interviews with patients; observation of nurses providing health education; and five focus group discussions with health-care professionals (nurses, dieticians and social workers). Qualitative data analysis was accomplished through using Tesch's (1990) steps of analysis to identify themes and categories. The situation analysis revealed, firstly, that there was a lack in the knowledge and self-management of Type 2 diabetes among patients. Secondly, that the health-care professionals acknowledged their collective role in health education and were burdened with the patients who were non-adherent to self-management. The result also revealed the necessity to change from a traditional teaching method to a structured educational process that is patient-centred.

The *second phase* of the research was the stage of developing the educational programme through collaboration with the stakeholders (health-care professionals and patients with Type 2 diabetes) using the findings from the data-analysis of the first phase supported with literature. In phase 2, Step 2 was to develop matrices from the data analysis in Phase 1 for the programme. Step 3 added theory-based intervention methods and practical applications to the preliminary program and in Step 4 the programme was described. This was followed in Step 5 by preparing health-care professionals for offering the programme to patients and implementing and evaluating the programme. The evaluation of the programme was by means of a quantitative pilot study in which a pre-post-test in a quasi-experiment was conducted with 28 patients and qualitative interviews after the program and post intervention interviews with the participants. The evaluation showed that the program was effective in meeting its objectives. In Step 6 a plan for the adoption, implementation, sustainability and evaluation of future implementations was developed.

DECLARATION

I, Juliana Ayafegbeh Afemikhe, declare that the dissertation entitled: "Development of Health Education Programme for Self-Management of Type 2 Diabetes in Edo State, Nigeria" is my own work and has not been submitted for any other degree or examination at any other university other than the University of the Western Cape. I have given full acknowledgement to the resources referred to in my study.

Juliana Ayafegbeh Afemikhe

Signed:_
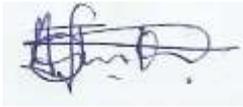
18TH MARCH, 2016

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DEDICATION

To my husband, Omaze Anthony who loves me unconditionally and never ceases to see the best in me, your love for me has been my strength.

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ABBREVIATIONS

AADE	American Association of Diabetes Educators
ADA	American Diabetes Association
AIDS	Acquired Immune Deficiency Syndrome
BMI	Body Mass Index
CDC	Centre for Disease Control
CMA	Canadian Medical Association
DECODA	Diabetes Epidemiology Collaborative Analysis of Diagnosis Criteria in Asia
FBS	Fasting Blood Sugar
IDF	International Diabetes Federation
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
IMB	Information-Motivation-Behavioural skills model
IMF	Intervention Mapping Framework
HIV	Human Immunodeficiency Virus
SCOgT	Social Cognitive Theory
NCD	Non Communicable Diseases
SHESMD	Structured Health Education for Self-management of Type 2 Diabetes
Sd	Standard deviation
SMBG	Self-Monitoring of Blood Glucose
UK	United Kingdom
UKPDS	United Kingdom Prospective Diabetes Study
USA	United State of America
WHO	World Health Organisation

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: ORIENTATION TO THE STUDY

1.1. INTRODUCTION

Diabetes is a global problem and its prevalence varies between different populations. Diabetes has no geographical boundaries since it is present in both the developed and the developing worlds. Diabetes is a lifelong, chronic, debilitating and costly disease, characterised by severe complications and posing a severe burden on the individuals, families, nations and the world (World Health Organisation, 2012).

Knowledge of diabetes as a disease and its management is essential to patients with Type 2 diabetes to enhance their adherence to self-management. Unwin and Marlin (2004) are concerned that global knowledge and awareness of diabetes remains low despite the prevalence. The global increase in the prevalence of Type 2 diabetes has also prompted the global identification of effective management strategies of Type 2 diabetes by health organisations such as American Diabetes Association (ADA) International Diabetes Federation (IDF) (ADA, 2014a; IDF, 2013b). The management and control of diabetes requires on-going health-care, health education and self-management to prevent complications and enhance patients' quality of life. Education to improve knowledge and self-management is vital strategy to manage Type 2 diabetes and, some international health organisations have suggested the provision of these services by multi-disciplinary health-care professionals in partnership with the patients with Type 2 diabetes (ADA, 2010a; WHO, 2012a). Many countries in the developed world have adopted structured education with the active collaboration of health-care professionals and Type 2 diabetes patients (Ory, Ahn, Jiang, Smith, Ritter, Whitelaw & Lorig, 2013) but this is still a mirage in many developing countries.

This chapter provides an introduction and background to the study.

1.2. BACKGROUND

1.2.1. Diabetes is a global health problem

Diabetes is assuming the status of a world-wide epidemic since the incidence and prevalence of the disease has continued to rise globally. According to the International Diabetes Foundation Atlas, (IDF, 2013b), the global prevalence of diabetes in 2013 was 8.3%. The IDF

(2013b) estimates that approximately 382 million people were affected by diabetes globally (with 3% of the population undiagnosed) and projected an increase of diabetes to 592 million by 2035. Impaired glucose tolerance is a 'grey area' between normal and abnormal blood glucose levels and was estimated to number approximately 316 million in 2013, with a projected increase to 471 million in 2035 and a prevalence of 6.9% (IDF, 2013b). These figures show the magnitude of a globally challenging health problem that requires multi-faceted management (Table 1.1).

Table 1.1: IDF regions and global projection of the number of people with diabetes (20-79 years) 2013 and 2035

IDF Region	2013 Million	2035 Million	Increase %
Africa	19.8	41.4	109
Middle East and North Africa	34.6	67.9	96
South East Asia	72.1	123	71
South and Central America	24.1	38.5	60
Western Pacific	138.2	201.8	46
North America and Caribbean	36.7	50.4	37
Europe	56.3	68.9	22
World	381.1	591.9	66

*Source: (IDF Atlas, 2013)

The global cost of managing diabetes is enormous since it affects the individual, the community and the world. The total estimated health expenditure world-wide in 2014 was 612 billion American dollars (IDF, 2014a). The IDF report also indicated that people from the lower socio-economic classes were affected most severely, although the middle-income group and the rich were also affected. The majority of people with diabetes were within the age group 40- 59 years (IDF, 2013b).

In addition to the disease's high prevalence, diabetes was also the cause of death of 5.1 million people globally in 2013 (IDF, 2013b). It was also projected to be the seventh leading cause of death world-wide, with 80% of deaths occurring in the low- and middle-income countries (IDF, 2013b).

1.2.2. Diabetes is a specific African health problem

Diabetes is described as a rare but fatal disease in Cook's (1901) notes cited in Koegelenberg, Kruger, Towers and Schutte (2013) addressing diseases prevalent in Africa. However, epidemiological studies have indicated an increase in the prevalence of diabetes in Africa

(Mbanya, Motala, Sobngwi, Assah & Enoru, 2010; Sobngwi, Endour-Mbaye, Boateng, Ramaiya, Njenga, Diop, Mbanya & Ohwovoriole, 2012). Epidemiological reports reveal that from 1959 to the mid-1980s, the Type 2 diabetes prevalence rate was equal to or less than 1.4%, excluding South Africa with an estimation as high as 3.6% (Mbanya et al., 2010). The IDF (2013b), estimates show that approximately 20 million Africans have diabetes, which is projected to increase twofold to 41.4 million by 2035, of which 62.5% are undiagnosed. Table 1.2 shows the top five African countries with the highest number of people with diabetes (IDF ATLAS, 2013).

Table 1.2: Five African countries with highest prevalence of diabetes

Countries	Number of people (in millions)
Nigeria	3.7
South Africa	2.7
Ethiopia	2.1
Democratic Republic of Congo	2.0
Tanzania	1.8

*Source: (IDF Atlas, 2013)

This change in rare to prevalent diseases is thought to be related to the development in many African countries, which have experienced rural urban drift, encouraged abandoning cultural practices in favour of urbanisation, the uptake of associated sedentary lifestyles and a westernised fatty diet (Shaw, Sicree & Zimmet, 2010). Of particular concern is Type 2 diabetes, which accounts for well over 90% of diabetes prevalent in sub-Saharan Africa, with prevalence ranging from 1% in rural Uganda to 12% in urban Kenya (Hall, Thomsen, Henriksen & Lohse, 2011). In a four-year study conducted in Kinshasa on the incidence of diabetes, 8.7% of the participants developed Type 2 diabetes before the finalisation of the study (Longo-Mbenza, On'Kin, Okwe, Kabangu & Fuele, 2009), providing evidence of the steady increase in the incidence of Type 2 diabetes in Africa.

An additional problem is that the estimated number of people with intermediate hyperglycaemia is steadily increasing. Most people are unaware of their high risk for Type 2 diabetes, and study has shown that a considerable number of patients with intermediate hyperglycaemia convert to Type 2 diabetes later on in life (Center for Disease Control (CDC) 2012); this further increases the number of patients with diabetes. The mortality rate in Africa is not only found to be high but additionally, 77% of the deaths in Africa occur in people under the age of 60, which are individuals' most productive years (IDF, 2014a).

1.2.3. The need for intervention in diabetes in Africa

Like other regions of the world, the sub-Saharan African region is struggling with communicable diseases such as HIV/AIDS, tuberculosis and non-communicable diseases such as diabetes (Marquez & Farrington, 2013). The increase in diabetes is occurring simultaneously with the increase in communicable diseases, other non-communicable diseases and political, security and economic problems, which have doubled the burden for the African region with its limited resources (Hall, Thomsen, Henriksen & Lohse, 2011). Realising the multi-faceted nature of the problem of diabetes and its impact specifically in Africa, a multi-stage and integrated approach is required to promote self-management practices among patients with Type 2 diabetes to avert long term complications (Shrivastava, Shrivastava & Ramasamy, 2013).

In this context, it is essential for individual countries and for Africa as a region, through co-ordinated government policies, to implement measures to manage diabetes to reduce exposure to risk factors and improve accessibility to quality health-care. Most countries in the African region have low budgetary allocations for health and are still far from meeting health financing goals (Musango, Elovainio, Nabyonga & Toure, 2013). Diabetes health expenditure in the south East Asian and African regions of the World Health Organization (WHO) accounted for less than 1% of all global health expenditure (IDF, 2013). The IDF report also revealed that Africa had the lowest diabetes related expenditure, which may be translated as the governments' lack of commitment to curbing diabetes in Africa (IDF, 2013b).

According to various studies from different countries within the African region, knowledge of diabetes and self-management among Type 2 diabetes patients were low (Okonta, Ikombele & Ogunbanjo, 2014). Additionally, the region faces challenges of impoverished patients and the lack of professional education for health-care professionals, poor policies and structured educational programmes, all of which could have a negative impact on optimal diabetes care (Asenahabi, 2014). Few African countries have initiated policies and programme to control the problem of diabetes (Renzaho, 2015), as others are still managing diabetes without policies and structured health education programmes.

1.2.4. Diabetes in Nigeria

Nigeria is currently experiencing a rapid increase in the prevalence of diabetes, although there is paucity in data relating to recent national studies on the prevalence of diabetes done in past

two decades (Maiyaki & Garbati, 2014). Data from a national non-communicable disease study in 1997 showed that the prevalence of diabetes was 2.2%, with the lowest prevalence of 0.6% in Mantul and the highest of 7.2% in Lagos (Akinkugbe (1997) cited in Ezenwaka, Nwankwo, Onuoha & Agbakoba (2014)). The IDF (2014a) estimates a prevalence of diabetes of 5%, which shows a more than twofold increase in diabetes' prevalence in Nigeria compared to the 1997 estimate. The estimated number of people living with diabetes was approximately 3.8 million, with 1.7 million undiagnosed in 2014 (IDF, 2014a). In the African region, Nigeria seems to have the highest estimate of people living with diabetes in Africa (IDF, 2014a).

Type 2 diabetes is thus a major health problem in Nigeria. About 90-95% of cases seen in Nigeria are Type 2 diabetes (Ogbera & Ekpebegh, 2014). There is also an increase in the number of people with intermediate hyperglycaemia or pre-diabetes, which is known as the forerunner of Type 2 diabetes (Nwatu, Ofoegbu, Unachukwu, Young, Okafor & Okoli, 2015). The increased number of undiagnosed and intermediate hyperglycaemia is assumed to be an indication of a silent increase of diabetes in the country and its related complications.

Numerous hospital-based studies in Nigeria demonstrate the prevalence of complications among patients with Type 2 diabetes, with poor prognosis. It was reported that hospital admissions due to Type 2 diabetes accounted for 15% of all medical cases and 22% of all medical deaths (Ogbera, Chinenye, Onyekwere & Fasanmade, 2007). In a related study, Type 2 diabetes accounted for 5% of all hospital admissions and for 32.5% of all medical deaths (Chijioke, Adamu & Makusidi, 2010). A high presence of co-morbidities has been reported among patients with Type 2 diabetes. These include patients presenting with hypertension (Anakwue, Arodiwe & Ofoegbu, 2013), high lower limb ulcerations (Otu, Umoh, Essien, Enang, Okpa & Mbu, 2013), diabetic nephropathy, a high prevalence of cardiovascular disease (Usman, Umar, Shehu, Wali & Nasir, 2012) a high rate of retinopathy, and other ocular diseases and blindness (Azuamah, Amadi, Esenwah & Iloh, 2013). People with diabetes are vulnerable to complications and to premature death, which is largely due to poor access to health facilities, delayed care, late diagnosis, complications and lack of equipment in medical facilities (Ezenwaka et al., 2014). In addition, the high rate of complications among these patients may be related to a lack of adequate knowledge and understanding of Type 2 diabetes among patients (Nwankwo et al., 2010).

Apart from the health impact of Type 2 diabetes, the economic impact is difficult to quantify. The impact and economic consequences of the disease have been predicted by some epidemiologists to surpass the ravages of HIV/AIDS in the future (Azevedo & Alla, 2008).

One of the key issues is that the working force's health is affected, since Type 2 diabetes is common among people in the 40-60-year age range (IDF, 2013b). Undetected and uncontrolled Type 2 diabetes results in life-threatening complications, increased cost of health-care, poverty and premature death (Inzucchi, Bergenstal, Buse, Diamant, Ferrannini, Nauck, Peters, Tsapas, Wender & Matthews, 2015). The burden of the disease reduces life expectancy, especially in the workforce and reproductive groups, thereby leading to increased poverty.

In the face of these poor economic circumstances, cost-effective health education programmes for patients should be implemented to reduce the burden of diabetes. Reports have demonstrated that Type 2 diabetes can be prevented and the manifestation of the disease can be delayed to curtail the current global epidemic (WHO, 2005). Lifestyle modification and educating people about their disease are cornerstones to improving patients' self-management practices and improving their health status; education is an essential part in the care of the disease and therefore it may be impossible to separate treatment from education (ADA, 2010a).

In the context of the poverty in Nigeria, it is essential to investigate suitable cost-effective programmes to manage diabetes. Nigeria was classified as a low socio-economic country with vast majority of people still living below poverty line (Falola & Achberger, 2013). As a cost-effective strategy, self-management can empower patients with Type 2 diabetes with cost-effective knowledge, skills and beliefs/values to minimise the cost of their care and reduce their increased dependence on health facilities, thereby reducing the economic burden on these patients (Weaver, Hemmelgarn, Rabi, Sargious, Edwards, Manns, Tonelli & James, 2014). Health-care professionals have the responsibility to inform the patients and the community about issues of health and illnesses, since the health-care professionals play the roles of educator, instructor and motivator to facilitate voluntary and informed behavioural changes (Antigoni & Dimitrios, 2011).

1.3. PROBLEM STATEMENT

Information alone may not be sufficient to motivate patients to actively participate in their care the attitudes of health-care professionals could also affect their interaction with the patients, especially in the traditional medical mode including patient education in which roles are predominantly paternalistic (Torres, Rozemberg, Amaral & Bodstein, 2010). The majority of patients may be influenced by the health-care professional's knowledge, beliefs and attitudes,

which could affect their subsequent self-management (Boström, Isaksson, Lundman, Graneheim & Hörnsten, 2014). Most patients may trust their providers' judgment and then act accordingly. However, poor attitudes by health-care professionals and the culture of an organisation, such as irregular diabetes education, long waiting times in a facility and no reminders or interactions like communication with cellular phones for reminder outside of the health facility are factors found to contribute to non-adherence and poor management of diabetes (Nwankwo et al., 2010).

Self-management of diabetes can be challenging to patients because of the multi-faceted nature of the disease, behaviour modification needed and multiplicity of therapeutic treatment available to these patients (Sobngwi, Ndour-Mbaye, Boateng, Ramaiya, Njenga, Diop, Mbayan & Ohwovoriole, 2012). The patient's ability to be effectively involved in self-management could be related to motivation, psychological, behavioural and educational factors (Berry, Lockhart, Davies, Lindsay & Dempster, 2015). The key feature of self-management is effective continuous patient participation in managing their own health-care within the health facility and in their own environment (Wilkinson & Whitehead, 2009). Patients should be motivated to interact with health-care professionals, since patients make the final decisions regarding their lifestyle choices from their own experiences (Inzucchi et al., 2012).

The WHO (2012a), has recommended the need for self-management of Type 2 diabetes by patients to enable them to have control over and manage their disease. Health education is central in facilitating self-management of patients, since through the process of health education, patients could be motivated to acquire knowledge, skills and beliefs/values to ensure that their diabetes are managed. Health-care professionals who interact with these patients are expected to play a major role in the patients' acquisition of information through health education to improve their ability to manage their own condition (ADA, 2014a).

The ADA (2010a), suggested that structured education for all patients with Type 2 diabetes should be given by a multi-disciplinary group of health-care professionals to facilitate the patients' understanding of diabetes and improve their self-management (ADA, 2010a). Evidence suggests that through a collaborative approach that is patient-centred and involves all relevant health-care professionals, patients can be exposed to how to manage their condition effectively (Powers, Bardsley, Cypress, Duker, Funnell, Fischl, Maryniuk, Siminerio & Vivian, 2015) and willingly participate in their own care to reduce complications. This process is referred to as self-management.

Additionally, to facilitate self-management in Nigeria, the Edo State in particular, there are two challenges to self-management of Type 2 diabetes. Firstly, patients with Type 2 diabetes are given a traditional disease-centred education that is generally prescriptive, requiring patients to comply with the recommendations of the health-care providers. Clinical management and patient education within the traditional consultation setting is not sufficient to support patients to achieve self-management and control of Type 2 diabetes. This is supported by several studies examining knowledge of Type 2 diabetes in Nigeria, which showed that the level of awareness of Type 2 diabetes and self-management is inadequate (Adisa, Fakeye & Okorie, 2010; Nwaokoro, Okokon, Nwaokoro, Emerole, Ibe, Onwuliri, Oputa & Chukwuocha, 2014; Odenigbo, 2012). Studies have emphasised the need for improvement in the health education programmes provided and a need to change from traditional approaches (Jackson, Adibe, Okonta & Ukwe, 2014; Okolie, Ehiemere, Iheanacho & Kalu-Igwe, 2009) to patient-centred approaches. Secondly, the consultant clinics are usually the primary point of patients' contact with care and these clinics are crowded and busy and may not be conducive for structured patient education and demonstrations to develop self-management skills. The consultation times for patients are limited and often there is insufficient time to engage patients in interactions that could impact on the health of the patient. Other problems are also that patients are anxious while waiting, that there is inadequate staffing and a lack of expertise to provide tailored health education for the patients with Type 2 diabetes.

Self-management activities can slow down the disease's progression and also improve patients' psychological state (Gucciardi, Chan, Manuel & Sidani, 2013). An educational programme can address effective approaches to self-management in Type 2 diabetes. It was unclear how patients visiting clinics at health-care facilities in the Edo State, experienced their self-management of Type 2 diabetes; and how health-care professionals provided health education to them.

1.4. AIM OF THE STUDY

The aim of the study was to develop a structured health education programme for self-management of Type 2 diabetes by patients in Edo State, Nigeria. The aim of the study was achieved through five main objectives and the applicable research questions that guided the research study.

Objective 1:

To explore and describe the patients' understanding of diabetes and self-management of Type 2 diabetes.

Research questions

- What is the understanding of patients on their Type 2 diabetes?
- How do patients with Type 2 diabetes self-manage their diabetes?
- What are the problems patients with Type 2 diabetes encounter with self-management?

Objective 2:

To explore and describe the health education provided by health-care professionals to patients with Type 2 diabetes and the problems encountered.

Research questions

- How do health-care professionals provide health education to diabetes patients?
- What are the problems they encountered with health education to patients with Type 2 diabetes?

Objective 3:

To develop a structured health education programme for self-management of Type 2 diabetes patients in Edo State, Nigeria.

Research question

- What are the components of a structured health education programme that can facilitate self-management of Type 2 diabetes?

Objective 4:

To implement and evaluate the health education programme for self- management of Type 2 diabetes in Edo State, Nigeria.

Research question

- How effective is the health education programme that was developed in achieving the objectives?

Objective 5:

To describe a plan for adoption, implementation, sustainability and evaluation that can be used for the health education for self-management of Type 2 diabetes in Edo State, Nigeria.

- What are the components of the plan for adoption, implementation, sustainability and evaluation that can be used for the health education programme for self-management of Type 2 diabetes that was developed?

1.5. RESEARCH DESIGN AND METHODS

According to Houser (2013), a research design is an outline or the structure of the study that features all the major study elements needed to enhance the integrity of the study. The Intervention mapping framework (IMF) was adapted with two phases (Table 1.3) and followed to develop a health education programme for self-management of Type 2 diabetes for patients through *a mixed method* approach (Table 1.4).

Phase 1 of this study followed an exploratory and descriptive design. In Step1 (Phase 1) the data collection was conducted by means of *qualitative* design, conducting individual, semi-structured interviews with patients with Type 2 diabetes, participant observation of nurses and focus group discussions with health-care professionals during January to April, 2014. A q*ualitative* research design is a method of exploring an area of human experience in order to understand their perception of the phenomenon of interest (Roberts & Priest, 2010). Plano-Clark and Creswell (2010) argue that it was important to record field notes as soon as possible after events had been observed, to add richness to the data. The data was analysed through steps outlined by Tesch (1990).

Phase 2 entailed developing the programme. Step 2 was to develop matrices from the data analysed in Phase 1 for the programme Step 3 added theory-based intervention methods and practical applications to the preliminary programme. In Step 4 the programme was described. This was followed by preparing health-care professionals for offering the programme to patients through a training programme. Step 5 addressed the implementation and evaluation of the programme. The evaluation of the programme was by means of *quantitative* pilot study with patients and qualitative post interviews. In Step 6 a plan for adoption, implementation, sustainability and evaluation was conducted.

1.5.1. Paradigm

Philosophical ideas influence the method of research since they facilitate the reasoning behind design choice. A paradigm is a framework, worldview, or a mutually accepted conviction based on the philosophies and assumptions of the individual regarding the social world that shapes the knowledge, views and the interpretation of reality and guides the consequent outcome to be taken (Babbie, 2009).

1.5.1.1. Meta-theoretical assumptions

The paradigmatic perspective of this study is social-constructionism because it provided philosophical direction for the research. Social-constructionism posits that knowledge and realities are social products of the individuals and that they are derived from individuals' interactions and the institutions or environment in which they operate (Flick, 2009). Researchers believe that people create meaning to understand their world and this should be regarded as reality since the researcher is guided by the desire to understand and interpret the social reality. The meaning that individuals have about the phenomenon of interest and the environment is subjective and is shaped by their experiences (qualitative phase). The aim was to explore the individuals' experiences about the phenomenon through various methods since different and multiple views were relied upon to provide insight into the phenomenon (Flick, 2009).

During the data collection and evaluation of the programme (quasi-experiment – quantitative phase), the researcher assumed that the information received from participants during the interactions was their perceptions. There are three specific paradigmatic perspectives underpinning this study, they are ontological, epistemological and methodological perspectives.

1.5.1.2. Ontological beliefs of social constructionists

The social constructionist believes that reality is local, that it exists within the individual and the context and therefore it is specifically constructed. Additionally, realities are constructed by individuals based on the meaning and perceptions that individuals attach to their experiences (Cohen, Manion & Morrison, 2007). There is an assumption that reality is created and interpreted according to the individuals' culture and social environment. The role of the researcher is also paramount in the form and nature of reality, because the researcher is actively involved in data collection, interpretation and analysis of the data and thus their subjective judgment is reflected (Grix, 2010). The researcher is viewed as co-construction of the interpretations made by the participants.

The researcher tried to guard against bringing herself into the research by engaging in a process of reflexivity and a transparent process of data collection and analysis (Mills, Bonner & Francis, 2006). A multiple method of data collection of semi-structured interviews, field notes and focus group discussions were used in Phase 1 to enable rich and in-depth data collection from participants at different times, thus creating reality with the data.

1.5.1.3. Epistemological beliefs of social constructionists

According to Schutz (1962) cited in Flick (2009), social constructionists view all forms of knowledge either as scientific or gained through interactions and experiences because constructs involved are specific to participants and knowledge is constructed depending on the function to be performed. The researcher acquired knowledge from the participant's experiences on the self-management of their disease in Phase 1 and their perceptions on the programme in Phase 2.

1.5.2. Theoretical paradigm and assumptions

This study departed from assumptions around behavioural change theories and Knowles adult learning principles.

1.5.2.1. Health behaviour change theories

Health education programmes are likely to be effective if guided by behaviour change theory (Glanz et al., 2008). Behaviour change theories provide the structure to understand why individuals engage in risky behaviour or why they adhere to healthy lifestyle modifications (DiClemente, Crosby & Kegler, 2009). Theories on health behaviour are used widely in the development of health interventions and programmes that are targeted at behaviour change (Conner & Norman, 2005) because they provide conceptual frameworks on which to build and test health education programmes (Glanz et al., 2008).

Assumptions of three theories namely, the self-determination theory, the social cognitive theory and information, motivation and behavioural skills model guided the study.

1.5.2.2. Self-determination theory

The self-determination theory developed by Ryan and Deci (1985) is a human motivation theory that postulates that maintenance of behaviour requires patients' internalisation of values, skills for change and self-determination (Ryan, Patrick, Deci & Williams, 2008). Self-determination theory is focused on motivation of an individual with emphasis on the intrinsic

motivation to initiate and maintain behaviour change. The individuals' needs should be met to enhance active participation and positive health outcome. For this study it was assumed that:

- The process of acquiring motivation for initiating and maintaining health behaviours and developing a sense of autonomy and competence to internalise new behaviour was important. Therefore, health-care professionals could provide an environment that is autonomously supportive of patients to self-manage their Type 2 diabetes.

- The environment can either aid or hinder the normal performance of human beings and therefore a treatment environment should support intrinsic motivation and confidence to influence adherence and positive health outcomes. For individuals to internalise a change in health behaviour, the health-care professionals need to maximise the patients' experience of autonomy, competence and relatedness with others in the health facilities (Williams, Rodin, Ryan, Grolnick & Deci, 1998).

- The effect of goal pursuit and attainment is related to the ability to satisfy basic psychological needs (Deci & Ryan, 2000), consequently patients should be motivated to develop insight into the disease of Type 2 diabetes and develop skills to manage the disease themselves.

- The origin of behaviour either originate from the self-opposed to behaviour in which the individual is controlled (Ryan & Deci, 2000a). Type 2 diabetes is a disease that mainly requires a change in lifestyle and pharmacological elements to adequately manage the disease and therefore patients need to be intrinsically motivated to facilitate initiation and sustain behaviour change over time;

- Extrinsic motivation influences the possibility of an individual to learn and practice new behaviours, while the intrinsic motivation results in high-quality learning and creativity (Ryan & Deci, 2000b). Individuals have natural instincts towards psychological growth and health that can be achieved by satisfying their basic psychological needs through e.g. information or a programme and therefore patients should be motivated to act positively after receiving adequate health education.

- The sense of self or self-evident is expressed when the individual engages in some degree of judgement that is a product of their background, experiences, values, education, culture and beliefs (Hungerford, Dowling & Doyle, 2014). Invariably attitude determines behaviour and therefore it is assumed that for behaviour to change, then attitude change must precede the behaviour. In an attempt to change these attitudes, approaches such as

goal-setting, demonstrations, prompt practice, home activities and use of log books will be utilised.

1.5.2.3.   Social cognitive theory

Social cognitive theory, which was propounded by Bandura (1986), is a behaviour change theory that proposes a model of reciprocal causation in which behaviour cognition, personal factors and environmental influences interact as determinants that influence each other (Bandura, 2001). According to Bandura (1986), what people feel, believe and think on e.g. Type 2 diabetes, affect their behaviour. Therefore self-efficacy, beliefs, functions with goals, outcome expectations and perceived environmental impediments and facilitators regulate human action, motivation and wellbeing. For this study it is assumed that:

- Individuals can learn and acquire new behaviour by e.g. observing others or a demonstrator (Bandura, 1998);
- Learning is associated with intrinsic factors that may lead to a change in behaviour.
- Behaviour learnt by individuals becomes self-regulated. Individuals begin to regulate behaviour and learning as they become self-efficient in performing skills.
- Visualised future events can be turned into reality, but this requires that the present directed intentions should direct and motivate the individual's focus of forging ahead (Bandura, 1991).
- Individuals have the capacity to influence their behaviour and the environment in a goal directed manner (Bandura, 2001).
- Learning and demonstration of skills are important as learning involves knowledge, values and skills (Bandura et al., 1999).

1.5.2.4.   Information-motivation-behavioural skills model

The information-motivation-behavioural skills model (Fisher & Fisher, 1992) is a health behaviour model for understanding and supporting health behaviour and the socio psychological factors influencing health-related behaviours (Fisher, Fisher & Harman, 2003). The model includes three constructs that can influence behaviour change of self-management of Type 2 diabetes, namely information, motivation and skills for performance (Fisher et al., 2003). In this study it is assume that:

- Health related information, motivation and behavioural skills are vital determinants of performance of behaviour.

- The extent to which individuals are well informed, motivated to take actions and possess the required skills for the activities, determines their likelihood of initiating and maintaining behaviour.

1.5.2.5.   Consolidated theory of behaviour change

Theories of health behaviour change provide framework and constructs on which to build and evaluate health education programmes. Their constructs have been identified through research as being important for predicting behaviour change (Chakema & Rhonda, 2009). Influencing individuals' behaviour change could be described as complex thereby integrating behaviour change theories may better explain behaviour than a single theory. Empirical studies support the utility of constructs of these behaviour change theories in change behaviour such as self-management of Type 2 diabetes (Peyrot & Rubin, 2007; Van Vugt, De Wit, Cleijne & Snoek, 2013). Integration of these constructs may be valuable in understanding patients' self-management as well as predicting their actions.

Three health behaviour change theories (self-determination theory, social cognitive theory and information-motivation-behavioural skills) have been identified as predictors of behaviour in this study. Maintenance of behaviour requires patients' internalisation of values, skills for change, and self-determination (Ryan, Patrick, Deci & Williams, 2008). The focus is on the process of acquiring motivation for initiating and maintaining health behaviours as well as developing a sense of autonomy and competence which is critical to the process of internalisation and integration (Ryan et al., 2008). Therefore, health care professionals could provide an environment that is autonomously supportive of patients taking charge of their health. The environmental influence can either aid or hinder the normal performance of human beings (Ryan & Deci, 2000c), however a treatment environment that supports intrinsic motivation and confidence is likely to influence adherence and positive health outcomes (Ryan et al., 2008). Three basic psychological needs namely, competence, autonomy, and relatedness must be met in order for people to function effectively (Deci & Ryan, 2000). The health care professionals would need to maximise the patients' experience of autonomy, competence, and relatedness with others in the health institution to facilitate behaviour change.

***Behaviour cognition*:** Behaviour cognition is the act of knowing and acquiring information about something that is referred to as behaviour capacity (Bandura, 1998). Knowledge of behaviour and skills are paramount to individuals in order to perform specific behaviour. This means that before a task can be effectively performed learning or impacting of knowledge must

have occurred. Although a task may be learned without any performance, performance presumes learning. Patients with Type 2 diabetes who are expected to perform self-management in order to live well with diabetes need to acquire knowledge and skills to enhance their ability to perform self-care.

Self-efficacy: Self-efficacy is a construct which believes in the abilities or capabilities to perform a task or organise and perform activities required to produce a given level of attainment (Bandura, Freeman & Lightsey, 1999). It reflects self-confidence in the ability to exert control over behaviour, personal motivation, thought processes, and the social environment (Bandura, 1986), thus enhancing accomplishment and wellbeing. These individuals do not approach difficult task as threats but as tasks to be mastered, thereby motivating a change of behaviour. Patients' capability to perform and master a task will be maximised through health education and skills building.

Outcome expectation: Outcomes are the consequences of an action therefore actions could serve different purposes or cause other unanticipated occurrences. According to Bandura (1991a), visualised future events can be turned into reality, but this requires that the present directed intentions should direct and motivate the individual's focus of forging ahead. Foresight behaviour will be promoted as the individual allows the anticipated outcomes to enable the performance of current activities and regulates the present to fit a desired future as the individual moves above the dictates of their present situations (Bandura, 1998). This is achieved because thought is linked to actions through a self-regulatory process of motivation, affect, and action, governed by self-monitoring, performance self-guidance, and corrective self-actions (Bandura, 1986).

*Information***:** The extent to which individuals are well informed, motivated to take actions, and possess the required skills for the activities, determines their likelihood of initiating and maintaining behaviour. Information includes relevant, accurate, and specific facts relating to the behaviour or phenomenon of interest or the faulty heuristics or misinformation regarding the behaviour or problem (Gao, Wang, Zhu & Yu, 2013). Information could also involve detailed, implicit theories in decision-making concerning health behaviour (Fisher et al, 2003). In this instance, the health professional communication with the patients is suggestive of information since they exchange information that could lead to type 2 diabetes knowledge and self-management skills that could motivate behaviour change.

1.5.2.6.   Adult Learning Theory by Knowles (Andragogy)

The onset of Type 2 diabetes is commonly found among adults between ages 45 and above and therefore adult learning theory was applicable to underpin the programme in order to achieve the aims and objectives. Learning is an eventful process that is undertaken in order to change the meaning of experiences and long term memory (Kandula, Malli, Zei, Larsen & Baker, 2011). It was assumed that through the programme, participants' self-management of their diabetes would change - facilitate health behaviour change. Knowles (1980), the father of adult education, or andragogy, made four assumptions about adult learners and subsequently in 1984 a fifth assumption was added. They are:

Self-concept: Self-concept is an idea that an individual holds about the self or the true belief of one's self (Baumeister (1998) cited in Leary and Tangney (2011)). Individuals have some belief of themselves, especially their competency in performing certain activities. Adults feel they know themselves based on their experiences (Fivush, 2011). Consequently, as adults they want to be responsible for their own decisions and actions and they want to be in control of their lives, be recognised and be considered responsible (Knowles (1980) cited in Chan (2010)).

Experience: Adults have a greater depth, scope and difference in the quality of previous life experiences than younger people do (Russell, 2006). Previous experience and how we feel about it, offer us a lot of information regarding our capabilities (O'Hanlon & Bertolino, 2012). Learning experiences during a programme may be sources of motivation for patients since they will be exposed to different activities. Patients will be viewed as distinct individuals with different learning capabilities based on their experiences and knowledge.

Orientation to learning: Most adults' orientation to learning is to create change that could consist of a change in knowledge, behaviour, skills and attitudes and are relevant to them (Russell, 2006). Therefore, the learning experience will facilitate communication with other patients and health-care professionals in order to enable the patients to learn. Since adult learners are task-oriented, the sessions and content should be organised around skills of self-management and demonstrations to stimulate their senses and retention.

Readiness to learn: Adult learners tend to prefer knowledge that is relevant and practical and which may be applied immediately to life situations or problems.

Motivation to learn: Adults have both intrinsic and extrinsic motivations for learning. Learner's motivation is an essential element for quality education and often a life experience stimulates learning (O'Brien, 2004). Motivation for learning using different approaches for

communicating information may provide a new experience to health education during the programme. The self-determination theory views the intrinsic motivation as a factor enhancing a patient's engagement in activities for their personal benefit (Patrick & Williams, 2012). Health-care professionals are needed to make learning meaningful and rewarding because different methods and approaches of teaching should be used.

1.5.3. Theoretical concepts

The following terms have been operationalised for this study:

Type 2 diabetes

Diabetes mellitus (diabetes) is a metabolic disorder with heterogeneous aetiologies and is characterised by chronic hyperglycaemia and disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both (ADA, 2011). In this study it will refer to a chronic disease that is symbolised by high levels of glucose in the blood due to lack or /and insensitivity to insulin that is common among adults aged 40 years and above

Glycaemic control for Type 2 diabetes patients

Theoretical definition: Maintenance of plasma glucose level constantly between 100mg/dl to 125mg/dl (WHO, 2013). In this study the term is operationalized as the maintenance of plasma glucose between 100mg/dl to 125mg/dl for three consecutive months.

Health education

Health education as a tool for health promotion is essential for creating and improving the health of individuals and populations, as well as promoting health capital (WH0, 2012). The focus of health education is teaching individuals to acquire experiences that lead to voluntary changes in behaviour, with the defining characteristic of voluntary active participation of individuals in shaping their own health behaviour (Green & Kreuter (1991) cited in WHO (2012)) since it raises the consciousness of individuals, arouses their concern and stimulates their action through their involvement and commitment to lifestyle modification in order to achieve optimum health.

Health education is an activity that seek to inform individual on the nature and causes of health/illness that individual's personal level of risk associated with that lifestyle behaviour which seeks to motivate the individual to accept a process of behavioural changes through

directly influencing their values, beliefs and attitude systems" (Whitehead, 2004). In the context of this study, it refers to structured education that is comprehensive, flexible in content, responsive to individuals' experiences (findings of Phase 1) and perceptions (findings of pilot study after the programme) and adaptable to the educational and cultural background of patients with Type 2 diabetes.

Active learning

Is defined as the use of various interactive approaches to education and training for the purpose of engaging students in their work to acquire and understand knowledge (Zoller & Harrison, 2007). Adults learn more when they are actively involved in their learning. They are not meant to be passive learners but active participants directing the learning process as their needs are considered as well as their interests. Activities will be learner centred.

Self-management

Self-management relates to the tasks that an individual must undertake to live well with one or more chronic conditions (Adams, Greiner & Corigan, 2004). Self-management is one's own behaviour when managing cognitive processes and consequences by means of planning, organising, leading and control (Jooste 2010). In this study self-management will refer to the knowledge, skills and beliefs/values required to effectively plan, organise, direct and control activities and tasks around Type 2 diabetes to cope positively with the disease.

Nurse

A nurse is an individual who has passed the nursing qualifying examination in order to be licenced by the Nigerian Nursing Council to enable the individual practice in Nigeria. In this study, the term nurse referred to the central player of health education in an institution.

Dietician

A lifestyle coach that supports and empowers patients with Type 2 diabetes to make healthy food choices and to lead active lifestyles that could help them meet their personal and medical goals (Delahanty, 2010).

Social worker

Social work is a profession concerned with helping individuals, families, groups and communities to enhance their individual and collective well-being (Canadian Association of Social Workers, 2008). In Nigeria social workers practising in health institutions are also known as medical social workers. In this study a social worker was involved with the

psychological and social issues of Type 2 diabetes and counselled patients as goals were being set.

Health-care professional

Health-care professionals are persons who are professionals based on their academic qualifications and who are employed to provide health-care to patients in the health facility. The health-care professionals in this study were nurses, dieticians and social workers who were involved in caring for patients with Type 2 diabetes in the health-care facility.

Multi-disciplinary team

This term refers to the health-care professionals providing health education to the patients on self-management of Type 2 diabetes. This may consist of nurses, dietitians, social workers, psychologists, pharmacists and doctors.

1.5.4. Methodological paradigm and assumptions

This is the philosophy underlying the principles and procedures used in the research study (Crotty, 2003). The general principles demonstrate the validity of the information and knowledge generated, which depends on the study's epistemological and ontological assumptions. The aim of the study was to develop a health educational programme. The steps of the Intervention Mapping Framework (Bartholomew et al., 2011) were used for development of the programme on Type 2 diabetes with a mixed method approach.

1.5.5. Intervention Mapping Framework (IMF)

Intervention mapping has been used and found effective in the development of various programmes of public health importance, namely HIV/AIDS (Leerlooijer et al., 2014; Wilson et al., 2014) and was also used in the study of drug abuse and was found very effective (Dupont, Lemmens, Adriana, van de Mheen & de Vries, 2015). Studies on Type 2 diabetes have found intervention mapping very useful in planning and implementing effective programmes (Cherrington, Martin, Hayes, Halanych, andreae, Safford & Appel, 2012; Nundy, Dick, Solomon & Peek, 2013).

Interventions are strategies or innovations linked by a causal mechanism to specified, intended outcomes (Chen & Cohn, 2003), which may be in the form of programmes and policies. Nursing intervention is defined as questioning existing care practices that are shaped by

nursing's values and goals, which are guided by a strong theoretical basis, informed by recent advances in science and planned to improve the quality of care and health of individuals, families and society (Naylor, 2003).

Intervention mapping is a health promotion and health education programme planning framework, which helps in building quality interventions that are systematically planned and based on theory and evidence (Bartholomew et al., 2011). It takes cognisance of the end users (patients with Type 2 diabetes) and those involved in the implementation of the emergent programme. These refer to participants in the study who actively participated and collaborated with the researcher in the planning development, adoption, implementation and evaluation of the emergent programme. The intervention mapping framework (IMF) was introduced by Bartholomew, Parcel and Kok (1998) with the purpose of providing programme planners with a structured process and theoretical applications for development of evidenced based programmes; and to make effective decisions at every step of development, implementation and evaluation (Bartholomew et al., 2011).

IMF is based on three factors, namely the ecological approach, active stakeholder participation and the use of theories and evidence. The ecological approach identifies and builds on the factors within the social and physical environment that might influence the identified health problem. The relationship between the environment and individuals are considered as changes in the environment that could affect individuals' behaviour. Equitable participation of stakeholders is viewed as a necessity since it ensures that the focus is on problems identified among the group participants (Kreuter, De Rosa, Howze & Baldwin, 2004). Incorporating the stakeholders e.g. patients is vital when attempting a change that affects them.

The use of multiple theories to a problem helps researchers to understand health and social problems (Glanz, Rimer & Viswanath, 2008) and increases the success rate of implementing such a planned programme (Kok, Schaalma, Ruiter, Van Empelen & Brug, 2004). Additionally, theories are likely to change behaviour and increase sustenance of behaviour change (Ellis, Speroff, Dittus, Brown, Pichert & Elasy, 2004). To this end, three behaviour change theories were used in the development of the programme. The IMF consists of 6 interrelated steps (Table 1.3).

Table 1.3: Adapted Intervention Mapping steps and tasks

STEPS	TASKS
PHASE 1	
Step 1: Situation analysis	Overview of background of Type 2 diabetes (Chapter 2) Assess community capacity Conduct the situation analysis, analysed the data
PHASE 2	
Step 2: Matrices of change objectives	State outcomes for behaviour and environmental change State performance objectives Select important determinants in theories Create a matrix of change objectives
Step 3: Theory-based intervention methods and practical applications	Generate programme ideas with the planning group Identify theoretical methods Choose programme methods Select or design practical applications and ensure that applications address change objectives
Step 4: Write the programme	Themes, scope, sequence and materials Prepare design document Draft programme materials and protocols Re-look programme materials Produce materials and protocols Specify programme goals/objectives for health and quality of life
Step 5: Implement and evaluate the programme	Train the health-care professionals on offering the programme Implement the programme Evaluate the programme
Step 6: Plan for adoption implementation, sustainability and evaluation	Identify potential adopters and implementers Re-evaluate the planning group State programme use outcomes and performance objectives Specify determinants for adoption and implementation Create a matrix of change objectives Design intervention for adoption and implementation Write effect evaluation questions Write evaluation questions for changes in the determinants Write process evaluation questions Develop indicators and measures Specify evaluation design

Source: (Bartholomew et al., 2011)

Table 1.4 at the end of the Chapter provides an outline of the methodology of the research study as it relates to each of the steps of the adapted IMF.

1.5.6. Integration of the intervention mapping framework and the three behaviour change theories

The IMF's second and third steps required selection of determinants of behaviour and these were identified from the constructs of the integrated theory as attitude/autonomy, competence self-efficacy, outcome expectations and the concept of information. These constructs were used as determinants of behaviour of the patients during the development and implementation of the programme.

It was assumed that provision of information improved knowledge of type 2 diabetes and self-management skills, which motivated individuals to develop self-efficacy/competence in performing these skills thus facilitating behaviour change. It was also assumed that the individual might be motivated to manage diabetes because behaviour change could increase glycaemic control, and when maintained, could reduce the risk for complications and improve quality of life. The constructs of the integrated theory were also used as theoretical methods of programme implementation, such as information that was used during lectures, demonstrations, individual counselling, and group discussions. Social cognitive theory suggested methods that could be used in enhancing some of the constructs, such as modelling and demonstrations that were also very useful in programme implementation.

Health care professionals were empowered through provision of information and knowledge of motivational interviewing, communication skills, and competence in individual counselling. A change in the culture of the health facilities regarding health education based on autonomous support by the health care professionals also motivated behaviour change as well as maintain the change.

In evaluating the programme, some of these constructs will be evaluated, namely knowledge based on the information received, self-efficacy, attitude, and autonomy, in order to determine the effect of the programmes on the patients with Type 2 diabetes.

1.6. JUSTIFICATION AND SIGNIFICANCE FOR THE STUDY

The researcher's current experience as a nursing officer in Nigeria has revealed that it is common practice to give health talks without clear goals and without considering patients' needs and interests. The majority of patients that attend the consultant clinics are not given routine health talks and patients are only managed via medications that are collected; minimal interaction with the other health-care professionals takes place. The literature reveals that there is paucity of information on health education programmes and interventions for patients with Type 2 diabetes in Nigeria and there is no structured education with multi-disciplinary group of health-care professionals. In this context, it is important to develop and evaluate a programme as recommended by the WHO; a programme that is planned collaboratively by

patients with Type 2 diabetes and health-care professionals. The programme is a nurse led health education programme for patients with Type 2 diabetes which can be used as a template for teaching nurses in training.

The aim of health education for self-management is to empower patients with Type 2 diabetes with adequate knowledge, skills and attitude to improve their glycaemic control and quality of life. Therefore, the outcome of the study can inform nurses and other service planners of a basic programme for teaching self-management education to patients with Type 2 diabetes in health facilities in the Edo State, with the expectation of enhancing effective self-management. The educational programme would have an important, cost-effective impact on the care of patients with diabetes, raise public awareness of the disease and prevent and control Type 2 diabetes in Edo State. The educational programme may reduce the burden of care on the patients, the family and the health facilities as it is assuming to increase adherence and therefore reducing complications. Additionally, benefits for health facilities are that through participating in the development of the programme, the nurses as well as other health-care professionals will update their own knowledge and skills that will improve communication among health-care professionals and foster an inter-professional culture of collaboration in supporting the patient. The programme will result in a paradigm shift in the method of teaching health education. Patients with Type 2 diabetes will be impacted with information and skills that will facilitate their self-management, increase adherence and improve their quality of life. The burden of Type 2 diabetes will be minimised as patients learn how to interact with others in the society and take decisions related to their health.

1.7. OUTLINE OF THE THESIS
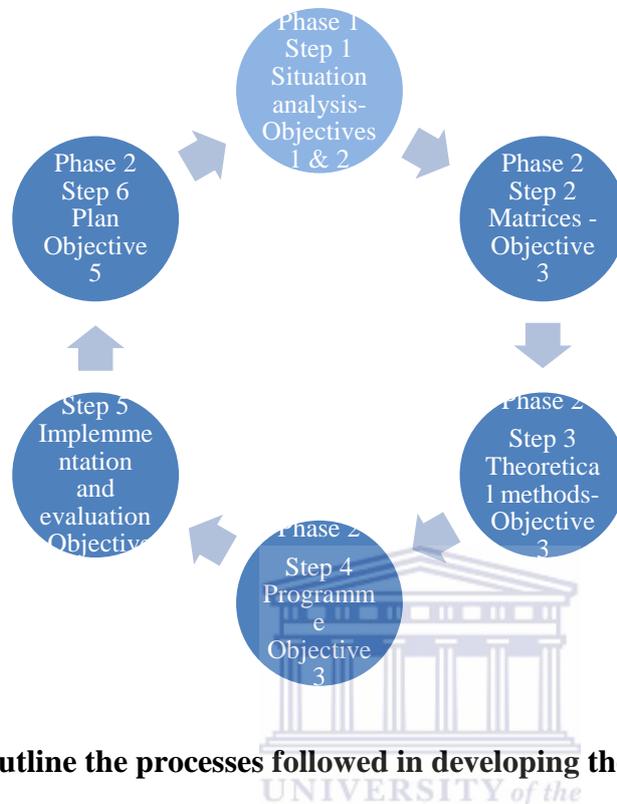
Figure 1.1: Outline the processes followed in developing the programme.

Chapter 1 is an introductory chapter that introduces information on the prevalence of Type 2 diabetes globally, in Africa and in Nigeria. The magnitude of the problem for Nigeria is explained. The aims, objectives and research questions that guided the study are also outlined. The intervention mapping framework that was used for research study and the three behavioural change theories used to guide programme development are also discussed. The significance of the study and principle of adult learning were also explained.

Chapter 2 provides an overview of the literature on diabetes as a disease, trends of diabetes globally, the African context, The Nigeria context, the roles of the health-care professionals in health education and the outcomes of multi-disciplinary health education programmes.

Chapter 3 described the methodology of the study.

The thesis from Chapter 4 onwards follows two phases indicating the six steps of the adapted intervention mapping approach and the tasks suggested by Bartholomew, Parcel, Kok & Gottlieb, 2011.

Phase 1 of the study is outlined in Chapter 4. Chapter 4 discusses Step 1, which is a situation analysis and describes the experiences of the participants on self-management of their Type 2 diabetes. Chapter 4 presents the results of the situation analysis which includes the results of the individual semi structured interviews with patients with Type 2 diabetes, the participants' observation of health education sessions by nurses with patients with type 2 diabetes, the focus group discussions with the health-care professionals regarding their perception of health education and the challenges they encountered with patients during health education.

Phase 2 is addressed in Chapters 5, 6, 7and 8.

Chapter 5 presents the results of steps 2, 3 and 4 of the programme intervention mapping framework. The chapter builds on the results of Chapter 4 and outlines the findings and underlying theoretical assumptions regarding behavioural changes, first for health-care professionals' to be prepared to offer the program, and secondly for the patients going to attend the programme. Matrices of change objectives and actions were developed.

Chapter 6 is the presentation of the developed health education programme. A detailed outline of the structured health education for self-management of Type 2 diabetes (SHESMD) programme is given with content, approaches/ methods/ material used for teaching and the activities expected to be performed by health-care professionals and patients. The chapter ends off with a training workshop for the healthcare professionals on motivational interviewing and communication skills and orientation on offering the programme.

Chapter 7 outlines a pilot study and evaluation of the pilot study to determine the accuracy and the effectiveness of the programme in meeting the goals. The result of quasi-experimental design used in evaluating the programme is presented.

Chapter 8 comprises of the plan for adoption, implementation sustainability and evaluation of the programme. Matrices for the activities of the different individuals who are to be involved is also drawn.

Chapter 9 presents the summary of the key findings of the research study with the limitations, recommendations for further research highlighted and the conclusion of the study.

1.8. SUMMARY

This chapter has served to set the orientation for the study by providing an introduction and background to the prevalence of Type 2 diabetes globally, in Africa and in Nigeria. Key points

included that Nigeria has the highest number of people with diabetes in African region of the WHO, with a steady increase in the incidence and prevalence of Type 2 diabetes, which may result in an epidemic if measures are not instituted to curb the prevalence. This problem is compounded by poor knowledge of diabetes among patients, nurses and other health-care professionals in Nigeria and the traditional patient education method that is still used in providing information which is not tailored to the needs of the patients. The qualitative approach was exploratory and descriptive and the researcher's knowledge stemmed from the social constructionist paradigm, which influenced the ontology, epistemology and methodology of the study. The need for a structured education programme tailored to patients' needs and their active participation is emphasized. Table 1.4 provides a summary of the research methodology followed in the study.

In the next chapter (Chapter 2) an overview of Type 2 diabetes, the global economic burden, trends in the developed and developing countries, the role of nurses and other health-care professionals in health education and some multi-disciplinary research studies are presented.

Table 1.4: Summary of the research methodology of the study

Objectives	Design	Methods	Participants	Sampling	Analysis	Reasoning strategies
Phase 1: Step 1 Intervention mapping framework						
Objective 1: To explore and describe the patients' understanding of diabetes and self-management of Type 2 diabetes	Explorative, descriptive, qualitative design	Individual semi-structured interviews	Patients with Type 2 diabetes.	Non probability - Purposive	Tesch's (1990) descriptive analysis and independent coder	Inductive
Objective 2: To explore and describe the health education by health-care professionals to patients with Type 2 diabetes		Participant observations with field notes	Patients and nurses	Convenient		
		Focus group discussions	Health-care professionals	Purposive		
		Literature support				
Phase 2: Steps 2, 3, 4, 5 and 6 of adapted Intervention Mapping Framework						
Objective 3: To develop a structured health education programme for self-management of Type 2 diabetes through collaboration and active participation of health-care professional s and patients		Step 2 Matrices of change objectives Step 3 Methods Step 4 Programme and workshop with stakeholders using core processes from intervention mapping framework	Health-care professionals and patients with Type 2 diabetes	Purposive Sampling Technique	Themes from analysed data from Phase 1 and information from literature support formed data used for programme development	Deductive Synthesis

28

Objective 4: To implement and evaluate health education for self-management of Type 2 diabetes in Edo State, Nigeria	Quasi-experimental design	Step 5: Participants undertook the programme for 5 weeks. Evaluation through quantitative approach followed by individual semi-structured interviews	Patients with Type 2 diabetes	Convenient	Qualitative data analysis using Tesch 1990 Laboratory investigation	Deductive Inductive
Objective 5 To describe a plan for adoption, implementation, sustainability and evaluation of the health education programme for self-management of patients with Type 2 diabetes in Edo State, Nigeria	Randomised Control Group	Questionnaire	Patients with Type 2 diabetes and health-care professionals	Randomised Control Trial	Quantitative analysis using Statistical package for Social Science (SPSS)	Synthesis

CHAPTER 2: OVERVIEW AND TRENDS IN TYPE 2 DIABETES AND EDUCATIONAL PROGRAMMES IN A MULTI-DISCIPLINARY CARE ENVIRONMENT
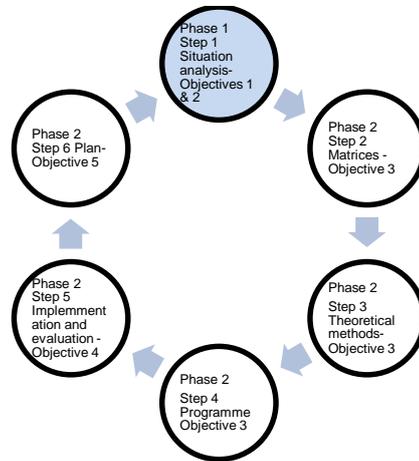
2.1 INTRODUCTION

This chapter provides an overview of Type 2 diabetes as a public health problem. For qualitative studies, there are different points of view among qualitative researchers with regard to the purpose of a literature review and under what circumstances it should be conducted (Burns & Grove, 2011). Minimal review of literature is included at the beginning of the study to enable a researcher to be conversant with prior studies that have been conducted instead of directing the study (Burns & Grove, 2011). The chapter is divided into four sections. The *first section* addresses diabetes as a disease. The *second section* discusses the global and African trends followed by the *third* section on the economic burden of diabetes. The *fourth section* focuses on the multi-disciplinary team, in providing health education. The *last section* explores studies conducted by multi-disciplinary teams, with an emphasis on their aims, theories, methods and findings.

LITERATURE SOURCES

Various strategies were adopted to review the literature utilising primary and secondary sources. The major bibliographic databases were searched, namely: Google Scholar, EBSCO Host, Science Direct, and Medline, using these key words 'diabetes', 'diabetes type 2', 'education of patients', 'health education', 'health education of patient', 'health education of diabetic patients', 'self-management', self-management education', 'self-care', 'self-

management of diabetes', 'self-management of chronic diseases', 'patients' knowledge', 'patients' knowledge of diabetes', and 'coping strategies with diabetes' up until the time of publication. Relevant articles were retrieved after reading through all the located articles and abstracts of journal articles, and a hand search was used to source information from relevant books, journals, newspapers, and policy guidelines for care using the university library. Consultations were held with experts who also recommended useful materials, and their references were also perused for useful information.

2.2 OVERVIEW OF DIABETES

The historical annals of civilisations found in India, ancient Egypt and Persia describe diabetes as one of the world's ancient diseases. The disease was first described and named 'diabetes' by a Greek physician called Aretaeus (Laios, Karamanou, Saridaki & Androutsos, 2012). Diabetes encompasses a group of metabolic disorders characterised by a chronic high level of blood glucose (hyperglycaemia) with disturbances to carbohydrate, fat and protein metabolism caused by defects in insulin secretion, action, or both (ADA, 2010a). Abnormalities in carbohydrate, protein and fat metabolism are due to the deficient action of insulin by pancreatic beta cells on the target muscles, adipose tissue and liver, which become insensitive to the action of insulin (Ozougwu, Obimba, Belonwu & Unakalamba, 2013).

2.2.1 Classification

Different types of diabetes are classified based on the ADA (2014a) classification.

2.2.1.1 Type 1 diabetes

Type 1 diabetes (formerly known as insulin dependent diabetes mellitus (IDDM) or juvenile diabetes mellitus) occurs among children and adolescents. Although its cause is unknown, it most likely results from a cell mediated auto immune destruction of the islet of pancreas' insulin-producing β-cells , resulting in severe insulin deficiency (Lebastchi, Deng, Lebastchi, Beshar, Gitelman, Willi, Gottlieb, Akirav, Bluestone & Herold, 2013). The auto immune destruction is linked to an environmental or genetic disposition. The body does not produce insulin and therefore the patients depend on exogenous insulin to survive and prevent ketoacidosis, coma and death. It accounts for <10% of the cases of diabetes. The onset of the disease is rapid with acute extreme elevations in the blood glucose and its effect is markedly noticeable in patients (Lebastchi et al., 2013).

2.2.1.2 Type 2 diabetes

Type 2 diabetes (formerly known as non-insulin dependent diabetes mellitus (NIDDM) or adult onset diabetes mellitus) is a disorder of the endocrine system characterised by abnormal fluctuations in blood glucose levels, usually related to a defect in insulin production and glucose metabolism that occurs due to insufficient insulin secretion and/or reduction in the tissue responses to insulin action (ADA, 2012). The body tissues (adipose tissue, muscles and the liver) become resistant or imbalanced when responding to normal insulin secreted in the pancreas' beta cells. The onset is silent, gradual and progressive, which could take some years and this explains why some diabetic patients develop complications before diagnosis is made (Soumya, 2011). Type 2 diabetes is the most common type of diabetes and accounts for about 85-90% of all cases of diabetes (IDF, 2013b). It usually occurs in adults older than 40 years and the group most affected is age group 40-59 years (IDF, 2013b) (that is, working age), compared to developed countries where the age group most affected is that of individuals older than 60 years (retired and dependant group) (Shaw, Sicree & Zimmet, 2010). Reports indicate that Type 2 diabetes is increasingly evident in children and youth globally (Dart, Martens, Rigatto, Brownell, Dean & Sellers, 2014; Karres, Pratt, Guettier, Temeck, Tamborlane, Dunger, Bejnariu, De Beaufort & Tomasi, 2014). Type 2 diabetes is also found to be related to certain ethnic and tribal groups (Centre for Disease Control (CDC), 2012), and weight and family history also play a role in the increase prevalence of Type 2 diabetes worldwide (Chen, Magliano & Zimmet, 2012). Evidence from several locations has revealed that Type 2 diabetes can be prevented or delayed through lifestyle modification, by promoting weight loss, managing nutrition and increasing physical activity in those who have impaired glucose (Penn, White, Oldroyd, Walker, Alberti & Mathers, 2009, WHO, 2010).

2.2.1.3 Gestational hyperglycaemia and diabetes

Gestational diabetes is described as any degree of glucose intolerance beginning or first detected during pregnancy, which may or may not persist after delivery (Soumya, 2011). Treatment is instituted early due to its associated adverse pregnancy outcome and long-term complications for both mother and child. The cause is unknown, but the placental hormone that supports foetal development blocks the action of the mothers' insulin, thus resulting in insulin resistance leading to hyperglycaemia (Zeck, Widberg, Maylin, Desoye, Lang, McIntyre, Prins & Russell, 2008). Dietary and behaviour modification are first line actions, however insulin is the gold standard for treatment, since it is effective and safe (Cheung, 2009).

2.2.1.4 Other specific types of diabetes

Other types of diabetes include a variety of uncommon diseases that are mainly genetically defined types of diabetes, or other forms of diabetes that are associated with other diseases or related to drugs. They include diabetes due to genetic defects of beta cell function–such as maturity onset in the young, diseases of the exocrine pancreas–such as pancreatitis and endocrine diseases–such as Cushing's disease and acromegaly. Other types of diabetes are caused by genetic defects of insulin action, drugs or induced chemically (ADA, 2014a).

2.2.1.5 Intermediate hyperglycaemia

This was formerly known as pre-diabetes and is also referred to as impaired glucose tolerance (IGT) or impaired fasting glucose (IGT). It is a stage in which an individual's blood glucose is higher than normal but not high enough to be classified as diabetes, with the range at the higher limit of normal blood glucose readings. It is a forerunner of diabetes since the gradual increase in glycaemia exposes the patient to an increased risk of developing Type 2 diabetes and its complications (Unnikrishnan & Mohan, 2015).

Note: This thesis is concerned with Type 2 diabetes and therefore the emphasis for the rest of the research study is on Type 2 diabetes unless otherwise stated, this will be referred to as either Type 2 diabetes or diabetes to minimise repetition.

2.2.1.6 Pathophysiology

In a normal, healthy situation, the pancreas' islet of Langerhans' beta cells produce insulin, which is a hormone that keeps blood sugar levels within the normal range after the ingestion of food and other physiological factors within the individual. Through the action of insulin, excess glucose is absorbed from the bloodstream however, in patients with Type 2 diabetes, the plasma glucose is higher than normal due to insensitivity of the tissues to insulin, or lack of insulin resulting from insufficient action of insulin, which is progressive over time. A hallmark of Type 2 diabetes is that there is a continuous deterioration in beta cell function which begins in patients as early as 12 years before diagnosis and this deterioration progresses throughout the disease process, increasing hyperglycaemia (Fonseca, 2009). Pancreatic β-cells normally respond to insulin resistance by increasing their output of insulin to meet the needs of tissues. Development of Type 2 diabetes essentially stems from a failure of the β-cell to adequately compensate for insulin resistance. The β-cell dysfunction progresses over time and

is well advanced by the time a person's plasma glucose level is in the diabetic range and continues to deteriorate when diabetes develops without any management (Utzschneider & Khan, 2011).

2.2.1.7 Diagnosis

Diagnosis is usually made according to the WHO and IDF's diagnostic standard. Blood tests are used to make accurate diagnoses for patients with diabetes with slight variations in values. A diagnosis is made on the basis of repeated elevated venous glucose concentrations, which are unexplained by other causes (ADA, 2015a). The values used in this study are the values stipulated by the WHO (2006, 2011) (Table 2.1).

- Fasting plasma glucose (FPG) is the blood measurement performed in the morning after eight to 12 hours of overnight fasting. The value is equal and <6.1mmol/l (110mg/dl). The range is 84mgdl-110mgdl. For patients with impaired fasting glucose the measurement is >6.1-6.9mmol/l (110-125mg/dl) and for Type 2 diabetes patients the measurement is >7.0mmol/l (126mg/dl) (Table 3). The venous plasma glucose test is the standard method (WHO, 2006)

- The oral glucose tolerance test (OGTT) or 2-hour plasma glucose measurement is the administration of a 75mg glucose drink to a patient after the night fast and a subsequent blood test taken two hours later to determine glucose concentration in the blood. OGTT is a useful test for identifying people with Impaired Fasting Glucose (IFG). The test is more sensitive but less convenient to administer. The range of the OGTT for those individuals with impaired tolerance test is >7.8-11.1mmol/l (140-180mg/dl). Patients with diabetes have a reading of >11.1mmol/dl (180mg/dl) (WHO, 2006).

- Random blood glucose testing could be carried out, especially when the test is done for a routine investigation or in an emergency, but this can only be confirmed when it is accompanied by symptoms.

In 2011, the WHO included;

- Glycosylated haemoglobin (HbAlc) as a diagnostic test. It was recommended that an HbAlc of < 6.5% is the cut-off point for diagnosing diabetes. This test is known as the 'gold standard' by health professionals due to its accuracy in monitoring glycaemic control, screening and diagnosis with retrospective readings of 12 weeks of glucose levels (Beard, Clark, Hurel & Cooke, 2010; Higgins, 2013). The test has also been effective in investigating the relationship between the control of blood sugar and the development of complications (Maple-Brown, Ye & Retnakaran, 2013). Even though

34

its usefulness is recognised, it may not be easily obtainable in most health facilities in developing countries, due to its high cost.

Patients with diabetes are expected to have perfect glycaemic control when plasma glucose is as close to a non-diabetic person's as possible, however it is always difficult to achieve (IDF, 2013b) and therefore a good glycaemic control is determined by the long-term control of plasma glucose within the normal range (Compeán Ortiz, Gallegos Cabriales, González González & Gómez Meza, 2010) (Table 2.1).

Table 2.1:   Summary of the WHO's (2006) recommendations for diagnosis criteria for normal blood glucose, diabetes and hyperglycaemia

Hyperglycaemic state	Value
Normal Blood Glucose	
Fasting plasma glucose	<6.1mmol/l (72mg/dl and 110mgdl/l
Diabetes	
Fasting plasma glucose	≥7.0mmol/l (126mg/dl) or
2–h plasma glucose	≥11.1mmol/l (200mg/dl)
Impaired Glucose Tolerance (IGT)	
Fasting plasma glucose	<7.0mmol/l (126mg/dl) and
2–h plasma glucose	≥7.8 and <11.1mmol/l (140mg/dl and 200mg/dl)
Impaired Fasting Glucose (IFG)	
Fasting plasma glucose	6.1 to 6.9mmol/l (110mg/dl to 125mg/dl)
2–h plasma glucose	and (if measured) <7.8mmol/l (140mg/dl)

*Source: (WHO, 2006)

Although controlling blood glucose is a difficult task. There are many health benefits to glycaemic control since studies have found that blood glucose control reduces the risk of complications and improves quality of life (UKPDS, 1998). In an attempt to ensure early detection and treatment, the WHO (2006) recommends screening of people aged 45 years and older every three years and for those at risk, the test should be commenced earlier than age 45 and more frequently, while all pregnant women should be screened at first contact to ensure early detection, control and a complication-free pregnancy (WHO, 2006) .

2.2.1.8 Clinical manifestations

Patients with diabetes may manifest symptoms prior to the diagnosis, or the diagnosis could be made incidentally through routine blood checks before the patient experiences the symptoms. These symptoms include polyuria (excessive excretion of urine), polyphagia (excessive hunger), polydipsia (excessive thirst) and weight loss despite eating excessively, blurred vision

and fatigue, numbness in the hands or feet and slow-healing wounds (IDF, 2014a). The onset is gradual, with symptoms often less marked and patients may be unaware of the disease, thereby allowing for development of complications before the diagnosis is made (Arden & Ramsey, 2015).

2.2.1.9 Risk factors

The specific causes of Type 2 diabetes are not known, but causal factors are related to impaired insulin, resistance insulin and environmental factors. It is a relatively multi-factorial and heterogeneous disorder in which environmental (lifestyle) and genetic (physiological) factors contribute to its development (Ozougwu et al., 2013). Additionally, researchers asserted that environmental factors, including lifestyle practices such as obesity, are significant contributors to the increased development of diabetes, leading to the word 'diabesity' (Abdullah, Attia, Oldmeadow, Scott & Holliday, 2014). Colagiuri (2010), reports that an increase in body fat and central fat, which is related to defects in glucose uptake and reductions in lipid oxidation, increase the risk for diabetes, as does an elevated body mass index (BMI) and a high waist-to-hip ratio (WHR), placing an individual at risk. This unit increase in the BMI has been shown to raise the incidence of Type 2 diabetes by 25% (Colagiuri, 2010). Report show that metabolic features such as elevated blood pressure and hyperlipidaemia also increase the risk (Wang, Xu, Xu, Wang, Bi, Lu, Dai, Zhang, Ding & Xu, 2015) as does physical inactivity due to sedentary lifestyles and lack of exercise (Isomaa, Forsén, Lahti, Holmström, Waden, Matintupa, Almgren, Eriksson, Lyssenko & Taskinen, 2010). The WHO (2015), estimates that 31% of the world's population is insufficiently active (WHO, 2015) and 27% of people with diabetes had the disease as a result of physical inactivity (WHO, 2015). However, studies report significant glycaemic control through moderate or intense increases in physical activities among people with diabetes (Colberg & Riddell, 2013; Umpierre, Ribeiro, Kramer, Leitão, Zucatti, Azevedo, Gross, Ribeiro & Schaan, 2011).

The dietary habit, which involves different patterns of food intake that can expose an individual to diabetes, includes low intakes of food rich in fibre and carbohydrate and fat-rich diets as well as high consumption of artificially sweetened drinks (Salas-Salvadó, Martinez-Gonzalez, Bullo & Ros, 2011), while other factors that are associated with diet are overeating, stress and aging (Kohei, 2010).

Short durations of sleep have been found to be associated with the onset of diabetes (Lai, Lin, Lin, Lee, Sung, Chang & Kao, 2013), while a history of gestational diabetes, polycystic ovary syndrome (PCOS) and severe mental illness (Rojas, Chávez, Olivar, Rojas, Morillo, Mejías,

Calvo & Bermúdez, 2014) are also found to predispose individuals to the disease. Other studies shown the relationship of deficiency of statins and testosterone to diabetes (Sampson, Linton & Fazio, 2011).

Genetic components play an important role in the susceptibility to Type 2 diabetes, as it is indicated in a combination of genetic factors, which is supported by the findings of a discovery of about 60 genetic variants related to the risk for diabetes (Morris, Voight, Teslovich, Ferreira, Segre, Steinthorsdottir, Strawbridge, Khan, Grallert & Mahajan, 2012). Positive family history of diabetes among first degree relatives increases one's risk to the disease, as there is a relatively strong association with future risk for Type 2 diabetes (Wagner, Thorand, Osterhoff, Müller, Böhm, Meisinger, Kowall, Rathmann, Kronenberg & Staiger, 2013). Monozygotic twins are found to be more susceptible to diabetes (Gillespie, Aitken, Wilson, Williams & Bingley, 2014), which may be related to a gene-environmental factor that exposes them to the disease. There is a relationship between intra-uterine conditions and the risk for the development of Type 2 diabetes in later life, since there is evidence that babies exposed to hyperglycaemia in mothers with gestational diabetes and those with low birth weights are at significantly higher risk (Dabelea & Crume, 2011).

2.2.1.10   Complications of diabetes

Diabetes is associated with reduced life expectancy, significant morbidity and diminished quality of life People living with diabetes are susceptible to various forms of disabling acute and chronic complications that often lead to premature death that is attributable to undetected, untreated and poorly controlled diabetes. The acute metabolic complications are severe hyperglycaemia and hypoglycaemia, which are emergencies that could lead to coma and death (Pinto, Villena & Villena, 2008). Chronic complications are mainly due to prolonged hyperglycaemia affecting various organs in the body, such as the brain, heart, kidneys and reproductive organs, resulting in serious and costly effects on the patients. Other chronic complications of diabetes include depression (Mommersteeg, Herr, Pouwer, Holt & Loerbroks, 2013), sexual dysfunction and decreased resistance to infection and dental disease.

These complications can also be grouped into micro-vascular and macro-vascular complications. Micro-vascular complications are damage to the smaller blood vessels, causing retinopathy, which is known to have high prevalence among diabetic patients and is the leading cause of blindness (Sivaprasad, Gupta, Gulliford, Dodhia, Mohamed, Nagi & Evans, 2012), nephropathy, which is the leading cause of End-Stage Renal Failure (ESRD), with patients having a higher risk of mortality related to cardiovascular diseases (Satirapoj, 2013),

neuropathy in the feet that exposes the individual to poor distal circulation, infections and foot ulcers, with poor wound healing and amputation (Bakker, Apelqvist, Lipsky, Van Netten & Schaper, 2015) and erectile dysfunction (Malavige, Jayaratne, Kathriarachchi, Sivayogan, Ranasinghe & Levy, 2014).

The macro-vascular complications include hypertension, stroke, cardiovascular disease and myocardial infarction (Jansson, Svärdsudd & Andersson, 2014). Cardiovascular disease is a major cause of death among these patients (Mann, Zipes, Libby & Bonow, 2014; Mayoux & Vallon, 2015) and it is indicated that the risk for cardiovascular disease starts before the onset of symptoms of diabetes, which has led to the "ticking clock hypothesis" (Scully, 2012). The United Kingdom Prospective Diabetes Study Group (UKPDS, 1998) report, indicates that improving dietary habits, reducing cholesterol, managing triglycerides levels, managing weight, exercising or increased physical activity and adhering to drugs to control diabetes and high blood pressure reduces the overall chance of diabetes patients developing cardiovascular disease (UKPDS, 1998).

The global mortality rate among diabetic patients is high, resulting in 5.1 million deaths in 2013, with 80% of these deaths occurring in low- and medium-income countries (IDF, 2013b). Diabetes causes one death every seven seconds and is responsible for 8.4% of all global mortality in the 20–79 years age group, with 48% of deaths occurring in those people under 60 years of age (IDF, 2013b). It is ranked in the top fifth leading causes of death in the world (IDF, 2013b) and is listed as the underlying cause of about 3% of all deaths and this number may be higher since in many deaths due to diabetes, diabetes is not recorded as the related cause of death. Death amongst these patients has been described as twice as high as that of people who are healthy within the same age group (Deshpande, Harris-Hayes & Schootman, 2008).

A European study indicates that a slight reduction in blood glucose that is sustained has a marked reduction in the development of complications (UKPDS, 1998). Improvement in glycaemic control is expected in all patients who are duly managed and engaged in behaviour modifications, techniques, or anti diabetic agents, but less than 15% of adults patients have attained the goal of care that includes glycaemic control, normal blood pressure and low density lipoprotein (LDL) (Nam, Chesla, Stotts, Kroon & Janson, 2011).

2.2.1.11   Diabetes management

Diabetes is a complex chronic illness that requires continuous treatment from a multi-disciplinary team of health-care professionals with the target of enhancing and maintaining

metabolic control to prevent all forms of complications and an optimum quality of life. The ADA (2015b) recommends that diabetes management should consist of disease prevention in the community, screening regularly for early detection, early diagnosis and management, lifestyle modification and continuous management to reduce complications and premature death. Additionally, the ADA (2014b), reports that pharmacological therapy combined with modification of lifestyles are the best methods of managing diabetes.

The goal of diabetes treatment is to keep the level of blood glucose within the normal range and to reduce blood pressure and lipid levels. To achieve this, patients and their treatment regimens must be monitored and adjusted regularly. A collaborative and integrative team of health-care professionals, with adequate referrals occurring where necessary to ensure that the recommended blood glucose level is achieved is suggested (ADA, 2014b). Allowing high blood glucose exposes the individual to developing acute and chronic complications. Injectable insulin is also administered and could be given as a single therapy or combined with oral hypoglycaemic therapy (ADA, 2014b).

Diabetic patients are maintained on treatment for life and active participation in their own care is a necessity. The majority of the management is done outside the health-care facility and to enhance adherence and quality of life; knowledge of the disease and self-management is important.
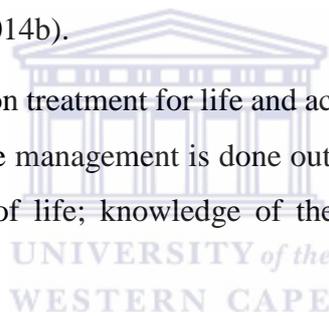
2.3 INTERNATIONAL TRENDS IN TYPE 2 DIABETES

Internationally, Type 2 diabetes affects about 90% of the total diabetes patients, with increasing prevalence globally. There has been no record of a decrease in prevalence (IDF, 2013a), even though many countries have policies in place for managing the disease and programmes planned for prevention and management. Diabetes is progressively devastating many countries of the world as significant financial resources are expended on diabetes management, especially with the development of complications.

The global epidemic of diabetes is a public health challenge, with the number of adults with diabetes in the developed world estimated to have experienced an increase of 20% from 2010-2030, while in developing countries it is estimated at 69% (Shaw et al., 2010). According to the IDF (2013), the developed and the developing world are experiencing a gradual gradient in the disease occurrence, with the economic and psychosocial burden falling on the individual and the community (IDF, 2013b). Type 2 diabetes, once viewed as a disease of affluence and

is now prevalent among the poor and once seen as adult onset, it is increasingly seen among children and adolescents (Hu, 2011), which shows the prevalence of the disease globally without exemption. Although the onset of Type 2 diabetes is within the higher age group 65 years, in the developed countries such as United States and the United Kingdom. This is in contrast with the 40-59 year age group affected in the developing countries such as Asia and the Pacific islands and also among some ethnic groups in the developed world (Ma & Chan, 2013).

2.3.1.1 Diabetes in the USA

In the developed world there are racial and ethnic differences in the prevalence of diabetes, as seen in America and the European countries. In the United States of America (USA), there is variance in the prevalence of diabetes, as studies have reported that all other ethnic groups have a higher prevalence of diabetes in comparison to the white population group (CDC, 2012) There is an increased occurrence of complications and mortality among Hispanics, African Americans, Asian Americans, American Indians and Alaskan natives compared to non-Hispanics whites and this is attributed to various causes such as genetic disposition and lifestyle (ADA, 2013a). Although the prevalence of diabetes is predicted to be on the increase, data from United States CDC (2012), indicates that there is a slowing in the increase of prevalence of diabetes among the 20-44 year age group compared to the 45-55 year age group that has a constant prevalence. There is a considerable reduction in the incidence of diabetes-related complications among patients with diabetes (Gregg, Li, Wang, Rios Burrows, Ali, Rolka, Williams & Geiss, 2014). This is a reflection of improvements in the care offered by health-care facilities and health promotion that is directed at patients with diabetes, which includes enhancing team-based care, patient education and supporting clinical decision-making (Gregg et al., 2014). In 2012, the estimated economic cost of diagnosed diabetes was USD245 billion, direct medical costs was USD176 billion and USD69 million in reduced productivity, accounting for more than 1 in 5 health-care dollars spent on health (ADA, 2013a).

Various programmes are in place in the USA for managing Type 2 diabetes, such as structured education programmes, work place health promotion programmes and disease management programmes that have been evaluated and found effective (Egginton, Ridgeway, Shah, Balasubramaniam, Emmanuel, Prokop, Montori & Murad, 2012). Many associations such as the ADA and non-governmental agencies are available to advocate for patients and various programmes are initiated to enable patients to cope with the disease, such as the chronic disease

self-management programme with adequate training of health professionals that raises awareness and improves management and health (Ory et al., 2013).

2.3.1.2 Diabetes in Europe

There is a difference in the variation in the incidence of diabetes in European countries, which is related to an increase in life expectancy of the old age group, since this group's life expectancy increased by 4-5 years (WH0, 2012) and a longer survival rate for diabetic patients with improved lifestyles. The prevalence of diabetes is heterogeneous, ranging from 2.4% in Moldona to 14.9% in Turkey, with an estimated pooled prevalence of 8.5% in 2013 (IDF, 2013b). There is a high incidence of undiagnosed diabetes estimated at 29.3% in European low-income countries such as Uzbekistan and at 36.6% in high-income European countries such as the UK (IDF, 2013b). Type 2 diabetes is seen more often in those aged between 60-70 years, but the incidence is becoming visible in the younger age as a result of childhood obesity.

In Europe, diabetes is a leading cause of death, even though Europe has witnessed a decrease in the mortality rate of diabetes in recent years, in comparison to the population of those without diabetes, patients with Type 2 diabetes still have a reduced life expectancy (Nwaneri, Bowen-Jones, Cooper, Chikkaveerappa & Afolabi, 2012). The care of people with diabetes is an economic burden on the region; the health expenditure for diabetics for 2010 was 10% of the total European health expenditure (Zhang, Zhang, Brown, Vistisen, Sicree, Shaw & Nichols, 2010).

Many programmes have been implemented for managing patients with diabetes, namely disease prevention and early detection, professional-led programmes, evidence-based disease management and integrated care models (Tamayo, Rosenbauer, Wild, Spijkerman, Baan, Forouhi, Herder & Rathmann, 2014). Many countries in the European region have developed diabetic management programmes with policies and guidelines for uniformity and to meet patients' expectations. There are various specialist groups such as the Association of British Clinical Diabetologist, the Primary Care Diabetes Society, Diabetes UK and National Health System Diabetes, which are supported by the Diabetes Education Network. Structured educational groups are organised for the newly diagnosed and those with a long-standing history according to the policy and they provide education at a primary level, which is comprised of guidelines and a plan of care that is followed by financial incentives (Gallagher, Bennett, Smith & O'Reilly, 2014).

2.3.1.3 Diabetes in the Western Pacific and Asian countries

The prevalence of diabetes in the Western Pacific and Asian countries is similar and it is increasing. Prevalence of diabetes in the Western Pacific in 2013 was 8.6% and this was projected to reach 11.1% by 2035 (IDF, 2013b). The rapid development and economic transformation in these countries, coupled with unhealthy lifestyles and obesity are the reasons for increased metabolic syndrome prevalent in these regions (Ma & Chan, 2013), which is reflected in the prevalence of undiagnosed diabetes, given at 49.4% in high-income countries, 54.1% in middle-income countries and 63% in low-income countries (IDF, 2013a). There is also a high prevalence of intermediate hyperglycaemia in this region (Ma & Chan, 2013). Genetic factors have been implicated in the prevalence of diabetes, phenotypic and genotypic heterogeneity of young children was emphasised as the marker of diabetes in the younger age group and it is prevalent in the region (Morris, Voight, Teslovich, Ferreira, Segre, Steinthorsdottir, . . . Mahajan, 2012). Diabetes occurs more commonly among the younger age group of 40-59 years (Shaw et al., 2010). Tokelau has 37.5% as the world highest prevalence rate and China has the highest number of 98 million (IDF, 2013b).

Diabetes complications and mortality is higher in this region than in the developed world and about two million deaths were recorded in 2013, with 44% occurring in the 60-year age group where there is reduction of life expectancy by six years amongst these patients (Chan, Cho, Tajima & Shaw, 2014). The economic burden of diabetes in the region is high when considering the economy of the countries situated in the region. Reports showed that approximately USD88.4 billion was spent on direct health-care for diabetes-related cases in 2013 in this region (Chan et al., 2014), which is a burden on countries that are just becoming economically stable as they experience economic growth.

The South East Asian region has features of the occurrence of Type 2 diabetes in common with the Western Pacific region and although the prevalence is higher in Asia, people of South East Asia are more affected. The South East Asian region was described as the global epicentre of the diabetes epidemic since it accounted for 60% of the world's diabetes population (Hu, 2011). India has estimated 65 million, while Indonesia, Pakistan, Bangladesh and the Philippines are rated in the top ten Asian countries, all with a high prevalence of diabetes (IDF, 2013a). Additionally, the impaired glucose tolerance rate is high in Asia (Ramachandran, Ma & Snehalatha, 2010) and this is an identified risk for future diabetes since a greater number of these people have the potential to develop diabetes.

Although environmental factors are implicated in exposing these people to diabetes, a study has shown that the rapid economic growth, urbanisation and improved nutritional status in this region recently led to an increase in the prevalence of Type 2 diabetes (Hu, 2011). The role of genetic factors is also very prominent, as reports show that Asian descendants are more insulin-resistant than other ethnic groups; this is also evident amongst those in diaspora (Abate & Chandalia, 2007) with many Asians having first-degree relatives with diabetes (Ng, Park, Oh, Tam, Cho, Shin, Lam, Ma, So & Cho, 2008). Prevalence among the younger age group is high, especially in young Asian populations. The Diabetes Epidemiology Collaborative Analysis of Diagnosis Criteria in Asia (DECODA) study showed that among Indians the peak age of prevalence is 60-69 years, while among the Chinese population the age is 70-89 years (DECODA, 2003), findings from other Asian countries are similar to findings from India (Ramachandran, Mary, Yamuna, Murugesan & Snehalatha, 2008). Although a large number of the population is affected, people of South East Asian descent are at higher risk, as are those in diaspora and high risk is linked to genetic and environmental factors (Espelt, Borrell, Roskam, Rodriguez-Sanz, Stirbu, Dalmau-Bueno, Regidor, Bopp, Martikainen & Leinsalu, 2008). These patients present with a high rate of complications and increased mortality, both within the region and among immigrants.

The cost of health-care is a burden to the region that consists of both the middle- and low-income countries. The health sector in this region is similar to those of the developing countries and therefore diabetes care is below optimum (Ma & Chan, 2013). Various preventive programmes are used in the prevention and management of diabetes and e.g. an endocrinologist reviews patients periodically. An international diabetes management study reported that about 35% of the patients treated by endocrinologists maintained glycaemic control in eight of the Asian countries (Yeung, Zhang, Luk, Yang, Sobrepena, Yoon, Aravind, Sheu, Nguyen & Ozaki, 2014).

Obesity is a problem in these regions, predisposing the population to diabetes since the early onset of diabetes in the 10-18 year age group is related to the obesity that is prevalent in this age group. The pooled prevalence of diabetes in rural and urban cities is high and is in contrast to studies from other regions of the world (Basit, Riaz & Fawwad, 2015; Ma & Chan, 2013). In line with the United Nations (UN) resolution (2006) directing member countries to institute programmes to curb the upsurge of diabetes, many Asian countries initiated programmes for prevention and control that were targeted at creating awareness, improved management and training of health professionals in the management of chronic diseases (Basit et al., 2015).

However, many of the programmes were not sustained due to challenges for the patients, health-care professionals and health facilities.

2.4 AFRICAN TRENDS IN TYPE 2 DIABETES

There has been an increase in the prevalence of diabetes due to the economic development in the African region; upper middle-income countries had rates of 7.0%, lower-income countries 5.0% and low-income countries 4.4%. Apparently countries such as Tanzania, the Democratic Republic of Congo and Ethiopia have had a prevalence greater than 10% due to their large populations (Peer, Kengne, Motala & Mbanya, 2014).

As a result of economic growth, urbanisation and industrialisation has increased the prevalence of diabetes and some other non-communicable diseases (NCDs) attributed to changes in lifestyles, westernised dietary habits and sedentary lifestyles (Ige, Owoaje & Adebiyi, 2013). According to the IDF Atlas (2013), Type 2 diabetes accounted for 90% of the total diabetes occurrence, with a pooled prevalence of 4.9%. The total number of people with diabetes was 19.8 million, with a projection of 41.5 million in 2035 and about 12.5 million undiagnosed cases (IDF, 2013a). Diabetes is more prevalent in the age group 40-59 years, which are the most productive years, with the prevalence of diabetes during these years having a negative effect on the workforce and impacting on the economy and development of the region. Fewer people in the 60-70 year age group are affected despite the 60-70 year age group being the most commonly affected group in the developed world, The distribution between males and females showed no apparent variation, with the prevalence of 49.5% and 50.5% respectively showing equal distribution (Mbanya et al., 2010).

2.4.1.1 Contributing factors to Type 2 diabetes in Africa

The magnitude of the prevalence of diabetes in Africa has been associated with diverse factors that are consistent with the developed world, such as an ageing population, a rise in life expectancy and obesity (Chen et al., 2012). Among Africans, genetic factors are also considered to increase susceptibility to diabetes and family history as a genetic predisposition was confirmed in South Africa and Sudan (Tekola-Ayele, Adeyemo & Rotimi, 2013).

Ethnicity is considered to be related to the prevalence of diabetes. Black Africans have a lower rate of diabetes in comparison to those of Indian descent in South Africa (Erasmus, Soita, Hassan, Blanco-Blanco, Vergotine, Kengne & Matsha, 2012) and attributed diabetes to urbanisation lifestyle and nutritional changes (Peer, Kengne, Motala & Mbanya, 2014) whereas in rural areas traditional values and customs are upheld. However, there are some

exceptions of rural areas with a high prevalence of diabetes, for example in rural Cameroon (Napoli, Mottini, Arigliani, Creta, Giua, Incammisa, Carotti, Sihom, Yimagou & Alombah, 2010).

In Africa, maintenance of weight depends on cultural, psychosocial and biological factors and people perceive obesity as a sign of health, wealth and good living, which confers influence and respect upon them (Gill, Mbanya, Ramaiya & Tesfaye, 2009). Thinness is often associated with disease and poverty in these regions and these perceptions can have a negative impact on peoples' health-seeking behaviour. However, these perceptions can be changed or modified through adequate culturally sensitive health education and increased public awareness of the risk factors. However, the region is faced with the challenge of poor patients and the paucity of professional education that has a negative impact on optimal diabetes care (Tuei, Maiyoh & Ha, 2010).

2.4.1.2 Complications of Type 2 diabetes in Africa

There was a high prevalence of debilitating complications in the region ranging from micro- and macro- vascular complications that affected the countries differently (Young, Critchley, Johnstone & Unwin, 2009). Africans have the highest prevalence of micro-vascular complications while macro vascular diseases are low, with an equally high mortality rate ranging from 8-41% in certain countries (Tuei et al., 2010) and the majority of diabetes-related deaths occurring in individuals below 60 years of age, which is higher than the global incidence of 49% (IDF, 2013b). Additionally, there is a high prevalence of undiagnosed diabetes in the region (IDF, 2014b) which shows that there is a tendency for an increase in the incidence of diabetes Psychosocial stress in diabetes, which is manifested as depression, is a common symptom among patients with diabetes in the region (Mommersteeg et al., 2013) and this may be related to poverty and a lack of care. Diabetes management could be stressful in an area where patients have low knowledge of a disease that has no cure and the individual is expected to manage the disease on their own, which is a common occurrence in the region.

2.4.1.3 Expenditure on Type 2 diabetes in Africa

In 2013 the African health expenditure on diabetes was about USD40 billion, less than 1% of the total global health-care spent on diabetes (IDF, 2013a). Many African countries are plagued by poverty since most of the countries located in the African region belong to the least developed countries as defined by UN and many families live below the poverty-line. In many African countries patients on insulin cannot afford the cost of the drug and there are inconsistent availability issues with the drug (Sobngwi et al., 2012) Despite the human and

economic issues and the increasing prevalence of diabetes, only 26% of countries have policy guidelines, framework, national diabetes programmes and structured patient education programmes (Ibrahim & Damasceno, 2012), revealing the low level of preparedness to tackle the diabetes epidemic. As a result, many Type 2 diabetes patients are exposed to complications and premature death. Sobngwi et al. (2012), reported that only 29% of patients with diabetes achieved glycaemic control out of the 47% that had undergone an HbAlc measurement in a year, proving that diabetes care is sub-normal in the region.

2.4.1.4 Type 2 diabetes policies in Africa

In September 2011, a high-level UN meeting on NC increased member countries' awareness on the prevalence and impact of diabetes and other NCD in all spheres of society (Echouffo-Tcheugui & Kengne, 2012). They resolved that policies and other modalities to curb the challenge should be implemented. Most African countries are yet to have policies, improved facilities and resources to care for Type 2 diabetes patients (IDF, 2013a), showing the lack of political will and commitment to the population's health issues. African leaders have to rise to their responsibility of implementing various programmes to respond to the challenge of diabetes. In most African countries, the care of diabetes is yet to be integrated into the primary care system and medical facilities are yet to adopt responsibility for caring for this group of people (Ibrahim & Damasceno, 2012). It is estimated that about 80% of cases of Type 2 diabetes can be prevented or delayed by early detection, management and behaviour changes affecting lifestyles (Habib & Saha, 2010). Additionally, health education is essential to increase the public's awareness of the risk factors.

2.5 NIGERIA DIABETES TRENDS

The prevalence of diabetes has been on the increase in Nigeria, following the trends in other countries world-wide. Nigeria has the highest number of people living with diabetes in Africa region of WHO with a prevalence rate of 5% (IDF, 2014b) and a high number of undiagnosed cases with an a asymptomatic preclinical phase (Chinenye & Young, 2013). Like every other developing country, Nigeria is undergoing economic development and is experiencing changes in lifestyle, especially diet and sedentary lifestyles and urbanisation (Akpan & Ekpenyong, 2013). Also implicated in the cause of diabetes is population growth, diet and aging (Zafar, Bhatti, Akhtar, Rasheed, Bashir, Humayun, Waheed, Younus & Nazar, 2011). Obesity is linked to increasing the prevalence of Type 2 diabetes in Nigeria, even among the major ethnic groups (Okafor & Ofoegbu, 2011) and is related to their cultural beliefs and practices. Traditional communities, such as the rural populations in northern Nigeria, have a low prevalence of 1.6%

(Fetugua, 2007) in comparison to some urban centres. Diabetes was found to be the leading cause of hospital admission in some health facilities (Azevedo & Alla, 2008) with high mortality rates.

The high prevalence of diabetes in Nigeria may have a significant impact on the economy since its prevalence affects the productive age of 40-59 years, which may lead to a devastating human and economic toll (Buowari, 2013). Diabetes has been described as an expensive disease with higher prevalence among the poor (WHO, 2013) in a country where the majority of the people live below poverty line (Falola & Achberger, 2013) and such a high prevalence results in a significant burden on the country. The cost of diabetes is borne by the patients and their families, further depleting family resources (Hall et al., 2011) and leading further to poverty. There is high incidence of undiagnosed diabetes and intermediate hyperglycaemia, which may lead to an increase in the incidence of diabetes in the near future if measures are not put in place to manage the situation. Diabetes awareness is low among the affected and other members of the society (Jasper, Ogundunmade, Opara, Akinrolie, Pyiki & Umar, 2014), which is motivation for teaching both the patients and the populace in order to improve their knowledge and skills of self-management. The use of traditional medication in the management of Type 2 diabetes was found to be very rampant despite the patients' use of hypoglycaemic agents (Buowari, 2013; Ogbera, Dada, Adeleye & Jewo, 2010).

2.6 THE ECONOMIC BURDEN OF TYPE 2 DIABETES

The prevalence of diabetes is on the increase globally, so it is a substantial burden on a country's economy. Diabetes is a costly public health issue (IDF, 2013b) since its human and financial burden is enormous, incurring significant financial cost on individuals, the family, the health-care system and the government. The total global expenditure on diabetes care was estimated at USD 548 billion, which is about 11% of the total amount spent on health world-wide (IDF, 2013b). The diabetes spend shows a huge disparity in spending, since countries that have a larger number of people with diabetes spent just above 2% of their total spending, which may reflect their governments' understanding of the problem and commitment to the populations' health in these regions and the lack of resources available despite their diabetes population (Peer, Kengne, Motala & Mbanya, 2014).

There is no adequate record of Nigeria's national expenditure on diabetes, but according to an IDF report on Nigeria, government allocation of funds for diabetes care is quite minimal since the health system covers less than 50% of the total costs of diabetic treatment (IDF, 2013b) and

most patients are not included in the health insurance scheme, so payment is an out-of-pocket expense. Only a very small proportion of 0.6% of diabetes deaths have been prevented, reflecting the insignificant amount that Nigeria spends on diabetes (IDF, 2013b), showing the necessity for the government to be adequately involved in the prevention and management of Type 2 diabetes.

The most productive age group, 40 to 60-year age group, is mostly affected, which is the peak income-earning period in an individual's life. Family breadwinners are mostly affected, so this incurs a financial burden on the individuals, their families and society, leading to poverty and despair (WHO, 2012). The major costs to society include lost economic productivity (work-related absenteeism and early retirement) (Herquelot, Guéguen, Bonenfant & Dray-Spira, 2011), increased medical admissions, chronic disability, premature death, reduction in those who are engaged in the labour force and reduced labour productivity both at home and at work (Alavinia & Burdorf, 2008). Unemployment due to illness may occur (Latif, 2009), which could translate into reduced earning, poverty and psychological problems such as depression and low self-esteem. Employers of labour could similarly be affected in that they suffer loss of productivity due to absenteeism and early retirement. A major factor in economic development is the good health of the work force and thus poor quality of life and a reduction in life expectancy produced by diabetes will hinder economic growth, especially in low-income nations such as Nigeria. This growing threat is an under-appreciated cause of poverty and hinders the economic development of many countries (IDF, 2013b) .

Diabetes constitutes a significant socio-economic burden on the health-care system, since it presents an unsustainable challenge to health-care services due to the cost of caring for people with diabetes. The direct cost is in the form of increased medical costs, since routine care for people with diabetes is itself expensive. However, a far greater economic burden is the hospital care required to treat serious diabetes complications (Dall, Zhang, Chen, Quick, Yang & Fogli, 2010). The impact of these direct costs to the health-care system may threaten to weaken already unstable economies and to disrupt development throughout developing countries (Peer, Kengne, Motala & Mbanya, 2014).

Diabetes is a lifelong disease with debilitating effects and its management is costly (IDF, 2013b). The incidence and prevalence is on the increase, as are the costs. The economic burden of diabetes is colossal in terms of the direct cost borne by the patients and their families. Survival and quality of life depends on the patients' effort in managing their disease, since it is a disease that patients live with and it is its care for which they are responsible. Self-

management involves intensive self-monitoring of blood glucose (SMBG), change in lifestyle, adherence to prescribed medication and complication management (IDF, 2013b). The intangible effects are substantial and difficult to assess, but they include costs due to poor psychological well-being, depression, anxiety, stress, feeling 'burned-out' with diabetes, diabetes management and diabetes complications (ADA, 2013a). Furthermore, patients, family members and friends experience pain and suffering due to patients with diabetes poor self-management, psychosocial effects on quality of life, diminished contribution to family tasks and the reduced income of care-giving family members (ADA, 2013a). Diabetes could also cause some temporary or permanent disabilities in patients, especially those with complications shown as an increase from 43% in 1990 to 54% in 2010 in the proportion of world-wide disability-adjusted life years (DALY) due to Type 2 diabetes (Murray, Vos, Lozano, Naghavi, Flaxman, Michaud, Ezzati, Shibuya, Salomon & Abdalla, 2013). In low-income countries, individual patients and their families may have to spend significant amounts of their income on diabetic treatment due to inadequate national funding or poor economies, which further impoverishes the patients. Consequently, the burden emphasises the significance of prevention and approaches to alleviate the complications and improve quality of life in patients with Type 2 diabetes. Early detection, intervention and the delay of complications in Type 2 diabetes patients are of economic benefit to the patient, the family and society (Alberti, Zimmet & Shaw, 2007).

2.7 MULTI-DISCIPLINARY APPROACH IN TYPE 2 DIABETES MANAGEMENT

As has been shown, the disease burden of diabetes is increasing world-wide and with this increased prevalence and burden, effective, quality care becomes essential. Due to the nature of diabetes, multi-disciplinary care is central to the management of diabetes. The overwhelming increase in the prevalence of chronic diseases, especially diabetes with its high mortality and morbidity, prompted a review of the chronic disease model with an emphasis on the use of a multi-disciplinary approach and active patient participation in the care of chronic diseases (Elissen, Nolte, Knai, Brunn, Chevreul, Conklin, Durand-Zaleski, Erler, Flamm & Frølich, 2013). Similarly, Standard 5 of the National Standards for Diabetes Self-Management Education supports the care of patients with diabetes by a multi-disciplinary team (Funnel et al., 2009), by utilising experts with different professional skills and knowledge who collaborate

to offer specialist support and interventions through a comprehensive and coordinated approach to help patients meet their goals.

Freeth, Hammick, Reeves, Koppel and Barr (2008) believe that an interpersonal approach to patient care that enhances patients' health outcomes through efficient and coordinated care is a function of improved professional relationships. According to the Canadian Inter-professional Collaborative Framework (CIHC, 2010), multi-disciplinary collaboration entails professionals understanding their roles, the roles of other professionals involved and their responsibilities as they respectively value each other in making unique contributions towards the patient's care (CIHC, 2010). Additionally, value for each other's contributions to the team, relational responsibilities to members of the team and the patients' increased autonomy as patients who are valued in the collaboration is required (Moser, Houtepen, Spreeuwenberg & Widdershoven, 2010).

Regular monitoring of patients with Type 2 diabetes changes in health status by health-care professionals is essential care for patients with diabetes that can be accomplished through continuity of care. Continuity of care has been found to improve assessment and early detection of complications, increased adherence to diabetes care (Atlas, Grant, Ferris, Chang & Barry, 2009), better glycaemic control and lower long term mortality (Wolinsky, Bentler, Liu, Geweke, Cook, Obrizan, Chrischilles, Wright, Jones & Rosenthal, 2010). Health-care professionals' roles in ensuring continuity of care involve providing adequate information, self-management skills and psychosocial support (ADA, 2010). Consequently the use of a team approach to manage Type 2 diabetes may enable multi-faceted care, since knowledge from different disciplines is being utilised.

Traditionally, diabetes education is provided by using professional nurses as teachers and dieticians providing dietary counselling in facilities where they are available (Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012). However, there is a recommended shift to collaborative, integrated, multi-disciplinary team care with the aim of increasing glycaemic control and reducing complications (ADA, 2010b). The rich pool of educators from diverse backgrounds are complementary in caring for these patients with problems in multiple organs (Lewis, Benda, Nassar & Magee, 2015), since the multi-disciplinary team members work interdependently, consult with one another and have shared objectives. The team may comprise of physicians, nurses, dieticians, pharmacists, psychologists, social workers, ophthalmologists, podiatrists, optometrists and physiologists, but the practice that use nurses, dieticians and pharmacists to realise their set objectives of glycaemic control is frequently seen. However, this group of

health-care professionals may not be available to care for patients in poorer countries, but a blend of professionals is desirable (ADA, 2010b).

In this approach, patients are the focus of the team and participate actively in the care that facilitates comprehensive integrated care (Bratcher & Bello, 2011). Health-care professionals act as caregivers, motivators, educators and facilitators (Anderson, Funnell, Aikens, Krein, Fitzgerald, Nwankwo, Tannas & Tang, 2009) in rendering collaborative care and each professional plays a distinct role to avoid repetition and boredom.

In the field of health education, *nurses* are regarded as the principal professionals who play the major roles of educators, motivators and coordinators in the care of patients in health facilities, since they coordinate the care of patients to prevent overlapping of services and deficiencies (Antigoni, 2011). Longo, Schubert, Wright, LeMaster, Williams and Clore (2010), proposed that nurses are the main source of information for patients with Type 2 diabetes, since nurses spend longer periods of time with patients and also form the largest group of the workforce in the health-care delivery system, stating the nurse assesses the needs as well as meets the needs of the patients. Studies have found that the functions performed by nurses improve the quality and efficiency of health-care facilities and decrease the costs (Weston & Roberts, 2013) and therefore their experience of health education can be utilised maximally since they coordinate the care provided during educational programmes. Health education is mostly nurse-led. Nurses care for patients with Type 2 diabetes using specified clinical algorithms or standards of care with structured health education programmes without any interference from other health-care professionals. This strategy has been associated with less risk to cardiovascular disease and good glycaemic control (Gill, Price, Shandu, Dedicoat & Wilkinson, 2008; Tshiananga, Kocher, Weber, Erny-Albrecht, Berndt & Neeser, 2011).

In supporting both the prevention and management of diabetes, *dieticians*, as members of the multi-disciplinary teams, have a central role to play in dietary and lifestyle modification. They are highly skilled educators applying the science of nutrition to counselling, promoting healthy nutrition in diabetes and reducing the burden of the disease through good nutrition (Delahanty, 2010).

The shock and stress of being diagnosed with Type 2 diabetes and lifelong management may result in social and psychological problems (Gonzalez, Fisher & Polonsky, 2011), hence the need for a psychologist or mental health professional. Rising stress levels may be associated with Type 2 diabetes at any stage as a result of daily self-management and the feeling of burn

out, however studies have reported that engaging psychologists to institute interventions tailored to psychosocial problems has had positive effects on patients (Carroll, Tsakindes, Hobkrirk, Moxon, Moxon, Dudfiel & Ingle 2011).

Integrating mental health professionals or training other health-care professionals such as *social worker,* mental health nurses to improve their knowledge and skills in providing psychosocial care would motivate patients in self-management (Wu, Liang, Lee, Yu & Kao, 2014). These health-care professionals could provide individualised care, group sessions, individual counselling and act as coaches to patients to ensure that knowledge and skills are learned and practiced. Personal and cultural beliefs, experiences, needs, interests and an individual's ability to change should be recognised in order to help patients adjust to living with Type 2 diabetes (Emami, Ghofranipour, Ahmadi & Alavi, 2012).Thus, these health-care professionals could provide both group and individual counselling to facilitate personal contact that would enable interactions with the patients.

TRADITIONAL HEALTH EDUCATION TO PATIENTS WITH TYPE 2 DIABETES

The educational approach in daily use in health care facilities to patients with Type 2 diabetes follows a prescriptive approach centred on transmitting information to achieve behavioural change (Cyrino, Schreiber & Teixeira, 2009). Patients are cared for by healthcare professionals independently without collaboration but with the goal of achieving glycaemic control with minimal information given to the patients. The traditional approach of obedience to or compliance with management and monitoring by the patients is practiced. Information on self-management is given by health care professionals with the patients playing the role of passive spectators during the education sessions. Management of patients is rarely done by the same physician (Miselli, Trendo, & Porta, 2012) thereby diminishing personal interest in the patients as there is poor communication and relatedness. Patients are not considered as people with their own feelings and experiences to share as the disease and its symptoms are the major interest of the health care professionals. The traditional didactic approach is professional-centred which is based on the medical mode as they are seen as the custodian of knowledge and management of the disease. Patients with type 2 diabetes are blamed for their health outcomes by the healthcare professionals and this behaviour is justified as a way of motivating the patients to compliant (Miselli, Trendo, & Porta, 2012). The negative aspect of the disease is also over emphasized in order to threaten the patients to abide by the rules without regards for the

negative consequences on the patients (Trento, Kucich, Tibaldi, Gennari, Tedesco, Balbo, Arvat, Cavallo, Ghigo & Porta, 2010).

The traditional method of health education and obeying the health care professionals order has been criticised and found not to be helpful in patients' self-management of Type 2 diabetes.

2.8 MULTI-DISCIPLINARY EDUCATION PROGRAMMES ON TYPE 2 DIABETES

A literature search on Diabetes Self-Management Education DSME programmes involving a multi-disciplinary team of health-care professionals and Type 2 diabetes patients was performed to provide insight to current educational programmes.

Steed, Lankester, Barnard, Earle, Hurel and Newman (2005), evaluated the University College of London's diabetes self-management programme consisting of 124 patients with Type 2 diabetes attending two outpatient clinics and two inner city hospitals. Using a randomised control trail, participants were allocated to an intervention group or a control arm after they had met the inclusion criteria of uncontrolled diabetes with micro-albuminemia >3.0mg/mmol. The programme included problem-solving and practical skills training. It was a group-based programme consisting of five weekly two and a half hour sessions and a booster session of two and a half hours held three months after the end of the programme. Leventhal's common sense model of illness and self-efficacy (1980) from the perspective of social cognitive theory were utilised. A multi-disciplinary group of nurses and dieticians facilitated the group using a facilitator's manual. All facilitators had a three-day training session on the techniques used in the programme, namely facilitating groups, problem-solving and goal-setting. The intervention group had a significant impact on both general and specific self-management behaviours and blood glucose monitoring that were sustained at three months at follow up compared to the control group. Quality of life was significantly different between the two groups at follow-up (Steed et al, 2005).

An Israeli study was conducted to determine the effect of a multi-disciplinary approach on patients with poorly controlled Type 2 diabetes with HbAlc of >10% in two primary care centres in Negev (Maislos & Weisman, 2004). A randomised control trial was used in selecting 48 patients for the intervention group and 34 patients for the control group. A multi-disciplinary team of a physician, a diabetes nurse educator and a dietician facilitated the group for six months of weekly evening clinic sessions. A structured education method was adopted to focus

on the education of the patients that was aimed at improving compliance and changing lifestyles. At the end of six months a laboratory analysis was done to evaluate the outcome based on an HbAlc result and compliance was based on patients' return for the follow-up session. At the end of 6 months a laboratory analysis was done to evaluate the outcome based on HbAlc result and compliance was based on their return for follow up. Adherence for follow up was 85% for intervention group and 68% for the control group, laboratory result showed significant improvement in the intervention group of which more than 70% had a decrease of 0.5% and above in their HbAlc level compared to the control group (Maislos & Weisman, 2004).

A third study was conducted to determine the effect of multi-disciplinary intensive education programmes for patients with Type 2 diabetes with prolonged self-management difficulties in the Netherlands (Keers et al., 2005). Participants were referred to the programme from different health facilities and only those who met the inclusion criteria were included, 89 participants were in the control group while 231 were assigned to the intervention. A pre-test questionnaire was used to assess the participants at baseline and the HbA1c was determined in the laboratory. A diabetes nurse specialist, who was the programme co-ordinator, an internist, a nutritionist, a social worker, a psychologist, a physiotherapist, an occupational therapist and an activity therapist, facilitated the programme. The range of professionals was available because the programme was embedded in a rehabilitation centre. The programme was based on an empowerment approach with the duration of 10 weeks and weekly group and individualised sessions with follow-up visits at six and 12 weeks after the programme was offered. Modules were used in teaching a range of topics related to Type 2 diabetes and self-management, as were psychosocial and behavioural coping strategies. Different approaches were utilised in teaching at different phases, namely lectures, group discussions, interactive sessions and goal setting using individual counselling. The programme effect showed improved HbA1c and mental health and satisfaction with treatment in the majority of participants in the intervention group compared to the control group with only 38% having improved HbA1c. Participants in the intervention group experienced less chance of control by others and less passive resignation.

A fourth study was conducted in Denmark to determine the effect of an empowerment diabetes self-management education programme on clinical parameters and knowledge and quality of life in patients with Type 2 diabetes, which consisted of 702 patients who were on regular

treatment (Molsted, Tribler, Poulsen & Snorgaard, 2012). Biochemical and clinical data of HbA1c, blood pressure, body weight, FBG and cholesterol levels were collected at baseline and intermittently as the education intervention was carried out. The multi-disciplinary team included nurses, physiotherapists, dieticians, general practitioners and an endocrinologist, with the overall objective of improving the self-management ability of Type 2 diabetes patients. A training programme was designed for members of the team to facilitate competence in carrying out the strategy. The education intervention that was based on an empowerment approach took one year and was divided into three modules. The intervention utilised group-based and individual counselling. The limitation was that there was no control group.

Lastly, a study was carried out in Chicago, USA to determine the effect of multi-disciplinary education that was focus on culturally tailored, own decision-making and communication education on patients with diabetes (Peek, Harmon, Scott, Eder, Roberson, Tang & Chin, 2012). There were 21 participants. The study was conducted in a federally qualified health centre after the recruitment of participants from various health centres. The group was exposed to a 10-week empowerment education on overview of diabetes, self-management, own decision-making and communication training. The group was followed up at three months after the programme (intervention) and at six months. Baseline data was collected to check for HbA1c, blood pressure and lipid profiles. A team of multi-disciplinary professionals consisted of primary care physician, registered nurses, diabetes educators and dieticians. The offering of the programme was a structured education empowerment programme to enhance patients' role in self-management, including own decision-making and communication. The assessment was done intermittently during the programme over 12-month. The outcome showed improvement in glycaemic control, lipid profile but there was no change in blood pressure. There was a change in self-management behaviour and patients were satisfied with the programme. There was no significant difference in taking decisions. The limitation of the study was that it was not a randomised control trial

The above studies were reviewed to explore the related research in structured education programmes on Type 2 diabetes. The studies were all quantitative. The review revealed that the utilisation of multi-disciplinary professionals with a multi-component approach was successful in increasing knowledge, glycaemic control, other clinical outcomes and the psychological health of patients with Type 2 diabetes (Table 2.2). The majority of published studies were conducted in developed countries and to the best of the researcher's knowledge

there were no Nigerian studies. The proposed study in this PhD will provide one of the first Nigerian program development and evaluation on Type 2 diabetes.

Table 2.2: Summary of multi-disciplinary education programmes on Type 2 diabetes

Citation	Country	Theory	Participants	Intervention	Nurses and other health-care professionals	Outcomes
Steed et al., 2005	UK	Leventhal's common sense model of illness and self-efficacy construct from social cognitive theory	124 participants in intervention group	Pre and post intervention baseline data. Problem solving and skills training in self-management, Group-based approach consisting of five 2.5 hour sessions held weekly for five weeks and one booster session of 2.5 hours held three months after the end of intervention	Diabetes specialist nurses and dieticians had 3 days training on techniques and use of manual	Result at post intervention showed improvement on self-management behaviours, quality of life and illness beliefs. Improved HbA1c in the intervention group compared to the control group. There was no change mood in both groups
Maislos & Weisman, 2004	Israel		48participants in intervention group and 34 participants in control group	Group and individual counselling for six months of weekly evening clinic sessions. The nurse and the dietician had another weekly visit during working hours at the same site with the patients. Diabetes principles and self- management activities were taught in a structured education routine	A physician, a diabetes nurse educator and a dietician	Compliance was based on participants return for follow up session.85% of intervention group retuned 68% for the control retuned. Decrease of HbA1c in intervention group
Keers et al., 2005	Netherlands		231particiapnts in intervention group and 89 participants in control group	Pre-test to assess baseline HbA1c. 10 weeks of weekly group and individualised sessions. Follow up visits at 6 weeks a d 12 weeks after intervention. The programme was based on an empowerment approach Modules were used in teaching a range of topics related to Type 2 diabetes and self-management, as were psychosocial and behavioural coping strategies	A diabetes nurse specialist, who was the programme co-ordinator, an internist, a nutritionist, a social worker, a psychologist, a physiotherapist, an occupational therapist and an activity therapist	HbA1c improved in 38% of the intervention group compared to the control group. Intervention group had less control by others and less passive resignation

Citation	Country	Theory	Participants	Intervention	Nurses and other health-care professionals	Outcomes
Molsted et al., (2012)	Denmark		702 patients on regular management	Biochemical and clinical data of HbA1c, blood pressure, body weight, FBG and cholesterol levels were collected at baseline and intermittently Group and individual counselling and modules were used in teaching. Based on empowerment approach took one year and was divided into 3 modules with hours and days allotted to each module	Nurses, physiotherapists, dieticians, general practitioners and an endocrinologist, A training programme was designed for members of the team to facilitate competence in carrying out the strategy	The result showed a significant change in the glycaemic control, knowledge of Type 2 diabetes, body weight and blood pressure. Physical activity, dietary modification and quality of life were much improved. A decrease in visitation to the clinic, which also reduced the total cost
(Peek et al., 2012)	Chicago, USA	Health belief model, Trans-theoretical model of change and self- efficacy	21 participants in the intervention group	The group was exposed to a structured 10-week empowerment education on overview of diabetes, self-management, own decision-making and communication training	Primary care physician, registered nurses, diabetes educators and dieticians	Improvement in glycaemic control, lipid profile but there was no change in blood pressure. There was a change in self-management behaviour and patients satisfaction with the programme

2.9 SUMMARY

This chapter provided an overview of literature relating to Type 2 diabetes, highlighting the risk factors and complications. The global, African and Nigeria trends of Type 2 diabetes and the economic impact were also discussed. The multi-disciplinary roles of health care professionals in health education and some multi-disciplinary educational programmes with Type 2 diabetes were highlighted. There was paucity of information on programmes developed in Nigeria. Limitations were seen in the structured multi-disciplinary approach with lack of systematic steps of developing a programme. The next chapter (Chapter 3) discusses the methodology used in performing the research study.

CHAPTER 3: METHODOLOGY
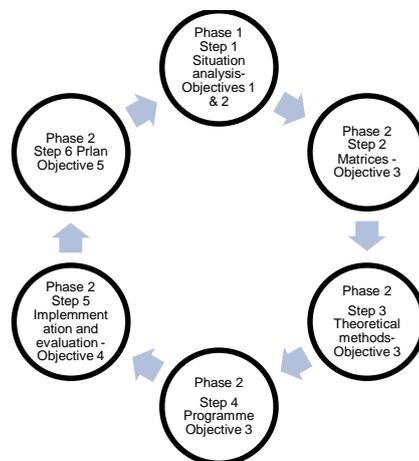
3.1   INTRODUCTION

This chapter provides a logical sense of the study in four sections referring to the phases followed in the Intervention Mapping Framework (IMF). The *first section* describes the research setting. The *second section* outlines the methodologies and the data collection processes for Phase 1, which focused on Step 1 of the IMF, which is the situation analysis of the IMF. Phase 1 was concerned with gathering information using semi structured interviews with patients, participant observations (patients and nurses) and focus group discussions with health-care professionals.

The *third section* describes Phase 2 of the study (Steps 2, 3, 4, 5 and 6) within the adapted IMF. Phase 2 was concerned with the development of an educational programme in collaboration with the stakeholders, implementation of the programme, evaluation of the programme through a quasi-experiment (pilot study) and individual semi-structured interviews. A plan for adoption, implementation, sustainability and evaluation was drawn.

The *fourth section* explains the overall rigour of the study and the ethics followed in the study.

3.2   THE RESEARCH SETTING

The setting is described within the Nigerian health context and within the specific context relating to the health-care institutions where the research study was done.

3.2.1.1 The Nigerian health context

Nigeria is a country comprising 36 states and a federal capital territory. The country operates a three-tier government comprising of local government and state and federal administrations (Federal Ministry of Health, 2004). The Federal Ministry of Health is responsible for the coordination of health-care services in Nigeria. The organisation of the health system in Nigeria is complex and includes a wide range of providers in both the public and the private sectors. Decentralisation of services through the three tiers of government is the method used to provide health-care services, with each sector performing major responsibilities to actualise provision of quality health to the populace (Federal Ministry of Health, 2004). The three tiers of government perform the major roles of financing, stewardship and provision of service at the different levels of care.

The Federal Ministry of Health is responsible for the provision of policies, strategies, guidelines, plans and programmes in regard to overall health-care services, national health management and collaboration with international agencies via provision of tertiary health-care services and international health matters (Federal Ministry of Health, 2004). Tertiary level care consists of highly specialised services that are provided by the teaching hospitals, special hospitals and some private organisations; advanced technology for investigations and research centres are also available. The State Ministry of Health is the health custodian at state level and therefore they are responsible for secondary level care at hospitals and they provide methods and guidelines for primary health-care. Secondary level health-care provides specialised services in hospitals and attends to patients referred from the primary health-care level to health facilities that are available at the district, divisional and zone levels. The local government provides the primary health-care, which is provided via different wards and communities within the local government. The community plays an important role in health-care because it links the primary health-care services to the people at grass root level. Health committees are formed at the community level and where they are functional they complement the services of the primary health-care through their active participation in health issues. At the primary level, general health services of preventive, curative, promotion and rehabilitation are provided by the local government (Abdulraheem, Olapipo & Amodu, 2012) and thus primary health-care serves as an entry point into the health-care delivery system because facilities are located in communities for proximity and utilisation.

Health facilities are not equitably distributed in several Nigerian states and there are inadequate facilities and human resources, (Magnus, 2008) A two-way referral system is expected to

facilitate effectiveness at the facilities, but a study has reported poor referral systems (Mohammed, Idowu & Kuyinu, 2010). Various departments, agencies and sections/units are set up at the federal and State Ministry of Health to ensure successful implementation of different health policies and for easy collaboration with other ministries in multi-sectorial implementation of policies.

Health-care is financed by tax revenue, out of pocket payments, donor funding and health insurance.(WHO, 2008). Poverty is keeping people in poor health due to lack of financial resources and the health of many Nigerians is keeping them in poverty (Federal Ministry of Health, 2005). The National Health Insurance Scheme that was implemented in 2005 was revived with the aim of financing health-care through this medium and improving access for the less privileged, however it has not improved access and financing because implementation is poor (Agba, 2010). Drug supply is a health facility function via different procurement methods, but unfortunately in most cases, especially at the primary care level, the drugs are not available. Private pharmacy and patent medicine stores abound in the community and therefore across-the-counter purchase of both prescribed drugs and new prescriptions from the store is a common occurrence.

The health-care delivery system is generally weak and fragile (Saka, Saka, Isiaka, Agbana & Bako, 2012). At the primary level, preventive measures of educating the community is absent and there is poor utilization of the facilities (Abdulraheem et al., 2012). The consequence is that preventable health problems may be glossed over by the citizenry, leading to referral of many cases at critical stages to the tertiary health facilities. In terms of the performance of the health-care system, Nigeria only ranks 187 out of 191 countries (WHO, 2012) a reflection of the state of health in the country. A great number of people earn less than $2 a day (Population Bureau, 2008), revealing the extent of poverty among those who have to pay for health services, especially those with chronic disease. The health-care system is grossly inadequate and incapable of handling the various intricacies in the lifelong management of diabetes. Therefore, Nwankwo et al. (2010) recommended that government should provide and enforce policy and guidelines for diabetes management for all health-care professionals.

Nigeria is located in West Africa and is Africa's most populous country it accounts for 1/6th of Africa's population and is the 10th most populous country in the world, with a population estimated at 173.6 million in 2013 and an annual population growth of 2.3% (World Bank, 2013). The country is bounded by the Gulf of Guinea, Niger, Benin and Cameroon and consists of 36 states with its federal capital city located in Abuja. There are about 250-350 ethnic groups

rich in cultural diversity. The major groups found in the country are Hausa, Fulani, Yoruba, Igbo, Ijaw, Kanuri, Ibibio and Tiv, with the major languages spoken being Yoruba, Hausa and Igbo. The dominant religious groups are Christians, Muslims and traditional worshippers.

Edo State is located in Central Southern Nigeria and was created out of Bendel State in 1991, with the capital located in Benin City. It is bounded by Delta State on the south, Kogi State on the north and Ondo State on the west. Edo State has an estimated population of about 3.4 million people, with 50.5% males and 49.5% females (National Population Commission, 2007). Several ethnic groups co-exist in this heterogeneous state, with cultural and linguistic affinities existing among the ethnic groups. Edo State consists mainly of the three major groups, namely Bini, Esan and Afemai. There are 18 local government areas in Edo State. Educational institutions and health institutions abound in the state, although most of the health facilities are privately owned. There are four tertiary health institutions and 33 secondary health facilities distributed in the three senatorial districts and there are many primary health-care facilities in wards and villages in the local government areas of the state (Edo State. Ministry of Health, 2010).

Benin City, the capital of Edo State, was the study area. Benin links the northern, southern and western parts of the country and the latest available estimated population of the city is 1.6 million people (National Population Commission, 2007). It occupies a land area of 17,802 square km and is one of the ancient cities of the world (Figure 3.1). The city is rich in ivory, bronze and iron and is known for its craftsmanship. The city of Benin, like other urban centres, is overpopulated with the concomitant problems of civilisation and uncontrolled urbanisation. There are two tertiary health facilities and two secondary health facilities in Benin City with many primary health centres located within the communities.

3.2.1.2 Specific context of the study

The context of a research phenomenon is an important aspect in a qualitative research because an individual's experiences are always viewed as a function of the context or they are context bound. This context is a natural setting in which the researcher immersed the self in order to explore meaning (Holloway & Wheeler, 2013). It is assumed that time and location has an impact on behaviour and therefore qualitative researchers try to understand the contextual effects on the participants' behaviour (Hennink, Hutter & Bailey, 2011) and also try to discover and understand an individual's behaviour, views of individuals and their meanings (Holloway & Wheeler, 2013).
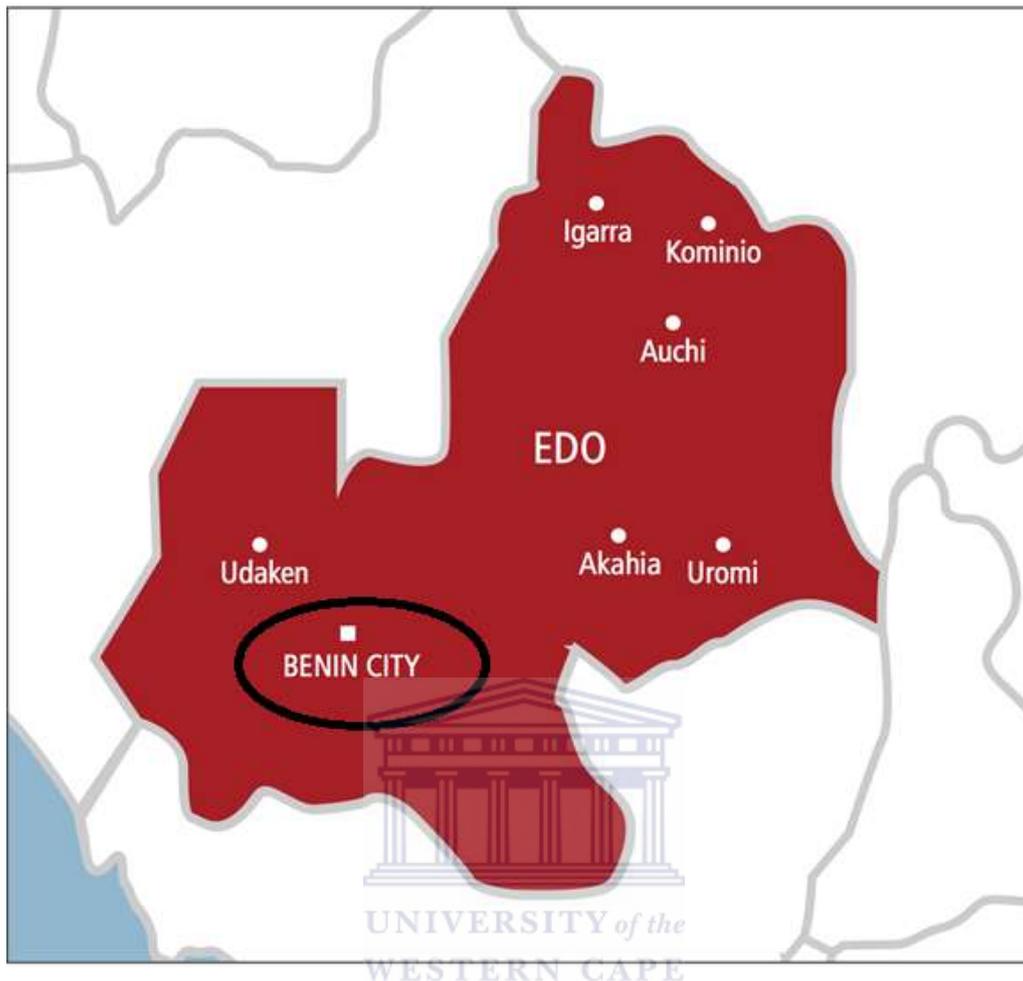
Figure 3.1: Map of Benin City, Edo State, Nigeria

The context of this study was (i) a federal government tertiary health institution and (ii) a state government secondary health institution in Benin City, Edo State. The tertiary health institution is a 720-bed hospital, with number of consultant clinics located within the same structure in the hospital and the institution has a mix of all groups of health-care professionals, allied health workers and auxiliary staff.

The secondary health institution serves as a referral centre for cases from rural and urban centres within the state and is a 432-bed hospital, has four outpatient clinics located in the same building. The institution is adequately staffed. The two institutions are teaching and research hospitals that render care to patients with chronic diseases such as diabetes within Edo State and those referred for specialised management from neighbouring states. The two health institutions provide continuous service to patients with chronic diseases in the consultant clinics on specific days, but in most cases multiple consultations are made within the same

clinics due to the increasing demand for outpatients' clinics (Abodunrin, Akande & Osagbemi, 2010). The clinics maintain patients' medical information and records in a paper-based recording system.

Patients with Type 2 diabetes are reviewed in the clinics on specific days with their physicians and nurses in attendance. According to the 2014 statistics about 2,320 patients with Type 2 diabetes were seen at the tertiary health institution between January and December, while the secondary health institution had about 1,524 patients. The majority of the patients had co-morbidities and patients were seen at the clinic every 4-6 weeks depending on the patients' health status. The majority of the patients were treated with oral hypoglycaemic agents while a few were managed with exogenous insulin.

3.2.1.3 Gaining entry/access to the setting

In order to gain access to the two institutions the researcher applied to the management boards. Permission was then granted to access the tertiary institution within six weeks after the proposal had passed through the Ethics and Research Committee (Appendix 3). Permission was granted by the *se*condary health institution within a month of application (Appendix 2) although audio recording of the methods of data collection was initially denied since it is against their policy to allow audio taping instruments during research in the hospital. The researcher appealed for a concession due to the qualitative nature of the study and permission was granted for use. The Deputy Director of nursing at the secondary health institution also counter-signed the copy of the approval and informed nurses to cooperate and render assistance where necessary. The heads of the departments of medicine in the various institutions were informed and permission was given.

Once the approval was granted, the researcher approached the Deputy Directors of Nursing in both institutions to formally introduce herself and to inform them about the research. Meetings were held with the Assistant Directors of Nursing where the Deputy Director of each institution solicited their support and cooperation. The researcher was then introduced to all the heads of the clinics where data was collected on patients with Type 2 diabetes.

3.3 DESIGN

Mixed method research is the type of research in which a researcher combines elements of qualitative and quantitative research approaches for the purposes of understanding and

corroboration (Creswell & Plano-Clark, 2010). A mixed method research combines the strengths of qualitative and quantitative data; builds from one type data to the other; and answers more than one research questions (Creswell & Plano-Clark, 2010). The distinctive strengths of qualitative and quantitative research paradigms can therefore be effectively combine to minimize their respective limitations while accentuating their strengths in a mixed method research (Creswell & Plano-Clark, 2010). The employing of a mixed method research enhances the integrity of the findings (Creswell & Plano-Clark, 2010).

3.4 PHASE 1 - THE SITUATION ANALYSIS

3.4.1   Intervention Mapping Framework Step 1

The situation analysis is an important aspect of programme development because the programme should be developed according to the identified problems and specific requirement of the group being studied (Jooste, 2010). Situation analysis is a systematic study of inconsistency between what currently is and what should be in a setting or among a group of people (Gilmore, 2011). This situation analysis enabled the researcher to gain an insight into the current situation and what ought to be, which was in terms of the health education for patients with Type 2 diabetes and the patients understanding of the disease and self-management. This was to describe how patients visiting clinics at health care institutions in the Edo State, experienced their self-management of Type 2 diabetes; and how health care professionals provided health education to them. This was also to assess the feasibility of planning an educational programme using intervention mapping.

The health institutions were assessed for their capacity in terms of facilities, personnel and materials needed for the educational programme. There were offices available for use and also the institutions had Fridays as free day which could be utilised for the programme without disrupting the normal routines of the institutions. There were health-care professionals that could offer their knowledge, expertise and time throughout the programme development and evaluation.

Patients with Type 2 diabetes were available and participated willingly in the programme and those who were approached to participate in the programme development played useful roles. The facilities were equipped for the laboratory investigations and also some of the materials needed were made available.

An exploratory descriptive design was followed. The methods used to collect the data were by means of: (a) individual semi-structured interviews with patients, (b) participant observations with patients and nurses, and (c) focus group discussions with health-care professionals, namely nurses, dieticians and social workers.

3.4.1.1 Qualitative research design

According to Houser (2013), a research design is an outline or the structure of the study that features all the major study elements needed to enhance the integrity of the study. It is the study's framework that specifies the different steps of procedures needed to accomplish the study. The researcher makes a series of decisions which included the purpose, the philosophical paradigms (see Chapter 1), context of the study and data collection techniques (Durrheim & Painter, 2006). For this study a qualitative research design was followed in Phase 1.

Roberts and Priest (2010), consider the qualitative research approach to be method of exploring an area of human experience in order to understand humans' world perception. Patients with Type 2 diabetes have different experiences due to living with the disease since they find themselves in a new life with diabetes where lifestyle change is paramount to achieving glycaemic control and to complication prevention. Qualitative research is also described as the belief that reality is constructed individually and therefore reality can never really be known (Houser, 2013). However, it can be known via different methods of data collection from participants.

Polit and Beck (2012), outline the following qualitative study characteristics that were confirmed in this study.

3.4.1.2 Characteristics of qualitative design

- A qualitative study involves the use of multi-methods of data collection, which results in data triangulation after the data has been analysed (Polit & Beck, 2012). Semi-structured interviews, participant observations and focus group interviews were utilised for data collection.

- The study is flexible and does not conform rigidly to stipulated methods and the number of participants allowed (Patton, 2002), since it allows for adjustment to new information during data collection, e.g. by probing. The study design used a purposive sampling method that involved using participants who were beneficial to the study, without insisting on a fixed number and allowed for probing until data saturation was reached. Interview guides were used, but probing questions were based on the sharing of participants' experiences.

- The approach is holistic because the researcher gained an understanding of the entire topic of interest (Polit and Beck, 2012). Patients with Type 2 diabetes and health-care professionals participated in the study allowing the researcher to understand the views of consumers of health and health-care professionals. Additionally, participant observation paved the way to rich data on the culture of the facility, the normal routine and communications that occur between patients and between patients and staff.

- The researcher was required to be actively involved and engages in all the process utilising experiences (Patton, 2002). The researcher played an active role as data collector; she established relationships with staff and the patients, participated in the facilities' daily activities during the data collection and during transcription and analysis. The researcher became more familiar with the problems encountered by both patients and health-care professionals in issues related to health education and self-management of Type 2 diabetes. Consequently, the researcher was able to develop the educational programme in consideration of their cultural practices based on the information provided.

- The researcher was an instrument of the data collection in the research. The use of self in a qualitative study was vividly demonstrated because the researcher was the primary gathering tool also during her observations of participants (Bartholomew et al., 2011).

- The approach involves on-going data collection and analysis concurrently to inform the questions for the next participant, especially when more clarification or information was needed (Creswell, 2009). The method was iterative since the researcher moved back and forth and each step informed the other.

A qualitative approach is naturally interpretative in order to make the world visible (Denzin & Lincoln, 2011) since it involves interactions using narratives and language that conveys meaning to the researcher and the participants.

Underpinning qualitative research are two interrelated approaches, namely exploratory and descriptive design.

3.4.1.3 Exploratory design

An exploratory design begins with a topic of interest to be fully examined, with the manner of manifesting and other factors related to it (Polit & Beck, 2012). An exploratory approach offers an understanding of the phenomenon of interest, especially in an area of study that is studied from a new perspective (Rubin & Babbie, 2013). In this study the phenomenon of interest is health education for self-management of Type 2 diabetes. The exploratory research provided a familiarity with the experiences of patients with Type 2 diabetes with the purpose of developing

a health education programme for self-management. In order to achieve objectives 1 and 2 as well as gain insights about the phenomenon of interest, participants understanding and past experiences of Type 2 diabetes were explored. The researcher explored the present through observations thus providing understanding and comprehension of health education given to patients with Type 2 diabetes and their resulting self-management of Type 2 diabetes.

3.4.1.4 Descriptive design

Detailed information was provided on patients and health-care professionals' experiences of health education and self-management of Type 2 diabetes, as were activities and interactions observed at the health facilities that were provided through data collection and then presented in a logical form. Burns and Grove (2011), indicate that a descriptive study provides a picture of a situation naturally and as it happens. Additionally, Houser (2013), indicate that a descriptive study is the description of a topic in a detailed and insightful form that enables others to acquire a thorough understanding of it. A complete picture of events at the health facilities was derived through interactions with health-care professionals and through participant observations that were described in detail during the presentation of the results. The researcher explored the experiences of the participants through various methods which were presented through a detailed description to deliberately provide adequate insight to the readers (Rubin & Babbie, 2013).
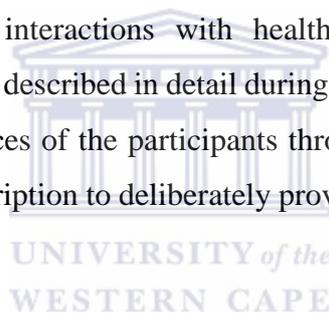
3.5 METHODS

3.5.1   Individual interviews with patients
3.5.1.1 Identifying the study population

A population in a research comprises those individuals with common, defining characteristics, which the researcher intends to study (Polit & Beck, 2012). In this study, the population comprised patients with Type 2 diabetes in Edo State, Nigeria. The target population was patients attending the consultant clinics or those admitted to the two health facilities in Benin City.

3.5.1.2 Sampling

Non-probability sampling is defined as a sampling method in which all participants have unequal probability of being selected and a chance of inclusion (Polit & Beck, 2012). The aim was not to have participants that were representative of the study population, but participants

who could provide insight and information that was valuable to the researcher (Speziale, Streubert & Carpenter, 2011). In maintaining the aim of the study, the researcher employed a purposive sampling in selecting patients who gave detailed in-depth descriptions of the topic of interest and added value to the study (Babbie, 2009).

Purposive sampling is described as a method of deliberately selecting individuals, settings, or events in order to provide rich information that may be difficult to obtain from other sources (Creswell, 2013). In this instance, the researcher selected participants based on inclusion criteria and her personal judgement regarding which participants should be most representative to the study. Only participants, who met the criteria, having experience of Type 2 diabetes, could share useful information and were therefore selected. Appropriateness and adequacy of data was considered (Onwuegbuzie & Leech, 2007), in selecting participants knowledgeable about the phenomenon of interest. Sampling in a qualitative study is a continuous planning decision and there was no fixed number of participants decided on, because sampling continued until there was repetition of ideas and views. When no new ideas were forthcoming, it showed that there was data saturation or that the point of data redundancy had been reached (Lincoln & Guba, 1985).

Participants were purposively sampled at the consultant clinics during their routine consultations and from inpatients' wards. The researcher participated in the normal activities of the clinic, which allowed easy access to the patients' information charts. Patients with Type 2 diabetes who met the inclusion criteria were identified and approached to participate in the study. Many of the patients were initially not willing to participate because the method of data collection was unknown to them, however, their cooperation was gained and no patient was coerced to take part. Participants who met the following eligibility criteria were chosen to be part of the sample:

- Patients were within the age range of 40 to 65 years;
- Patients had been diagnosed with type 2 diabetes for at least six months and have regularly been attending the clinics at health institutions in Edo state, Nigeria for at least three months; and
- Patients had not participated in similar research in the past.
  The exclusion criteria were patients:

  - with Type 1 diabetes;
  - with psychiatric or cognitive problems; and

- who had participated in similar studies.

Patients (n=30) with Type 2 diabetes visiting the clinics within the health institutions, who met the inclusion criteria, participated in the research study.

3.5.1.3 Data collection for individual interviews

Pilot interviews: Pilot individual interviews were conducted with two participants from each health institutions to explore the interview questions in collecting the intended data. The results of the pilot interview were included in the main findings (n=30) as the results indicated that the research question was answered.

Preparation of the field: After identifying participants, the researcher made appointments with them, scheduling them for a convenient time chosen by them. Interviews were held after-hours, after consultations with the physicians and clinic consultations. A comfortable office was created for the interview sessions; the setting had no distractions and was conducive to communication. The seating arrangement allowed face-to-face interaction that facilitated observation and enhanced interaction (Watson, McKenna, Cowman & Keady, 2008). Although the office was within the structure, it was located out of earshot of other people, thus the participants were comfortable to share their experiences without fear of eavesdropping and unease. The interview sessions should be regarded as those times when the researcher got to know the participants as they described their understanding of Type 2 diabetes and experiences with self-management of Type 2 diabetes (Babbie & Mouton, 2009).

The purpose of the research and the process of the interviews were explained to the participants. Consent forms were signed (Appendix 5) and the participants also consented verbally. The researcher asked for permission to use the tape recorder and the participants obliged. Recording allowed for accuracy because it prevented the researcher from missing out any information. The recorder was prepared before the recording and extra batteries were available. Rapport was established between the researcher and the participants to increase a participant-researcher interaction that fostered trust and enabled communication.

Semi-structured interviews: Interviewing is a process of verbal communication between the researcher and the participants for the purpose of collecting data (Rubin & Rubin, 2011) and for providing thick and rich data from participants in various settings (Creswell, 2007). Semi-structured interviews with open-ended questions were utilised, which allowed for free expression of experiences on having Type 2 diabetes. The interviews were held in Pidgin English and did not take longer than 30 – 45 minutes to conduct. Interviews were conducted

individually with the patients within this time frame, but became longer because the researcher soon realised that many of the patients saw the interview as an opportunity to interact with health-care professionals about their burdens of diabetes and therefore the interviews took longer than anticipated.

A semi-structured interview also including some demographic background questions on e.g. age was utilised in collecting data (Appendix 8). The purpose of an interview guide was to provide direction and uniformity for the interview. Therefore, constructing an interview guide was essential (Mason, 2010). Questions were constructed for an effective semi-structured interview process and to allow for adequate narration of participants' experiences. Questions were brief, precise, neutral and open-ended, which allowed the researcher access to information that hadn't been anticipated, since participants were able to provide adequate information. The interview guide (Appendix 8) consisted of key questions that defined areas of interest that needed to be explored, but it was flexible in that it allowed both the facilitator and the participant to diverge from the questions in order to pursue an idea/issue or to provide a detailed experience.

Although these questions guided the interview, there was some form of flexibility since the interviewer asked questions prompted by the participants' experiences shared, but the flexibility ensured that adequate information needed was collected (McNamara, 2009). The flexibility in interviewing of patients with Type 2 diabetes allowed for probing and clarification of experiences (Polit & Beck, 2012). The interviewer's listening skills were essential in order to identify emerging issues that had not been considered earlier yet were applicable to the research (Maree, 2010). Probing questions enabled a better understanding of the experiences, thereby providing a more involved experience (Merriam, 2014).

Saturation is described by Guest, Bunce and Johnson (2006) as the point of data collection and analysis where new information reflects little or no change. This is the gold standard according to which the sample size in a qualitative study is determined (Guest et al., 2006).

Field notes were written during and after each interview. Field notes are described as the descriptive record of occurrences during data collection in a qualitative study. Written notes taken during qualitative approaches or written immediately after data collection has been reported as being superior to the exclusive use of audio recordings that are transcribed verbatim (Wengraf, 2001). Many of the patients appreciated the interviews, stating that they had appreciated the opportunity to discuss diabetic issues with a health professional. Recordings

were labelled with dates and coded for identification after each procedure. Data was transcribed within a short period after the interview in order to prepare for areas that were not covered or understood.

3.5.1.4 Data analysis

The aim of data analysis was to generate Themes by organising, providing structure and making sense out of the data. In order to actualise the aim, the researcher used the descriptive analysis techniques by (Tesch (1990) cited in Creswell (2009)). See section 3.6.

3.5.2   Participant observation

People's beliefs and their actions are sometimes inconsistent with their behaviour and the frequency of the variation in human behaviour makes observation a powerful assessment of people's perspectives.   Observation is a systematic description of behaviours, artefacts, activities and events that occur in the social setting or an environment chosen for study (Driscoll, 2011). Participant observation was subjective and the researcher learned about the behaviour of the participants while observing them, (Dewalt & DeWalt, 2002).

3.5.2.1 Participants

The participants in the study were nurses in the clinics who gave education on diabetes to patients with Type 2 diabetes. Four nurses of two clinics were conveniently sampled as they volunteered to be observed. They had 5 to 12 years of experience. Observation was done during health education sessions with Type 2 diabetes within 4 months of data collection. Although they were not licensed diabetes educators they had educational backgrounds such as nursing education diplomas and/or higher degrees in nursing education. They had also attended various workshops in various aspects of diabetes management.

3.5.2.2 Participant observation Settings

The settings were consultant outpatient clinics in the tertiary and secondary health institutions where the research was performed.

3.5.2.3 Methods

Participant observation was conducted by the researcher who served as an observer and a worker. The researcher helped in rendering services to patients and moved about to observe interactions within the facility and interacted with the patients. Written and verbal consent was taken from the nurses (Appendix 4) and the patients and demographic data was taken from the nurses (Appendix 9).

Observation as a source of data collection is viewed by some researchers as fundamental to all research processes (Denzin & Lincoln, 2000). It is regarded as source of gaining information about participants and the contexts in their natural settings with the individuals being engaged in the phenomenon of interest to the researcher (Hennink et al., 2011). The method was used as an exploratory function (Denzin & Lincoln, 2005). The objective was to observe nurses giving health talks to patients with Type 2 diabetes in order to understand the method of giving health talks and the content, also to collect information that was used in the focus group discussions. (Usually dieticians and social workers do not provide health education on diabetes to patients in these institutions).

The focus was on the participants' natural settings, since it helped the researcher to acquire a detailed description of the participants' experiences in the context (Hennink et al., 2011). The setting and the participants assisted the researcher to develop an understanding of the health education sessions given to patients and the patients' involvement in the educational interactions that occurred.

3.5.2.4 Advantages of participant observation;

The following are advantages of participant observation:

- It can allow researchers to study behaviour across a range of settings and under circumstances that should be either difficult or ethically questionable to create, such as subjecting participants to stress;
- It does not have to rely on memory as much as other research approaches do; and
- More salient results are recorded since they are seen and heard by the researcher and are useful for plotting changes overtime (deMunck and Sobo, 1998).

3.5.2.5 Possible disadvantages

The following are disadvantages of participant observation;

- It is naturally subjective, and the result depends on the researcher's creativity in maintaining objectivity to a certain extent; and
- It is difficult to document all the important points observed accurately due to the researcher's dual role, therefore the process may necessitate involving an assistant to take the necessary notes (Creswell, 2013).

Observation was essential because the researcher experienced the routine and culture of the facilities and gained insight into the daily health talks given at the health facilities. Participant observation also helped to enrich data that facilitated the programme development.

The questions that guided the observation in order to reduce bias and subjectivity were (Appendix 9);

- What was the nature of health talks that nurses gave to patients with Type 2 diabetes?
- What are the approaches used in the process of health education?
- What was the level of communication between patients and professionals and between the patients?

3.5.2.6 Data collection during participant observations

Data collection during participant observations occurred within the period of four months of data collection for the research study, in the health institutions. The participant observations took place in the mornings between the hours of 8 a.m. and 9 a.m. when nurses gave health education. Bias was reduced through the selection process where nurses at the health institutions were selected based on the unit health education rosters which were planned monthly and did not volunteer. The nurses introduced the researcher to the patients and sought their consent, which was given and the researcher who is knowledgeable of the topic collected data through reflexivity and bracketing. The researcher only took brief notes to avoid distractions. She also used an assistant who was introduced to the nurses prior to the observations. The assistant was trained in the purpose and method of observation by the researcher. The assistant also took detailed notes of the observations in the clinic although the researcher also jotted down occurrences. The researcher finalised the notes directly after each observation session in order to have detailed descriptions of the event, which included interactions, observations and routines of the facility, the content of the teaching, approaches used and other occurrences.

3.5.2.7 Observation notes

During observation qualitative researchers are required to get close to the participants in order to accurately capture the activities and actions occurring at the setting. Detailed and accurate presentation of occurrences to reflect the happenings and description of the field is important (Polit & Beck, 2012). Observation notes are likened to field notes, but this is used in jotting down all activities and behaviours observed in the field during participant observation. Since participants were observed in their natural settings, which formed part of the data, it was necessary to systematically record happenings in order to create a picture of the participants' experiences that could have affected their understanding and self-management of Type 2 diabetes. During observation, mental recording is relied upon, therefore writing is done as soon as possible after observation and not during observing to prevent distraction (Polit & Beck,

2012). An assistant who had been introduced to the health-care professionals was employed to keep detailed notes of relevant activities, interactions and the setting during participant observations. The researcher also made notes after each observation, of both selected moments and activities that were remarkable. Notes were collated together for data analysis.

3.5.2.8 Data analysis

The researcher identified the themes and categories from the data using Tesch (1990) analysis method (described under section 3.6).

3.5.3   Focus group discussions

3.5.3.1 Identifying the population

Focus group discussions involved health-care professionals who interacted with patients with Type 2 diabetes. They served as sources of rich data for the discussions. They consisted of a multi-disciplinary team of nurses, dieticians and social workers.

3.5.3.2 Sampling

A purposive sampling technique was used since the purpose was for the researcher to select professionals who met the inclusion criteria, which were:

- Participants who had work experiences with patients with Type 2 diabetes;
- They worked in the clinics, wards, or departments where patients with diabetes were cared for; and
- They had cared for patients with diabetes within the previous six months.

The focus group was a heterogeneous group of professionals which consisted of 35 professionals who participated in 5 focus group discussions:

Group 1 Tertiary health institution 8 participants

Group 2 Tertiary health institution 11 participants

Group 3 Secondary health institution 5 participants

Group 4 Secondary health institution 7 participants

Group 5 Tertiary health institution 4 participants (pilot)

3.5.3.3 Data collection

Pilot focus group discussion: A pilot focus group was held by the researcher with the assistance of an expert in qualitative research with an interview guide (Appendix 10). The

results of the pilot interview were included in the main findings as the results indicated that the research question was answered.

*Preparation of the field***:** The group discussions were pre-arranged to enable good attendance and support was solicited. A mini-hall within each health facility was secured and prepared before the focus group and the researcher was informed that the most productive time for conducting focus group sessions was between 11:00 a.m. and 12:30 pm. to enable participants' involvement in both the morning and afternoon unit routines. Chairs were arranged in a circular sitting formation to create an environment that facilitated discussion (Burns & Grove, 2011) and to allow the researcher's presence to fade from the group while the group shared their experiences and thought (Krueger & Casey, 2009). Consent forms were signed by individuals in the group (Appendix 4). Participants were informed about the purpose of the research and the research process, consent forms were signed and demographic data were collected (Appendix 10). The ground rules were given. All information disclosed was seen as confidential. A tape recorder was prepared before the recording and extra batteries were available, permission was asked for use of a tape recorder which was granted.

The researcher was able to facilitate 5 focus group discussions (including the pilot) after being observed by the experienced moderator during the second focus group discussion. Rapport was established between the researcher and the participants to increase a participant-researcher interaction that fostered trust and enabled communication. Permission to use the tape recorder was sought from participants and same was obliged. The tape recorder was used to record the conversations that occurred during focus group discussions in order to assess the conversations during transcription. Recording allowed for accuracy because it prevented the researcher from missing out any information. Focus group discussions were held within the two health institutions. Five group discussions (including the pilot) were held with health-care professionals. The duration of the discussions was 50 minutes to an hour 15minutes.

Focus group discussion is a very popular approach in health research and it is now widely used to collect data for qualitative studies (Green & Thorogood, 2013). Focus groups are organised interactions between a number of individuals in a group with a common interest and the aim is to elicit information about a phenomenon of interest (health education) while engaging in face-to-face talks (Botma, 2010). There is explicit use of group interaction as data, in order to gain insight that would otherwise remain hidden if another method was used (Ho, 2011). The interaction allowed multiplicity of information within a shorter time period and it generated

rich information, as well as providing an insight into normative understanding of issues of interest and various non-verbal and verbal clues that could indicate comfort with the issues of interest (Wellings, Branigan & Mitchell, 2000). Focus group discussion does not have a fixed number of participants, but researchers have advocated for five to 12 participants, a number that can be managed by the facilitator since questions are asked simultaneously (Brink, Van der Walt & and Van Rensburg, 2012). The group number can be varied, so as to facilitate active participation and group members' contributions while they shared their experiences and insight (Sim & Wright, 2002). The unit of analysis in the focus group is the group data and therefore group cohesion is important.

The purpose of the focus group was to elicit information from the health-care professionals about their experiences with patients with Type 2 diabetes and their challenges with health talk. Focus group discussions focused on themes from the data obtained from the patients' interviews and participant observation of health talk sessions in order to provide content on the how and why of the patient education being provided. The discussions were enhanced with the use of an interview guide starting with one open question and further probing questions were asked for clarification based on experiences shared (Appendix 9). Discussions generated rich information because participants were able to build on experiences of members of the group and also reacted to their experiences without being judgemental or defensive. Focus group discussions were flexible in that individuals were allowed to question group members who might have generated new ideas and dimensions to the study.

The group was facilitated by the researcher who guided the group using an interview guide (Appendix 10). The pilot and the first focus group discussions were facilitated by an experienced facilitator who was approached by the researcher in order to learn the skills. An assistant was also engaged and was in control of the tape recorder; the assistant took note of participants' non-verbal communications to avoid any loss of information and important points and also took care of distractions such as unnecessary noise. The researcher also jotted down a few important points. All these were later used in data analysis. The focus group interview guide included one open ended question followed with sub and probing questions:

The open question was:

How is it for you to educate Type 2 diabetes patients?

Sub-questions:

What do you focus on during health talk to patients with Type 2 diabetes?

78

Why do you give these patients health talk and what do you want to achieve?

What are the challenges you encountered with giving of health talks to patients with Type 2 diabetes?

What are your future suggestions?

Probing questions

Tell me more…

What do you mean?

3.5.3.4 Data analysis

Interim data analysis was performed after each focus group discussion to detect areas not properly discussed and the data was transcribed verbatim to facilitate early determination of saturation of data (Creswell, 2013). Data analysis was performed separately using Tesch (1990) descriptive analysis for themes and categories (Section 3.6).

3.5.3.5 Saturation

Straus and Corbin (1998) cited in Mason (2010), suggested that saturation should be reached at a point of counter-productivity. In this study, the use of good listening skills in the focus group discussions facilitated the early recognition of data saturation, but the researcher continued with the intention of eliciting new information. The focus group discussions reached saturation since there was continuous repetition of ideas expressed in the first group during the second group discussions in the health facilities, although there was some new information.

Straus and Corbin (1998) cited in Mason (2010) posit that saturation is a matter of degree and that the longer researchers familiarise themselves with the data the greater the potential that new information will emerge. During data analysis, the researcher spent time with the data to familiarise herself with the data and she was confident that the data reached saturation since new information was not emerging.

3.5.4   Role of the researcher during data collection

The researcher played an active role in the data collection. As an instrument of data collection, collaborative participation was necessary to enable accurate detailed information on the participants and the context.

Facilitating: An experienced researcher was engaged during the first focus group discussion to assist the researcher (Watson et al., 2008). Her role was delineated because she guided the

conversation using the question guide, rather than participating in the discussions and focused on the discussions without any bias. She played a non-judgemental role because expressing her own views may have given participants' clues to their experiences and could have resulted in participants discussing the moderator's subjective views rather than their own. The experienced researcher was natural and comfortable in order to create a relaxed environment for the participants, she also facilitated and ensured an equal environment with active participation and motivated taciturn participants. The researcher of the study was able to continue with the second interview.

3.5.4.1 Skills during data collection

The following skills were displayed by the researcher during individual interviews, participant observations and focus group discussions to motivate the patients to actively participate without feeling threatened:

Active listening skill: Active listening skills were adopted throughout all approaches and discussions, which relaxed the participants and made them willing to discuss their experiences. This made them feel that they were heard, thus enhancing their collaborative role. The researcher focussed on each participant while they made their contributions and the assistant researcher prevented all distractions such as noise.

Congruency: The use of interview guides facilitated asking the same questions during the interviews and focus group discussions in a respectful manner. The participants' discussion of questions determined the use of probing questions that were relevant to the discussion.

Observation: Observation was used as a technique to capture all the participants' non-verbal clues during the interactions, which clues may have conveyed meanings to the phenomenon of interest, thereby enriching the data. The groups were observed to understand the characteristics of a particular group and then utilised different skills for separate groups, so as to forestall inhibition during conversations. Participants were observed for non-verbal communication, their interactions with others and their reactions to statements made by others. Field notes were made of observations.

Probing: Probing is the use of short questions or statements to clarify information provided by the participants and could be used when a participant doesn't understand question or to clarify a statement (Polit & Beck, 2012). The purpose is to enable eliciting more useful information than the participants volunteered during an earlier reply to a question or to contribution to discussions. Some identified probes are:

- repetition of the original question;

- silent probe, namely the researcher maintaining a long pause that is communicated as an indication that the participant should continue because the moderator is listening;

- use of complementary questions that are not directive and open-ended, for example "what was your reaction?"; and

- Use of affirmative comments such as "Uh-Hum" and "Okay".

The ability to use probes effectively is viewed as the greatest test of an interviewers' skills (Polit & Beck, 2012). In this instance the researcher elicited adequate information from the participants through the use of various probes.

3.5.4.2 Communication techniques during data collection

Verbal communication skills: These were applied throughout the research study. Verbal communications included:

- *Open-ended questions*: These questions were asked to give participants sufficient time to use their own words freely to describe experiences and to make detailed narrative expressions (Polit & Beck, 2012). The researcher used probes for clarification. Paraphrasing of participants' information facilitated better understanding because the researcher used simple and fewer words to restate the participant's description of an experience. Focusing was used to direct and redirect the discussions intermittently when participants strayed from the topics. Simple language with minimal use of terminology was used to facilitate understanding and easy communication with the participants. A reflective summary was used to summarise participants' information and to clarify and confirm understanding of the purpose of the group.

- *Minimal verbal responses:* The researcher used minimal verbal responses to allow participants time to discuss the topic/s of interest and focus. Some of the non-verbal responses included occasional nodding to maintain the conversation flow and maintaining eye contact with the participants to indicate attentive listening to limit verbal responses such as "mmm" (De Vos, Strydom, Fouché & Delport, 2006).

3.5.4.3 Reasoning strategies

Inductive reasoning: Inductive reasoning is described as making projections about different conditions based on existing knowledge (Hayes, Heit & Swendsen, 2010). In research it is a process of reasoning from the specific to overall conclusions (Mouton, 2006). The process could be viewed as making predictions that are probabilistic. The research process through

generation of evidence-based data and observation gradually facilitated developing the conclusion of the research (Babbie & Mouton, 2009). Inductive reasoning is also viewed as a creative reasoning design supplementing the scientific knowledge since adequate literature may be required to gain insight into a researched topic (De Vos, Delport, Fouché & Strydom, 2011). Through inductive reasoning, the data analysis method in Phase 1 allowed for patterns and categories to emerge, which were then used for generalisations using the discussions of the findings. In data verification, inductive reasoning is used to make predictions.

Deductive reasoning: This form of reasoning is logical in nature and moves from the pattern that is general to the specific (Johnson-Laird, 2006), also known as a top-down approach. The researcher needs to prove the assumptions for the study logically (Babbie & Mouton, 2009). The researcher engaged in collection of data from the participants in order to confirm the assumptions. In the study deductive reasoning was used in the evaluation of the programme, and in the plan for implementation and evaluation. The use of behaviour change theories and theoretical assumptions of the study were confirmed in the findings and the programme.

*Reflexivity***:** The researcher is the primary instrument in qualitative research and therefore learns to reflect on the thoughts and behaviours in the research process. Reflexivity necessitates the researcher being sensitive to the effect of the researcher on the process and outcomes of research (Hennink et al., 2011). Alvesson and Sköldberg (2009), described reflexivity as an interpretation of the researcher's interpretation. In qualitative research, the study design includes interpretation and therefore it may be impossible for the researcher to be neutral to the topic of interest, but the researcher must strive to avoid obvious, conscious and systematic bias throughout the research process (Ritchie, Lewis, Nicholls & Ormston, 2013) . The presence of the researcher may have an effect on the participants and the activities in the environment, but being reflexive takes cognisance of the researcher's involvement (Hennink et al., 2011).

The researcher reflected on who she is - her perceptions, values and beliefs and the purpose of the study. This is a form of inter-subjectivity in the research methodology because the researcher is actively involved in the process of the research and is also a co-constructor of meanings (Anderson, 2008). Researchers may become aware of what has allowed their seeing and what has inhibited their seeing (Watt, 2007) in the research process and design and therefore it is important that the researcher reports on the technical detail of strategies used in combating potential sources of bias (Ritchie et al., 2013).

The method of data collection reflected the co-creation of the data achieved through the interactive process of the semi-structured interviews and the group cohesion that prevailed during the conversations in the focus group discussions. The researcher kept a research journal where short notes on ideas and thoughts about the research were written down throughout the process (Maxwell, 2012) and this served as a valuable asset and checking mechanism for the researcher (Lapan, Quartaroli & Riemer, 2012).

Reflexivity is part of trustworthiness. Audit trailing was done after the interviews for verification of idea (Morse, Barrett, Mayan, Olson & Spiers, 2008) and member checking was carried out to determine the researchers subjectivity. There was generous description of the methods of data collection and analysis and quality time spent with the data also aided reflexive thinking because it reflected how the researcher knew what is known about the data. Self-awareness and introspection was also practised because the researcher was conscious of her role throughout the research process.

Bracketing: Bracketing is a reasoning strategy used by qualitative researchers to suspend their knowledge about a research topic and allow the information received from the participants to convey the accurate meanings explained by the participants (Brink, Dellve, Hallberg, Abrahamsson, Klingberg & Wentz, 2006). In this instance, the researcher identified what is known, perceptions, experiences and biases about the topic that were written and the researcher consciously suspended them (Burns & Grove, 2005) before proceeding to data collection. The researcher also minimized bias by limiting reviewing the literature comprehensively prior to data collection and analysis (Streubert & Carpenter, 2007). The in-depth literature was reviewed after data analysis was completed. The researcher was able to deal with interest in the topic by bracketing because preconceived ideas and experiences were suspended to facilitate gathering rich data for the study.

Intuiting: This a technique in a qualitative study in which the researcher focus all awareness and the energy on the participants (Burns & Groves, 2009). The researcher gained an insight and knowledge about the patients with Type 2 diabetes and the health-care professionals through this process as she remained open to the meaning that the participants gave about their experiences of health education and self-management. It was an active way of knowing as the researcher became immersed in the data provided by the participants (Brink et al., 2006).

3.6 QUALITATIVE DATA ANALYSIS

Data analysis is defined as the process of reducing and organising data in order to assign meaning to information that requires interpretation by the researcher (Burns & Grove, 2011). It is a challenging enterprise that requires creativity and sensitivity and it is labour intensive (Polit & Beck, 2012). The researcher was involved with the data analysis in order to develop an understanding of the participants' experiences and also to generate codes that speak for the data. The process was active and iterative because the researcher scrutinised data by going back and forth carefully and deliberately reading and re-reading data to familiarise and immerse herself in the data for the purpose of gaining insight into all the data (Polit & Beck, 2012). Additionally, Creswell (2013) suggested that in data analysis the researcher moves in an analytic cycle rather than in a fixed orderly approach because the stages are interrelated. Since qualitative data analysis takes place throughout the entire data collection process, a study is shaped and reshaped as the study proceeds and data is gradually transformed into findings.

Data collected from interviews, observation notes, focus group discussions and field notes were the sources of information used in the analysis. Data was analysed separately for the individual interviews, observations and focus groups. Data was prepared for analysis through a detailed transcription. Data transcription started e.g. immediately after the first interview and continued through all data collection approaches since it was an iterative process. Transcription and analysis were completed concurrently as this facilitated identification of areas not properly covered during the interview and these were corrected with subsequent interviews. Verbatim transcription was carried out to ensure accuracy and reflection of the participants' experiences and knowledge and transcriptions were cross-checked to avoid any form of error and bias during recording.

The aim of data analysis was to generate themes by organising, providing structure and making sense out of the data. In order to actualise the aim, the researcher used the descriptive analysis techniques by (Tesch, 1990) cited in (Creswell, 2009). Data was analysed separately for the interviews, observations and focus group discussions. Data was prepared for analysis through a detailed transcription.

Transcription: Transcription is the process of making a verbatim written record of narratives from interviews and focus group discussions in preparation for data analysis (Hennink et al., 2011). Data transcription started immediately after the first interview and continued through

all data collection approaches since it was an iterative process. Transcription and analysis were completed concurrently for each method as this facilitated identification of areas not properly covered during the interview and these were corrected with subsequent interviews. Verbatim transcription was carried out to ensure accuracy and reflection of the participants' experiences and knowledge and transcriptions were cross-checked to avoid any form of error and bias during recording. Data transcription was a rigorous and difficult task, but the researcher had to be personally involved since the transcription encompassed asking judgement questions about the level of detail to include and interpreting to elicit meaning from the data (Bailey, 2008)

Tesch's (1990) descriptive coding technique for data analysis was used and includes the following eight steps for data analysis and guidance for the coding process:

- The researcher engaged in a detailed and careful reading of the transcript to familiarise and immerse self in the data to ensure that the participant became the focus of analysis. It also enabled the researcher to develop an insider's perspective while being aware of her own role in the study (Shaw, 2010). The meanings were created because the researcher had a sense of all the data. The researcher referred to a code book and ideas were jotted down as they occurred to the researcher.

- Each transcript was read again to gain insight into participants' experiences and questions were asked, such as "what does it mean?" and "What is this statement about?" to enable the researcher to arrive at a description of the participants' feelings and words and to make meaning of them. The researcher's thoughts were jotted down and this was done for all the transcripts In order to create meaning and to understand and some questions related to the data were asked (Henning, Van Rensburg & Smit, 2007), such as:

  o What is the data saying?
  o Which category specified the experience?
  o What feature within the group specified the experience?
  o How do I describe it using a concept?

- A list of all the topics was made and similar topics were clustered. The researcher checked through the data to see if there was any omission of any striking statement and in this way the process was continuously iterative to avoid error. These topics were listed in columns of major, unique topics and leftovers to show their relatedness to the phenomenon of interest.

- Topics were abbreviated as codes ensuring that the codes resembled the participants' information and they were written next to the applicable sections. The researcher scrutinised the work through repetitive checking and found new codes emerging.

- Similar codes were grouped to form categories using a descriptive word from the health education and self-management of patients with Type 2 diabetes. To show interrelationships, lines were drawn between codes to facilitate grouping them into categories and reducing the total number of categories.

- The researcher decided on the abbreviations for each category and the codes were arranged alphabetically.

- Data materials belonging to each category were assembled and the researcher performed a preliminary analysis.

- The researcher read through the data again and existing data was recoded where necessary.

Field notes served as points of reference. An experienced independent coder was used to code the data after which a consensus discussion took place that added credibility to the study.

The following steps are discussed in more detail:

Developing codes: Code development is essential in qualitative data analysis. Codes were generated after verbatim transcription of data. Codes are referred to as ideas, topics, issues and opinions that are outstanding in the data (Hennink et al., 2011). Codes served as pointers to the data set because they assisted the researcher to identify areas with important issues and also facilitated retrieval. Codes also allowed the researcher to ascertain the variety of ideas mentioned in the data, thus increasing the understanding. In this study the codes were induced since they allowed the data to speak for itself without the researcher imposing them.

Data verification: The main purpose of verifying the data was to check for its credibility. This was achieved using the suggestions by Creswell (2007), namely:

- The use of a tape recorder in data collection and the use of an independent coder in analysing the data.

- Peer review by students who examined the researched process at various stages, including the analysis results.

- Member checking was actualised by presenting the transcribed data to some of the participants to ensure accurate interpretation and clarification of information. The result of the analysis was also shared with the participants for evaluation.

- Triangulation of results of the data collected via the multi-methods of semi-structured interviews, participant observation and focus group discussions, was collated to provide supporting evidence and to provide understanding of the research problem.

3.6.1   Literature support

In Phase 1 literature confirmed the findings. Literature search was done in chapter 2 to have an understanding of programme developed by a multi-disciplinary group and the findings were reported in Chapter 3.

3.7 PHASE 2: DEVELOPMENT OF A HEALTH EDUCATION PROGRAMME FOR THE SELF- MANAGEMENT OF TYPE 2 DIABETES

Phase 2 of the study was performed using the mixed method design. The development of the programme was achieved using a qualitative approach, the pilot testing and evaluation was actualised with a quantitative approach. Quantitative research according to Gay, Mills & Airasian, (2012) uses numerical data and statistical/computational methods of analysis to measure the incidence of some phenomenon, determine how factors relate to one another, or explore cause-effect relationships. It relies on numerical data which are collected and analyzed to describe, explain, predict, or control variables and phenomena of interest. It is based on the assumption that reality is out there and can be studied in an attempt to make generalizations. In quantitative research are seen as separately and that the world exists as a single reality—composed of facts—that can be discovered through observation or other measurements (Fraenkel, Wallen & Hyun, 2012).

3.7.1   Intervention Mapping Framework Step 2,3,4,5 &6

Objective 3 was to develop a structured health education programme for self-management of Type 2 diabetes through the collaboration and active participation of stakeholders (health-care professionals and the patients) same was actualised through active collaboration.

This phase involved the development of the educational programme to assist patients with Type 2 diabetes to increase their knowledge of the disease and to enhance their self-management and quality of life. This phase also entailed collaboration and participation of the stakeholders in the further development of the educational programme. According to Bartholomew (2011),

programme development should involve the beneficiaries in order to increase acceptance and sustainability. Therefore, health-care professionals and patients were actively involved in all the steps phases of the programme's development and evaluation (Cullen, Coryn & Rugh, 2011). This phase included Steps 2, 3, 4, 5 and 6 of the adapted IMF. Stakeholder participation in the development of programmes, implementation and evaluation is an essential part of the IMF (Blanchard, Petherick & Basara, 2015; Cullen et al., 2011). Traditionally, research was conducted on group of people with certain needs or interests, rather than with the people (Russo, 2012). Many researchers and organisations are advocating for stakeholders' involvement in research affecting them so that their voices can be heard (Bartholomew et al., 2011; NICE, 2006).

3.7.2   Step 2: Performance objectives and matrices

3.7.2.1 Preparation for Step 2

Firstly, the researcher had to motivate both the patients and health-care professionals in order to conduct a scheduled meeting. The meeting was to familiarise the stakeholders with the adapted IMF and their roles during the development of step 2 of the framework. The IMF stipulated equal power sharing and confidentiality, which, in addition to ground rules, had to guide the group. A safe place was needed for the meetings to shield the less privileged members of the group from intimidation and fear of being persecuted as a result of their expression of feelings and ideas by giving them a voice (Cook, 2012). A place that was outside the clinic but within the hospital (mini-hall) was provided, which guaranteed safety and instilled confidence in the participants.

3.7.2.2 Workshops

A two-day workshop was held to develop the educational programme jointly with all invited patients and health-care professionals from the two health facilities and these took place in the tertiary health facility. In order to achieve the goal of step 2, the workshop was held in an informal and friendly atmosphere and the participants were welcomed individually. In order to build personal relationships with participants of the workshop they introduced themselves and told stories regarding their experiences with Type 2 diabetes. Health-care professionals were asked to describe the core principle of their care to patients and to elaborate on what they expected the workshops would provide for patients with Type 2 diabetes. The results of the situation analysis, which consisted of themes and categories from the analysis of data from

semi-structured interviews, participant observations and focus group discussions, were presented to the group. Information from the literature support was also shared.

Phase 1 was discussed and agreement was reached on the underlying philosophy for the workshops:

- Group members acknowledge that patients with Type 2 diabetes are responsible for their self-management of the disease, that is indisputable;
- Patients should be given adequate information about diabetes; to facilitate informed own decisions;
- Patients should be supported in understanding the information and in making their own decisions when collaborating with health-care professionals; and
- Health-care professionals will treat patients with diabetes with respect and empathy for the educational programme to be successful.

Periodically, patients were asked questions and their inputs were provided during the workshops.

The collaborative work allowed for taking ownership of an educational programme (Spangenberg, 2011); it triggered a learning process for the researcher and the stakeholders; empowered and motivated stakeholders to participate actively in the adoption and implementation of the programme as they identified with the programme (Lang, Wiek, Bergmann, Stauffacher, Martens, Moll, Swilling & Thomas, 2012); and their involvement ensured that the programme was tailored to patient needs and the problems identified during the situation analysis.

The invited participants were four patients (that were part of the individual interviews) and seven health-care professionals from the health institutions (that were part of the focus groups) and consisted of seven nurses, two social workers, two dieticians. The content of the workshop then focused on:

- Compiling matrices of change objectives based on the goals and objectives for the programme identified from Step 1. Participants had to;
- State outcomes for behaviour and environmental change of patients,
- State performance objectives; and
- Discuss how the theoretical determinants in behavioural theories (theoretical assumptions Chapter 1) were important.

These tasks were accomplished to facilitate the development of the realistic matrices.

The matrix of change is the basic tool or the foundation of intervention mapping as it entails planning for the programme, specifying areas changes will occur as a result of the educational programme and what will be done for a change to occur as a result of the programme (Bartholomew et al., 2011). A set of changes to be addressed by the programme at both individual and environmental levels was documented to improve health outcome and quality of life of the patient.

The first task was stating the programme outcomes: Programme outcomes are the specific behaviours that are to be realised or achieved by the patients as a result of the intervention programme. These are the positive effects of the programme on the patients that are expected to be actualised through their participation in the programme. A thorough situation analysis and literature support performed during the first phase provided an understanding of the problems of the patients and the environmental barriers to patients actualising the self-management activities. The participants in the workshop (also later referred to as the planning group) departed from the themes of the data and confirmed literature (Phase 1) and utilised the core processes of questions and brain storming to deliberate on the performance objectives and outcomes for the patients that are relevant to the programme based on the themes from the data analysis since there was no educational programme for patients with Type 2 diabetes before in Nigeria.

According to NICE (2006), interventions should be implemented in real clinical world and non-clinical settings and should include the effect of the settings such as the mode and the source of delivery on the effectiveness of the intervention. The situation analysis confirmed that patients had superficial knowledge of diabetes and inadequate self-management of diabetes which may have been as a result of the method of health education used in the health facilities. Health-care professionals were burden with the challenge of non-adherence by the patients despite their effort to improve on traditional patient education approach and they acknowledge their collaborative role in health education. It was also assumed in this study (Chapter 1) that the environment can either aid or hinder the normal performance of human beings and therefore a treatment environment should support intrinsic motivation and confidence to influence adherence and positive health outcomes.

Organisational environmental factors, such as teaching methods, may contribute directly or indirectly to poor management of diabetes (Sallis & Glanz, 2009), therefore the health-care facility approach to health education was altered as suggested by health-care professionals during the situation analysis in order to facilitate health education and improve outcomes of health-care.

The second task was subdividing the behavioural outcomes and environmental outcome into performance objectives. This task involved matching the objectives to be achieved with the programme and the actual activities that patients were expected to perform. The planning group utilised their professional knowledge, experiences and creativity to develop the performance outcomes (Tables 5.1-5.2).

The third task was development of determinants of behaviour which was actualised using constructs from the theories of behaviour change (Chapter 1). Determinants are factors that are associated with the performance of self-management that are within the individual, that the individual can easily control, or those factors within the environment that can be modified (Bartholomew et al., 2011). IMF is theory-based and to actualise the task of developing an educational programme it was expedient for the group to understand the theoretical departure of the study, the theories that directly addressed the determinants of behaviour (Draper, Micklesfield, Kahn, Tollman, Pettifor, Dunger & Norris, 2014). Theory facilitates understanding of factors that work best because theory-based interventions make use of specific causal pathways (Abraham & Michie, 2008). The educational programme was intended to affect behaviour therefore theory guided behavioural constructs to enhance changes in behaviour of patients with Type 2 diabetes were derived using constructs from theories of behaviour change self-determination theory, social cognitive theory and information motivation and behavioural skills model (Chapter 1). The determinants of behaviour such as self-efficacy, skills, autonomy, attitude, outcome expectations and knowledge were selected.

The fourth task was matrix of change objectives: This involved creating matrices for each performance objective. Performance objectives and determinants of behaviour were used in forming tables for the matrices. Matrix of change objectives represented the trail of important changes expected to occur in the health behaviour of the patients, reflecting as pathways for immediate changes in behaviour and the capability to influence health behaviour and actions taken by health-care professionals (Bartholomew et al., 2011). The matrix specified what the patient needed to learn and changes expected to occur in the environment. Matrices had to be developed (Tables 5.3-5.10). This was the basic tool of intervention mapping (Bartholomew et

al. 2011) since it entailed detailed planning of the proposed programme. The themes from the data analysis of the situation analysis (Phase 1) were used to provide a clear statement of the patients' experiences that indicated behaviour and attitude needed to be changed as well as improved skills and self-efficacy. The environmental factors were also linked to the needed changes (Chapter 4 which was revealed during observation).

3.7.3 Step 3: Selecting theory-based methods and practical strategies for health education

The planning group reflected on the theoretical assumptions that were the departure of the study. It was acknowledged that certain assumptions were made as they indicated that changes in determinants of the behaviour of patients were needed towards self-management as well as environmental factors (Bartholomew et al., 2011) such as e.g. educators in the health-care environment. Theoretical assumptions formed the underlying basis of the programme for the patients with Type 2 diabetes.

A theoretical method is an overall technique for influencing changes in the determinants of behaviour and the environmental conditions (Bartholomew et al., 2011). Patients with Type 2 diabetes were required to effect certain behaviour changes to enable a quality life therefore the use of theoretical techniques to influence their behaviour may help in initiating and sustaining healthy behaviour.

Practical strategy is the practical use of theoretical approaches that are suitable for the programme activity. Interventions that are targeted at causal determinants of behaviour are more effective when planned with theories. Theoretical methods for changing the determinants of behaviour were identified by the programme development group in order to ensure effectiveness in changing behaviour (van Achterberg, Huisman-de Waal, Ketelaar, Oostendorp, Jacobs & Wollersheim, 2011). Four tasks were accomplished during this step, these were generating the programme ideas with planning group by:

- Identifying theoretical methods for teaching;
- Choosing programme methods for teaching; and
- Selection or designing practical applications and ensuring that applications addressed change objectives.

The first task was to generate programme ideas with the planning group: The idea of the educational programme was already becoming visible at this stage following the tasks performed in step 2 by the planning group. The form of the programme was discussed based on the themes from the need analysis and the literature support to enable members to have a better understanding of what the programme would be, which paved the way for more discussions on what could be included based on their practical experiences and creativity. The purpose of the intervention programme was to create a change in behaviour of patients with Type 2 diabetes, therefore methods and approaches to effect this change were sought based on the suggestion of ADA (2015b), that patients should undergo structured education on diagnosis.

The second task was identifying theoretical methods: Theoretical methods were techniques for influencing changes in the determinants of behaviour (Bartholomew et al., 2011). In order to effectively select the methods, the performance objectives and the activities to be performed utilising the determinants of behaviour were considered. A list of change objectives was made with a list of methods of change and their applications by the programme planning group and were discussed and deliberated on, outlining methods that addressed selected behaviour determinants (Table 5.11). Abraham and Michie (2008) conceptualised taxonomy of behaviour change techniques that have been useful in many intervention programmes (Sanchez, Grandes, Cortada, Pombo, Balague & Calderon, 2009). The taxonomy was adopted to enable the use of theory-guided approaches for the methods used with the patients.

The third task was approaches and methods used in teaching: Many approaches are used in communicating information and skills to patients during a health education programme to allow for understanding of the message and assimilation. The method used depends on the goal to be achieved and the topic. Additionally, when approaches are varied it shows the importance of the message being passed. Brainstorming was used in suggesting various approaches such as group and individualised teaching, demonstrations, literature materials, elaboration, participation, active learning, tailoring, modelling, lectures, role-play, feedback from the patients and discussions. The environmental methods chosen were discussions, demonstrations and lectures.

The fourth task was selection or designing practical applications and ensuring that applications addressed change objectives. This step entailed application of theoretical methods and approaches to the determinants of behaviour in order to ensure accuracy (Table 5.12). Theoretical methods that were discussed in the previous task were matched with the objectives

in order to differentiate theoretical methods from practical applications. The planning group deliberated on the approaches for selection of theoretical methods to prevent errors and poor outcome, especially to prevent a repetition of what was already in practice. Brainstorming was used in suggesting various approaches such as group and individualised teaching, demonstrations, literature materials, elaboration, participation, active learning tailoring, modelling, lectures, role-play, feedback from the patients and discussions.

3.7.4 Step 4: Write the programme

The purpose was to produce a creative and innovative educational programme that would be sensitive to the needs and the culture of the patients with Type 2 diabetes in Edo State. Programme components and materials in support of the education programme were agreed on by the planning group from the findings. Based on the planning steps completed in the previous section and the themes from the data analysis supported with literature to produce a structured health education programme. Patients with Type 2 diabetes were considered at every point due to their heterogeneous nature in terms of education, social economic level, cultural practices and ethnic background.

The planning group considered the integration of the programme into the contexts and therefore the capacity of the health institutions and the available resources were considered. The heads of the nursing, social work and dietician departments/units were contacted to join in at this stage. This step entailed a lot of iterative movement of back and forth between the previous steps to determine any omission or unnecessary emphasis, but due to the cohesive nature maintained, knowledge and experience of the multi-disciplinary team and the patients, a creative structured educational programme emerged. The programme was planned to suit patients with Type 2 diabetes, health-care professionals and health institutions. To accomplish the programme's goal six tasks were performed collaboratively with members of the planning group:

- Created themes, scope, sequence and a list of materials for the programme;
- Prepared design documents for the materials used for the methods and practical applications;
- Reviewed available programme materials and selected materials that matched change objectives, methods and practical applications;
- Drafted materials and protocol for the programme;

- Re-looked programme materials and protocol; and
- Produced materials and protocol

The tasks involved in this step were technical and required scientific applications. In order to capture the matrix developed in step three, all the professionals were highly involved and they were creative and utilised their knowledge and experiences. The programme was conceived to be culturally relevant to the patients who are from diverse cultures in Nigeria and materials for the programme were such that they related to the norms and values of the people.

Creation of programme plans and structure: The theme, scope, sequence and lists of materials needed for the programme were created based on the tasks that have been performed previously. The programme development was grounded on the assumption that optimal health status was attainable by all patients through adequate self-management of Type 2 diabetes regardless of their duration of diabetes, gender, educational status, socio-economic status, place of abode and ethnic or cultural background. The planning group designed the educational programme using the behavioural objectives, the performance objectives, the matrices (previous steps) and the themes from the situation analysis. The methods to be used and various approaches were derived also from step 2 (Tables 5.12). The content to be included in the programme were expanded to contain detailed points that participants would easily recall (Chapter 6).

Programme materials were teaching tools that stimulate different senses in the individual such as visual, auditory and tactile and are necessary for learning (Lowenstein, Foordand & Romano, 2009). These tools may affect the individuals' psychological affect that is an essential factor for behaviour change (Lowenstein, Foordand & Romano, 2009). According to Babcock and Miller (1994) cited in Lowenstein (2009), the purposes of teaching tools were:

- To provide various content materials enabling the educator to tap into the learners' learning style;
- For abstract or complex concept clarification; and
- To simplify complicated explanations by making them easy to understand.

These teaching tools included written materials and the widely used materials included hand-outs, brochures, booklet, pamphlets, log books, note books and goal-setting action plan books. The available materials were reviewed to find those that would be culturally sensitive and

tailored to the needs and characteristics of the population. There was nothing available in the health institutions, which was confirmed by the situation analysis (Chapter 4). Internet sourcing for materials from different health organisations such as the WHO, ADA and IDF African region was performed. It has been suggested that existing materials that are compatible with a planned programme could be reviewed for use to guide reviewing and improving materials for health teaching (Daley, Cowan, Nollen, Greiner & Choi, 2009).

Although suitable materials were found, such as curriculum for diabetes education, guidelines and readable materials, however, due to the lower literacy level, a financially disadvantage group and multi-ethnic audiences, some of the available materials were adapted to suit the population. Researchers have recommended that to improve the effect of the materials on the participants and improve comprehension the materials should be tailored to the participants' learning needs (Kasteleyn, Gorter, Stellato, Rijken, Nijpels & Rutten, 2014). Research has shown that many health and health-related topics are written at levels higher than patients' reading ability (Wilson, Wallace & DeVoe, 2009), which may affect their understanding and retention and therefore the materials were adapted with due consideration for the low educational status of the patients. Educational materials were then written in English at the 6th grade level and lower due to the patients' low educational levels.

A variety of State Ministries in Edo State, Nigeria which produced materials related to diabetes were contacted for pictorial posters, such as the Edo State Ministry of Health and Education through their information, education and counselling units for relevant posters. Educational materials focused on Nigeria's staple food, with cultural variability substituted by pictures, food issues and graphics. Some available posters were received.

Health information on the internet was evaluated to ensure reliability and quality of the information and source. The United State National Library of Medicine and the National Institute of Health (2007) advised users through the Medline plus Guide to healthy Web surfing to evaluate written health information from any source before it can be used. All web materials used were accessed through MedlinePlus. Few materials were developed for use with the patients in order to have content-specific and information tailored to the needs of the patients. This was done with the health-care professionals who were assigned to perform the tasks. Factors considered were the target audience, especially their literacy level and therefore common words were used, objectives to be achieved with the material were established and content and layout of the material was designed.

During the planning group sessions, it was established that a motivational interviewing model should be used by health-care professionals during offering of the programme, for which they had to be trained.

The materials adapted and developed were *re-looked* using few patients with Type 2 diabetes from both health institutions to ensure that the programmes messages in the developed leaflets, posters and messages were reflective of the needs of the patients (McKenzie, Neiger & Thackeray, 2012). This is also a process in which prototypes of materials such as posters, written materials and audio messages are tested for audience reaction (Baranowski, Cerin & Baranowski, 2009). The purpose was to ascertain the audience's perception of the materials and their messages. Some patients with Type 2 diabetes volunteered to participate after informing patients at the consultants' clinics. Re-looking of the materials was achieved with four patients with Type 2 diabetes from the health institutions and the phrases and the summaries of the messages were presented by the health-care professionals and the leaflets were shared. The group had an additional opportunity to provide additional information and to share new ideas related to the programme. The following question was posed to the patients:

- How is the information for you?
- Is there any new information that is needed?
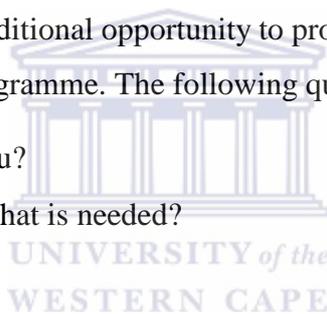
Gatekeeper's reviews were also included. The deputy directors of nursing services, dietetics and social works were then consulted to enable them to review the components of the programme. The heads of the Department of Medicine were also consulted with the materials, content and activities planned for the programme. These professionals offered useful suggestions that were used in creating the new educational programme. The educational programme was produced based on the tasks performed in steps 2, 3 and 4. The materials were rechecked with the objectives of the programme and they were produced after making necessary changes and adjustments based on the suggestions of the patients and other stakeholders.

The health-care professionals were trained to offer the program using a motivational interviewing model (Miller & Rollnick, 2004), before the programme was implemented.

3.7.5 Step 5: Implement and evaluate the programme

3.7.5.1 Pilot testing (evaluation) of the appropriateness and effectiveness of the programme

This is the process of having a mini demonstration of the programme prior to a wider implementation (Bartholomew, 2011). This entails having the programme with the implementers and some of the patients with Type 2 diabetes and using the materials accurately and timely. Activities were also carried out to evaluate the appropriateness in achieving the goal. The message, activities, content, timing, methods and the approaches were evaluated to determine the accuracy (McKenzie, Neiger & Thackeray, 2013). This was also performed to determine whether the materials and method were suitable in achieving the goal and objectives of the educational programme and to allow a fuller view of the programme. Pilot tests enabled the planning group to determine the effectiveness of the programme and also identify aspect to be revised. It allowed the planning group to workout changes before offering the programme to a larger population. Five main areas were checked during the pilot testing:

- The implementation of the intervention strategies assessing whether an adequate dose was delivered;
- The effectiveness of the intervention strategies;
- Adequacy of the resources; and
- The participants' ability or opportunity to evaluate the programme and whether the intervention was appealing to them (Stevens, Taber, Murray & Ward, 2007).

The methods, materials, content, approaches used, space, professionals' effectiveness, timing and the resources were critique by the participants (See report in Chapter 7).

Design: The evaluation had both quantitative and qualitative phases. The quantitative phase was a quasi-experimental study and involved the collection of demographic data, anthropometric data of weight and height. The use of post programme evaluation participant interviews was to determine the effects of the programme on the patients. A quantitative quasi-experimental design (pilot study) was used comparing an intervention group and a control group to evaluate the educational programme. This method is also referred to as controlled trial without randomization, it involves two groups of participants in an intervention but there is an absence of randomization (Polit & Beck, 2012). A quasi-experimental design was a two group before and after design, comparing an intervention and a control group from the two outpatient clinics in the health institutions for selected primary and secondary diabetes outcome measures.

After the programme was offered individual semi-structured interviews with the 23 patients on their experiences around the programme was conducted. These interviews were managed and analysed in the same manner as described in Chapter 3 (Section 3.6). The results are discussed in Chapter 7.

Population and Sampling: Twenty-eight (28) participants who volunteered to participate in the pilot study after the invitation was given at the consultants' clinic were available for the pilot study which was conducted at the health institutions. The participants were selected from the Consultants' Clinic. On a selected clinic day, all patients who agreed to participate in the study were allocated to the Intervention group. The control group was selected on alternate clinic days. Selection was done twice a week for two weeks to allow for a reasonable number. The sampling frame for the study was participants attending the diabetes clinics in a tertiary and a district hospital in Nigeria.

Inclusion criteria for the study were: (i) Patients should be willing to participate voluntarily in the study. (ii) Patients should be able to take independent decisions and have self-care. (iii) Patients should not show any sign of cognitive problems.

The intervention group consisted of 15 patients of whom 15 were available for the pre- and 13 for the post-measurements, resulting in 13 pairs of data of which 7 were from the tertiary health institution and 6 were from the secondary health institution. Two participants were lost to follow up (Figure 3.2). The control group consisted of 13 patients of whom 13 were available for the pre- and 10 for the post-measurements, resulting in 10 pairs, 5 from the tertiary health institution and 5 from the secondary health institution. Three participants were lost to follow up (Figure 3.1). They patients were all available for the five-week intervention programme and both groups received routine usual clinic care and consultant visits. Allocation of patients to Intervention (I) and Control Groups (C) was done based on alternate days. Selection was done twice a week for a two week periods to allow for a sample size of 28, which would allow for a 0.5 effect size, alpha of 0.05 and power of 0.8 for a one-tailed t-test for matched p (Tshiananga, Kocher, Weber, Erny-Albrecht, Berndt & Neeser, 2011). Allocation was concealed from the patients.
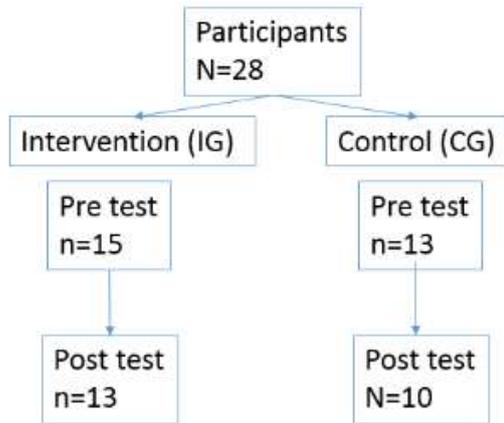
Figure 3.2: Sample selection and follow up

Data Collection: Pilot testing was done for five weeks, two hours weekly on Fridays, in both health institutions to enable the patients to have adequate exposure to the content of the programme. This was to evaluate their opinions about it and also to allow health-care professionals to have adequate time in training to combat probable challenges of implementing the programme (Baranowski, Cerin & Baranowski, 2009). Consent was taken prior to offering the programme and was signed by the participants (Appendix 5). Demographic data was collected (Appendix 8). Patients were provided with all the resources needed to facilitate adherence and learning. Logbooks were given patients to enable recording of homework assignments in between the programme sessions. Goal setting action plan sheets were given for counselling sessions and in the case note for reference purpose. Adequate information about the programme, materials and content was given by health-care professionals during the programme. All lectures, activities and timing were maintained and health-care professionals in the institutions who had been prepared through the one-day workshop took part in the pilot testing. Participants' anthropometric data were taken Pre-test to determine their baseline understanding and anthropometric data weight and height to calculate Body Mass Index (BMI). Blood pressure and FBS were also taken. The use of post programme evaluation participant interviews was also used to determine the effects of the programme on the patients.

Instrument: The instrument was a log maintained by the researcher which included patient demographics, diabetes outcome measures including Fasting Blood Sugar (FBS mg/dL), Systolic and Diastolic BP (BP mmHg) and anthropometric measurements of height (cm) and weight (kg)). Blood pressure was taken by the nurse in the clinic using a standard manual blood pressure monitor. Weight and height was measured using a Sohenle patient weighing scale with

a height rod. Height was measured to the nearest 0.5cm and the weight was measured to the nearest 0.1kg. Fasting Blood Sugar blood samples were obtained pre intervention on the 26th of September and post intervention on the 7th of November. Fasting Blood Sugars were collected after 8 hours of fasting and tested in the local hospital laboratories.

Data analysis: The primary diabetes outcome measures were FBS levels and BMI ratios. The secondary measures were mean blood pressure and mean weight loss. Participants' Blood Pressure (BP in mmHg) and anthropometric measurements of height and weight were checked on the first day. Fasting Blood Sugar (FBS) results were recorded from the laboratory results. Body Mass Index (BMI) was calculated using the standard formula of BMI=weight/(height) 2Pre and post test scores and anthropometric measures were compared using non-parametric tests (Related Samples Wilcoxon Signed Rank Test and Independent Samples Mann-Whitney U test). A Fasting Blood Sugar level less than 80-125mg/dL was considered as glycaemic control.

3.7.6 Step 6: Develop plan for programme adoption, implementation, sustainability and evaluation

Although step 6 was not included in the scope of this study, plans were made for the adoption, implementation, sustainability and evaluation of the educational programme.

Researchers have argued that effectiveness of an intervention will not be felt if the programme is not used (Oldenburg & Glanz, 2008). Others also argue that an intervention research must be evaluated, adapted and disseminated in order to be classified as design and developmental research (Richey & Klein, 2007). The researcher then drew up two plans, one to adopt, implement, sustain and evaluate the programme (Step 6). This step will enable the management staff in the health institutions to implement and evaluate the educational programmes.

Plan 1, programme adopters and implementers were identified, the programme's objectives and outcome were stated and matrixes of their performance objectives and the determinants were designed for adoption, implementation and sustainability.

Plan 2, apart from the earlier evaluation study plans were made for process and outcome evaluation of the programme with a description of programme outcomes. Questions were outlined that might facilitate evaluation of both patients and health-care professionals. A matrix of actions to be performed was also developed.

3.8 MEASURES TO ENSURE RIGOUR

3.8.1   Measures in qualitative studies

Trustworthiness in a qualitative study refers to the objectivity of the data or the truth value of the findings (Lincoln & Guba, 1985) and can be described as the accurate description of the data from the participants' experiences. Although quantitative researchers view qualitative research differently to other research because of the methods utilised, the overarching goal of trustworthiness is to show the rigour of the study (Golafshani, 2003). In the integrity framework Lincoln and Guba (1985) suggest four criteria for ensuring trustworthiness of a qualitative research, they are credibility, dependability, confirmability and transferability. Guba and Lincoln (1994), also include authenticity, which is a construct in a constructivist paradigm. To ensure rigour of this study, the researcher adopted the five criteria proposed by Lincoln & Guba (1985; 1994).

Credibility: Credibility is equivalent to internal validity of the positivist, which refers to the confidence in the truth of the data and the interpretations or the belief in the findings of the study (Polit, Beck & Hungler, 2006). The measures employed to ensure meeting these criteria were:

- The researcher ensured that the research methodology incorporated adequate operational procedures, such as a sampling method using the purposive sampling method and data was derived from semi-structured interviews, participant observation and focus group discussions.

- Prolonged engagement with the participants and context was achieved via visits to the health institutions to get familiar with the culture, while trust was established before the commencement of the research. During the research process the researcher spent 30 minutes to one hour with the participants in the process of data collection. During data analysis, quality time was spent with the data since the researcher engaged in repeated readings to become immersed in the data.

- In terms of triangulation, various methods were used in data collection and there was triangulation of results of the different methods before the programme development, which enabled the researcher to arrive at the Themes used for the programme. Additionally, a wide range of participants were involved in data collection, namely patients and health-care professionals from different disciplines and therefore triangulating of data sources was possible and a rich picture of the patients' behaviour was constructed as a result of the

contributions of the different professionals (Shenton, 2004). Data was collected from two health institutions in order to reduce the effect of local factors as a result of using one institution. Site triangulation was also achieved.

- Participants were given autonomy to participate in the research and they had the right to discontinue when and if they so desired without any fear of penalty. There was no form of coercion or intimidation to ensure honest information and therefore data was freely offered.

- Member checks were ensured during data analysis to provide context and alternative clarification. Reports were taken back to some participants to check whether or not the transcribed word represented their thoughts and experiences (Creswell, 2007). Guba & Lincoln (1989) viewed member checking as the most essential strategy for credibility (Shenton, 2004).

- An independent coder was involved with the data analysis and this was done to check the researcher's subjectivity and also to ensure that interpretations were coded accurately against the emerging themes. Reflexivity was done intermittently to evaluate the researcher's role as the study developed and diaries were kept to record actions and thoughts that were used to understand the self-involvement, influences and bias in the study.

- A thick description of health education for self-management of Type 2 diabetes, the participants, the context and the research methodology to enable readers to develop insight into the research and determine the true value of the study was done.

- A literature search was carried out to confirm the findings from the data analysis. The literature search also assessed the consistency of the results obtained by other studies (Silverman, 2010).

- The researcher's experience and qualifications are also significant because the researcher is the major instrument of data collection and analysis (Polit & Beck, 2012) and therefore there was a need for explicit information regarding the researcher's role during various research processes. Ethical approval was obtained from the university's ethics committee and also from the health institutions and the various heads of units before gaining access into the various units. The PhD programme was made possible through an in-service training granted by the University of Benin, Benin City and it was funded by the Nigerian Government's Education Trust Fund (ETF).

- Peer scrutiny of the research was performed through a departmental research seminar and through discussions with colleagues and peers. Feedback was used to refine the methods and to improve the research's general outlook.

Transferability: This can also be compared to generalisability and the external validity of the quantitative research that is related to the extent of applying the results of a study to other situations (Streubert Speziale, 2007). It can also be described as applying a study finding outside of its original context. Although the aim of a qualitative study is not for generalisation but to generate evidence (Polit & Beck, 2012) of the phenomenon, contexts, the process of data collection, analysis and the result to enable the reader to gain insight and then apply it to a new situation. To achieve this, the researcher gave a detailed rich description of the process, the participants, contexts and the results in order to allow readers to gain insight and to make a transfer.

Dependability: This criterion corresponds with the reliability of a quantitative study. The criterion is focussed on the integrity in the study and the stability of the data over some time and conditions. According to Lincoln and Guba (1984), credibility cannot be obtained in the absence of dependability therefore it can be achieved through the use of multi-methods of data collection. In this instance it was realised through use of multi-methods of data collection, peer debriefing and an audit trail, since their input was valuable from the planning stage up to programme development. Additionally, the input of the research supervisors was valuable.

Confirmability: Refers to objectivity in the data generated as well as accuracy in the process of data generation and analysis. It is also concerned with the proof that the data represents the participants' opinions and that the transcription was not created (Polit & Beck, 2012). Data collection was guided by research questions that were scrutinised by the supervisor and an experienced senior colleague. Additionally, an experienced interviewer guided the focus group discussions to ensure skills development and efficiency. Member checking was done. The use of an experienced independent coder for data analysis to ensure accuracy in data interpretation and avoid subjectivity was very helpful in determining this criterion. The participants' voices were ensured through accurate transcription of data, analysis and presentation.

Authenticity: This criterion was included in 1994 by Guba and Lincoln. It refers to the ability to show different realities in the research process, from data collection to the interpretation of results. This is the extent to which the readers can follow the trend in the phenomenon of

interest while they become sensitive to the issues being described and are better able to describe the participants' lives being described. The report contained excerpts from the interviews, reflecting the participants' experiences in health education and self-management and their interactions with the environment. There was also a detailed description of the research process.

3.8.2 Measures in quantitative study

The rigor of quantitative research involves a consideration of validity and reliability. Whereas validity involves the amount of confidence that one has on the uses and interpretation of information collected, reliability is the consistency of information collected (Nitko & Brookhart, 2010). There is internal validity which focuses on whether there is a causal relationship between treatment and the outcomes; external validity attempts to find out the extent to which the results can be generalized. Reliability has an internal component where interest is consistency of results among subjects. External reliability concerns consistency across results.

3.8.2.1 Validity

To ensure the validity of the quasi-experimental study, attempts were made to address threats to internal validity. The internal validity is the extent to which one can say that the programme caused the outcomes. The threats to internal validity such as history, maturation, regression were not seen to be important here as the study period was not too extended. This study does meet the criteria for a two group before and after design, but possible selection bias may exist due to the lack of randomisation. This is countered by the alternate day selection of participants. Attempts were also made to reduce bias by keeping the two groups separate as the programme was held on a different date from the patients' routine clinic days as the possible confounding impact of the Hawthorne effect is acknowledged. The programme was held within the health institutions but outside the clinics. External validity which focuses on how generalizable the results are was taken care of as extraneous variables were not allowed to operate. To ensure an adequate sample size, sample size was calculated with the aim to have enough power to determine effectiveness.

3.8.2.2 Reliability

Reliability in the quasi-experimental study was ensured in the following ways:

- Only one staff member was involved in the measurement of all anthropometric measurements.

- Blood pressure was taken by the nurse in the clinic using the same blood pressure machine.

- Weight and height was measured using a Sohenle patient weighing scale with a height rod.

- All blood tests were done in the health institution laboratories.

3.9 ETHICS

An ethical certificate number 13/9/37 for the study was obtained from the Senate Research Committee of the University of the Western Cape (Appendix 1). Permission to gain entrance to the health facilities was sought from the management board in charge of the secondary health facility and from the Research and Ethics Committee of the tertiary health facility and permission was granted.

The Belmont Report articulated three ethical principles on which this study was based (Beauchamp, 2008), namely:

The principle of beneficence: This principle is based on freedom from harm. The researcher does not anticipate any harm from the process of research but there could be some form of psychological distress in the process of discussing experiences with others. Participants were protected from physical and psychological harm since careful thought was given to the nature of intrusion on participants' wellbeing. Qualitative research is unpredictable and it involved participants discussing their understanding of Type 2 diabetes and self-management, which may be distressing to patients. Therefore, some form of minimal harm was expected, especially psychosocial distress. The researcher made a sincere effort to support participants during the research process, since patients' countenances were observed through their facial expression and voice tone changes and very sensitive questions were avoided. The researcher's phone number and email were made available for any future clarification of issues.

Participants were free from exploitation. Participants were not exploited because data was collected on the participant's appointment date and all effort was made to avoid extra financial involvement attached to their participation. Minimal time was used for interviews and the routine appointment time was not encroached upon. Patients were interviewed after their normal consultations and other routines at the hospital. Participants were informed that they might be contacted again to clarify issues and member check.

The potential risks and benefits were discussed with participants. This study had minimal risks in comparison to the benefits for the participants. Adequate information regarding the study

was given to the patients to enable good understanding of the purpose and benefits of the research.

The principle of respect for human dignity: The researcher established rapport with patients and maintained effective interaction throughout the research period. Participants had the right to voluntarily participate in the study and to terminate at any time without any penalty or intimidation. They were respected and there was no lowering of self-esteem of participants during focus group discussion since all participants were treated equally and there was no form of argument and participants had the equal right of participation and their opinions were respected. The nature of the participatory approach to research is also embedded in the principles of respect for human dignity.

Principle of justice: this is everyone's right to fair treatment. Participant selection was done fairly because the eligibility criteria were strictly followed and no discriminatory selection occurred. Those who declined or withdrew at any time were not victimised. Participants were offered access to supportive care as a result of any psychological distress, although no participant was referred. Most of the women were experiencing psychological stress due to illness and some spouses were not cooperative. These women were counselled and some were referred to the dietician for dietary counselling.

In addition, the following two principles were also applied:

Right to privacy: information collected was kept in confidence and coded so that data could not be linked to the participants to ensure confidentiality. Only the supervisors and the external coder had access to the information that was kept under lock and key. Thick descriptions were maximally used and permission to use direct quotes for the process of publication was obtained. Anonymity was guaranteed.

Informed consent: Adequate information about the study regarding the time, purpose, process of the study, discomforts and potential benefits to them and others was disclosed to the participants and their written and oral consent were obtained. The hospital routines were not interfered with and embarrassing questions to the participants and the organisations were avoided. Participants were informed about the use of the audio recorder for all the interviews and permission was received from the participants after they were informed about the purpose of the study. They were assured that their identities would not be disclosed while the recorder was in use.

In the qualitative study, participants were informed about the field notes being taken during the focus group discussions.

In the quantitative study, the purpose of the study was explained to the patients, including the time frame for data collection which was not exceeded. The patients' time of consultation was not encroached as intervention classes were held on a day agreed upon by the patients and the health care professionals, also the control group members were interviewed after their normal consultations and other routines in the hospital. Participants were informed of the likelihood of being contacted again for clarification of information and some of them were contacted during program development. Participants who could not afford glucose meter were provided with meters to enable them practice and master the skill of self-blood glucose monitoring at home. Strips were also provided for all the patients throughout the period of the intervention program to prevent and minimise unnecessary financial strain on the patients. Confidentiality and anonymity of the participants were addressed and adhered to by providing their records with unique identifiers such as pseudo names.

Result of the study was communicated to the institutions where the study was carried out, the participants were informed of the results during the programme development and other patients were seen at their clinics. The result of the evaluation study has been accepted in an International peer review journal for publication and the other results will be published in educational peer review journals later.

3.10   SUMMARY

Embarking on this study required a qualitative research process to guide the study. Overall the IMF guided the methodological process, thus providing structure for the study. Data was collected in phases that informed each other. A purposive sampling technique was used to sample the participants, namely patients with Type 2 diabetes and health-care professionals (nurses, dieticians and social workers). Phase 1 situation analysis was done though semi-structured interviews, participant observations and focus group discussions, which facilitated the generation of rich data from the participants. Transcription of data was done and data analysis was accomplished using Tesch's (1990) descriptive analysis approach to generate themes and categories. Phase 2 was a collaboration involving the researcher and stakeholders (health-care professionals and patients with Type 2 diabetes) in the development of an educational programme for self-management, using data from phase 1 and literature search. A

detailed description of the quantitative approach utilised in evaluating the programme was also described. In Chapter four the result of situation analysis was presented and discussed according to the relevant literature.

CHAPTER 4: DISCUSSION OF RESULTS
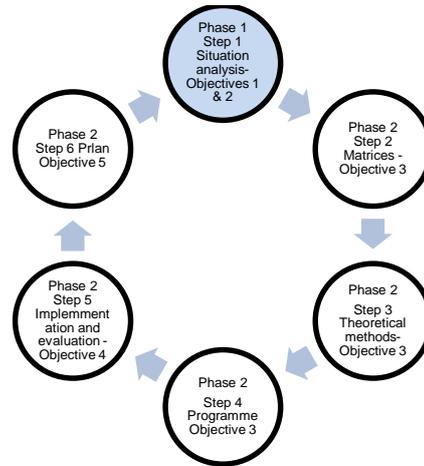
4.1 INTRODUCTION

This chapter presents the results of analysis of data collected from Step 1. The data includes themes and categories that have emerged during the situation analysis of the intervention mapping framework. The results and discussions are presented logically according to the methods of data collection.

The two objectives of Phase 1 were:

- To explore and describe the patients' understanding of diabetes and self-management of Type 2 diabetes; and
- To explore the health education by health-care professionals to Type 2 diabetes patients.

The results are presented in four sections. The *first* section presents the themes generated from the patients' interviews, the *second* section presents the description of findings from the observations, the *third* section presents the themes from the health professionals' focus groups and the *final* section presents the triangulation of the findings. The results are presented in a narrative structure including participants' quotations that are reported in italics and supported by literature.

4.2 INTERVIEWS WITH PATIENTS WITH TYPE 2 DIABETES

Semi-structured individual interviews were conducted with patients with Type 2 diabetes from two health institutions.

4.2.1 Description of study participants

The participants were 30 patients with Type 2 diabetes attending consultant outpatient clinics in the health institutions (Table 4.1)

Table 4.1: Frequency of background of participants in the individual interviews

Background	No of participants
Sex: Males	12
Females	18
Age group in years:	
40-50	7
50-60	14
60-65	9
Tribe: Bini	16
Esan	4
Etsako	3
Igbo	2
Urhobo	4
Yoruba	1
Highest educational qualifications:	
No education	2
Primary school	10
Secondary school	11
Tertiary education	7
Occupation:	
Civil servants	4
Retired civil servants	3
Traders	14
Artisan workers	6
Farmers	2
No occupation	1
Marital Status:	
Married	25
Divorced	4
Widow/widower	1
Years of diagnosis: 1-10 years	21
11-20 years	7
21-30 years	2

There were 30 participants (patients), 14 from the tertiary health facility and 16 from the secondary health facility. They were 12 males and 18 females within the age group 40-65years old. Participants were from different ethnic groups within Edo State and the neighbouring states in Nigeria. Their occupations ranged from housewives, traders, artisan workers, farmers, retired civil servants, to civil servants (Table 4.1). Their educational status varied from primary school education, junior secondary school, senior secondary school, diploma certificates, to university graduates, while some of them had no formal education The majority of the participants were married, some were divorced and a few were widows. Their years of experience as patients with diabetes ranged from six months to 30 years, which showed that many of the participants had managed the disease for a long time. Only one of the participants

engaged in smoking and a few of the participants consumed alcohol which they said is taken only during social gathering.

4.2.2   Discussion of individual interviews results

A central theme and six themes with categories emerged from the individual interviews with patients. An overview of the themes and categories are presented in Table 4.2.

Table 4.2: Themes emerging from the individual interviews of patients

Themes	Categories
Awareness and understanding of diabetes	Awareness of diabetes as a disease Causes and effects of Type 2 diabetes Symptoms of Type 2 diabetes
General management of diabetes	Understanding and management of diabetes through exercise, diet and drugs, self-monitoring of blood glucose and lack of equipment Use of traditional medicine Belief in faith to cure and cope with diabetes
Health education on diabetes	Acknowledgement of health education by health-care professionals
Accessing information on diabetes	Lack of knowledge/information on diabetes Lack of education on diabetes Sources of information on diabetes from peers, media, family members
Perceived facilitators and challenges in managing diabetes	Facilitator: Support from the family Challenges: Expensive and challenging diseases and changing lifestyles Pressure of socialisation in the community Fear of stigmatisation
Recommendations on the management of diabetes	Different suggestions regarding the management of Type 2 diabetes Patients have a need to ask more questions about diabetes/need to be more educated and have a need to know more about diabetes

4.2.3   Discussion of the central story-line

The underlying story-line of the interviews was that patients understood Type 2 diabetes as a sickness superficially and tacitly and they thus found the self- management of their diabetes challenging. Diabetes is described as challenging with relation to e.g. expenses and is also found to be more prevalent among the lower socioeconomic group (WHO, 2012).

Understanding diabetes as a disease is paramount in managing the disease. Diabetes as a lifelong, incurable disease needs to be understood to enable individuals to manage the disease.

112

It was generally evident that there was awareness of diabetes as a disease, but that patients with Type 2 diabetes were not able to manage the disease due to certain challenges. Even though patients encounter various challenges in the process of self-management, studies have shown that the benefits of health education can cushion these challenges (Powers et al., 2015).

Six themes and related categories (Table 4.2) emerged from the individual interviews. A narrative account of the themes and categories is supported by direct quotations from participants as follows (*in italics*).

4.2.4   Theme 1: Awareness and understanding of diabetes

Nurses at the health facilities provided patients with Type 2 diabetes with health talks on the consultation days, using a traditional patient education method to provide information on diabetes and different methods of self- management. It was anticipated that participants would have some awareness of what diabetes is and what it means. Three categories emerged in Theme 1, namely awareness of diabetes as a disease, causes and effects of diabetes and symptoms of diabetes.

4.2.4.1 Category 1: Awareness of diabetes as a disease

The category of awareness of diabetes as a disease focused on what diabetes is and what it means to patients. Awareness and understanding of diabetes is essential for self-management and positive coping with diabetes, especially in the prevention of life-threatening complications. Studies have shown that increasing patient knowledge regarding the disease and its complications has important benefits to patients' adherence to treatment and to decreasing complications associated with diabetes (Brunisholz, Briot, Hamilton, Joy, Lomax, Barton, . . . Cannon, 2014). It was assumed that knowing will enable the individual to take precautions to avoid complications.

A few of the participants gave a comprehensive description of diabetes as a process within the body:

"It is lack of the activity of insulin in the body which controls the sugar level…". (P 19)

Participants based the disease's description on the signs and symptoms they experience as patients. These participants also know that diabetes is a disease that causes excessive urination and the presence of sugar in urine:

"This is when you pass urine excessively, at night 3 to 4 times… when you sustain injury it takes time to heal, when you eat a large quantity of rice and yam flour the blood sugar increases…". (P 17)

"…diabetes is a sickness that makes you pass excessive foamy urine because of the sugar substances contained in the urine…". (P 13)

The participants showed a shallow understanding of the sugar levels of diabetes as to what diabetes is:

"High sugar in the body...". (P 3)
"Diabetes is too much of sugar in the body...". (P 21)
"I was told that the sugar level in the blood...". (P 23)
"... I was told that it is excess sugar in the blood system...". (P 26)
"I learnt diabetes is caused by sugar, the sugar level in the blood is high...". (P 1)

"I was told diabetes is too much sugar in the blood. This can cause damage in the body such as heart failure, cancer, if you can maintain your blood sugar...". (P 4)

Among many African urban and rural dwellers diabetes is commonly referred to as "sugar disease" and a patient with diabetes considered to be someone with too much sugar in the blood (Awah, Unwin & Phillimore, 2009; Kiawi, Edwards, Shu, Unwin, Kamadjeu & Mbanya, 2006) The experiences provided by the participants attest to a basic understanding of diabetes. These results are in tandem with a similar study in Nigeria (Kolawole et al., 2010) and studies in South Africa and Brazil that showed a reasonable understanding of diabetes among patients (Ayele, Tesfa, Abebe, Tilahun & Girma, 2012; Rodrigues, Santos, Teixeira, Gonela & Zanetti, 2012).

Many of the participants referred to diabetes differently, revealing their psychological feelings or perceptions of the disease:

"Diabetes is a deadly disease and I do not like it, I have never suffered it". (P 2)
"It is not an easy experience; it requires good management in order to survive…". (P 9)

"Diabetes is not a good disease I cannot eat what I like…". (P 19)

The diagnosis of a chronic illness may be shocking to many people, however a diabetes diagnoses may require a bio-psychosocial change in the individual's lifestyle. Some of the participants' experiences confirmed this:

"Diabetes is a thing that no one prays for it comes on an individual suddenly. I learnt diabetes is a killer disease so one needs to control it…". (P 22)

"I was told that diabetes is a killer disease with excess sugar in the body…". (P 6)

"When I was diagnosed, I was very sad and disturbed because I thought the end has come…".
(P 7)

The diagnosis and subsequent changes required by these patients is a lifelong change that was not anticipated and could therefore be a source of stress and psychological anguish. Reports show that mental and psychological problems are experienced by patients with Type 2 diabetes (Mommersteeg et al., 2013). Such experiences of psychological anguish are evident in the participants' experiences.

4.2.4.2 Conclusions

Awareness of diabetes as a disease among patients with diabetes is important for self-management and adherence to treatment. Self-awareness could reduce stress because then patients could be aware of what to expect.

- The participants showed understanding of Type 2 diabetes specifically on being a disease with high sugar, or based on signs and symptoms, such as increased urination.

- Although participants were aware of the disease it is often accompanied by psychological anguish. How is it for you to educate Type 2 diabetes patients?

- The management of Type 2 diabetes requires individual lifestyle changes for which an understanding of the disease is essential for adherence and the promotion of quality health.

- Participants need to move beyond this rudimentary understanding of the disease in order to empower themselves to confront challenges they might face in managing the disease.

- Participants depend on health-care professionals and other sources for information on the disease.

- Health related information is a vital determinant of performance of behaviour especially among patients with diabetes.

- Therefor there is a need for health-care professionals to provide an education programme that addresses awareness of the disease, reduction of stress and increased self-control and active participation in taking care of their own health.

4.2.4.3 Category 2: Causes and effects of Type 2 diabetes

Participants had some understanding of the causes/risk factors predisposing them to developing diabetes. Some of the participants knew that if they were excessive overweight it play a role in Type 2 diabetes:

"Weight can cause it too, so I am struggling to reduce my weight; the diet one eats is a cause too…". (P 7)

"I know that it is caused by hereditary, excessive weight and excess of carbohydrate[s]…".

(P 11)

Participants had relatives with Type 2 diabetes and were able to identify heredity as a risk factor in developing the disease:

"Diabetes is a disease that runs in the family in my own case, my father had diabetes; also our food could cause diabetes…". (P 5)

Having a close relative with a chronic illness can be a good source of health information (Ezenwaka & Offiah, 2003; Whitford, McGee & O'Sullivan, 2009) and the information may also arise from caring for someone with Type 2 diabetes.

The experiences showed that diabetes is becoming a common household disease in Nigeria since these participants knew that their parents and siblings had diabetes. This experiences were in agreement with other studies that reported patients' knowledge of some risk factors of diabetes, especially the heredity factor (El-Khawaga & Abdel-Wahab, 2015; Ulvi, Chaudhary, Ali, Alvi, Khan, Khan & Shahid, 2009)).

The majority of participants attributed diet as a risk factor, especially in relation to the consumption of diet high in carbohydrates:

"...Eating sugary food may cause it…". (P 2)

"...But I think when one takes a lot of sugar or sweet food, she may develop diabetes…". (P 3)

"The diet one eats is a cause too. The diagnosis affected me in my thinking because I thought eating sweet food and drinking beverage is the cause of diabetes, which I do not indulge in…". (P 4)

"It is as a result of eating lots of carbohydrates…". (P 6)

"It is as a result of eating lots of carbohydrates. Diabetes patients do not have sufficient insulin to digest carbohydrates…". (P 7)

"If you eat sugary food it may cause diabetes in future…". (P 9)

"Eating sweet things, but I don't take alcohol. I do not know how I came about the disease, was really very surprised when I started having oedema and when I consulted the doctor, he made a diagnosis of diabetes…". (P 18)

"People said eating too much sugar, taking alcohol and consuming sweet food…". (P 22)

> *"…I was told that sugar or carbohydrate consumption is not the cause, so I am confused, eating excessive sugar is elementary, as there are some secondary causes like heredity and some other means…".* (P 6)

These experiences revealed the lack of adequate information regarding nutrition management, since many participants still believe that eating a sugary diet predisposes an individual to Type 2 diabetes, which assumption could be linked to poor knowledge of the relationship between nutrition and diabetes (Al-Maskari, El-Sadig, Al-Kaabi, Afandi, Nagelker & Yeatts, 2013). However, this knowledge is inadequate because the end product of all carbohydrate food is glucose and therefore it is inaccurate to attribute the occurrence of diabetes only to sweet food. The diets recommended for diabetics are foods such as sweet potatoes and some fruits and although they are sweet the glycaemic index is the important consideration (Bahado-Singh, Riley, Wheatley & Lowe, 2011). Although researchers have shown positive associations between eating food with high glycaemic indices and risk of Type 2 diabetes (Jung, Suh, Hong, Kim, Hong, Hong & Chang, 2009), not all carbohydrate diets result in high glycaemic indices (Bahado-Singh, Wheatley, Ahmad, Morrison & Asemota, 2006) and such diets are important.

Some participants added the following risk factors of their disease:

> *"I do not know the cause, but my children said old age can cause it…".* (P 8)

> *"It could be associated with alcohol as I was taking alcohol before…".* (P 21)

These experiences differed from the commonly mentioned risk factors and could be attributed to these participants' experiences or from accessing information from other people within their social groups. Old age is a risk factor to Type 2 diabetes and studies have shown an increased prevalence of diabetes is common with old age (Ma & Chan, 2013). The consumption of alcohol is also implicated as a risk factor and also as a behavioural change occasioned by improved economic development.

Diabetes complications affect multiple organs and reduce quality of life. Knowledge of the complications is important since it could influence participants' adherence and prevent complications. The majority of the participants had awareness regarding complications since many of them revealed that they were already experiencing these complications.

The experiences revealed that participants' knowledge of complications may have been based on previous complications:

> *"…it weakens the organs of the body, causes cataract[s] in the eye and poor vision because of the sugar substance...".* (P 13)

"It could cause stroke, eye problem[s] such as blindness and destroy something inside the body, does not heal…". (P 18)

"There is no physical sign, but I don't know…I had a partial stroke last year February, which affected my voice and my right hand…but my speech is still slurred... My manhood…it has caused me my manhood…". (P 19)

"It can cause blindness; without my glasses I see blurredly…I have impotency...". (P 21)

"I found out that I do not have erection so I can no longer have affair with my wife, so I have weak erection...". (P 22)

"It affects organs within the body as it weakens the body...". (P 25)

"I have experienced loss of libido although I am a widower but I do not have any interest and when I attempted I had poor erection which I think is due to diabetes. ...". (P 6)

"I do not know, but I know that diabetes is a bad disease that can affect other parts of the body if not properly cared for. When I had the symptoms, I could not see properly, even to read or dial my number...". (P 29)

"It can cause blindness, without my glasses I see blurredly, causes hypertension as you see my blood pressure is high, I have impotency and I think it is the cause, constipation, burns on any part of the body like the penis, the diabetes has burnt mine…". (P 21)

Participants had some knowledge of diabetes complications as it affected various organs. This finding is similar to other studies where patients with Type 2 diabetes had some knowledge of complications of diabetes (Al Bimani, Khan & David, 2013; Ali, 2011; dos Santos, dos Santos, Ferrari, Fonseca & Ferrari, 2014) and is in opposition to other studies in Bangladesh and Nigeria where patients had poor knowledge of complications of diabetes (Desalu, Salawu, Jimoh, Adekoya, Busari & Olokoba, 2011; Islam, Niessen, Seissler, Ferrari, Biswas, Islam & Lechner, 2015).

An interesting part was that knowledge of complications may not guarantee adherence, since a participant stated that he did not heed the information until he developed complications:

"I smoked and engaged in alcoholism until about five years ago when I was almost dead due to the severity of the disease. In my case the kidney was affected because I had diabetes and hypertension, when I developed diabetes ulcer, the doctor changed my treatment to insulin and I have been on it for two years now. I got serious with the management and all the problems have stopped and the wound is almost healed". (P 9)

The goal of diabetes care is to assist participants with knowledge and skills to enhance self-management and reduce complications or delay the onset of complications. It is imperative that patients have adequate knowledge of complications in order to adhere to treatment (Rise, Pellerud, Rygg & Steinsbekk, 2013), but a study has shown that awareness does not

automatically lead to practice (Odili, Isiboge & Eregie, 2011). This shows that there is disconnect between knowledge and practice and could be a function of motivation to engage in self-management and also patients' perceptions and values for their lives. Although most of the complications mentioned are those suffered by the participants and they are indicative of the prevalence of complications among patients with diabetes in Edo State, Nigeria, which is similar to a Russian study where a high prevalence of complications among patients with Type 2 diabetes was noted (Litwak, Goh, Hussein, Malek, Prusty & Khamseh, 2013). Many of the participants were aware of the risk factors of Type 2 diabetes, although most of the factors are diet related, which may be attributable to a lack of adequate knowledge regarding dietary modification.

4.2.4.4 Conclusions

- Participants were aware of some of the causes/risk factors (weight, heredity factors and carbohydrates), but the experiences revealed a lack of adequate information regarding nutritional management.

- Participants experienced complications that inform their understanding of the effect of diabetes on their health.

- Prepositional knowledge existed associated with their experiences of the symptoms. Although this form of knowledge may facilitate self-management, these patients needed insight to the need for commitment to treatment.

- Participants need an understanding of some acute complications that every patient with Type 2 diabetes should know to prevent acute complications and death.

- Knowledge alone may not be sufficient to effect behaviour change there is a need to motivate patients into setting achievable goals to change their health behaviour and attitudes.

- The effect of goal pursuit and attainment is related to the ability to satisfy basic psychological needs consequently patients should be motivated to develop insight into the disease of Type 2 diabetes and develop skills to manage the disease themselves.

- Therefore, the importance of multi-disciplinary health education cannot be overemphasised since inadequate information erroneously provided to these patients can be corrected by dieticians using different approaches to raise awareness and increase knowledge.

4.2.4.5 Category 3 Symptoms of Type 2 diabetes

Diabetes is a disease that can be described as a silent killer because of its method of manifestation. The onset is gradual and it could take years before the manifestation of symptoms and complications develop. An individual may have an increased glycaemic level without realising it, until the disease is accidently diagnosed or manifestations of complications appear.

Many of the participants were aware of the symptoms of diabetes, which could be attributed to their experiences or what they may have observed in others. Some of the symptoms highlighted were:

> *"The individual feels dizzy as the sugar overpowers the blood…".* (P 13)

> *"An individual with diabetes passes urine frequently, sometimes with swollen legs, sweating profusely...".* (P 18)

> *"I had frequency micturition and quantity of urine was more. I was weak and restless especially at night". (*P 19)

> *"I was urinating about eight times at night...".* (P 23)

> *"I had frequency in micturition, emaciated with dry mouth and I was taking more water. I came to the hospital...".* (P 24)

> *"The first time I noticed that I was passing urine frequently...".* (P 26)

> *"I had fever, frequency in micturition, thirst and weakness…I was emaciated too and was not seeing properly".* (P 1)

> *"I passed urine excessively, headache, dizziness, I had sensation of feeling on pepper on my extremities...".* (P 3)

> *"I had temperature, headache[s], abdominal pain, constipation, offensive flatulence frequency in micturition and I was emaciated...".* (P 4)

> *"The signs I experienced is that I had frequency in micturition...".* (P 6)

> *"In my case, I had problems with my eyes so I visited the ophthalmologist, some investigations were done and I was told that nothing can be done until my blood sugar level is controlled. I also had cramps in my fingers and legs".* (P 11)

> *"Passed urine and ants were around the urine, cloudiness in the eyes, weakness, oedema of lower limbs and pain on the sole of the foot…".* (P 16)

> *"Prior to the diagnosis, my body was shaking and I had itching all over my body…".* (P 17)

These experiences revealed that participants were aware of the symptoms as they had experienced them. Some studies have shown good knowledge of symptoms among patients

with Type 2 diabetes (dos Santos et al., 2014; Okolie et al., 2009), but participants only mentioned those symptoms that they had experienced. Many patients with diabetes are found to have poor knowledge of the symptoms of diabetes (Deepa, Bhansali, Anjana, Pradeepa, Joshi, Joshi,Unnikrishnan, 2014; Mohammadi, Karim, Talib & Amani, 2015). Awareness of signs and symptoms of diabetes is necessary since it keeps the patients in check and reduces the risk of complications because patients are aware of signs to look for when their health status is deteriorating (Khurshid & Othman, 2014). Awareness and understanding of diabetes as a disease is assumed to have been enhanced through health education and through participants' contact with the health-care professionals (Rise, Pellerud, Rygg & Steinsbekk, 2013), since many of these patients have had diabetes for 20 years or more.

4.2.4.6 Conclusions

- The main symptoms participants were aware of urination frequency, dizziness, eye problems, weakness and pedal oedema.

- Participants' awareness of symptoms was based on those symptoms that they had experienced and which could have a negative effect on them and family members, because if an individual does not present with these symptoms the appropriate action may not be taken.

- Participants who have experienced diabetes for many years and exposed to health talk are expected to have been able to give more information than what these patients have given. This was a sign of lack of adequate information despite their continuous health talks in the clinic which is assumed to be either wrong information from the nurses or right information is given through an approach that does not allow for understanding.

- Some of the participants were aware of complications but did not adhere to treatment, therefore approaches to motivate adherence could be used to increase awareness and adherence.

- Participants are required to manage their own diabetes, they need to have an understanding of the effect of their actions and beliefs on their health;

- Hence, there is need to educate participants regarding other symptoms and effect using a different approach and to encourage screening of their family members.

4.2.4.7 Discussion of Theme 1: Awareness and understanding of diabetes

Knowledge plays an essential function in our everyday life. It indicates how an individual understands the world and may therefore determine the behaviour or the response to their surroundings. Although knowledge is a concept that is not evident, the consequences are evident through behaviours displayed (Hunt, 2003). That may be why Sueiby (1997:37) cited in Hunt (2003) suggests that knowledge is invisible and therefore defined it as a "capacity to act". Knowledge is also defined as information viewed as true in its sense, which is sufficient enough to lead to understanding (Megill, 2012). Additionally, knowledge is described as actionable information (Botha, Kourie & Snyman, 2014).

Knowledge is important to patients with Type 2 diabetes because through it they act to shape their health behaviour. The knowledge possessed by patients could determine their behaviour in their environment, especially on issues pertaining to their health. Patients with diabetes are given information on diabetes whenever they are given health talks and such information is expected to lead to an insight into the disease, however the knowledge provided during this study could be considered below average considering their years of experiencing diabetes and despite having received health talks from the nurses. The reason for low knowledge could be assumed to be as a result of the method of health education as patients are passive during teaching with minimal interaction with the nurses.

Knowledge can be classified as explicit or tacit and diabetes Type 2 requires different ranges of knowledge and skills to effectively manage the disease, often learnt during patients' engagement with the health-care professionals. Although experience plays a role in the management of diabetes, patients learn from the health-care professionals and increase their knowledge through their positive experiences, which is tacit knowledge. They therefore require both explicit and tacit knowledge. Explicit knowledge may be acquired through a structured education programme with individuals being exposed to formal teaching to impact scientific knowledge that can soothe their lives and their environment (ADA, 2010). In diabetes management the use of readable materials written in easily understood English language enables patients to have written reminders of health-related issues and this can be classified as explicit knowledge (Mancuso, 2010) that is useful to patients acquiring knowledge. Both forms of knowledge are important since the patients need the interaction of tacit and explicit knowledge to foster learning. The acquisition of Type 2 diabetes-related knowledge may not

be sufficient to increase commitment and maintenance of self-management since individuals need a minimal level of motivation from the health-care professionals.

4.2.5   Theme 2: General management of Type 2 diabetes

Type 2 diabetes has no cure, resulting in a lifetime of living with the disease and managing it. Management consists of behaviour modification, a pharmacological component and self-management skills to adequately cope with living with the disease. Self-management is viewed as the capability of individuals in combination with the health-care professionals, family and community to manage their disease, including lifestyle modification and the psychosocial consequences of the   chronic disease (Wilkinson & Whitehead, 2009). Participants are required to monitor and manage their health and to be vigilant about what they eat. In order to ascertain their self-management techniques, they were asked "*how do you manage your diabetes at home*". Experiences from participants showed awareness of some self-management techniques that they have been employed in their life-style. The perceptions of participants are presented under the main management strategy.

4.2.5.1 Category 1: diet, exercise and self-monitoring

Dietary modification is the cornerstone of the management of Type 2 diabetes (ADA, 2010). Diabetes is a metabolic disorder affecting carbohydrate, protein and fat metabolism and therefore diet plays a major role in regulating blood glucose and maintaining lipid levels and healthy living. The first line management of Type 2 diabetes is dietary management (ADA, 2014) and some patients have thrived well on it.

These participants acknowledged the role of diet in the management of Type 2 diabetes:

> "*Diabetes goes with food and vegetable. Food is very important. The recommended food is unripe plantain flour, to make plantain meal eaten with vegetable soup, wheat, semolina…*".
>
> (P 13)
>
> "*The diet is important; I eat unripe plantain, elubo, beans, moimoi, akara, water yam...*"
>
> (P 21)

Some participants also acknowledged that diet is prescribed in the management of diabetes:

> "*...and also I eat the prescribed diet. I eat plantain flour, beans, yam, pap, unripe plantain, wheat and soup...*". (P 22)

These experiences indicate that there was a prescribed diet for participants in the health institutions. According to ADA (2013b), diet regulation should not be a "one-size-fits-all" eating pattern for individuals with diabetes (Evert, Boucher, Cypress, Dunbar, Franz, Mayer-Davis et al., 2014). They recommended a low carbohydrate diet, with plant fat, protein, vegetable and fruit intake at every meal, the ingredients of which should be natural and unprocessed. Patients who have appropriate intake of carbohydrates and nutrients have improved glycaemic control and reduce their risk of complications (Coppell, Kataoka, Williams, Chisholm, Vorgers & Mann, 2010). However, most participants experienced the monotony of their diet since they were advised by some health care professionals to only eat certain foods and were prohibited from eating other foods.

This can be inferred from these experiences:

> *"The foods I take are plantation flour, wheat, beans, unripe plantain, vegetables and fruits…".* (P 15)

> *"I eat plantain wheat, beans, vegetable, white rice, fish, cracker biscuit, fruits like garden egg, cucumber and green tea. I do not drink mineral or anything sweet…".* (P 5)

> *"…the diet includes unripe plantain, wheat, unripe plantain flour, beans, wheat bread, slice of yam, rice and beans…this is how I have been managing diabetes...".* (P 20)

> *"The food is unripe plantain flour with soya beans, beans, and two slices of yam, vegetables and okra. …".* (P 1)

> *"…I was advised to eat cocoyam, unripe plantain, beans; but if I don't have enough food, I take cracker biscuits and groundnuts. I eat rice and beans...".* (P 23)

Only a few of the participants mentioned some factors that are considered with diet:

> *"We need to eat little quantity of all the food frequently, but before then I used to eat unripe plantain, amala with vegetable soup…".* (P 3)

> *"I have reduced the quantity of food I eat and [have been] advised to take more vegetable…".* (P 4)

A participant said that her diet is sugar-free and mentioned some of the food she eats:

> *"…I manage this condition by eating food that does not have sugar. I take vegetables, wheat, water yam…".* (P 20)

The diet mentioned was again a carbohydrate diet, but this was classified by patients as food without sugar due to the taste. The classification of food based on the taste could have a negative effect on glycaemic control, because the glycaemic index of foodstuffs is important in influencing blood glucose.

Timing of diet is also emphasised in order to allow for digestion before retiring for the night. A patient who takes supper early stated:

"...I was told about the diet and that I should take my supper before 5.30 p.m. to allow for digestion. If I eat later then 7 p.m. the diabetes will increase...". (P 17)

In Nigeria there is an erroneous belief regarding diabetes and diet; a diet that promotes certain foods and discourages carbohydrates (Ogbera & Ekpebegh, 2014). A study conducted in south east Nigeria confirmed that participants scored higher in areas that were more familiar, such as diet, which is the traditional feature of self-management of diabetes (Jackson et al., 2014). The study participants were able to discuss their dietary modifications in relation to carbohydrate intake without references to other classes of food such as protein and fats, which affects their metabolism. Medical nutrition therapy entails the quality of food, its quantity and the timing of the meal. The quantity of diet consumed by the participants is determined by certain factors such as the health status, age, weight, physical activities and the occupation; however, patients are advised to take a smaller quantity of food at regular intervals. Having an early supper is one of the misconceptions of diabetes because participants eat a very early supper without a bedtime snack and also lacked knowledge of their blood sugar which could affect the patients negatively.

The experiences from these participants revealed the focus of patient education given to these patients because the emphasis is predominantly on diet and doesn't appear to consider other factors. The participants' experiences also indicated that the suggested diet was monotonous and focussed on certain foodstuffs; this may lead to deficiencies that are against dietary recommendations for patients with Type 2 diabetes (Bantle, Wylie-Rosett, Albright, Apovian, Clark, Franz et al., 2008). This practise may affect glycaemic control and adherence. The Institute of Medicine (2000) reports that there was evidence that dietary modification could improve the clinical outcome of diabetes and that it is cost effective. They further proposed that an individualised diet provided by a dietician is central to good adherence.

4.2.5.2 Conclusions

- Diet is recognised as an important aspect of diabetes management and diets are often prescribed to patients without consideration of timing of eating their meals.
- Diets are often considered monotonous when the same food is eaten.
- There is lack of knowledge regarding what constitutes a good diet and the quantity of food to be consumed and there are misconceptions regarding a carbohydrate diet owing to common traditional beliefs about the disease.

- Misconceptions around diets need to be corrected through information given by a dietician to the patients.

- Learning and demonstration of skills are important as learning involves knowledge, values, skills and self-efficacy.

- Therefore, the dietician would teach patients with type 2 diabetes methods of managing diabetes with diet in order to increase adherence and quality of life.

4.2.5.3 Exercise

Increased physical activity and exercise are also known approaches for the prevention and management of Type 2 diabetes (ADA, 2010). Obesity, physical, inactivity and sedentary lifestyles are risk factors for the development of diabetes (Chen et al., 2010) and patients with diabetes are required to increase their physical activity or engage in some form of exercise to improve their glycaemic control and prevent complications.

Some of the participants knew that diabetes can be managed with increased physical activity. One of the participants was also aware of the effect of exercise on patients with diabetes:

> *"Exercise enables blood to circulate well so that sugar will not overpower you. I do walk or jog…I do exercise in my office when I am in the office…". (P 13)*

The effects of exercise on the system can only be achieved when the exercise is regular. Some of the participants engaged in exercise, but duration and consistency of exercise are important factors:

> *"I try to walk round the environment where I live or take a taxi to the market and walk round the market for window shopping...".* (P 21)

> *"I do a little exercise at home, I watch AM express TV show and then join them in doing exercise but not every day...".* (P 15)

> "…I now take a walk in the evening...". (P 5)

> "I am old, but I try to walk round my house…". (P 8)

The duration and intensity of exercise in patients with Type 2 diabetes is equally important, because they need to know the effect of the long-term duration of exercise on their health:

> *"I do a lot of exercise, like making long distance to see my mother...".* (P 17)

Studies have shown that a high proportion of Nigerian adults do not engage in physical activity (Abubakari & Bhopal, 2008; Oyeyemi, Oyeyemi, Jidda & Babagana, 2013). Additionally, adherence in developing countries has been reported to be poor (Ganiyu, Mabuza, Malete, Govender & Ogunbanjo, 2013). A study conducted in Nigeria showed a high level of physical

activity among participants (Oyewole, Odusan, Oritogun & Idowu, 2014), which was in contrast to another study that showed low levels of physical activity among patients with Type 2 diabetes (Kabanda & Phillips, 2011). There is a variation in the adherence to increased physical activity/exercise and thus motivation from health-care professionals to exercise is important.

Participants reported that they engaged in walking, especially within their environments and such activity may be related to leisure or to ease transportation. These assertions were similar those of a study that showed that women might also increase their engagement in household chores (Oyeyemi et al., 2013). Due to low socioeconomic status of many individuals in Nigeria, it is common for many individuals to trek long distances and to engage in farm work and thus these activities may not be considered to be increased physical activity by most Nigerians.

Health-care professionals need to place more emphasis on the importance and value of exercise to motivate those participants who may regard exercise as a foreign practise because exercise is uncommon in their environment. The benefits of exercise should be emphasised, namely that exercise facilitates coping with stress and also stimulates positive emotions, thereby reducing the mental effect of diabetes (Moonaghi, Areshtanab, Jouybari, Bostanabad & McDonald, 2014).
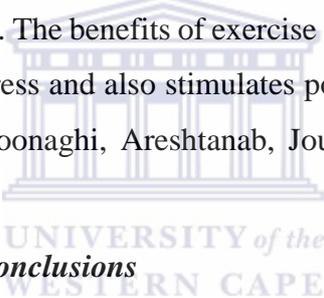
4.2.5.4 Conclusions

- The effect of exercise is known but not the duration and the consistency of exercise. More types of exercises must be included in a health life-style apart from walking and carrying out household chores.
- Although exercise is not a common routine in the environment but individuals have the capacity to influence their behaviour and the environment in a goal directed manner
- Participants could be motivated to value exercise through teaching various exercises and the importance and mentoring approach could but utilised by inviting specialists to the clinics to engage the patients.

4.2.5.5 Self-monitoring of blood glucose

Self-monitoring of patients' health and their blood glucose in particular, is crucial in the management of Type 2 diabetes. Participants are taught to monitor for symptoms of complications to ensure immediate response and to monitor their glycaemic state. In order to understand how participants, monitor their health they were asked how their blood glucose was monitored.

A few of the participants responded that they monitored their blood glucose at home, those who did monitor their glucose had glucometers at home and they understood the readings and the range of readings:

"I have a glucometer which I use at home…". (P 17)

"I have a glucometer which I use to test my blood for sugar level. I carry out the test once or twice a week. I was taught how to test my urine to know the presence of sugar also, but we do not use that again...". (P 22)

"I have the testing machine at home and I use it once a month and I also check at the clinic on appointment day… ". (P 26)

These experiences indicated that some participants monitored their blood glucose level at home despite their economic status and the cost of a glucometer, but testing was inconsistent. Some of the participants did not only check their glucose level but knew the importance of checking their health, they were also aware of management of problems that could arise as a result of adverse glucose level readings:

"I have my own machine for checking my blood sugar to know when it is high or low. If it is low, I will quickly take something to increase the level, if it is high, I will increase my medication and when low, I reduce the medication. I do check my blood weekly especially when I have eaten too much, then I reduce the quantity of food". (P 3)

"I was given the machine to check my blood sugar regularly, before eating. I was taught how to manage with my drugs depending on my blood sugar level, when the sugar level is high, I should increase the dose of the drug to enable it come down when I check the sugar level and it is lower than 65, I should take anything like mineral to increase the sugar level. The sugar level fluctuates". (P 11)

Participants differ in their testing since some indicated that they tested weekly and one participant stated that she does the test once a month before consulting the physicians.

The majority of the participants did not monitor their blood glucose because they only tested their blood glucose at the health facility when they consulted their physicians; they gave various reasons for not testing at home:

"I only do the FBS when I come to the clinic as I cannot afford the machine. I test blood when I visit on clinic days. I do not test my blood at home...". (P 13)

"I only test it when I come to the clinic or when the doctor sends me to the laboratory…I do not have the machine...". (P 16)

"I always check my blood sugar level whenever I come in for check-up, I cannot afford it, so I don't check it at home...". (P 18)

"I only test my blood on my clinic days…the machine is expensive so cannot afford it to use home…". (P 21)

"I only check my blood sugar in the hospital before my appointment. I know that it can be checked at home but I do not have the equipment…". (P 10)

"I always do the test once a month in the hospital before seeing the doctor but I hope to purchase my own equipment so as to test it daily…". (P 11)

Since diabetes management entails daily actions, the evaluation of blood glucose should be more regular and consistent (Garg, 2008). A few of the participants had glucometers at home, even though many of them are of the lower socio-economic group, thus showing their commitment to the management of their disease (Gelaw, Mohammed, Tegegne, Defersha, Fromsa, Tadesse et al., 2014). Nigerian studies showed that most patients with Type 2 diabetes do not test their blood glucose at home because they lack the glucometers (Eregie & Unadike, 2010; Nwankwo et al., 2010). The US Centre for Disease Control and Prevention reported that only 63.4% of diabetes patients monitored blood glucose once daily (CDC, 2007).

Some of the participants do not check their blood glucose at home and they do not consider it an important activity, this could be due to their attitude towards their self-management. One participant stated that he had not considered it and this may be attributed to a lack of knowledge of the benefits of monitoring:

"…I only check it in the laboratory few days before seeing the doctor. Although I know that the equipment can be bought and used at home, I have not given it a thought …". (P 4)

"I only check in the hospital when I come in for check-up, but I have problems checking because I am always late to the clinic. I have not checked my blood for about three months now. I do not have the equipment for checking as I do not have sufficient money… ". (P 6)

SMBG has been related to improved glycaemic control (Franciosi, Lucisano, Pellegrini, Cantarello, Consoli, Cucco et al., 2011) and is considered a basic element of self-management for patients with Type 2 diabetes (Tomky, Cypress, Dang, Maryniuk, Peyrot & Mensing, 2008). Glycaemic control is vital in monitoring the health status of patients with Type 2 diabetes and in defining the progress of complications. There is almost universal agreement that SMBG should be available to all patients with diabetes, its many benefits include the detection of hyperglycaemia and hypoglycaemia and the effect of increased physical activity and diet on glycaemic control (Malanda, Bot & Nijpels, 2013). An additional benefit is that the written results can be presented to a physician to enable him make an informed decision in adjusting hypoglycaemic agents (Malanda et al., 2013).

Participants should monitor their blood glucose at home and that such monitoring should be centred on patients' clinical needs and not on their ability to afford it (Owens, Barnett, Pickup, Kerr, Bushby, Hicks et al., 2004). Self-monitoring of blood glucose may have a positive effect on the health of the individual if the result is positive it can influence patients' behaviour by motivating them to adhere strictly to self-management activities due to the evidence of benefits of self-monitoring blood glucose (McAndrew, Napolitano, Pogach, Quigley, Shantz, Vander Veur & Foster, 2013). The result can improve the participants' self-management, beliefs and values that may affect their quality of life, because participants who realise that blood glucose results are lowered by engaging in some activities will be motivated to continue to do so. The common sense model of self-regulation suggests that individuals use their symptoms to understand their illnesses and evaluate treatments (Abubakari, Cousins, Thomas, Sharma & Naderali, 2015), therefore participants may be motivated when activities they engage in have positive effects on their blood glucose.

Participants may engage in self-monitoring. The accuracy of the monitoring system such as the test strip chemistry and the techniques used are factors that contribute to accuracy (Klonoff, Blonde, Cembrowski, Chacra, Charpentier, Colagiur et al., 2011) and these have to be taught to participants in order for the result to be meaningful.
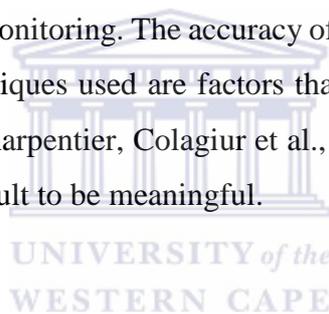
4.2.5.6 Conclusions

- Self-management of diabetes should be the cornerstone of disease management since patients are required to care for their health and be responsible for their actions, which translates into increased glycaemic control.

- Participants should monitor blood glucose at home with their glucometers, with consistency of use, without only relying on clinic testing, since self-monitoring is important.

- It is assumed that learning and demonstration of skills are important as learning involves knowledge, values and skills

- The need for a positive attitude of patients towards self-management of their disease is essential. Individuals begin to regulate behaviour and learning as they become self-efficient in performing skills.

- Most of the self-management activities would be performed within the participants' environment hence acquisition of skills to enable management of their own diabetes is

important as this could change their beliefs as they become competent in performing self-management techniques.

4.2.5.7 Medications

Although some patients can be managed with dietary modifications and increased physical activity, the majority of patients thrive better with different forms of hypoglycaemic medication (ADA, 2014b), such as oral hypoglycaemic drugs and injectable insulin.

A participants' experience was as follows:

> *"The individual is given some drugs which helps in reducing the blood sugar…"*. (P 13)

Another participant acknowledged the potency of the medication and this could be a function of the adherence to medication:

> *"...doctors give me [a] prescription for about six weeks, which has been very helpful in treatment…"*. (P 15)

Some participants' experiences indicated adherence to medication since they have experienced the effect of medication on their disease, however, despite these assertions, many of the patients' glycaemic control was still above optimal level:

> *"…I make sure I take my drugs regularly…"*. (P 17)
> *"I take my drugs as prescribed..."*. (P 22)
> *"...I always use only the drugs prescribed..."*. (P 20)
> *"I try to comply with the drugs..."*. (P 5)
> *"I have to keep my appointment with the doctor. I was on insulin injections for a long time until recently when he converted me to tablets…"* (P 3)

> *"I depend solely on the recommendation of the drugs given at the clinic..."*. (P 5)

Medication use has some benefits to the patient, the family and society (Asche, LaFleur & Conner, 2011), since adherence to medication has positive effects on the patients' health. Adherence is defined as the degree to which a patient's actions are in agreement with the prescribed time and dosage of a dosing regimen (Cramer, Roy, Burrell, Fairchild, Fuldeore, Ollendorf, & Wong, 2008). Participants' adherence is important since they depend on hypoglycaemic medication to prevent complications and to maintain glycaemic control. Reports have shown that adherence to a task such as medication, suggests adherence to other aspects of a management plan that are needed to regain health (Graves, Roberts, Rapoff & Boyer, 2010).

A study showed a high adherence rate among patients with Type 2 diabetes in Nigeria (Adisa, Fakeye & Fasanmade, 2011; Awodele & Osuolale, 2015), however, the adherence patterns in this study did not translate to glycaemic control as this was low. Another American study also showed high adherence to medication (Ciechanowski et al., 2014) and in this study it was evident that the communication pattern between the care providers and the participants significantly influenced their adherence and their glycaemic control.

Other studies have shown that the adherence rates were low in Nigeria and in Ghana, Bruce Acheampong & Kretchy (2015); Jackson, Adibe, Okonta & Ukwe, (2015), with many contributory factors being attributed to this low adherence. Diabetes drugs are expensive and thus, due to their socioeconomic status, the participants may not adhere regularly to treatment. Although the cost was recognised as a challenge, many of the participants in this study were adherent to their medication regimes.

The problem of adherence and non-adherence in chronic diseases is a global issue and this was a concern in the WHO's (2003) report on medication adherence, wherein a statement by Haynes et al. was quoted "that increasing the success of adherence interactions could have a greater effect on the health of the people than any improvement of certain medical treatments" (Sabaté, 2003). Patients who adhere to medication always present with good glycaemic control, which has been found to delay the onset of complications or prevent its occurrence (Basu, Khobragade, Kumar & Raut, 2015). However, in the literature, only less than 15% of adult patients have attained glycaemic control, normal blood pressure and low density cholesterol (LDL) (Nam et al., 2011). Therefore, adequate support and motivation may be required to gain patients' collaboration and participation in care, thereby enhancing adherence.

4.2.5.8 Conclusions

- Patients should be aware of the use of medication to manage Type 2 diabetes and the need for adherence.
- Visualised future events can be turned into reality, but this requires that the present directed intentions should direct and motivate the individual's focus of forging ahead
- Therefore, providing health information to increase patient insight into the actions of the medications would create awareness and beliefs thereby increasing adherence which will be manifested in good glycaemic control.

4.2.5.9 Alternative medicine

In African culture, individuals who are ill may use many forms of treatment ranging from self-help, medical treatment, traditional medicine, complementary medication, alternative medicine

and faith-healing. In Nigeria, traditional medicine runs parallel to the modern health-care system but there is no integration (Federal Ministry of Health, 2005). Many people in rural areas resort to traditional medicine (Opatola & Olabode, 2014), which may be attributed to various factors.

Participants in this study revealed that they do use their medications exclusively, but are inclined to supplement it with traditional medication in a bid to find a cure for diabetes:

> *"I used native medicine for some years although I was still seeing my doctor. I told some people about my health status and some native herbs were prescribed, I used it and it seemed as if the drugs subdued it, but some did not have any effect. I visited the traders who sell the native medicine and some mixture of traditional medications was given without any permanent cure, so I decided to leave everything for God".* (P 10)

> *"...I visited the traditional healer but they could not do much, so I had to stop...".* (P 21)

Some of the participants also resorted to taking herbal remedies that they eat or drink without knowing the correct dosage, but they had sufficient quantities:

> *"I have been using bitter leaves, I chew the leaves raw…".* (P 18)

> *"No other way, some people advise us to eat much quantity of bitter leaf. I also take or drink the bitter leaf water, when I take the bitter leaf water, I skip my drugs…".* (P 22)

The use of traditional medication could be influenced by the participants' support groups. This participant's response revealed the use of traditional medicine due to a parent's advice:

> *"After discharge, my mother brought traditional medicine and I took all with my drugs I was given in the hospital and I noticed some form of improvement. I do use native medicine such as bitter leaves; when you drink the bitter water, it flushes sugar out of your system. I also use "Osu" which is a native drug call "abiri", you mix it with water or native gin and then drink. I always mix mine with water because I don't drink alcohol. I then take it three times a day. The third one is another native medicine mixed with garlic; it is left for two days to allow for fermentation before it is taken in the morning to allow you [to] pass out all sugary substances in your body. All these will help reduce your sugar level".* (P 20)

These participants used the traditional medications in conjunction with orthodox medicine. From one participant's description, the medications were not quantified and the prescription was given to her without consultation. Type 2 diabetes is a chronic disease without cure, but according to traditional beliefs, every illness has a cure and the scientific prognosis of diabetes being incurable negates their faith in orthodox medicine and motivates them to use alternative treatments (Chinenye & Ogbera, 2013). Many of the herbal medications are not processed and their composition and prescription for participants are questionable, which puts participants at risk for multiple complications affecting major organs such as the heart and the kidneys. Herbal

medication has found favour among patients with Type 2 diabetes in both developing countries and developed countries (Hjelm & Atwine, 2011; Manya, Champion & Dunning, 2012; Nwankwo et al., 2010) since about 80% of people are reported to use traditional medicine for various ailments (Renzaho, 2015).

Many participants believe that taking bitter substances has an effect on the blood glucose control, but this notion is not scientifically sound. The main form of traditional medication used for the management of diabetes was bitter leaf, which is taken in liquid form or chewed, usually first thing in the morning since consumers believe that the bitter taste of the leaves will neutralise their blood glucose levels (Buowari, 2013). This practice was also reported by patients with diabetes in other countries (Manya et al., 2012; Shah, Kamdar & Shah, 2009). Some participants also used substances such as aloe Vera powder, garlic, ginger, Forever Living products, medicinal teas and other local herbs mixed with either alcohol or water (Xie, Zhao & Zhang, 2011), indicating the amount of complementary treatments that patients engage in globally.

The active ingredients, the toxicity of these medications, their side effects and their shelf life cannot be determined, especially in patients whose organs have been compromised. While some herbal medications may have positive effects, because their component is unknown, toxic substances contained in the medication could be injurious to the health of the patients (Buowari, 2013).

4.2.5.10   Conclusions

- The practice of alternative therapy alongside medical therapy among participants should be understood with regard to appropriate dosages and quantities.
- Alternative medications used are bitter leaves, osu, abiri mixed with native gin or water and other bitter substances that are erroneously believed to have a positive effect on blood glucose.
- Information on traditional medicine will affect the belief, and behaviour to use the medication as it is assumed that information affects behaviour.
- There is a need to intensify health education to empower these patients in order to enhance their own decision-making, even in the use of traditional medications.

4.2.5.11   Faith-based healing

This is another form of complementary and alternative medicine that is practiced by many people all over the world. Africans' belief systems suggest that every illness has a spiritual

origin and a cure and therefore the scientific description of diabetes as a disease without a cure negates these participants' beliefs and motivates them to seek help elsewhere (Chinenye & Ogbera, 2013). Traditionally, diabetes is categorised into three groups, namely that it is man-made, naturally occurring, or caused by ancestors or gods coupled with the belief that a cure exists for all forms of disease (Awah, 2006). The individuals' beliefs about diabetes, its causes, treatment and cure invariably determine attitude towards lifestyle modification and adherence to management (Moonaghi et al., 2014).

One participant responded as follows:

> *"I believe in prayers and I know it is an attack which God will remove. I do not take my drugs regularly as I depend so much on prayer which is working for me…".* (P 25)

Belief in God may be seen as a source of strength and a resource for management of Type 2 diabetes and this can be deduced from the following experiences that depicted participants' belief systems regarding God's divine intervention in diabetes:

> *"…they are all praying for me and I know my God will do it. The sore will heal and the diabetes will be cured…".* (P 2)

> *"God knows how diabetes entered my body. I have faith that one day the disease will be cured from my body as I will be declared healed. The disease is from somewhere so it will go back to them...".* (P 20)

> *"...I believe God can heal me, even in my church...".* (P 21)

> *"...by God's grace we are praying for His help, as it is not within man's power to be healed…".* (P 22)

> *"...All I believe is prayer that God will heal me...".* (P 25)

> *"...I believe that there is one who can cure diabetes Jesus can heal any disease so I trust in him…I am also praying to God for healing. I believe He will do it…".* (P 8)

> *"I just depend on God for his grace to take control because I am not the one that created myself...".* (P 11)

> *"By the grace of God, if one is able to comply with the management, the person will live well..."* . (P1)

These experiences illustrate how patients have used prayer and their belief in God as a coping mechanism and in managing their diabetes:

> *"I believe in God as I always pray to Him and prayers have helped me to cope well...".* (P 18)

Many of the participants demonstrated their faith by praying for a cure from their Almighty God, which showed that their belief system regarding the causes of diabetes is based on their

cultural practices and values and religious beliefs and practices (Awah et al., 2009). In a study by (Okolie et al., 2009) in the eastern part of Nigeria, about 75% of the participants claimed that diabetes is caused by witches. Although patients have the right to their religion and beliefs, as the custodians of health, health-care professionals have a duty to provide adequate information to patients that will enable them to make informed decisions. Active participation and good provider patient communication may enhance a change in beliefs so that patients can engage in behaviour that will affect their health positively. In related studies, participants also demonstrated their belief in prayer and remained faithful to the practice while they adhered to their self-management (Jones, Utz, Williams, Hinton, Alexander, Moore et al., 2008; Smith, 2012).

4.2.5.12   Conclusions:

The experiences from the participants reflected that:

- The use of faith-based care is also common among the participants, both as a source of strength and as a coping mechanism;
- The adherence rate could be affected by these practices
- The sense of self or self-evident is expressed when the individual engages in some degree of judgement and self-determination that is a product of their background, experiences, values, education, culture and beliefs.
- Health care professional could motivate participants through change from traditional patient education to collaborative approach which could increase their involvement with the system and thus change their beliefs and self-management behaviour.

4.2.5.13   Discussion of Theme 2: General management of Type 2 diabetes

Type 2 diabetes is a chronic disease that requires management to live as near to normal a life as possible since the disease is incurable (WHO, 2009). Self-management is assumed to be a lifelong process and day-to-day care of the disease should be learned by the patients and they should commit themselves to such self-management. Self-management goes beyond consultations with health-care professionals and adherence to medication, it includes patients taking responsibility for their health by making modifications to their lifestyles (Jarvis, Skinner, Carey & Davies, 2010) and allowing self-management to become an integral part of their daily lives. Lifestyle modifications consist of healthy dietary habits, increased physical activity, weight maintenance, self-monitoring of blood glucose, stress management, decision-

making, problem-solving and communicating with health-care professionals (AADE, 2010). The adherence to medication and the ability to adapt the medication dosage according to self-monitored readings is also important (AADE, 2010). Furthermore, there is a need for these patients to manage the psychological consequences that may arise, such as stress management, disease acceptance, depression, fear and other psychological problems (Snoek & Hogenelst, 2008).

An international study on diabetes patients' attitudes, wishes and needs (DAWN) reported that among patients with Type 2 diabetes the adherence rate was 16.2 % (Funnell, 2006). To overcome this, a collaborative interaction involving two experts who are health-care professionals and patients who set goals and used informed decision-making in planning these achievable goals is important (Funnell & Anderson, 2004). Self-efficacy is crucial in diabetes patients' self-management and studies have shown that changes in self-efficacy are correlated with changes in health status (Johnson, Feinglos, Pereira, Hassell, Blascovich, Nicollerat et al., 2014). It is important that patients are taught skills that will facilitate their competency in the self-management of diabetes. The British Medical Association (BMA) suggests that people with chronic diseases should own and control their diseases, rather than allow the disease to determine how they conduct their lives (BMA, 2007). Without adequate knowledge, skills and decision-making techniques an individual may not be able to control Type 2 diabetes.

4.2.6   Theme 3: Health education on Type 2 diabetes

Health education is described as a process of creation and recreation of knowledge with an emphasis on activities that help in developing social responsibility, autonomy in meeting the health-care needs of individuals, groups and communities and the practice of social control (Gazzinelli, Souza, Fonseca, Fernandes, Carneiro & Godinho, 2015). The process entails increasing knowledge and understanding in individuals or groups and equipping them with adequate skills to live independently. According to the WHO (2012), health education is a tool for health promotion and is essential for creating and improving the health of individuals and populations.

4.2.6.1 Category 1: Acknowledgement of health education by health-care professionals

Health education is assumed to be one of the essential responsibilities of all health-care professionals within or outside the health facility, especially when there is contact with patients. The National Standards for Diabetes Self-management Education Standard 5 supports health education and the care of patients with diabetes by a multi-disciplinary team (Funnell et al., 2009).

Participants' experiences indicated that they did indeed receive information on diabetes:

> *"I was given the lecture here once…the lecture was given by the matron, but occasionally they give lecture especially early in the morning on food and drugs… ".* (P 13)

> *"…also the nurses teach early in the morning but I always come late…the doctors do advise me on how to manage it…".* (P 14)

> *"The matrons do lecture us occasionally…lecture us on the management especially diet to prevent high blood sugar level…".* (P 17)

> *"The nurses also teach occasionally….I was admitted once at the male medical ward and I was also given health talk on how to manage the disease…".* (P 18)

> *"…The nurses always teach in the clinic and doctors advise when you have a problem".* (P 6)

> *"We are taught in the hospital…".* (P 22)

> *" …they gave me a lecture and they do tell us in the clinic occasionally...".* (P 24)

> *"We are always taught in this clinic and some of my children who are working in the hospital also teach me. …".* (P 3)

> *"The nurses always teach us in the clinic and the doctors also advise us. My children come with their idea as well…".* (P 11)

> *"Also the nurses teach early in the morning but I always come late so I have not had the talk. The doctors do advise me on how to manage it…".* (P 15)

These participants confirmed that it is mainly nurses that teach in the two health facilities and these teachings mainly take the form of lectures (patient education), but participants did receive some information that was used in self-management.

Some of the participants also said they were advised by their physicians and nurses, especially when their blood sugar levels were high:

> *"The doctors and nurses always advised me especially when the sugar level is high…".*

> (P 16)

"The doctors advised me, nurses give health talk occasionally...". (P 25)

"It is through the lecture we are given here, especially in the first hospital where I was diagnosed. The doctors also advise me when my blood sugar is high…". (P 7)

Information was also sought from health-care professionals outside the health facility, showing the important role of nurses in the dissemination of accurate information and this may also be reflective of the level of trust the community has in nurses and other care professionals:

"My sister is a retired nurse; immediately the diagnosis was made I informed her and have been asking questions…the pharmacist told me the first time that I should not eat meat, rice, or mineral. But eat more of vegetables but then...". (P 21)

The content of the education encompasses both information and skills for self-management of Type 2 diabetes, which was demonstrated by this participant who was taught the skill of injecting insulin:

"...I was taught to give insulin which I can do very well...". (P 1)

Participants acknowledged the positive effect of patient education on their coping with Type 2 diabetes. At the time of diagnosis of a chronic illness, most patients are faced with multiple problems, such as fear of death and coping effectively with the disease. Information and skills for self-management are provided to enable adequate coping with the disease. These experiences revealed the health-care professionals' empathy and listening skills that created a feeling of trust while motivating participants' involvement in self-management of diabetes (Oftedal, Karlsen & Bru, 2010). A study among Asians in America revealed that patients were comfortable learning from their care professionals and they reported having positive experiences (Imran et al., 2015).

The concept of "diabetes educator" (Duncan et al., 2011) was lacking in the two health facilities since there was no individual who was specifically trained in disease management. In the facilities where diabetes education was provided, it was conveyed in the traditional method and used professional nurses as teachers or dieticians providing dietary counselling (Steinsbekk et al., 2012). However, there is need to shift towards a collaborative integrated multi-disciplinary team with the aim of increasing glycaemic control and reducing complications, thereby achieving effective outcomes (ADA, 2010). The rich pool of educators from diverse backgrounds complement each other in caring for these patients with problems in multiple organs (Lewis, Benda, Nassar & Magee, 2015) because multi-disciplinary team members work interdependently, consulting with one another and they have common objectives. Different organisations advocate a voluntary education practice that involves dialogue, freedom,

participation and creativity (WHO, 2012; ADA, 2014), therefore the method of health education is crucial to motivate patients with Type 2 diabetes to actively adhere and commit to self-management.

4.2.6.2 Conclusions:

- Health-care professionals gave information to participants within and outside the health facilities on diabetes, such education took the form of lectures and was mostly delivered by nurses.

- The educational content included information and skills development and participants were satisfied with the information they received since it supplemented/aided their coping skills.

- Participants trusted information provided by health-care professionals who are regarded as authorities in their various professions and nurses showed empathy and listening skills.

- Dietary counselling was mostly provided.

- The process of acquiring motivation for initiating and maintaining health behaviours and developing a sense of autonomy and competence to internalise new behaviour was important.

- Therefore, it may benefit the participants if patient-centred approach is considered and a multi-disciplinary group of professionals add to the quality of information provided.

4.2.7   Theme 4: Accessing information on diabetes

Information on diabetes is essential in aiding management and positive coping skills for Type 2 diabetes patients, especially in the prevention of life-threatening complications, thereby allowing patients to gain knowledge and skills to enable them to manage their diabetes. Knowledge acquired facilitates behaviour change, but behaviour change has to be sustained through continuing care support by health-care professionals. Two categories were identified, namely a lack of information and education on diabetes and the sources used to acquire information.

4.2.7.1 Category 1: Lack of information and education on diabetes

Information is valuable to patients with Type 2 diabetes. It can be described as data that is accurate, specific, timely, organised and presented within a context making it relevant and it can increase understanding. Patients with Type 2 diabetes are required to have adequate

information before they can make quality decisions about their health such information is possibly available at the health facilities they attend.

As confirmed in Theme 1 and below, some of the participants displayed a lack of knowledge and a poor understanding of the disease:

> *"...When I go out for parties, I will eat whatever I am given because I know that I will take insulin injections which will dissolve it...".* (P 1)

> *"...diabetes is a deadly disease and I do not like it, I have never suffered it, I do not know if it is the cause of this ulcer on my leg. ...I don't know the cause, but it may be due to eating too much sugar".* (P 2)

> *"I don't know much about it...I do not know the cause but think one takes a lot of sugar or sweet food, she may develop diabetes...".* (P 3)

In most cases patients with diabetes are diagnosed at a time when they lack scientific knowledge about the disease, relying instead on information gleaned from contact with close relatives who have diabetes. The management of diabetes requires lifestyle changes for which knowledge and understanding of the disease is essential for adherence and promotion of quality health. Patients without adequate information on diabetes may not cope appropriately and certain actions or behaviours may lead to susceptibility to complications, increased use of health facilities and hospital admissions and they may become an economic burden to society (Islam, Niessen, Seissler, et al., 2015). Results of a study in Benin City, Nigeria, revealed poor knowledge of diabetes among patients with diabetes in a tertiary health facility (Odili et al., 2011). In the United Arab Emirates many participants in a study had low knowledge of Type 2 diabetes (Al-Maskari et al., 2013). These patients were given health talks at the health facilities, but because of individual differences they exhibited poor knowledge. Therefore, it is assumed that an active collaborative approach will assist these patients and that individual counselling will be more helpful than group counselling.

The participants' lack of knowledge may be due either to a lack of exposure to education or a lack of access to quality information on diabetes. Some of the participants expressed a lack of information regarding certain aspects of diabetes and they also expressed their disappointment with the lack of access to information when they attended health facilities:

> **"***In this hospital, they are not really interested in teaching patients, I was taught once since...".* (P 20)

Some participants reported that there were occasions when patients left the health facility without having adequate information on how to maintain self-management.

"The nurses have not taught us anything and do you know that when I was discharged although… They did not even give us any form of pamphlet to read at home…". (P 1)

Health-care professionals' responsibility to render care and education to patients is a major aspect of their job, which includes providing adequate information to patients to enable self-management and cope effectively with the disease. One study has highlighted the lack of education among a percentage of patients in a health facility in Nigeria (Chinenye et al., 2012). Education is a patient's right and should not be denied to them. In the absence of, or in conjunction with methods of providing information, a substitute form could be used. Educational materials made available to patients in the health facilities could have a beneficial effect on patients' knowledge and understanding of the disease Wallace, Seligman, Davis, Schillinger, Arnold, Bryant-Shilliday et al., 2009). Diabetes diagnosis and management could be stressful without information and may result in poor adherence to management, poor self-efficacy and poor attitudes toward management (Stanković, Jašović-Gašić & Lečić-Toševski, 2013).

4.2.7.2 Conclusions:

The experiences from the participants revealed that

- Participants were given health talks on diabetes and self-management (Theme 3), but some participants did not benefit as is evidenced by their poor understanding (Theme 1).
- Some participants complained of not receiving health information during the period they were admitted to wards, arguably a time they may have needed it most.
- The environment can either aid or hinder the normal performance of human beings and therefore a treatment environment should support intrinsic motivation and confidence to influence adherence and positive health outcomes.
- Therefore, health-care professionals should devise other methods of reaching all patients with Type 2 diabetes e.g. through motivational interviewing and providing adequate, relevant information on diabetes and the environment should support for autonomy.

4.2.7.3 Category 2: Sources of information on diabetes

The majority of participants sought out health information from different sources in a bid to satisfy their need for information and to acquire information and understanding of the disease. Information-seeking behaviour could be regarded as both an active and a passive receipt of health information in which patients stumble across information without actively seeking it

(Kalantzi, Kostagiolas, Kechagias, Niakas & Makrilakis, 2015). Literature shows that patients consult doctors, family, friends, hospitals, the internet, news reports, books, pamphlets and posters in order to acquire health information (Longo et al., 2010).

4.2.7.4 Peers/patients with diabetes

Some of the participants' acquired information from their peer groups, during waiting time at the clinics. The waiting time in the consultants' outpatient clinics is an avenue for socialisation during which patients interact freely with others. The following experiences showed participants' learning experiences with their peers during waiting time:

> " *especially when we are awaiting the arrival of the doctor, we share ideas...".*(P 17)
> *"...and also the patients discuss it among themselves. We always discuss how we have been managing the disease and also advise one another on what we ought to eat and avoid...".* (P 22)
> *"Patients are always discussing how they are managing themselves when we are waiting the doctors...".* (P 24)
> *"We are taught in the hospital and also the patients discuss it among themselves. We always discuss how we have been managing the disease and also advise one another on what we ought to eat and avoid...".* (P 22)

The acutely ill patients on the ward still had time to interact and teach other patients about self-management, based on their own experiences:

> *"I learnt this from my discussion with other patients on the ward the last time I was admitted. There was a woman who has been on drugs for about 15 years, she even gave me a diet sheet and taught me how she has been managing herself at home".* (P 1)

People interact quite easily, especially when there is a common problem to be resolved and most people consider such informal networks as a good medium through which they can access information (Momodu, 2002). Knowledge and experiences are shared and patients clarify information from their peers, which helps them to cope with diabetes (Munn-Giddings & McVicar, 2007). According to Munn-Giddings and McVicar (2007), social interaction enables rapport between people experiencing similar problems and such interaction changes people's perceptions and views and they are able to recognise common problems. Social interaction also reduces social isolation.

This is supported in the literature by a qualitative study in Mexico in which patients reported that they looked forward to social discussions since they benefited from them (Fort, Alvarado-Molina, Peña, Montano, Murrillo & Martínez, 2013). An international study of patients with

diabetes in European countries also reported interaction between patients with diabetes/peers was a support that contributed to improved health (Koetsenruijter, van Lieshout, Vassilev,Portillo, Serrano, Knutsen et al, 2014).. A Malaysian study reported that patients admitted to being more confident in information received from diabetic peers (Low, Tong & Low, 2015).

Although interaction is encouraged, the accuracy of information shared may be problematic for these patients especially if there are conflicting statements that result in confusion (Wu & Ahn, 2010). Peer-led interventions have been reported as effective in the management of diabetes (Van der Wulp, de Leeuw, Gorter & Rutten, 2012) and can be utilised in health facilities, especially where there are complaints of manpower shortages. Health-care professionals need to empower participants with both information and decision-making skills to enable them to filter what they hear and to make appropriate decisions.

4.2.7.5 Media

The media plays a role in providing information on health issues. The following experiences showed that participants received information from the media:

> *"I watched a discussion on diabetes on ITV on the causes and management…".* (P 17)

> *"…I listen to radio/TV programs...".* (P 15)

> *"I always sit with my husband to watch TV when it is being discussed I pay attention to their discussion. I learnt about diabetes and injury...".* (P 20)

> *"…but I do hear them discussing diabetes on television...".* (P 1)

Participants also purchased books and pamphlets to access information. The sources of information could be classified as authentic and valuable:

> *"…I also read some books to know about complications...".* (P 19)

> *"…yes I read some books…I also had pamphlets from the clinic and some from the ward during admission…".* (P 5)

The media reaches out to a larger population of both the literate and the illiterate, but the accuracy and content of information supplied by the media depends on their motive for disseminating the information (Grajales III, Sheps, Ho, Novak-Lauscher & Eysenbach, 2014). Accurate health messages from the media can influence the individuals and the publics' health-related knowledge and conduct, but unstable and conflicting information may be a source of confusion (Wu & Ahn, 2010). In Nigeria, the media is considered to be less reliable due to governmental influence and information may be politically motivated (Momodu, 2002).

This study's findings are similar to other studies that report on patients access to information through books, journals, pamphlets, newspapers, television, radio and the internet to learn about diabetes (Antón, Connor, Lauten & Balunda, 2012; Longo et al., 2010).

4.2.7.6 Family members

Many participants also seek information from family members, especially those who are medical personnel, supporting the notion that people always trust information received from professionals. The role of the family in the health-care of an individual is very important since the family is the patient's social support system, their care givers and their problem solvers (Miller & DiMatteo, 2013).

The following experiences revealed that many patients depend on their family members for information:

> *"They are very supportive as they provide for me, give me information about the disease, what to eat, food to avoid and management. I am always moving from one house to the other so they are helping me...".* (P 7)

> *"My children are very supportive as they provide for me, give me information about the disease, what to eat, food to avoid and management...".* (P 8)

The role of family members who are health-care professionals cannot be over emphasised in the health education of these participants. Even within their families, they are called upon first because of the trust society has for them:

> *"I called my brother who is a medical doctor, he has been encouraging me and he reassured me that it is something that can be managed. I have been gathering information from him...".* (P 2)

> *"My sister is a retired nurse, immediately the diagnosis was made, I informed her and has been asking questions. The pharmacist told me the first time that I should not eat meat, rice or mineral. But eat more of vegetables but then I was not serious with the management".* (P 21)

Family members could be involved in patient care and could provide considerable information regarding diagnosis, complications, treatment and possible outcomes (Winocour, 2002), which may motivate patients to engage in self-management. Relatives and friends become supportive during periods of illness and therefore patients turn to them for advice and also to discuss conflicting information from other sources to gain clarity and reassurance (Longo et al., 2010). A Malaysian study revealed that the majority of participants accessed their information from family members, peers, health-care professionals and social medial (Low et al., 2015).

4.2.7.7 Conclusions

- Participants had a need to seek information from different sources both in and outside health facilities.

- Participants freely shared information with peers in health facilities and seek information from media, family members and health-care professional.

- Peer-led information could be effective but information sought from others could be inaccurate or confusing.

- Different media platforms including TV, radio, books and pamphlets may be accurate.

- The role of family members as a support system and a source of information is also important.

- Participants have an unmet need for information about their diabetes such that they seek information from others.

- There is need to empower patients with adequate and accurate information provided by multi-disciplinary health-care professionals to enable patients to make decisions and solve problems.

4.2.7.8 Discussion of Theme 4: Accessing information on diabetes

Participants had a need for quality health information. Information-seeking behaviour and the sources consulted invariably depend on the motive for the information-seeking behaviour. Participants information-seeking behaviour is to obtain information and to improve their health literacy, both of which are associated with improved self-management, use of health facilities and patient-professional interaction (Antón, Connor, Lauten & Balunda, (2012); Von Wagner, Steptoe, Wolf & Wardle, 2009). In this study, participants sought for information from different sources, which behaviour is congruent with findings from other studies that showed that patients with diabetes always seek information from the internet, media, newspapers, books, brochures, family members and friends (Cutilli, 2010; Moonaghi et al., 2014).

It is important that accurate sources of information are provided to patients with diabetes so that inaccurate and misleading information is avoided. Health-care professionals need to utilise accurate sources when engaging patients in health education programmes. Family members could also be actively involved in education and management. Training of peers and also reaching out to the media so as to enable adequate transfer of accurate and consistent information.

4.2.8 Theme 5: Perceived facilitators and challenges of managing Type 2 diabetes

Managing Type 2 diabetes could be challenging to participants due to the rigour of self-management, the need for behaviour modification and other social factors. Three categories emerged, namely social support from family and relatives (facilitator), cost challenges and socialisation and stigma.

4.2.8.1 Category 1: Facilitators - Social support from family and relatives

The role of the family in coping, adherence and self-management of chronic diseases is crucial since their support enhances the patient's ability to accept and understand their disease (Koetsenruijter et al., 2014). Diabetes does not affect only the patients, family and care professionals are also affected (Rosland, 2009). Social support is the aid provided by family, relatives, neighbours and other people in the individual's social network and such support consists of information, emotional support, comfort and practical help (Koetsenruijter et al., 2014).

Participants in this study reported the positive effect of their family members and considered their support as enhancing their ability to cope with Type 2 diabetes. Spouses were seen as supportive because they provide advice and monitor the patients' actions and participate in self-management activities:

> *"...my wife is very supportive as she prepares only the prescribed diet for me to take to my station...".* (P 21)

> *"My husband is aware and he is very supportive...".* (P 4)

> *"My husband knows that I have diabetes so they are very supportive. My husband eats the food with me occasionally. My children are learned so they caution me when I am not complying..".* (P 3)

> *"My husband comes with me to the clinic...".* (P 24)

> *"My husband is also helpful, he reminds me of my appointment and ask questions about how the doctors attended to me...".* (P 12)

Other members of the family, such as children also played supportive roles because they provided information, encouragement, monitoring and love and this concern encouraged the participant to strive for adherence:

> *"My children are aware of my health so they know what to give me and they always support us financially...".* (P 7)

147

"...two of my children who are in Lagos are aware of my diagnosis...they encourage me to take my drugs and food...". (P 15)

"Almost all my children are medical doctors and also my in-laws, so they are all aware of the sickness. They are very supportive as they provide for me...". (P 8)

"My children are aware of the problem and from their support so far, I do not envisage any problem because they have been helping financially". (P 2)

"...my children really took care of me ever there and they are still trying in helping me with the drugs and food...". (P 12)

Other members of the extended family were also very supportive and offered advice and care:

"I informed my family and they have been very supportive. I have a doctor and nurse relations and they have been encouraging me in the care...". (P 22)

"My family members are aware of my health so they are very supportive in choosing my diet...". (P 25)

"My family members who are aware are very supportive through their counselling...". (P 4)

"My younger sister is aware of my health she can only support me emotionally or prayerfully...". (P 10)

These experiences reflected strong family support, which is typical practice in traditional African societies. This support is backed by a similar study in Botswana among patients with Type 2 diabetes (Ganiyu et al., 2013), where the family were found to play their roles as care-givers and problem-solvers in the health-care of individuals (Miller & DiMatteo, 2013). A report from a systematic review on social support to patients with Type 2 diabetes revealed that many patients who were supported by their families had a reduced HbA1c (Stopford, Winkley & Ismail, 2013). Although in this study, psychological effects were not measured, support that is given is assumed to have a psychological effect on the participants and also affect their mental health (Fortmann, Gallo, Walker & Philis-Tsimikas, 2010). This study is also consistent with those of Diabetes Attitudes, Wishes and Needs (DAWN) study which showed that social support are necessary in assisting patients implement coping strategies in diabetes management (Alberti, 2002).

Adherence to treatment is also important in self-management of Type 2 diabetes, since these participants revealed the areas in which their families have been supportive, namely diet, medication and reminding them about their appointments. A systematic review of studies on social support and clinical outcomes among Type 2 diabetes revealed that patients with a high level of social support had better clinical outcomes (Strom & Egede, 2012) and increased dietary modification and physical activity (Wolever, Dreusicke, Fikkan, Hawkins, Yeung,

Wakefield et al., 2010). An individual's support system influences the effectiveness of self-management (Hinder & Greenhalgh, 2012), invariably affecting the outcome of their diabetes.

The effective management of Type 2 diabetes does not only rely on self–management effort by the patient but a complete lifestyle modification, which might not be achieved without the support of family and friends. When individuals have a sense of guilt and feel nagged by their family's support, concern and involvement then social support could also have negative effects (Carter-Edwards, Skelly, Cagle & Appel, 2004).

4.2.8.2 Conclusions

- Family support, from spouses and children in particular, is seen as positively supporting self-management.

- Areas of support include adherence, reminders of appointments and financial support.

- Family members should be included in health education programmes in order to enhance patients' self-management.

4.2.8.3 Category 2: Challenges: Expensive and challenging disease and lifestyle changes

Diabetes management is demanding and costly for the individual who spends money, time and other resources on the disease. The cost of caring for diabetes is high for the affected individual, the family, the health-care system and the nation (WHO, 2015).

The majority of participants complained about the cost of caring for patients with Type 2 diabetes:

> *"...diet and habits especially now that it is expensive to care for oneself...taking care of diabetes is very difficult...".* (P 4)

> *"...diabetes is a very expensive disease as the drugs are expensive. The individual has to comply with the treatment".* (P 18)

> *"The management is not very easy as it involves money and time...".* (P 21)

> *"It is very expensive.... The treatment is very expensive, if you want to go well, you need to spend some money...".* (P 24)

> *"...the care of diabetes is very expensive...".* (P 17)

A second issue raised was the challenge of behaviour change. Behaviour change is a prerequisite for the management of diabetes because the individual must consciously learn and maintain their behaviour to improve the management of diabetes.

Many participants complained that they found the new lifestyle difficult to manage:

"It is a difficult thing to manage as it is a life one is not familiar with...". (P 13)

"I find the management to be very difficult because I can't eat what I am very fond of. ...". (P 10)

"...To treat diabetes is not easy so one needs to learn so as to enable you manage the disease effectively or else the individual will die...". (P 4)

"Diabetes is not a good disease, I cannot eat what I like...my problem is I don't know the type of food to eat the quantity and when to eat it, it is not a good disease". (P 5)

Self-determination is important in care and adherence to self-management techniques by individuals with Type 2 diabetes. Autonomous motivation through intrinsic factors is equally vital, because patients who have insight into the disease will take action voluntarily.

Participants acknowledged the importance of being determined to change:

"...the management of diabetes is very difficult for me because I was not used to taking drugs it is difficult to manage this disease unless one is determined". (P 7)

"...it is difficult as it requires determination because the habit formed is not easy to stop and it is expensive to maintain. You have to match your meal both in quantity and quality, also the drugs are expensive...". (P 9)

The patient and the family bear most of the costs of the disease. In Nigeria, health-care services are paid for through out of pocket expenses. While health insurance is operational, the majority of the patients are not yet enrolled in the system (Federal Ministry of Health, 2005). The direct cost of diabetes care to individuals is in the form of medication, diet and disposables and a patient from a low socioeconomic class who is on exogenous insulin could spend 29% of their monthly income on insulin (Ogbera & Ekpebegh, 2014). Participants were particular about the cost of caring for diabetes and described the cost as very expensive; the perception of the high expense could be due to the patient's socioeconomic status. The majority of the participants in this study belong to the lower socioeconomic group and such assumption is based on their educational levels and/or their occupations. A Spanish study found that diabetes was more prevalent among the lower socioeconomic group (Tol, Sharifirad, Shojaezadeh, Tavasoli & Azadbakht, 2013).

Diabetes is said to be costly and it affects the lower socioeconomic group more than other groups (IDF, 2013). The study is supported by reports that participants complained of the cost of diabetes (Adisa, Fakeye & Fasanmade, 2011; Pastakia, Cheng, Kirui & Kamano, 2015). Educational programmes have been found to be cost-effective because it focuses on all aspects

of diabetes (Healy, Black, Harris, Lorenz & Dungan, 2013), consequently such patient-centred programmes could be planned to reduce costs.

Diabetes care requires commitment to treatment to maintain behaviour and this can be achieved through self-determination, self-efficacy in performing skills and autonomous motivation. The majority of participants complained of difficulty in disease management, which has been supported by other studies (Tsujii, Hayashino & Ishii, 2012) and it could be resolved through adequate health education using a patient-centred approach. Diabetes diagnosis and management can be overwhelming (Skovlund & Peyrot, 2005), but a planned education programme coupled with effective communication can help patients to overcome these problems.

4.2.8.4 Conclusions

- Diabetes is expensive to manage due to the cost of medical equipment, disposables and the need for behaviour modification.
- Behaviour determination is difficult and determination is needed to sustain good care
- Intrinsic motivation is needed to change individual's beliefs and practice and engage in cost effective management of their diabetes.
- A structured educational programme could help patients to overcome distress of self-management and such programmes are considered to be cost-effective.

4.2.8.5 Category 3: Pressure of socialisation in the community

Social support from family and friends has been determined to be a positive factor in accepting and coping with diabetes, but it could also have a negative impact on the patients. In this study, participants admitted that their social groups could be negative influences. Social gatherings proved to be challenging for these participants. During community celebrations, the study participants were expected to join community members in celebrations and consume food and wine. When participants refused to dine with others, they were perceived as being disrespectful and consequently these patients faced a dilemma when they were expected to participate.

They described the methods of coping that they have developed:

> "...I do not eat what my friends eat because I don't want to have problems...when I attend parties I collect drinks and bring home to entertain my visitors". (P 13)

> "When I go out to parties I do not eat, but I cannot refuse, I take a little quantity of pounded yam...". (P 15)

"When I am with other people who are not aware I try to control myself. I do not eat pounded yam at all but I eat rice and beef and drink water… I just try to cover up so that they do not ask questions". (P 3)

"...my friends do lure me into eating but if the pressure is much I tactically tell them I am okay...".(P 19)

Many patients with Type 2 diabetes do not disclose their status to others for various reasons, such as fear of being perceived to be sick (Weiler & Crist, 2009) and the participants in this study expressed a similar tendency. Some of the participants who attempted to interact with their community members had to put on a façade for the group because they feared being labelled:

"...but because I did not disclose it to friends and relations, when we go for social functions, I eat a little quantity of food and take water…". (P 18)

"People always tell me eat and drink what is forbidden, but because I love my life, I try to avoid it, although I fall into their temptation...". (P 14)

"...I ate all kind of food especially pounded yam. I did not tell them in the village, so I had to eat with them. Even when I go to parties, I try to avoid starchy food but at times I have just to succumb...". (P 23)

"...because I did not inform all of them. Occasionally I eat a little quantity when it is mandatory to eat". (P 8)

Some participants do segregate themselves from these friends to enable adherence, resulting in social isolation. The influence of family members and friends could cause non-adherence and to avoid this one individual avoided social gatherings:

"...I stopped the consumption of alcohol and to avoid people knowing about my problem, I don't go for social gatherings so that I will not be lured...". (P 6)

The impact of the environment on participants' adherence to treatment is crucial because participants have to exist within this context and the behaviour of friends, their support system and cultural practices are considered important influences on motivation (Deci & Ryan, 2012). The self-determination and self-will to change and maintain behaviour among patients with Type 2 diabetes may be influenced by others in their social group. In this study, due to the negative influence of the members of the community, many patients had to develop certain behaviours to facilitate acceptance and to fit into the society even when it was contrary to their health. This was confirmed in other studies conducted with diabetes patients (Ebrahim, De Villiers & Ahmed, 2014; Weiler & Crist, 2009). People engage in such behaviour to avoid stigma, to satisfy their guests/hosts and to be seen as normal, which is considered deceitful

(Imran, Jauhari, Chaudhry, Uddin, Bengali, Uddin et al., 2015). Invariably these actions can cause stress to the individual since they fear discovery and this fear increases their plasma glucose.

The negative effects of social groups on patients with diabetes was reported by (Fortmann et al., 2010) and it negatively affects their adherence and outcome of the disease. Some participants also isolated themselves to avoid social interaction. This method could have negative effect on the individual's psychological health because they may experience guilt and lay blame on others (Ebrahim, De Villiers & Ahmed, (2014)

4.2.8.6 Conclusion

- Participants feel pressure when engaging at social gatherings and or during meals, resulting in these patients not disclosing their diabetes and in their becoming socially isolated.

- Extrinsic motivation influences the possibility of an individual to learn and practice new behaviours, while the intrinsic motivation results in high-quality learning and creativity.

- Therefore, participants can interact better with their community members if behavioural interventions such as problem-solving, decision-making and skills are taught during health education programmes and if patients acted assertively and taught members of their community, thereby change their beliefs and perceptions, so there is definite need for effective educational programmes to teach and motivate patients about their adherence and to improve their communication skills.

4.2.8.7 Category 4: Fear of stigmatisation

Stigma is the practice of social labelling that disturbs the individual's social identity (Engebretson, 2013). Chronic illness may subject an individual to possible stigmatisation by those who do not suffer from the disease. Patients with diabetes may not disclose their diagnosis to family members and friends because of fear of been stigmatised.

Some of the participants admitted that they did not disclose their diagnosis to some relatives and friends:

> *"I did not tell my friends and relatives about my ill-health...".* (P 13)

> *"I did not tell my friends as it is not everybody one should discuss health problems with...".* (P 15)

153

"…You do not tell everybody your problem so I try to pretend that all is well. I did not tell my friends I did not inform my friends and distant relations so they are always surprise when I do not eat when we meet, although they try to talk me into going...". (P 30)

"You know that you do not broadcast illness so many people do not know my ordeal, when I go out, I pretend all is well and eat a little of the food provided…" . (P 10)

"I did not inform my friends and distant relations so they are always surprise[d] when I do not eat when we meet…". (P 11)

In a bid to be accepted into society, people living with chronic diseases critically manage information about their health and are hesitant to disclose their disease and are selective regarding who they share information with. Participants become stressed and fearful. The participants did not disclose their diagnosis to others because of the anticipated stigma that they might face or due to fear of being labelled (Joachim & Acorn, 2000). In a related study, participants said they did not disclose their diagnosis due to fear of been blamed and stigmatised (Browne, Ventura, Mosely & Speight, 2013). Non-disclosure may be associated with increased psychological distress (Quinn & Chaudoir, 2009) due to the fact that patients do not tell their problems to others and experience a subjective feeling that leads to feelings of guilt, shame, reduced self-esteem, embarrassment and being responsible for their disease (Kılınç & Campbell, 2009; Person, Bartholomew, Gyapong, Addiss & van den Borne, 2009).

Diabetes is perceived as a behavioural disease that the individual could have prevented and therefore, people with Type 2 diabetes always feel that they will be stigmatised for having the disease due to their lifestyles, which have caused the disease (Browne, Ventura, Mosely & Speight, 2013). Participants in this study may have exhibited an attitude of non-disclosure due to fear of stigmatisation, which was supported by a Nigerian study (Olagbuji, Ezeanochie, Agholor, Olagbuji, ande & Okonofua, 2011). There is concern that non-disclosure could result in non-adherence due to a patient's fear of being observed adhering to medication and dietary modification (Enwereji & Enwereji, 2010). In contrast, another Nigerian study reported high disclosure of diagnosis, which was due to soliciting for financial support for management (Achigbu, Oputa, Achigbu & Ahuche, 2015). Lack of resources was also a problem among the participants in this study, but they did not disclose their disease and such non-disclosure may be related to personal/cultural beliefs and values.

Cultural beliefs and practices are contextual and can affect an individual's health beliefs and behaviour. In Nigeria, human life is perceived as sacred and should be protected and preserved (Onyeabochukwu, 2007). Culturally, the practice of disclosure of diagnosis is considered a taboo and "truth telling" (Aniebue & Onyeka, 2014), which may have influenced some

participants' attitude. This is similar to the practice in the Netherlands, where it is considered taboo to discuss the disease since they believe it will cause shame, gossip and social disgrace to the individual and family (Kohinor, Stronks & Haafkens, 2011).

Cultural beliefs and practices are also related to the issue of stigma among patients with Type 2 diabetes. A UK study reported that Asian people with diabetes have to accept sweets for fear of being stigmatised and their families always advise them to conceal their diagnosis in order to increase their marital prospects (Browne et al., 2013). These problems of non-disclosure and stigmatisation could lead to psychological and mental problems and non-adherence to management occasioned by fear. These problems can be overcome through education of patients, thereby empowering the patient and improving their quality of life (Tang, Funnell, Noorulla et al., 2012).

4.2.8.8 Conclusions

- Participants are faced with the social and cultural problems of stigmatisation in order to ensure adherence to treatment resulting in nondisclosure and social isolation. Participants' behaviour of social isolation and fear of stigmatisation is a sign of lack of knowledge of the causes of diabetes.

- Non-disclosure of diagnosis to family and friends is not to the advantage of the participants and the family and may lead to non-adherence and stress.

- Non-disclosure and fear of stigmatisation and guilt feelings are signs of poor understanding of their diabetes.

- Participants need to be empowered with information and communication skills to adequately interact with other members of the society.

4.2.8.9 Discussion of Theme 5: Perceived facilitator and challenges

Patients with Type 2 diabetes have revealed how pressure from society and fear of stigmatisation prevents effective management of their diabetes condition facilitates not disclosing their health status to others in society. Patients with diabetes are prone to stress, depression and other mental problems (Mommersteeg et al., 2013), which may affect their glycaemic control and the outcome of the disease. Knowledge and insight into the disease process and management of diabetes through practical and emotional support given to patient and the family members may have a positive influence on their beliefs and perceptions (Rosland, Kieffer, Israel, Cofield, Palmisano, Sinco et al., 2008). In order to minimise the occurrence or frequency of mental illness among patients with Type 2 diabetes, effective education tailored to the individuals' problem will benefit these patients.

Family support was a facilitator in this study and is also assumed to be strength and as such it could be emphasised and acknowledged in order to motivate the participants and their family members. Diabetes is hereditary and in a situation where participants do not disclose their status to family members who are also susceptible to the disease, such non-disclosure could have a negative effect on others who could have prevented the occurrence of the disease. In this study, the majority of participants have experienced diabetes for many years and are expected to have gotten a good understanding of the disease as such they should not have the fear of stigmatisation and social isolation because they know the causes. This is a sign of inadequate knowledge of diabetes. Consequently, participants should be empowered with information and communication skills to deal adequately with the issue of disclosure, thus reducing the incidence.

4.2.9   Theme 6: Recommendations for management of Type 2 diabetes

Participants had different concerns regarding their care. Various questions were asked and suggestions were made, revealing the need for interaction with health-care professionals to acquire more information to improve participants' management of their disease.

Participants made different suggestions regarding the management of diabetes, but the need for improved education was evident:

> *"I will suggest regular lectures as awareness will help people to manage better...".*(P 13)

> *"Doctors should tell us what to do and also write them out for us to enable us manage ourselves better at home...".* (P 14)

> *"In fact, scientists are trying but they should do more work on diabetes so as to find a cure for it as soon as possible. Many people are suffering many people have died and some have their legs amputated...".* (P 9)

> *I will suggest that they should give us educational materials to serve as reminders at home, especially for these old people and the illiterate…".* (P 11)

4.2.9.1 Category 2: Need for more education

Patients have a need to ask more questions regarding diabetes, demonstrating their need to know more about diabetes.

The majority of the patients asked various questions that were answered and those patients that needed help were referred to appropriate sections where appropriate services could be rendered:

"Will they find final cure for diabetes? Because I have been taking drugs without much improvement...". (P 13)

"Does it mean that I should not eat pounded yam?" (P 15)

"... you have to help me with what I will be eating How I will be eating? I will like my blood sugar to go down…". (P 19)

"I want to know more about the diet and management. Why is my sugar level not stable as it is always high and low even when I am on my diet". (P 2)

"I want to know about the complications and the food akpu...". (P 6)

"Is there any other management you know that I can add to what I know?".(P 10)

Many of the questions asked were related to Type 2 diabetes information and this may be a reflection of a lack of adequate understanding of the disease, its progression and its management. The qualitative approach allowed participants to discuss issues and suggested that participants require more information on diabetes as a disease and on its management.

4.2.9.2 Conclusion

- There is need for improved education and information on the management of Type 2diabetes.
- The majority of the questions asked revealed that participant's knowledge of the disease was below average which may be related to the health talks given or the method used.
- The patients lack of knowledge could also be a result of inadequate knowledge of the health care professionals engaged in health education of the patients.
- An educational programme tailored to the needs and interests of these participants may provide understanding insight into the disease and its management.
- Knowledge is needed to enhance behaviour changes in the lifestyle of patients with Type 2 diabetes.

4.3 PARTICIPANT OBSERVATION

Patient education was given to patients with Type 2 diabetes who were taught by nurses during their routine visits to the health-care facilities, to enable them to learn about diabetes and self-management techniques for effective care. The knowledge and skills gained during their routine visits to the health facilities may have an impact on the management of diabetes and its outcome because patients are assumed to be responsible for the outcome of their disease.

Patient teaching is a critical aspect of diabetes management, such that some health organisations have recommended that specialist health-care professionals should be involved in the teaching of the patients (ADA, 2010; IDF, 2013). Therefore, it is important to observe the health education sessions in situ. In these health institutions health education given to patients in the clinic is referred to as "Health Talk".

4.3.1   Aim

Participant observation was embarked on to gather detailed information regarding health education provided by nurses to patients with Type 2 diabetes to generate data to inform focus group discussions and to enrich the data that facilitated the programme's development. The questions that guided the observation in order to reduce bias and subjectivity were:

- What was the nature of health education given to patients with Type 2 diabetes by health-care professionals?
- What are the approaches used in the process of health education?
- What was the level of communication between patients and professionals and between patients?

A framework considered the environment, learners, learners' needs, teaching content, teaching methods, evaluation and discussion of the findings.

4.3.2   Results

4.3.2.1 Nature of health education

The environment of health education: The nurses in the tertiary health institution frequently gave health education compared to nurses in the secondary health institution that only gave health education to their patients at random. The consultant outpatient clinics consist of many clinics having clinic consultations concurrently with patients waiting together in the general waiting areas. The waiting areas were large halls for mixed groups of patients that were there to consult their physicians. The environment was not convenient for the patients and there was no space or facility for demonstrations. Communication was poor due to the noise and patients could not actively participate in any health education.

Health education was directed to patients with Type 2 diabetes and their families in the clinics. Patients showed interest in the talks whenever the nurses taught and they showed signs of

concentration, abandoning whatever activity they were engaged in prior to the education session. Family members who were available also participated in the health talk.

4.3.2.2 Assessing learners' needs

Learners' needs and interests were not assessed since the nurse only gave a standard general overview of Type 2 diabetes and its dietary management. There was no form of interaction with the patients before the talk to determine their needs and interests, but patients were asked a few questions.

4.3.2.3 Approaches used in the process of health education

The teaching method was the traditional patient education method and utilised teaching methods such as lecturing and questions and answers.

4.3.2.4 Teaching content

The health education content was routine because the different nurses routinely gave talks on the same topics centred on diabetes, medication, dietary management and the need for continuity in management. The scope of the teaching was limited and the health talks were not structured. There were no demonstrations of skills and procedures. The focus was on medication and dietary management rather than behavioural and psychological elements of self-management. The information offered was specific and self-management skills needed for a quality life style were not taught.

4.3.2.5 Teaching methods

Information was given via oral communication to a group of patients with the nurse playing the role of teacher and patients listening attentively. There was no demonstration of skills and patients did not interact with the nurse throughout the period of teaching, except when patients were asked few questions. Educational materials were not available for the patients to refer to at home. Patients' participation was minimal and they only expressed their fears and worries through the questions they asked.

4.3.2.6 Level of communication

Communication during the patient education sessions was minimal as it was done mainly by the nurses teaching the group while instructions were being given. Occasionally patients were asked questions during the teaching. Patients asked numerous questions on dietary management and answers were provided by the nurses. Interaction between patients was cordial as they were seen to be interacting.

4.3.2.7 Evaluation of learners

Nurses taught the lessons for the day and patients asked diet-related questions, especially after the health talk.

4.3.2.8 Nurses' knowledge

The nurses demonstrated knowledge in the topics they taught and provided factual information to ensure self-management. As was evident in the talk, routine information showed that the nurses may have lacked knowledge regarding the needs of patients with Type 2 diabetes, because valuable information needed for patients to effectively cope were omitted. Diabetes management is not about dietary modification only but also encompasses skills, motivation and psychological, behavioural and educational factors (Berry et al., 2015).

4.3.3 Discussion of observed session

Three Themes were identified from the data, namely nurses' knowledge, structure of health education and patient-provider communication.

4.3.3.1 Theme 1: Nurses knowledge

Nurses' demonstrated knowledge of topics taught, but the information given was not sufficiently in-depth to create understanding of the disease and information was more on diet. Knowledge of health-care professionals have been the subject in some studies since it was observed that health-care professionals lack adequate knowledge of management of Type 2 diabetes (Catsicas, 2014), although this assertion could not be measured in this study.

4.3.3.2 Theme 2: Structure of patient education

The method of teaching was the traditional didactic approach, which was the method of training for many health-care professionals that is mainly used for acute illness (Anderson & Funnell, 2010). Health education tagged "health talk' by the nurses was routine educational talks with superficial content. The talk generally did not focus on any specific topic, but issues discussed were about different aspects of diabetes, such as dietary management, but few details were given.

Diabetes education was given in a crowded, open waiting room where all other patients were gathered. This was inadequate because the peculiarity of Type 2 diabetes demands behavioural changes, adequate motivation and self-efficacy in performance of skills. To address this, ADA (2010) suggested that education should be structured and tailored to patients' needs and

interests to motivate patients and ensure active participation and commitment to care (Schiøtz, Bøgelund, Almdal & Willaing, 2012). Active participation was absent since patients merely listened to teaching and instructions. Health information received during the routine health education was limited and superficial, which showed that patients may not have been adequately informed about how to engage in self-management activities (Okolie et al., 2009). Some of the patients may not have received any information at all, since they went in search of their results, showing the importance of subjective information of self-monitoring in the care of patients with Type 2 diabetes (Pastakia et al., 2015).

The increase in prevalence of diabetes demands a change in method of health education. According to the ADA's suggestions, health education should be structured and given by multi-disciplinary group (ADA, 2010). Consequently, there may be a need for a paradigm change in order to effectively engage patients in the management of their diabetes.

4.3.3.3 Theme 3: Patient-provider communication

There was minimal communication between nurses and patients during the health talks. An effective patient-provider communication is an essential component of patient care, which is the patient's right. With minimal communication some of the patients' communication needs may be unmet. Active and collaborative care has been suggested for patients with diabetes (ADA, 2010), both of which were absent because the environment was not conducive to such care and the method of teaching did not permit it either.

Research has shown that patients prefer a collaborative, actively involving approach with face-to-face interactions with health-care professionals in the process of acquiring competence (Schiøtz et al., 2012). Patients who are actively involved in their care with the health-care professionals are found to be successful at making behaviour changes and experience positive health outcomes (Ciechanowski, Katon, Russo & Walker, 2014).

4.3.3.4 Conclusion

This study finding illustrated that:

- The environment was not conducive to adequate patient education due to crowdedness related to multiple clinic.
- The traditional teaching of patients did not allow for patients' active participation and nor demonstration of skills.

- Communication between nurses and patients was minimal and patients' needs and interests were not sought out before the patient education, which could lead to unmet communication needs.

- The use of a single professional in rendering patient education is not to the benefit of the patients.

- The health talks were not specific and were not in-depth, which could affect the understanding of Type 2 diabetes by the patients and affect their commitment to their care.

- Structured health education given in a more conducive environment should benefit the patients and health-care professionals as they would collaborate to achieve a common goal.

4.4 FOCUS GROUP DISCUSSIONS WITH HEALTH CARE PROFESSIONALS

Focus group discussions with a focus group guide was utilised to collect data from health-care professionals in the two health facilities regarding their experiences of previous health education of patients with Type 2 diabetes. Health-care professionals consisted of nurses, dieticians and social workers. The discussions were conducted with an opening question of "How is it for you to educate Type 2 diabetes patients?"

4.4.1 Description of study participants

Five focus group discussions from the two health facilities were held with 35 health-care professionals consisting of 26 nurses, 4 dieticians and 5 social workers. Descriptive data was collected on the participants (Table 4.3). The participants were numbered for the purpose of confidentiality and anonymity. Individual consent was obtained through written and oral consent, participants' names were not taken and they were given numerical numbers for identity, which were used in presenting the results and at all times ensured that information was treated as confidential and anonymous.

Table 4.3: Descriptive data of study participants

Characteristics	Number of participants
Health-care professionals	35
Nurses	26
Dieticians	4
Social workers	5
Sex Males	6
Females	29
Years of experience	
2-10 years	10
11-20 years	16
21-30 years	9

The tertiary health institution had three focus group discussions with Group 1, which consisted of eight participants, six nurses, one dietician and one social worker. Group 2 had 11 participants consisting of nine nurses, one dieticians and one social worker. The secondary health institution had two focus group discussions: group 3 had five participants consisting of four nurses and a social worker. Group 4 had seven participants, consisting of five nurses and one social worker and a dietician. Group 5 had four participants, two nurses, one social worker and a dietician (Pilot study from the tertiary health institution). There were 29 females and 6 males. The years of health-care professionals' experiences varied from two years to 30 years of practice in providing health education to patients, which is quite important, especially with expertise required in handling patients with Type 2 diabetes.

4.4.2 Discussion of focus group interviews

Three Themes with several categories emerged from the focus group discussions with the health-care professionals (Table 4.4), namely health education on diabetes, challenges encountered with health education and recommendations.

Table 4.4: Themes and categories emerging from the focus group discussions with health-care professionals

Themes	Categories
Health education on Type 2 diabetes	1. Role of health-care professionals in health education 2. Focus of health education 3. Essence of health education 4. Management adherence by the patients
Perceived challenges of health education	Health-care professionals' factors Shortage of staff Patients' factors 1. Non-adherence to treatment 2. Lack of resources 3. Attitude of patients 4. Cultural and religious practices
Recommendations for management of diabetes	Initiatives to curb diabetes

4.4.3   Discussion of the central theme

The central theme that emerged from the data was health-care professionals believed that they should be involved in the health education of patients with diabetes, while cultural beliefs and religious practices make it challenging for patients to comply with diabetes treatment. The Theme is a reflection of the role of health-care professionals in the management of patients with Type 2 diabetes and their experiences with these patients.

Health-care professionals play a vital role in facilitating patients with Type 2 diabetes acceptances and continuous self-management of Type 2 diabetes through education. At the initial diagnosis, most patients are uninformed about diabetes, but with positive communication and motivation the individual could gain insight into the disease and make the relevant health behaviour changes to manage the disease. Health education of patients with diabetes is identified as an effective tool for management of Type 2 diabetes (Powers et al., 2015) and a multi-disciplinary team of health-care professionals was suggested by some health organisations (ADA, 2012, IDF, 2013) Consequently, there is a need for collaboration among health-care professionals to educate patients with Type 2 diabetes in these facilities and to advocate for policies that could favour this group of patients.

Nigeria has various ethnic groups with diverse cultural and religious beliefs and practices that affect the health beliefs and health behaviours of the majority of the people. Patients with Type 2 diabetes have a need to source information on diabetes and a cure for diabetes even though there is no cure and this is influenced by the cultural beliefs and values that affect individuals' health-seeking behaviour and practices. Although patients might be assisted by significant

others to find remedies elsewhere, an effective, on-going educational programme targeted at the behavioural and psychosocial skills required for the management of diabetes could empower these patients in making decisions and solving problems related to diabetes and its care.

The central theme was supported by three themes and related categories (Table 4.4). A narrative account of the Themes and categories, supported by quotations from participants follows. The quotations are italicised and represent the perceptions of the health-care professionals as discussed during the focus group discussions.

4.4.4   Theme 1: Health education on Type 2 diabetes

According to the WHO (2005), education plays a crucial role in the management of Type 2 diabetes and the acquisition of skills is necessary to empower patients for effective self-management. The goal of education is to achieve glycaemic control and prevent complications through health education that is focused on the behavioural and psychosocial domain (ADA, 2010). Traditional patient education is disease-centred with the focus on giving information on diabetes without patients' participation and without imparting disease specific skills (Steinsbekk et al., 2012), however diabetes is a chronic lifelong illness, which requires patients' collaboration with health-care professionals in determining their care to ensure long term adherence. Therefore, health education is a skills-based approach focused on helping patients to make informed choices on self-management while communicating with health-care professionals and others in the community. Patient-centred care has been identified as an essential element of high quality care (Institute of Medicine, 2001) and is required to achieve behaviour change.   A cost-effective health education tailored to patients' needs and interests that may impact positively on patients' health is an essential tool for continuous management of Type 2 diabetes.

4.4.4.1 Category1: Role of health-care professionals in health education

One of the frequently used methods of giving health education was nurse-led health education (Tang, Funnell, Noorulla, et al., 2012), the increase in the prevalence of diabetes resulted in the WHO, in 2008, recommending that a structured education method developed for effective patient education . Additionally, health education by a multi-disciplinary team of health-care professionals was suggested by ADA (2010) and has been found effective in achieving positive outcomes in diabetes.

The participants agreed with the above statement and felt that the role should not be a job specified for a particular profession or group but that it should be carried out by all health professionals within the health facility as a care responsibility:

"...I feel we have much work to do in the aspect of health education...". (HCP 3)

"We are all involved in giving health talk to the patients...". (HCP 20)

"I believe that all care professionals are expected to be involved, the doctors, the nurses and even the patient's relations. It is the duty of the nurses on the ward to give health talk to the patients...". (HCP 7)

Health education could be given as part of the activity performed by different health-care professionals as they encounter patients:

"I believe anyone that has a service to render should be involved in health educating the patients. Everybody should be involved in giving health talk to the patients because at one point in time you come in contact with them...". (HCP 1)

"Everybody is expected to give health education, you should teach patients whenever you come in contact with them and when the need arises no matter where you work...". (HCP 5)

Health education was provided by nurses in the health facilities without the input of other professionals and this could be termed traditional patient health teaching. However, the participants felt that this should change:

"We should try new methods especially in the clinic. In the clinics, we could organise health talks to patients with diabetes where patients will listen to health-care professionals and also share their views by discussing what they heard outside the hospital so as to advice on what to do. New approach may be more...". (HCP 25)

Although health teaching has been part of the facilities' routines, the attitudes of those who engage in patient education were also exemplified:

"A health educator has to be patient and persistent; we need to show empathy to these patients. We need to teach some of them so as to enable them accept the message. The follow-up and advice will help patients to cope with the disease". (HCP17)

Counselling of patients is an approach that should benefit patients with Type 2 diabetes because they encounter various self-management needs and conflicting stories outside the health facilities. Counselling is not the practice of the health facilities because the traditional method used does not permit it and the available space for teaching made it an impossible task, but participants suggested that counselling was necessary:

"Every care provider within the hospital setting: the doctors nurses, dieticians, social workers are expected to counsel patients depending on the problems...". (HCP 24)

166

"All health-care providers are expected to give health talk to patients especially during counselling…". (HCP 23)

"Individual counselling should be encouraged as patients will benefit more…". (HCP 25)

The overwhelming increase in the prevalence of chronic diseases prompted the review of the chronic disease model, which emphasised the use of a multi-disciplinary approach and active participation by the patients in the care of chronic diseases (Elissen et al., 2013). Additionally, there was an emphasis on patients' autonomy in decision-making, problem-solving and self-management of the disease, with the use of multi-disciplinary professionals in the care Chen, Lee, Huang, Chang and Chen 1986) cited in (Odili et al., 2011). Nurses have been involved in the health education of all patients with both chronic and acute illness (Tang, Funnell & Oh, 2012), which is the traditional method that has been described as ineffective with a low success rate (Hollis et al., 2014), thus there is need for change in the method.

The increase in the prevalence of Type 2 diabetes calls for a change to a multi-disciplinary team of health-care professions, which could consist of the many professionals that care for patients with diabetes (ADA, 2013b), since they perform different roles utilising multiple approaches in the process of motivating patients to adhere to self-management techniques. The roles are performed differently but complement one another in caring for these patients with problems in multiple organs (Lewis et al., 2015), because multi-disciplinary team members work interdependently, consult with one another and have shared objectives.

As advocated by the AADE (2008), different approaches are used to reach out to patients, thus allowing for patients' active participation in collaborative care with health professionals. Health education can be implemented using many strategies, however studies have favoured a combination of strategies, such as group and individual approaches and this has been reported as more effective in improving patients' knowledge and being able to cope with the disease.

4.4.4.2 Conclusions:

- Health-care professionals acknowledged that all health-care professionals in the health facilities should teach patients whenever there is need for it and that new methods should be identified.

- The additional role of counsellor should to be performed by all health professionals to address psychological effects of diagnosis and the distress of the self-management of Type 2 diabetes.

- The approaches for teaching will be varied to meet patients' needs while considering their interests and health-care professionals should have positive attitudes towards teaching the patients.

- Therefore, there is a need for a change of health teaching, since the traditional method of patient teaching using a single health-care professional will be substituted by a multi-disciplinary team of health-care professionals using the patient-centred care method as they collaborate to achieve their goals as recommended.

4.4.4.3 Category 2: Focus of health education by health-care professionals

Health education is aimed at controlling blood sugar level and preventing complications. The content depends on the goal to be achieved, but in continuity care support, every aspect of the health education curriculum for Type 2 diabetes should be included, with emphasis on areas that patients find difficult to adhere to. According to the ADA Standard of Care (ADA, 2010), activities include practices such as dietary modification, performing increased physical activity, adherence to prescribed medications, monitoring medication and blood glucose levels, regular clinic visits, managing stress, rest, psychological management and continuous monitoring of health (ADA, 2010).

4.4.4.4 Diet, exercise, medication and increased physical exercise

Health-care professionals discussed various areas on which they focus their health education during their encounters with patients with Type 2 diabetes. The majority of health-care professionals focus on diet, as can be deduce from the following excerpts:

> . *"And the diet too, we try to encourage that they can eat every food but with caution, in smaller quantity so that it would not cause harm...".* (HCP 6)

> *"...I like giving talk more on diet because when patients come they do not know much about their diet so I like to tell them more about what to eat, how and when to eat...". (HCP 20)*

> *"I like to talk about diet because even when we tell them all the kind of food they can eat we need to tell them how and especially the quantity...".* (HCP 21)

> *"I also discuss their diet, as we know they need to eat right to enable them manage with the disease...".* (HCP 24)

> *"...we try to know about their diet prior to admission as our culture determines our diet. We advise them on how to change their diet...".* (HCP 22)

Dietary education was also complemented with a diet sheet, but patients did not adhere to the diets, even when there was a reminder. The following health professional's response emphasised the need for continuity in care support through health education:

> *"I discuss diet during counselling with my patients and I used to give diet sheet but there is the problem of negligence. In most cases patients do not keep the diet sheet so they are not guided by the instruction so you see them coming up with uncontrolled diabetes. They need continue education…".* (HCP 16)

Dietary moderation entails quality, quantity and timing of meals in order to positively affect a patients' glycaemic control. The following response concerns the problem of measuring the quantity of food that patients can eat:

> *"When you ask patients to eat little quantity they do not comply, as there is no means of measuring the quantity. They complain that the quantity is too small and this invariably affects their sugar level…".* (HCP 27)

The focus of health education on exercise and medication was also identified by a few of the health-care professionals. Exercise is of great benefit to patients with Type 2 diabetes especially when consistency is maintained:

> *"...that has always been my main aim, encouraging and telling them about their diet, the exercise and their drugs...".* (HCP 23)

Dietary management is the bedrock of self-management of Type 2 diabetes since it concerns the achievement and sustenance of good glycaemic control. Patients with Type 2 diabetes are advised on dietary modification from the onset of the diagnosis of diabetes and should be sustained throughout their lives in order to enable control of the disease. According to the ADA's (2008) nutritional recommendations and intervention, patients with diabetes should adhere to the healthy lifestyle nutrition recommendations for the general population (Bantle et al., 2008), Dietary advice should be personalised with considerations for cultural practices, religious practices, socioeconomic status and the patient's needs and the interests (Ogbera & Ekpebegh, 2014).

In this study the majority of the health-care professionals emphasised on diet which showed a lack of adequate knowledge on self-management activities. A study reported that health-care professionals lay more emphasis on dietary control in the care of patients with Type 2 diabetes (Jackson et al., 2014). Although health-care professionals focus on different aspects of self-management approaches, studies have shown that there was poor knowledge regarding the content of health education among health-care professionals (Oyetunde & Famakinwa, 2014). A South African study reported that the majority of health-care professionals overestimated

169

their knowledge of self-management, indicating that misconceptions and misinformation about behaviour modification is high among health-care professionals (Parker et al., 2010), therefore health-care professionals would collaborate in developing the educational programme as well as receive training on the use of the programme.

4.4.4.5 Conclusions

- The main focus of health education was on dietary control of Type 2 diabetes.
- Other approaches were mentioned, but only by a few of the participants.
- Management of Type 2 diabetes demands behaviour changes in many areas and therefore other areas of self-management that were not given attention will be emphasised.
- Therefore, the content of the educational programme will include all activities required for self-management of diabetes.

4.4.4.6 Category 3: Essence of health education

The essence of health education to patients with diabetes is to explain, teach and use other approaches that would allow patients to learn that wellness, rather than illness, is the reason for the management of Type 2 diabetes. While there is no cure for the disease, patients can live quality lives without complications. Through the quality of education, understanding of diabetes and skills of self-management can be improved. Knowing about the disease can provide insight into the problem, thus facilitating patients' understanding of their management regimen. Health-care professionals illustrated their essence of teaching the patients as follows:

> *"The focus is to help patients manage their diabetes but one thing I want you to know is this… I personally teach them about their disease condition...".* (HCP 7)

> *"...we try to give information on causes of diabetes and changes that have occurred in their bodies due to diabetes...".* (HCP 3)

> *"...we give health talk to help the patient know their problem and how to manage to curtail the problem...".* (HCP 22)

The goal of health education is to supply adequate information that enables patients to improve knowledge and skills that will facilitate management of the disease while the patient communicates with the health-care professionals. Patients are taught to practice self-management, which is confirmed by the following experiences:

> *"...The essence of giving health talk is for them to manage themselves at home but what about our lifestyles...".* (HCP 1)

> *"My focus is helping patients to manage their state and live healthy...".* (HCP 2)

"What I want to achieve when I give health talk is for my patient to live successfully well with whatever ailment they have and able to function like every other person. ...". (HCP 23)

A common approach used by health-care professionals in teaching patients at the health facilities is fear arousal with the intention of scaring patients into managing their health:

"One other focus is to help them know that diabetes is deadly with many complications…my focus is to help them manage their disease…". (HCP 20)

Health education for patients with diabetes is the main element that is inherent and complementary to management of the disease. The process is to create awareness of the disease while increasing knowledge and skills to manage the disease in a well-informed patient (Powers et al., 2015). Due to the chronicity and the multi-organ complications of the disease, using the traditional patient education method of teaching may not have yielded the benefit of health education to patients. Patients need to be given insight into the disease process instead of scaring them into taking actions that are not understood. The aim of teaching is to empower the patients to make informed decisions and to transform knowledge to practice. Though health-care professionals use fear arousing approach laying emphasis on complications but it has been found that it is unlikely to be effective (Flynn, 2003). Patients with Type 2 diabetes need guidance to develop new skills and change their lifestyles so that they can acquire the required attitude and functioning for the control of their blood sugar   .

4.4.4.7 Conclusions

- The essence of health education was to facilitate successful management of Type 2 diabetes;

- The use of fear arousal in motivating patients to engage in self-management was evident in the study;

- Health-care professionals had different goals for health education from what is suggested by the ADA, which could be a function of lack of curriculum for health education; and

- Therefore, a structured health education programme with a planned curriculum will be developed in order to have a set goal and definite approaches directed at achieving goals and objectives.

4.4.4.8 Category 4: Management adherence by the patients

Adherence is defined as the degree to which a patient s' behaviour matches up with recommendations from health-care (García-Pérez, Álvarez, Dilla, Gil-Guillén & Orozco-Beltrán, 2013), which is required for effective management of Type 2 diabetes. The traditional didactic teaching method emphasises giving information without teaching skills (Anderson &

Funnell, 2010), with no consideration for the disease process and this could affect patients' understanding of reasons for adherence. Adherence to behavioural changes initiated and medication are important for patients to live quality lives with diabetes.

Participants' experiences showed how they have interacted with patients to motivate them achieve regularity in their medication adherence:

> "...we still encourage them because it might not be divine healing as they think as such we tell them there is a need to comply with their drugs...". (HCP 6)

> "I encourage them to see their drugs as multi-vitamins also many people are on drugs so they are not alone...". (HCP 4)

> "Some find it cumbersome taking drugs every day and we tell them see your drugs as your food and keep it close to you when you eat so as to take it accordingly, also you can have your drugs with you and still pray...". (HCP 6)

Patients could grow weary of adhering to their diets due to either attitude to the disease, negative influences, monotony of diet and many other reasons. Continuous motivation through education by health-care professionals and family is needed to overcome this:

> "...as we know they need to eat right to enable them manage with the disease. Diabetes needs a lot of encouragement and teaching to cope with it. ...". (HCP 24)

Adherence could take many forms as it could affect any of the prescribed regimens, depending on the patients' beliefs and attitude. A synergetic form of adherence is required because management can only be effective with positive and sustained control through adherence to overall prescribed management (García-Pérez et al., 2013). Communication between patients and providers is a determinant factor for patients adherence to management and has been reported as a facilitator of adherence (Ciechanowski et al., 2014). A study has shown that there is poor communication between patients with Type 2 diabetes and their providers in health facilities in Nigeria (Nwankwo et al., 2010), which could increase non-adherence that would result in a negative disease outcome. Studies have shown that adherence is related to positive outcomes of Type 2 diabetes (Awodele & Osuolale, 2015; Islam, Niessen, Ferrari et al., 2015).

In Nigeria, patients with Type 2 diabetes were found to have low adherence in their medication regimes (Jackson et al., 2015). Health-care professionals should identify acceptable approaches for teaching that will motivate patients to adhere to treatment. Becoming an expert manager of the individual's health requires confidence and self-efficacy in skills for self-management, therefore approaches to improve patients' confidence and self-efficacy will be used, since they

have been shown to improve patients adherence to management (Mishali, Omer & Heymann, 2010).

4.4.4.9 Conclusions

The data from the discussion showed that:

- Health-care professionals have experienced low adherence to self-management techniques by the patients.

- Health-care professionals have tried motivating patients to adhere to self-management.

- A client-centred approach that will involve patient active participation and a multi-disciplinary team approach may be used with motivational interviewing to counsel patients.

- Therefore, health-education that is tailored to individuals' needs and interests to motivate patients' adherence with a curriculum planned with health-care professionals will be beneficial.

4.4.5   Theme 2: Challenges encountered by health-care professionals in the care of patients with Type 2 diabetes

Health-care professionals agreed that there were some factors that militate against effective achievement of their goal of providing health education. These can be categorised into health-care professionals' factors and patient's factors.

4.4.5.1 Category 1: Health-care professionals' factor-shortage of manpower

Shortage of manpower was a very common response among the majority of the health-care professionals in terms of how it influenced time available to devote to health education:

> *"For some time now we have not been able to continue due to shortage of manpower...".* (HCP 20)

> *"The problem of inadequate health talk is shortage of staff and lack of motivation...".* (HCP 24)

> *"...but with the shortage of manpower we may not be able to achieve all that...". (HCP 23)*

> *"In this hospital, shortage of manpower is a problem and you may be alone to work in a shift, so health education cannot be your priority...".* (HCP 21)

> *"In this clinic we are two nurses on duty, even when we were three, things were not still better off… the work load is so enormous...".* (HCP 20)

"...there are no materials to work with, shortage of manpower, the environment is not very comfortable, so how do you help somebody when you are stressed yourself, it takes extra grace for you to do that...". (HCP 3)

Shortage of manpower in the health-care facilities is a common global problem affecting both public and private facilities (Booysen & Schlemmer, 2015; Burch & Reid, 2011), of which Nigerian health facilities are included. The IDF (2014) recognised the shortage of health-care professionals in the health facilities, but affirmed that diabetes self-management education is a patient's right (IDF, 2014). However, it is important for health-care professionals to utilise strategies such as the peer group to influence patients and the use of a multi-disciplinary team.

4.4.5.2 Conclusions:

- There was a manpower shortage problem at the health facilities that has affected the provision of health education; and

- Therefore, the use of a structured education at diagnosis with multi-disciplinary team of professionals would enable health education that may impact maximally on the patients. Other approaches could be explored to reduce work load of the health-care professionals such as use of informed peer member to motivate others and use of technology.

4.4.5.3 Patient-related factors

Patient-related factors include non-adherence to treatment, lack of financial resources, attitude of the patients and cultural and religious practices.

4.4.5.4 Category 2: Non-adherence to treatment by Type 2 diabetes patients

Patients with Type 2 diabetes are expected to be involved with many day-to-day self-management activities, to observe their health in order to maintain glycaemic control, and to note complications that could arise. Even though they are expected to take responsibility for their actions and the outcome of their health as they make behaviour changes, non-adherence is still found to be high among the group (WHO, 2014). Participants complained of non-adherence among the patients:

"I really see compliance as one of the major problems...". (HCP 3)

Adherence includes adherence to diet, exercise and medication. Dietary modification is the hallmark of diabetes management, however patients still find it difficult to adhere and self-determination is needed to effectively observe diet adherence. Patients do not sustain glycaemic control due to non-adherence:

"Compliance with their diet is a problem they only follow their diet when they start experiencing some symptoms...". (HCP 4)

A major factor contributing to non-adherence is the duration of the disease. It has been found that a drop in adherence is found after six months of management of chronic illness (Gelaw et al., 2014). An understanding of the disease is required to provide an insight into the disease process and although the symptoms may not be present it does not signify healing and glycaemic control could be sustained purely through adherence:

"One of the problems we have on this issue of been diabetic is that when they comply for a short time and they found that they are much improved, they feel that their problem is over, return back to their former habits...". (HCP 4)

The chronicity of Type 2 diabetes and behaviour modification that accompanies management differentiates Type 2 diabetes from many other chronic diseases and makes the adherence more difficult. Diabetes affects the bio-psychosocial being and therefore changes affect all areas of the individual's life, making it more burdensome and difficult to adhere to:

"We have a lot of problems with the patients as some of them are not ready to comply at all, even as we intensify the health talk...". (HCP 8)

As discussed previously, the influence of the social support system on the individual with chronic illness is important; chronic illness affects the patient and significant others who may seek out information and alternate management in a bid to help the individual with diabetes:

"...but they do not comply as some of them do not believe in what you tell them, instead they believe what others tell them...". (HCP 20)

As reported by WHO (2014), non-adherence is a global problem fort the majority of patients in both developed and developing countries who do not adhere to management (WHO, 2014). Supporting this observation, a report from Nigeria confirmed the high rate of non-adherence among patients with Type 2 diabetes (Adisa et al., 2011), which may have a negative effect on their health. Additionally, another study has indicated that less than 50% of patients with Type 2 diabetes achieve the recommended glycaemic control (Bailey & Kodack, 2011). Behaviour change can be initiated and sustained when an individual has value for the behaviour and also endorses its importance (Ryan et al., 2008), health-care professionals should motivate patients to have insight into the disease and see reasons for change in behaviour.

Many factors may be associated with non-adherence, which may be related to the patient, medication and the health facility. Patient-related factors are demographic factors, support system, psychological as beliefs, motivation, negative attitudes, health literacy and knowledge

(García-Pérez et al., 2013). Management factors may be related to duration, timing and multiplicity of regimens (Khan et al., 2012). Facility-related factors may include reliability, policies, organisational structures and health-care professional factors (Adisa et al., 2011). The influence of social support and other members of society is a common occurrence among patients with Type 2 diabetes (Parajuli, Saleh, Thapa & Ali, 2014) as they seek out information and cure.

Non-adherence has negative effects on the patient, the family and society because it is related to poor glycaemic control, complications and economic burden (ADA, 2013b; Dall et al., 2010). Most of the factors associated with non-adherence may be amended by using a multi-disciplinary team of health-care professionals to impart knowledge to the patients, additionally, using motivational interviewing in interactions may increase adherence and possibly improve disease outcome.

Studies have shown that improving patient education and motivation are associated with improved adherence (Carratalá-Munuera et al., 2013) and improved continuity of care through positive interactions between patients and providers and education, which has shown positive disease outcome, decreased cost and increased adherence (Chen, Tseng & Cheng, 2013).

4.4.5.5 Conclusions

- Non-adherence is relatively high in these health facilities, as emphasised by participants.
- There is a high rate of poor glycaemic control among the patients due to non-adherence as stated by participants.
- Participants are frustrated by the burden of the non-adherence among the patients, with patients not believing the health education despite intensifying the education
- Intrinsic motivation is needed to enhance maintenance of behaviour change.
- A change in the method and approaches of health education will be necessary to improve adherence because an individualised approach of care will be utilised in the programme.

4.4.5.6 Category 3: Lack of resources

The cost of managing Type 2 diabetes is a global problem that is evident in developed and developing countries (WHO, 2015) and patients with Type 2 diabetes spend a lot of resources on materials, medication and time. The economic impact of the disease may be described as enormous. Some of the participants' experiences reiterated resources as a factor mitigating against health education:

> *"...they have financial problem and so how to get resources to feed, buy their drugs become a*

problem the problem of the poor economic status of the patients cannot be overlooked...". (HCP 1)

"...they find it difficult to comply due to finance...". (HCP 22)

"There is the problem of poverty and many of the patients are poor and so cannot afford the care and lack of educational materials". (HCP 11)

A low socioeconomic status makes Type 2 diabetes management difficult. Finance is needed for the purchase of materials used by the patients, which will lead to negative effect on outcome of the disease if not provided (Mshunqane, Stewart & Rothberg, 2012). A study in the US also revealed that lack of resources and cost was a challenge to patients (Safaii, Raidl & Ramsay, 2013). This study is also supported by a report from a study in Nigeria that found costs as a barrier to management (Desalu et al., 2011). In sharing their experiences, patients also discussed the problems of cost of materials and lack of resources.

Health education and behaviour modification is the first line of treatment for patients with diabetes and is assumed to be cost-effective (Brown III et al., 2012). Additionally, adherence to self-management has been found to enhance glycaemic control, thereby reducing complications and costs (Odnoletkova et al., 2014). To help individuals who are financially disadvantaged, a change in the methods and approach of health education that will facilitate motivation and adherence should be considered since this will reduce the costs.

4.4.5.7 Conclusions:

- Participants reiterated the cost of managing diabetes as it affected patients in the health facilities.

- Poverty and cost were factors related to non-adherence to self-management among patients; and

- Therefore, health education that is cost effective must be intensified with motivation for adherence in order to reduce costs.

4.4.5.8 Category 4: Patients' attitude towards diabetes care

Attitude is defined as an enduring pattern of beliefs, perceptions, feelings and behavioural tendencies towards socially significant objects, groups, events, or symbols (Hogg, 2005). The individual's attitude also plays a major role in influencing self-management.

Many participants were concerned about the attitude of patients with Type 2 diabetes towards their management:

"...some people have formed some habits that they cannot let go, for instance people who were alcoholics before they were diabetic, when they are admitted and you tell them don't drink

177

alcohol again and they say 'you mean I should not drink so what should I do?' They try to analyse it, especially the men. They feel since they do not go out with women nor smoke, so what else should they do now apart from drinking, so it is a lifestyle problem". (HCP 1)

"...they are adamant, some will tell you that if they do not eat pounded yam they are not themselves...". (HCP 8)

A positive attitude toward a diagnosis of Type 2 diabetes is equally important to maintain behaviour change. Accepting the diagnosis of diabetes and living with the disease could cause some form of psychological distress, which could lead to maladjustment:

"...they come back worse than when they were first diagnosed, as such most of them do not make it. Some patients will even tell it to your face that they cannot stop some habits or rather prefer to die instead of complying...". (HCP 4)

"...but some patients say they prefer to die than complying and as such you see them coming in frequently for admissions or even with complications. I was with a patient with diabetic foot yesterday at the request of the doctor, after teaching him about all he needed to know and what he should not do, then I asked if the relations have any problems or questions. The wife informed me that the man is a drunk and whenever she cautions him, he beats her...". (HCP 2)

Patients' attitude could be a reflection of their understanding of diabetes as a disease and the value for their health and life. This attitude could be changed through the health-care professionals when communication is improved and patients are accepted without discrimination or judgement. Patients with negative attitudes could have an impact on the outcome of the disease as they may develop complications (Gul, 2010), resulting in hospital admissions and death (Chijioke et al., 2010). Participants' non-supportive attitudes towards the patients may also affect the patients' behaviour. Health-care professionals usual approach of blaming, advice-giving, harassing, uttering harsh words and using scare tactics are examples of health-care professionals attitudinal problems that could demotivate patients (Booysen & Schlemmer, 2015; Cyrino, Schraiber & Teixeira, 2009) and lead to non-adherence.

The change to other acceptable approaches of respect and collaboration could motivate patients. Studies have shown that patients with Type 2 diabetes are faced with attitudinal problems (Kheir, Greer, Yousif, Al Geed & Al Okkah, 2011; Odenigbo, 2012) that may result in non-adherence and associated complications (Ajayi & Ajayi, 2009; Gul, 2010). Although knowledge is a prerequisite for self-management, it has been revealed that it is not sufficient for maintenance of behaviour change (Steinsbekk et al., 2012) attitude of the patients play a major role also.

Participants expressed some of the challenges presented by patients, challenges that can be modified through the use of different approaches in communicating information to patients.

4.4.5.9 Conclusions

- Patients resist attitude change

- There was a lack of positive attitudes regarding the diagnosis of diabetes

- There it is important to try and change patient attitudes by implementing new educational approaches.

4.4.5.10   Category 5: Cultural and religious practices

Cultural and religious practices among patients with diabetes are seen as challenges to health education and self-management of the disease. Culture may influence the interpretation and the experiences that patients with diabetes have with the disease and its management (Sowattanangoon, Kotchabhakdi & Petrie, 2009) and influence the use of traditional herbs. According to the experiences of the participants:

> *"...in this era of different herbal drugs flocking the market they would tell you that it worked for so and so person and then you can try it and you even spend more money and it's disastrous, at the end of the day people end with one complication or the other and you see people end up with kidney complication or the other and most of our patients, either cardiac or diabetes, suffer from this complication, we try to advise them to keep off this things".* (HCP 6)

> *"...but when they go out somebody tells them 'wash bitter leaves and drink' without telling them the quantity, they can comply with it...". (HCP 4)*

Diabetes is a chronic, incurable disease and this fact goes against the traditional belief that all diseases can be cured with herbs:

> *"Our cultural belief has a way of dictating the way we see things, so what we do is to try and tell them that diabetes is not any form of witchcraft, they should see their doctor and take their drugs with the diet...".* (HCP 14)

> *another problem, they always depend on what people tell them, as most people claim to be medical personnel, like drink bitter leaves water without thinking of the consequences on the patient's health...".* (HCP 4) *"...*

Cultural and religious beliefs also affect beliefs regarding the cause of the disease, which could be attributed to various sources. The belief of the cause will affect the treatment use:

> *"...we have a culture and with our cultural beliefs, we attribute many things to witchcraft and a lot of them believe that somebody somewhere is responsible for their condition, another thing is they run from one church to another, thinking it is spiritual, demonic and what will determine their illness behaviour...".* (HCP 1)

> *"...they get home they would now be dragged into their cultural beliefs, believing somebody*
>
> *is behind it, they would now go and kill goats, taking native medicine, they would still end up*
>
> *with diabetes...".* (HCP 11)

The traditional medicine is prepared in a crude form without any consideration given to the constituency of the herb, dosage, or its effect on the system, causing further damage to organs:

> *"...they believe in the traditional medicine and occasionally the native doctor may also have diabetes that he is struggling to live with, but they continue to deceive others by giving herbal drugs to complicate their problems...".* (HCP 21)

> *"...The native medicine can cure it and it will be over, so they continue taking it, at the same time damaging their liver and other organs, complicating issues. They may be told about a man who can cure diabetes with some traditional medicine, they will go and try...".* (HCP 4)

Patients with diabetes seek out information from different sources as discussed by the patients and confirmed by participants and this was supported by literature. The use of alternative medicine among patients with diabetes has been reported in many studies across the globe (Nwankwo et al., 2010; Shapiro & Rapaport, 2009) and could be a result of their cultural beliefs regarding the cause and cure of the disease and may also be due to a lack of adequate information on Type 2 diabetes. In the traditional belief system many factors are believed to cause a disease and this affects health-seeking behaviour (Moonaghi et al., 2014). Additionally, faith-based beliefs direct patients' towards prayer (Jones et al., 2008) and affiliation to religious sects and local culture have been found to influence patients' adherence to management (Collins-McNeil et al., 2012).

These are individual problems that could be attended to through interactions with individual patients during individual counselling sessions that are tailored to their problems and interest. Adequate information through patient-provider interaction may improve patients' knowledge and practices, which could be introduced through a change in the structure and the process of their practice relating to health education.

4.4.5.11   Conclusions

- Health education is challenged by the use of traditional medication and faith based healing.
- Participants emphasised the negative influence of social support and social groups on the patients, leading to poor management practices.
- Behaviour and communication skills should be included in an educational programme to enable patients to negotiate effectively with members of society.

4.4.6   Theme 3: Recommendations from health-care professionals

Participants made some recommendations for a change in the method of teaching patients and also to form an advocacy group that could represents patients to management. The suggestions were:

> *"...we need to have a forum whereby every first Friday we invite all the patients with health care professionals in attendance and give health talk to the patients as well as practice some of what we talk about, we may need to follow the patients up at home...".* (HCP 4)

> *"There is need for improvement in health-care services; policy should be put in place for the management of diabetes in the health-care setting...".* (HCP 13)

> *"We are trying to form a diabetic club and also build a centre for them where patients can come together and interact, with the aim of helping each other and to prevent the increase ...".* (HCP 21)

Some of the suggestions were considered during the development of an educational programme that was developed collaboratively with health-care professionals and the patients with Type 2 diabetes.

4.5 TRIANGULATION OF RESULTS FROM VARIOUS STUDIES

An organised basic approach of enhancing trustworthiness of data was used to elicit information using three approaches of semi-structured interviews, participant observations and focus group discussions during data collection from participants. Data was analysed and various themes and categories emerged from the data. Main conclusions of themes are given on Table 4.5. Data triangulation was done after analysis (Table 4.6). The emerged themes aided the development of a structured health education programme.

Table 4.5 Main conclusion

Conclusions	Patients	Participant observations	Health-care professionals
Knowledge and understanding of diabetes	Patients had tacit and superficial knowledge of diabetes as a disease with experiential knowledge of symptoms and complications.	Nurses had specific knowledge of the disease but the health talk was focus on diet with erroneous information on the diet.	The focus of the health education was mainly on diet with less emphasis on the disease process and other self-management activities which may have affected the patients understanding.
General management of diabetes	Patients' knowledge and self-management of Type 2 diabetes was poor compared to the duration of their diabetes and their exposure to health teaching at the health institutions. Some of the patients were also utilizing traditional medicine and faith based healing which is a sign of poor understanding of the disease, its management and is indicative of poor problem solving technique.	Nurses emphasis on dietary modification was a sign of inadequate knowledge of the management of diabetes which could affect the patients understanding and practice as well. Patients who were faced with health challenges needed to know how to handle difficult situations relating to their health. Motivational interviewing is needed as a method to educate patients.	One of the approaches used was fear arousal to compel patients to manage their health but this was met with resistance as revealed by the professionals. Motivation to engage in self- management was lacking and information given also was inadequate foe a change to occur.
Health education on diabetes	Patients acknowledged that some health-care professionals gave health talks and advise in the health facilities.	Nurses gave health talks using the traditional approach which is centred on the teacher and the disease with less patients' communication and involvement.	Acknowledged their collective role in health education but suggested a new approach due to high level of non- adherence by patients.

Accessing information on diabetes	Patient had an unmet need for information which was not met at the health facilities therefore sought for help from others.	There was high level of interactions among patients which could have increased the chances of teaching one another and minimal patient provider interactions which could have led to unmet information need.	Health-care professionals emphasised that patients are exposed to various form of information from members of the society which could have led to their non-adherence. This could have been due to their inability to communicate their problems with professionals in the health-care facilities.
Perceived challenges and facilitators	Patients had the challenges of cost of managing diabetes and lifestyle changes which could be related to their low socio economic level. There was pressure of socialization from the society which could increase their non-adherence. Patients had the fear of stigmatization from members of the society which resulted in social isolation. Family support was a facilitator to self-management.	The traditional patient education and crowded clinic did not allow for individual counselling and good communication with health-care professionals which may have identified these problems and needs during counselling and tailored education would have been used in solving the problem.	Shortage of staff could have led to inconsistent health talks thus affecting the quality of health education. Cost and lack of resources was also emphasised by health-care professionals with the concern that it could affect the patient's adherence. Use of traditional medication and faith based healing was also a challenge which may have been reduced through adequate information that gives insight into the disease.
Recommendations and questions	Had a need for various unanswered questions that revealed poor understanding of diabetes. They suggested for an improved and consistent education approach.		They recognised the failure of the traditional method to adequately meet patient's need and recommended a change to a method that will enable communication with the patients.

Table 4.6: Triangulated findings to be included in the education programme

Themes/ categories	Summary of conclusion	Modules in the programme
PATIENT OBJECTIVE 1: INCREASE KNOWLEDGE AND UNDERSTANDING OF DIABETES		
Awareness of Type 2 diabetes	A patient need knowledge and understanding regarding Type 2 diabetes, specifically regarding the signs and symptoms	Overview of Type 2 diabetes – the signs and symptoms, risk factors and complications. Management of complications of Type 2 diabetes
	An awareness of psychological anguish that may occur should be instilled.	
	Patients with Type 2 diabetes need to move beyond this rudimentary understanding of the disease in order to manage themselves to confront challenges they might face in having the disease	
	Motivational interviewing should be an underlying method in teaching Type 2 diabetes	
Awareness of symptoms of Type 2 diabetes	Self-awareness of symptoms that may occur is essential	
	A positive attitude towards self-management of the disease should be instilled	
Awareness of causes and effects of diabetes	Patients need to plan and implement their own nutrition management, they need to understand the effect of their actions on their health	
	Patients need to understand possible complications of diabetes	
	A commitment to self – management of Type 2 diabetes is essential	
Non adherent to treatment	Patients are faced with the social and cultural problems of stigmatisation resulting in nondisclosure and social Patients	
	Behaviour of social isolation and fear of stigmatisation is a sign of lack of knowledge of the disease' causes	

PATIENT OBJECTIVE 2: IMPLEMENT HEALTY LIFESTYLE: CHANGES IN DIET, EXERCISE		
Self-monitoring of basic needs of diet and exercise	Focusing on maintaining a good balanced diet by addressing misconceptions	General method of managing Type 2 diabetes through healthy diet. Exercise and weight maintenance
	Plan and implement an own exercise plan to enhance a health life-style, by an awareness of the effect of exercise on the disease	
Alternative medicine	Alternative therapy alongside medical therapy is highly recommended among patients with Type 2 diabetes	
PATIENT OBJECTIVE 3: IMPLEMENT SELF-MONITORING OF TYPE 2 DIABETES		
Ensure adherence to self-management of the disease	Health-care professionals should motivate patients to adhere to self-management techniques through teaching of management skills	General management of Type 2 diabetes through self-monitoring of blood sugar with own meter, medications and care of the feet.
	Self-directing towards a healthy life-style includes regular self-monitoring of blood glucose at home with own glucometers	
Financial challenges in managing the disease	Changes in behaviour and daily living are needed for cost-effective measures in managing the disease	
Cultural and religious practices	Health education should take cognisance of the use of traditional medication and faith based healing	
	the negative influence of social support and social groups on the patients, leading to poor management practices	
PATIENT OBJECTIVE 4: MANAGE STRESS AND PROBLEM SOLVING SKILLS		
Faith in self-management of the disease	The use of faith during self-management of Type 2 diabetes, is a source of strength and serves as a coping mechanism	Management of stress, use of problem solving skills and family support
	Poor adherence due to exercise of faith	
Pressure of socialization from the community	Patients should manage pressure when engaging at social gatherings and or during meals	
	Persons should avoid social isolation by time management	

Social support from family and relatives	Family support, from spouses and children in particular, should be seen as positively supporting self-management of the disease	
Fear of stigmatization	Patients should believe in themselves to stand up against social and cultural problems of stigmatisation resulting in nondisclosure and social problems	
	Patients should have knowledge to control behaviour of social isolation and fear of stigmatisation	
PATIENT OBJECTIVE 5: COMMUNICATE WITH HEALTH CARE PROFESSIONALS		
Structure of patient education	The traditional teaching of patients did not allow for patients' active participation and demonstration	Communication and collaboration with health-care professionals in the management of own diabetes. Communicate with members of the community. Continuity of care
	The environment was not conducive to adequate patient education due to crowdedness related to multiple clinics	
Patient-provider communication was minimal	Communication between nurses and patients was minimal and patients' needs and interests were not sought out before the patient education	
Attitude of patients	Patients should be assisted to develop a positive attitude in managing diabetes	
Patient-provider communication was minimal	Communication between nurses and patients was minimal and patients' needs and interests were not sought out before the patient education	
HEALTH CARE PROFESSIONAL OBJECTIVE 1: APPLY GENERAL HEALTH EDUCATION PRINCIPLES IN THE MANAGEMENT OF ADULTS HAVING TYPE 2 DIABETES (FOR HEALTH CARE PROFESSIONALS)		
Adequate offering of health education by health-care professional	Health-care professionals should provide information to participants within and outside the health facilities on Type 2 diabetes. Educational content should focus on information that addresses knowledge, skills and beliefs and skills development	

	Patients should trust the information provided by health-care professionals	Health-care professionals with utilise their knowledge and skills to motivate patients to initiate and maintain health behaviour.
	Nurses should show empathy and listening skills during offering of health education	
Updated role of health-care professionals in health education	Health-care professionals should use effective teaching methods in health education to patients	
Focus of health education on balanced diet	The main focus of health education should be on behaviour modification	
The essence of health education	The essence of health education should be to facilitate successful self-management of Type 2 diabetes;	
	The use of fear arousal in motivating patients to engage in self-management was evident which should be discouraged but patients must be motivated	
Sources of information on diabetes-peer, media and family member	Need to seek for information both within and outside health facilities	
	Sharing of information with peer valued	
	Social support by family should be demonstrated;	
Relevant health education and educational materials	Health-care professionals to adopt latest technology and methods in guiding patients to a health live style and self-management of the disease	
Structure of health education	The traditional teaching of patients did not allow for patients' active participation and demonstration	
	The environment was not conducive to adequate patient education due to crowdedness related to multiple clinics	

4.6 SUMMARY

The findings revealed that patients had superficial knowledge of diabetes as a disease. They had inadequate knowledge of self-management and poor practice, especially in self-monitoring of glucose. The results and literature support revealed that there was a lack in the knowledge of both patients and health-care professionals on Type 2 diabetes and its management and it is assumed that this may impact negatively on the patients' glycaemic control and their quality of life. Patients' negative attitude to self-management featured in the experiences of both patients and health-care professionals and was assumed to be a factor that cumulates in non-adherence and negative outcomes of the disease. Health-care professionals acknowledged their roles as health educators and suggested the need for a new approach to health education and this was also observed in the participant observation. Both patients and health-care professionals enumerated various challenges and cultural practices and faith-based care practised by patients were discussed extensively. Additionally, socioeconomic status and financial costs prevented patients from adequately adhering to management and this was emphasised by the health-care professionals. Education is cost-effective and knowledge, skills, behavioural skills and beliefs should be acquired to have a lasting effect on the patients' outcome physiologically, physically and psychologically if maintained by the patients through continuity of self-management.

Chapter six discusses the process of developing a structured health education programme using the findings from the results and literature support and guided by steps from the IMF.

CHAPTER 5: STEPS IN THE EDUCATIONAL PROGRAMME DEVELOPMENT PROCESS (STEPS 2, 3 and 4)
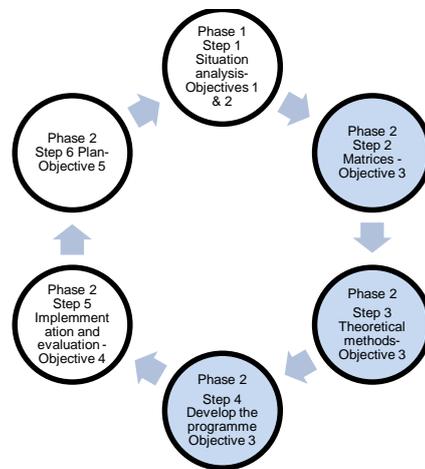
5.1 INTRODUCTION

This chapter describes the input given by the planning group and stakeholders in steps 3 and 4 of IMF. The objective for Phase 2 was to develop a structured health education programme for self-management of Type 2 diabetes through the collaboration and active participation of stakeholders (health-care professionals and the patients). Information used in the development was obtained from the situational analysis (Chapter 4) and literature reviewed (Chapter 2). The chapter describes Phase 2 of the research study consisting of steps two, three, and four of the IMF. Step 2 describes the approaches used in preparing matrices for the patients and the health care professionals using various tables. In Step 3 Constructs of the theories that guided the study were used as determinants of behaviour. Step 4 describes the programme objectives thereby setting the stage for the programme.

Stakeholder participation in the development of programmes, implementation, and evaluation is an essential part of the IMF (Blanchard, Petherick, & Basara, 2015; Cullen et al., 2011). Health care professionals and patients with type 2 diabetes represented the stakeholders because they worked in partnership with the researcher in the planning and development of this intervention programme. The researcher and the stakeholders formed an intervention programme development group that was committed to achieving the common goal.

In order to achieve the goal of coming together, a workshop was held in an informal and friendly atmosphere and the participants were welcomed individually. This was done to establish recognition and personal connection between the stakeholders. The roles, responsibilities of individuals, and the time commitment were emphasised, as were the valued contributions of the individuals and team members. To build personal relationships with team members, the development group took some time to introduce themselves and told stories regarding their experiences with type 2 diabetes. Health care professionals were asked to describe the core principle of their care to patients, and to elaborate on what they expected the workshops would provide for patients with type 2 diabetes.

5.2 PREPARING MATRICES OF CHANGE OBJECTIVES (STEP 2)

The matrix of change is the basic tool or the foundation of intervention mapping as it entails planning for the programme, specifying areas changes will occur as a result of the educational programme and what will be done for a change to occur as a result of the programme (Bartholomew et al., 2011). A set of changes to be addressed by the programme at both individual and environmental levels was documented to improve health outcome and quality of life of the patient.

Firstly, the overall desired outcome of the programme is to improve *patients'* self-management of Type 2 diabetes. The behavioural outcomes are directed at activities to achieve the overall desired outcome. By the end of the programme the patient will be expected to be able to (objectives):

- Increase their knowledge and understanding of what Type 2 diabetes is;
- Implement a healthy lifestyle: adhere to nutritional therapy, increase physical activity and maintain weight;
- Implement self-management: monitor blood glucose daily or as specified, care of the feet; and use prescribed medication appropriately
- Manage stress and use decision-making skills appropriately; and
- Communicate with health-care professionals and utilise problem-solving skills

Secondly, health-care professionals will offer the programme and use it as a manual. Organisational environmental factors, such as teaching methods, may contribute directly or

indirectly to poor management of diabetes by patients (Sallis & Glanz, 2009), therefore the health-care facility approach to health education was altered in the new programme order to facilitate effective health education of Type 2 diabetes. The organisational environmental objectives to address the environmental factors for the group of health-care professionals are that by the end of the programme they will be able to:

- Utilise a collaborative team approach in health education;
- Adopt patient-centred focus health education; and
- Use motivational interviewing (Miller & Rollicks, 2004) in the counselling of patients.

Two approaches are identified in facilitating this:

Collaborative integrated approach: Collaboration in health-care is defined as health-care professionals assuming complementary roles and cooperatively working together to share responsibility for problem-solving and making decisions to formulate and carry out plans for patients' care. In this study education in self-management of Type 2 diabetes (Fagin (1992) cited in Hughes (2011)). Collaboration in education of Type 2 diabetes patients should involve physicians, nurses, dieticians, pharmacists, psychologists, psychiatrists, podiatrists, ophthalmologists, social workers and other relevant professionals (ADA, 2010b). This group should function as a multi-disciplinary group. The group should collaboratively work to achieve a common goal as professionals focussed on their patients. Team collaboration is based on trust, respect and understanding of one another's' skills and knowledge, with a mutually agreed upon division of roles and responsibilities (O'Daniel & Rosenstein, 2008). The relationship must be beneficial to the patient, health-care professionals and the facility (CMA, 2007) to enhance positive outcomes in health education.

The programme engaged professionals at different stages of development of the programme and they were engaged from problem identification through to programme development and planning for evaluation. Interpersonal relationships were developed and the team work exposed participants to team-building. The curriculum was developed in a modular form, stipulating the content and activities to be performed by health-care professionals and patients. Nurses led the team since they act as effective coordinators and prevent duplication of roles (Antigoni & Dimitrios, 2011).

Motivational interviewing: The decision to change behaviour depends on the patient and not on the health-care professional. Although the professional may initiate a need for change, the motivation to change is inherent in the client. Motivational interviewing according to literature

is a client-centred, therapeutic style developed for helping individuals work through ambivalence and maintain change Miller (1984) cited in (Miller & Rose, 2009). It is defined as "a collaborative goal-oriented style of communication with particular attention to the language of change, which is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reason for change within an atmosphere of acceptance and compassion" (Miller & Rollnick, 2012).

The motivation involves conversations between a health-care professional as educator and a client in order to address the uncertainty about change enable the client to convince himself to change based on his/her principles and interests, which may be contrary to the conventional health education where a client is persuaded to change behaviour. The philosophy emphasises the partnership between professionals and their client and eliciting patients' internal motivations (Pollak, Childers & Arnold, 2011). The counsellor collaborates and engages clients in change talk in order to guide the client to motivate himself/herself as he/she gains understanding and gives reason for his/her concern and also argues for change.

For an individual to succeed in the management of a disease there is a need to set goals that will keep the individual focused and direct their plans or behaviour. Additionally, they can be used as a benchmark for determining the level of success achieved (Miller & Rollnick, 2004). Goals should be SMART; that is specific, measurable, attainable, relevant and time bound. These set goals will be written and kept in the patients' case file for future references.

Goal-setting will be a major task for health-care professionals during the programme. It is a new concept in these facilities since patients have not been receiving individual counselling. It was decided that professionals will be trained in the use of motivational interviewing and goal-setting by resource persons from the University of Benin. The National Standard for Diabetes Self-management Education and Support advocated for continuous support to patients in goal-setting and achievement (Haas et al., 2013). Additionally, patients who are actively involved in goal-setting with health professionals and with clear goals are more successful in achieving their goals and are satisfied with their care (Heisler, Cole, Weir, Kerr & Hayward, 2007). It has been found that goal-setting among patients with diabetes increased their self-management with positive outcomes (Khunti et al., 2012).

The principles of motivational interviewing will be addressed in the programme. A review of the literature showed that the most empirical support for motivational interviewing has been found in the field of substance abuse, but nowadays, motivational interviewing is increasingly

being advocated in other health-care areas such as diet, exercise and diabetes (Hollis, Williams, Collins & Morgan, 2013).

Health-care professionals have the responsibility of assisting patients to improve their health behaviours and to maintain them. Motivation by health-care professionals is necessary, because motivation has been described as the most important factor that educators can target in order to improve behaviour change (Williams & Williams, 2011). Patients may not appropriately set health goals on their own because they require information, motivation and probable skills to accomplish this. Therefore, through a collaborative process with patients who have chosen a change in behaviour, health-care professionals will engage in guiding decision-making to set the goals with an agreement on self-management goals since it affects the various activities for self-management and goal action plans. This should be documented by keeping a copy in the case file for future reference and to determine how the patient is adhering to the plan. Patients with diabetes need to set short-term goals due to the nature of their disease follow up to determine attainment or a need for retraining and resetting of goals, especially difficulty is experienced in attaining the goal.

The second task was sub-dividing the behavioural outcomes and environmental outcome into performance objectives. This task involved matching the objectives to be achieved with the programme and the actual activities that patients are expected to perform. Performance objectives are the precise behaviour expected from patients with Type 2 diabetes and the health-care professionals (Table 5.1 & 5.2).

Table 5.1: Performance objectives of the behavioural objectives for patients with type 2 diabetes

Behavioural objectives Patients will	Performance objectives
Overview of the Type 2 diabetes disease process – personal determinants	i. Identify the types of diabetes ii. Identify the symptoms, causes, risk factors and complications of Type 2 diabetes iii. Describe the management and prevention of Type 2 diabetes
Adhere to nutritional therapy, engage in increased physical activity and maintain weight	i. Describe the diet suitable for Type 2 diabetes ii. Plan diabetic menu with locally available food iii. Describe timing of meals and effect of diet on their health iv. Maintain weight or reduce weight through diet and physical activity v. State the advantages of increased physical activity vi. State the various methods of physical activity
Monitor blood glucose level at home using personal glucometer, maintain foot care and adhere to medication with an emphasis on the effects of traditional medication	i. State the advantages of monitoring blood glucose regularly at home. ii. Use the glucose meter accurately. iii. Identify the range of blood glucose level iv. State reasons for care of the feet and the effect of the disease v. Describe the care of the feet vi. Identify the prescribed medicine stating the dose, time and possible side effects vii. Adherence is maintained viii. State the negative effect of traditional medication
Manage stressful situations as they occur using learned techniques and use of social support systems, as well as use of problem-solving skills.	i. Identify the sources of stress ii. Use a variety of stress management technique iii. Generate alternative methods of psychosocial adjustment to daily life iv. Cope with stress v. Describe the use of Social support vi. Describe problem-solving skills
Participate actively in management of diabetes through improved communication with health-care professionals and members of the community. Maintain continuous management.	i. State goals for self-management tailored to their immediate needs. ii. Participate actively during counselling as they ask questions freely. iii. Interact with HCP through cell phone iv. Patients make informed decisions with care professionals and others in the community v. Engage in goal-setting with health professionals vi. Identify reasons for continuous care vii. Continuity of care is maintained

Table 5.2: Performance objectives for behavioural objectives (Health-care professionals)

Behavioural objectives-Health-care professionals	Performance objectives
Use collaborative team approach in health education	i. Mutual respect and power sharing ii. Communicate patients teaching promptly with other professionals
Practice patient-centred approach	iii. Patient as the focus of teaching since patient needs are catered for iv. Allows collaboration and participation of patient during teaching
Utilise motivational interviewing in counselling patients	v. Patients are motivated to change their own behaviour vi. Initiate one-on-one counselling with listening skills

5.3 SELECTING PERSONAL AND EXTERNAL DETERMINANTS OF BEHAVIOURS

The third task was the selection of the important personal and external determinants of behaviours which were performed using constructs from the behaviour change theories as discussed in Chapter 1. Determinants are factors associated with the performance of self-management within the individual, that the individual can easily control, or those factors within the environment which can be modified (Bartholomew et al., 2011). IMF is theory-based and to actualise the task of developing an educational programme it was expedient for the group to identify theories that directly address the determinants of behaviour (Draper et al., 2014). Theory facilitate understanding of factors that work best because theory-based interventions make use of specific causal pathways (Abraham & Michie, 2008). Additionally, theory used can be tested because such interventions accelerate an understanding of how theory works, thereby assisting in further developing theories for different contexts (Catherine et al., 2012). Considering all the outlined factors the group brainstormed some of the determinants. Determinants chosen *for the patent* were knowledge, self-efficacy/skills, attitude/autonomy and expected outcome.

Knowledge: Knowledge is defined as a fluid of framed experiences, relative information, values and expert insight that provides a framework for appraising and integrating new experiences and information (Davenport & Prusak, 1998). Knowledge is not static and it

involves information and an individual experience that may affect their behaviour or reaction to the environment.

Individual behaviour and performance may be affected by the knowledge acquired. To have "knowledge is to have the power to give a successful performance, not actually to be given one" (Ayer, 1958:10, cited in (Hunt, 2003) patients should have knowledge and the skills to perform at a higher level than they would have done without learning. Experience with others and the environment plays a role in the type and amount of knowledge gained and retained by an individual (Hunt, 2003), therefore the learning environment should be favourable and related to what is to be learnt and the approaches used in communicating would allow for positive interactions with others to facilitate learning.

The utmost desire is a behaviour change and therefore knowledge acquired cannot be seen, but it will be deduced from the change in behaviour as it affects self-management of diabetes. Different approaches will be used in communicating information to the patients, such as lectures, demonstrations, use of computer-based discussions, posters, pictured educational materials, role-play and prompt practice.

Self-efficacy and goal-setting are related to maintaining self-management activities. According to Bodenheimer and Hondley (2009), self-efficacy develops when a patient is able to achieve the targeted goal. Achieving this goal may motivate patients to set higher goals and when goals are not met, self-efficacy may depreciate. Invariably, if patients are not motivated it could lead to non-adherence, goal abandonment and poor self-management, therefore it is important that patients should be followed up with their set goals and motivated to enable behaviour change. Just as provider education is continuous throughout a career, becoming a self-manager of diabetes must be recognised as continuous throughout a patient's lifetime; diabetes is a lifelong disease and continuity of management has been advocated (ADA, 2010).

Attitude: Attitude is defined as a psychological tendency that is conveyed by viewing a particular object with favour or disfavour (Eagly & Chaiken, 1993, cited in (Eagly & Chaiken, 2007) additionally (Di Martino & Zan, 2010) described attitude as a tendency to respond to a certain object in either a positive or negative way, therefore attitude can be seen as the mental position of an individual's assessment of a situation that is expressed as the behaviour. The sense of self or self-evident is expressed when the individual engages in some degree of judgement that is a product of their background, experiences, values, education, culture and beliefs (Hungerford, Dowling & Doyle, 2014). Invariably attitude determines behaviour and

therefore it is assumed that for behaviour to change, then attitude change must precede the behaviour. In an attempt to change these attitudes, approaches such as goal-setting, demonstrations, prompt practice, home activities and use of log books will be utilised.

Autonomy is the ability to take a course of action and decisions intentionally with adequate understanding and without any external controlling influences (Beauchamp & Childress, 2009). It is also viewed as an individuals' inherent desire or preference to experience a sense of choice and psychological freedom when carrying out an activity (Deci & Ryan, 2000). It is a construct of the self-determination theory which is a psychological need that should be met for a behaviour change to occur. Through intrinsic motivation by the health-care professionals behaviour change can be initiated and sustained as the individual has value for the behaviour and also endorse the importance (Ryan et al., 2008). Controlled motivation through external regulation will be minimized as there will be minimal use of authority and introjection as they have been found as unrelated to long term adherence (Ryan et al., 2008). Autonomous motivation will be facilitated through adequate provision of relevant information and skills for behaviour change without use of external force.

Competence is the ability or feeling confident and having the capability of achieving a desired outcome (Patrick & Williams, 2012) which can be assumed to be the same concept of self-efficacy in Bandura's Social cognitive theory. Self-determination theory posits that achieving a sense of competence is enhanced by autonomy, adherence cannot be initiated and sustained only through self-efficacy but this must be accompanied by autonomy (Ryan et al., 2008). Since individuals' competence requires autonomy, then their intrinsic motivation will be maximized as patients are taught skills needed for coping with Type 2 diabetes. There is a need for the patients to feel capable of performing self-management therefore health care professionals will create an enabling environment and support the patients through education, demonstration of coping skills, performance of skills, setting achievable goals, active participation of patients in care and decision making as well as advocate for tools that will enable changes to occur.

Behaviour cognition: is the act of knowing, acquiring information about something which is referred to as behaviour capacity (Bandura, 1998), knowledge of behaviour and the skill are paramount to individuals in order to perform specific behaviour. This shows that before a task can be effectively performed, learning or impacting of knowledge must have occurred. Although a task may be learned without any performance however performance presumes

learning. Patients with Type 2 diabetes who are expected to perform self-management in order to live well with diabetes need to acquire knowledge and skills to enhance their ability to perform self-care which would be impacted through various activities that the health care professionals and the patient will be engaged in.

Self-efficacy is a construct of the social cognitive theory which beliefs in the abilities or capabilities to perform a task or organize and perform activities required to produce a given level of attainment (Bandura, Freeman, & Lightsey, 1999). It reflects self-confidence in the ability to exert control over behaviour, own motivation, thought process and the social environment (Bandura, 1986) thus enhancing accomplishment and wellbeing as the individual does not approach difficult task as threats but as task to be mastered there by motivating a change of behaviour. Researchers have revealed that self-efficacy is associated with behaviour change (Mahdizadeh, Peymam, Taghipour, Esmaily, & Mahdizadeh, 2013). Belief in self-efficacy can be developed through four sources of influence of mastery experiences, vicarious experiences through modelling, social persuasion through motivation and reducing individuals' stress reactions as negative emotional thoughts and misinterpretations are corrected (Bandura, 1998). Diabetes-related confidence in the ability to perform the necessary self-care activities is an essential outcome measure for education programmes.

Outcome expectations- outcomes are the consequences of an action therefore action could serve different purposes or cause other unanticipated occurrences. According to Bandura, (1991a), (Social cognitive theory) the visualized future events can be turned into reality which requires that the present directed intentions should direct and motivate the individual's focus or forging ahead (Bandura, 1991). Outcome expectations are constructed by individuals based on their observation of conditional relations between environmental events within their society and the consequences of their given actions (Bandura, 1986). Foresight behaviour is promoted as the individual allows the anticipated outcomes to enable the performance of current activities and regulate the present to fit a desired future as the individual moves above the dictates of their present situations (Bandura, 1998). This achieved as thought is linked to actions through a self-regulatory process of motivation, affect and action, governed by self-monitoring, performance self-guidance, and corrective self-actions (Bandura, 1986). Type 2 diabetes is a disease that requires responsibility for ones' health as well as continuous care to ensure positive outcome of disease, foresight into the outcome of their immediate actions in relations to their health outcomes is important. And to achieve this during the structured programme adequate

information through lectures and group discussions, motivational interviewing and goal setting, skill acquisition and modelling will be employed.

Environmental determinants for health-care professionals were selected based on the situation analysis results and the findings from the literature reviewed. Determinants needed for collaborative teamwork to enable the programme's goal to be achieved are knowledge of the approaches and self-efficacy in the skills needed to actualise the approaches.

Based on the theoretical assumptions of the study, the behaviour theories were discussed by the planning group.

5.4 MATRIX OF CHANGE OBJECTIVES

This is the fourth task and it involves creating matrices for each performance objective. Performance objectives and determinants of behaviour are used in forming tables for the matrices. Matrix of change objectives represent the trail of important changes expected to occur in the health behaviour of the patients, reflecting as pathways for immediate changes in behaviour and the capability to influence health behaviour and actions taken by health-care professionals (Bartholomew et al., 2011). The matrix specifies what the patient needs to learn and changes expected to occur in the environment. A separate table was constructed for each stage of intervention planned for the performance objectives for both patients with Type 2 diabetes (Table 5.3 – Table 5.7) and for the health-care professionals (Table 5.8 – Table 5.10).

Table 5.3: Matrix: Overview of the Type 2 diabetes disease process – personal determinants

	Performance objectives	Knowledge	Self-efficacy /skills	Attitude/beliefs	Outcome Expectations
1a	Identify own type of diabetes	Distinguish own situation with regard to other types of diabetes	Express confidence in recognising own condition of Type 2 diabetes	Willingness to inform family members of own and other types of diabetes.	Expect that understanding about diabetes is a step needed in adherence to own self-management of the disease
1b	Self-awareness own symptoms, causes, risk factors and complications of Type 2 diabetes	Identify own symptoms causes, risk factors and complications of Type 2 diabetes	Express confidence in sharing actions to monitor causes, risk factors and complications of the symptoms of Type 2 diabetes with others	Feel positive towards informing family members and friends of symptoms causes, risk factors and complications of Type 2 diabetes	Expect that by being vigilant to symptoms, causes, risk factors and complications one will be able to plan and organise prompt actions to accessing health-care disease
1c		Identify ways to organise daily living to prevent causes and risk factors	Express confidence in organising daily activities to prevent causes and risk factors of the disease.	Share ideas on how to adapt a healthy life style while managing the disease	Share examples of how the understanding of risk factors can help to manage diabetes or delay occurrence
1d		Explain the disease process and possible complications	Direct their actions to appropriately manage hypoglycaemia	Can as an individual assist other to feel positive after crisis e.g. a complication of the disease	Demonstrate that early treatment can improve the health of a person living with Type 2 diabetes

Table 5.4: Behaviour – utilise locally available food in planning diet

	Performance objectives	Knowledge	Self-efficacy /Skills	Attitude/Autonomy	Outcome Expectations
2a	Identify the diet suitable for own Type 22 diabetes	Explain how consumption of nutrition-managed therapy helps glycaemic control	Express confidence in identifying the suitable diet	Feel positive about nutrition-managed therapy diet	Describe expectation that nutrition-managed therapy diet will help glycaemic control and adherence
2b			Express confidence in telling others about diets suitable for diabetes	AA.2.b. Express positive attitude towards being helped by others	OE2.b. Describe expectation that family members will help in providing the right diet
2c	Plan nutrition-managed menu with locally available food	Identify local diet and state the cost in terms of money and choice	Demonstrate confidence in ability to identify options for effective and suitable diet	Feel positive about nutrition managed diet	Expect to have good glycaemic control through adherence
2d	State the timing of diet and control of craving	State the different time for diet		Feel positive about the timing of diet	Expect that timing will help to control impulsive eating habit
2e	State the different activities that can be engaged in and the duration	Describe the different physical activities suitable for patients with diabetes, duration and contra-indications for exercise	Demonstrate identifying appropriate exercises	Feel positive about increased physical activities and glycaemic control	Expect that appropriate duration will affect glycaemic control
2f	Perform physical activities accurately	Describe types of physical activities accurately	Express confidence in taking time to engage in physical activity	Express positive attitude towards increased physical activity	Expect that physical activity will keep health stable through stable blood glucose
2g	Maintain weight	Describe the effect of maintaining weight and methods of weight maintenance		Feel positive about weight reduction	Expect that normal weight will prevent complications of diabetes and give psychological satisfaction

Table 5. 5 Behaviour Monitor blood glucose at home with personal glucose meter

	Performance objectives	Knowledge	Self-efficacy/Skills	Attitude/Autonomous	Outcome Expectations
3a	State the advantages of self- blood glucose monitoring	Explain the advantages of self -blood glucose monitoring		Feel positive about self-blood glucose monitoring	Describe how Self blood glucose monitoring will help monitor health status
3b	Identify the ranges of blood glucose levels	State ranges of blood glucose levels	Express confidence in stating ranges of blood glucose levels		Describe hyperglycaemic, normal and hypoglycaemic blood glucose levels
3c	Accurately use the glucometer	Describe self-monitoring of blood glucose	Demonstrate accurate use of glucometer	Feel positive about self-blood glucose monitoring	Expect that if blood glucose is monitored, diabetes can be controlled
3d	Care of the feet	Describe examination of the feet	Demonstrate accurately the examination of the feet	Feel positive about examining feet	Expect that examining the feet will help in detecting abnormality
		State the method of caring for the feet	Demonstrate efficiently the care of the feet		Expect that care of the feet prevents risk of Ulcer
3e	Adherence to medication and discuss the effect of traditional medication on diabetes	State the medication used for management of Type 2 diabetes	Express confidence in describing the dose		Expect that adherence will enhance positive health outcomes
		Maintain adherence to medication	Maintain commitment to medication.		
		State the effect of traditional medicine on the organs	Express confidence in describing traditional medication and its effect.	Feel positive about the side effect of traditional medication	Patient expects that use of traditional medication exposes patient to danger

Table 5.6: Behaviour – Manage stress and problem-solving skills

	Performance objectives	Knowledge	Self-efficacy /skills	Attitude/Autonomous	Outcome Expectations
4a	Identify sources of stress	Explain stressful situations and how stress affects diabetes			State expectations that knowing sources of stress can help to prevent stress
4b	Generate variety of techniques of stress management	Describe the various stress management techniques	Demonstrate and express confidence that stress management techniques can be done independently	Express positive feeling toward stress management	State that managing stress will help cope better with diabetes
4c	Cope with stress	Describe effective stress coping methods	Express confidence in the use of stress management techniques	Feel positive about stress management	State that stress management will help cope with diabetes
4d	Problem solving technique	Describe the skill of problem-solving	Express confidence in the use of problem-solving techniques	Feel positive about discussing the problems encountered with diabetes	State that the use of problem-solving helps individuals to cope with Type 2 diabetes

Table 5.7: Behaviour – Participate actively in management of diabetes through improved communication with health-care professionals

	Performance objectives	Knowledge	Self-efficacy /Skills	Attitude/Autonomous	Outcome Expectations
5a	Communicate positively with health-care professionals and participate actively in management	Describe patient-provider interaction and collaborative care	Demonstrate skills in effective communication with professional and collaborative care management	Express positive attitude towards collaborative care management	Expect that being active and collaborating in management will increase coping adherence
5b	Set goals with health-care professionals	Explain how to meet goals for self-management		Express positive attitude towards setting of goals	Expect that if goals are set with health-care professionals then patients will ensure adherence
5c	Interact with HCP through cell phones and during one-to-one counselling			Feel positive about improved communication	State that improved communication will enhance adherence

	Performance objectives	Knowledge	Self-efficacy /Skills	Attitude/Autonomous	Outcome Expectations
5d	Use decision-making skills effectively	Describe techniques of making decisions	Demonstrate decision-making skills	Express positive attitude towards decision-making	State that the use of problem-solving skills will enhance adherence

Table 5.8: Behaviour – Use collaborative team approach in health education (for health-care professionals)

	Performance objectives	Knowledge	Self-efficacy/Competence
1a	Mutual respect and power sharing	Describe mutual respect and power-sharing with others.	Express confidence in communicating respect and sharing with others
1b	Communicate patients care promptly with other professionals	Discuss patients care with other health-care professionals who are involved in the care	Demonstrate skills in communication

Table 5.9 Behaviour Practice patient centred approach of care

	Performance objectives	Knowledge	Self-efficacy/competence
2a	Patient as the focus of management as patient's needs are catered for	Recognise change in method of health education regarding patient-centred approach	Participate actively in patient-centred approach
2b	Allows collaboration and participation of patient in the care	Describe the effect of collaborative care on patients' outcome and quality of life	Demonstrate skills in collaborative care.

Table 5.10 Behaviour –Utilise patient motivational interviewing in counselling patients

	Performance objectives	Knowledge	Self-Efficacy/Competence
3a	Patients are motivated to change	Describe intrinsic motivation and effect of change on patients' adherence	Express confidence in motivating patients for behaviour change
3b	Initiate one-on-one counselling with listening skills	K3.b. Recognise the need for individual counselling	SC3b. Demonstrate skills in counselling of patients.

5.5 STEP 3 – SELECTING THEORY BASED METHODS AND PRACTICAL STRATEGIES

The planning group performed four tasks to actualise this step (Chapter 3). The programme was already taking its form based on the completion of tasks performed in Step 2. The topics for the modules of the programme had been outlined, the group deliberated on the detailed content of the programme. This was facilitated by the health-care professionals making useful and creative contributions especially in their areas of specialty. The content of the programme was developed utilising the behavioural objectives and the performance objectives.

5.5.1   Theoretical methods

The second task was identifying theoretical methods: Using the behavioural change theories discussed in chapter one with literature support, the planning group identified theoretical methods that would enhance teaching the content and enable active participation of the patients. The change objectives were also considered. Abraham and Michie (2008), conceptualised a taxonomy of behaviour change techniques which was used as a template in identifying constructs from information, motivation and behavioural skills model and social cognitive theory (Chapter 1) (Table 5.11). Constructs of the motivational interviewing framework were used for the behavioural determinants of the health-care professionals and these were motivation, individual counselling and goal-setting.

Table 5.11 Change objectives and methods

Change objectives	Methods
Describe what is Type 2 diabetes	Provide information on Type 2 diabetes (IMB)
Identify and plan diet suitable for patients with diabetes. Discuss types of exercise and weight maintenance.	Provide information about health behaviour link onto consequences (IMB) Demonstrate the behaviour modelling (SCOgT)
Monitor blood glucose level at home with personal glucometer and demonstrate foot care	Provide information about behaviour health link (IMB) Demonstrations (SCOgT) Provide instruction (SCOgT)
Manage stress, discuss problem-solving techniques and adherence to medication and discuss effects of traditional medication on patients with diabetes	Provide information (IMB) Demonstrate the new behaviour to be learnt (SCOgT)
Participate actively in management of diabetes through improved communication and decision-making skills with health-care professionals and the community	Provide information (IMB) Demonstrate behaviour (SCOgT)

5.5.2 Teaching approaches and methods

The third task was approaches and methods used in teaching: The method used depends on the goal to be achieved and the topic. Additionally, when approaches are varied it shows the importance of the message being passed. Many approaches would be used during each module of educational programme to allow for an active class with patients interacting with others and performing various activities at different times (Figure 5.1). Various approaches such as group discussions, demonstrations, literature materials (written instructions), lectures, role-play, feedback from the patients and pictorial designs were suggested. The environmental methods chosen were discussions, demonstrations and lectures.
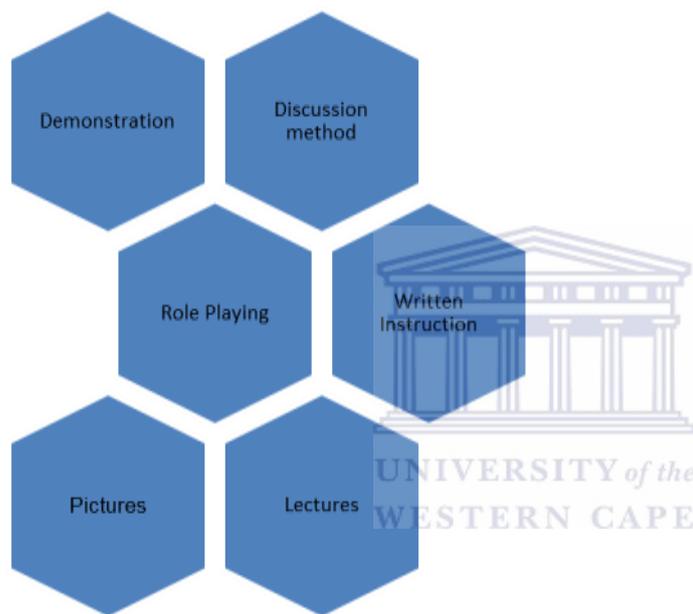
Figure 5.1: Teaching methods

Group discussion: A group discussion is one focusing on health issues among some patients with the same health problems to facilitate flow of information and allow members participate. The group is formed to meet their needs. It is used for a few people in a group to enable participation and collaboration with other members of the group. Members of the group provide support to one another and encouragement. It could be used for fact-finding, problem-solving and enlightenment (Eliles, 2002). This approach has been reported to have some advantages that are beneficial to the patient, the family and society and it is considered to be cost-effective, increase inter group interaction, motivate modelling and help to maintain blood glucose (Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012). The advantage is that the group approach allows for more interaction between patients, interpersonal relationships and social modelling

(Koetsenruijter et al., 2014). Cost-effective study indicated that programmes that incorporate group education with clinical care were effective in improving self-management among patients with Type 2 diabetes (Scain, Friedman & Gross, 2009).

*Lectures***:** Lectures are verbal and are the most common method of communicating information to patients. A lecture is a formal lesson whereby a teacher presents a prepared lesson to the learner. The lesson is designed to allow patients to make use of knowledge gained in different environments with confidence. There is a need for a health-care provider to understand the group with individual differences in learning and abilities. Cultural beliefs and values must be respected. It can be combined with other methods to increase effectiveness.

Written instruction: Written instruction is used to complement the lecture method; it could be in the form of booklet, leaflet, information hand-out, or written instruction. It should be written in language that is easily understood by the majority of the patients and therefore there is a need to know your target population. It should be simple and clear, with the language written at a fourth to sixth grade level (National Institute of Health, 2006)

Pictures: Pictures are used to illustrate information that is communicated verbally. Well-designed pictorial material can stimulate reading and interest and also provide understanding, attention, recall and adherence (Houts, Doak, Doak & Loscalzo, 2006). They assist patients' understanding of directions and schedules more effectively. Pictures must be related to topics discussed and should be relevant; this should not be distracting.

Demonstration or actions: This is a pleasant method of sharing information and skills because individuals have the chance to apply their different senses. The method involves a mixture of formal teaching and practical teaching and the group must be manageable and not too large so as to allow everyone to participate and to have a view of what is being demonstrated. Patients should have a chance of practicing the skill and therefore materials must be available and familiar so as to allow for return demonstration and prompt practice. Skills must be relevant to the topic and the health problem and must be of importance and have a relevant health outcome. Reinforcement by oral and written materials is equally important to increase concentration, recall and adherence (Lowenstein, Foord & Romano, 2009). Health-care professionals would allow time for questions and answers and allow time for practice.

Role-playing: This consists of acting out of real life situations that are used in studying the learners competence (Liu & Ding, 2009). Actors in a role playing are volunteers. The facilitator gives a description of the characters to be acted and the form, the actors then act out the play

making up the actions and the dialogue that may ensue. The facilitator would discuss the play with group after the role-play and ask for their views regarding the role-play, the lessons learnt and what could have been improved on. The role-playing is always related to the health problem or issue being discussed, therefore it enables patients to understand their problems, the effect of non-adherence and patients and the facilitator try to explore modalities for solving problems. It could stimulate interest and modelling of character (Liu & Ding, 2009).

Telephone conversations: This is the exchange of information through the use of technological devices such as telephones and computers. It could be done through voice messages or messages to individuals or a group. The exchange of information between the health-care professional and the patients takes place within the social context of the patients. There is a continuity of care and reiteration of the information given earlier at the health-care facility. In this programme the health-care professionals will use both the voice conversation and short messages to remind patients of their responsibilities and activities for the week and the message may depend on the patients' health outcome the previous week.

The fourth task was selection or designing practical applications and ensuring that applications addressed change objectives. This step entailed application of theoretical methods and approaches to the determinants of behaviour in order to ensure accuracy (Table 5.12). Theoretical methods and applications were matched with the determinants and change objectives.

Table 5.12: Methods and applications

Determinants and Change Objectives	Methods	Applications
Knowledge of type 2 diabetes	Information regarding disease, elaboration, lecture, demonstrations, posters, pictures, role-play and home activities	Health-care practitioners give lecture on disease Use of computer-based discussions. Posters Pictured educational materials
Knowledge of self-management of Type 2 diabetes	Information on self-management through lectures Cues to action Activity lessons for the group and individuals Demonstration of skills Motivational interviewing Goal-setting Literature materials	Health-care professionals give information on self-management of Type 2 diabetes, self- monitoring of blood glucose, diet control, physical activity, stress management technics, relaxation, time and foot care Demonstration of skills using available material Patients actively participate in group and as individuals Literature materials with illustrations on self-management procedures Information motivates patient to take actions
Self-efficacy and skills in self-management	Goal-setting chart Demonstration Monitoring Prompt practice Habit formation	Patients monitor behaviour using goal-setting chart. Patients demonstrate the ability to perform skill for self-management. Personalised messages are tailored to patient's need. Acquired skills are changed to habits.

Determinants and Change Objectives	Methods	Applications
	Personalised information Assignment	Assignments are given to enable patients to rehearse skills at home to enhance competence
Attitude towards self-management techniques	Goal-setting action plan chart Monitoring of blood glucose Feedback, demonstration, assignment, prompt practice Active participation in health-care and group discussion	Patients monitor behaviour using the goal-setting chart Patients demonstrate skills of SBGM and record result Patients record results of blood glucose and physical activities performed at home Patients actively participate in demonstrations, ask relevant questions and contribute actively.
Outcome expectations of change in behaviour regarding self-management	Computer-aided lecture Feedback lectures, pictorial presentations, role-play, group discussions	Lectures on diabetes using pictures and models for illustration and understanding Pictures on self-management of diabetes with people who have managed it successfully and who are living a healthy life with the disease Feedback on patients' ability to successfully learn and manage new skills

5.6 STEP 4: PRODUCING PROGRAMME COMPONENTS AND MATERIALS

The purpose was to produce a creative and innovative education programme that should be sensitive to the needs and the culture of the patients in Edo State. The planning group also considered the integration of the programme into the contexts and therefore the capacity of the health facilities and the available resources were considered. Six tasks were performed during this step to adequately produce the materials for the programme and outline the scope of the study (Chapter 3). The programme was planned to suit patients with Type 2 diabetes, health-care professionals and health facilities. The scope, sequence, channel of delivery and materials needed for the programme were created (Chapter 6). The methods to be used and various approaches were derived also from step 2 (Tables 5.12). The content to be included in the programme were expanded to contain detailed points that participants would easily recall (Chapter 6).

5.6.1 Reviewed available programme materials and developed programme materials

Teaching tools that stimulate different senses in the individual such as visual, auditory and tactile were considered for learning. These teaching tools include written materials and the widely used materials include hand-outs, brochures, booklet, pamphlets, log books, note books and goal-setting action plan books. Materials were collected from the internet and few materials were also developed to enhance teaching and learning. Educational materials with pictorial designs to stimulate learning on all the modules were collated and tailored to the patients' needs

and literacy level. Materials were gotten from the State Ministry of Health and Education on diet, universal percussions, environmental and personal hygiene. All the materials developed for the programme such as posters, written materials and audio messages were tested for audience reaction as they were relooked by 4 patients with Type 2 diabetes from the two health institutions (Chapter 3).

Feedback was collected from the patients after they had been exposed to the content of the programme and the literature materials as the group discussed the information given to them. Some of the feedback was that the language used for the teaching should be simplified and that more pictorial materials should be used in the leaflets with culturally relevant messages.

Gatekeeper's reviews offered useful suggestions such as the day of the week that would be suitable some modification of the content although they were sceptical of the patient centred approach to be used as they acknowledged that it was not feasible. All the suggestions were used in creating the educational programme. The educational programme was produced based on the tasks performed in steps 2, 3 and 4. The materials were rechecked with the objectives of the programme and they were produced after making necessary changes and adjustments based on the suggestions of the patients and other stakeholders.
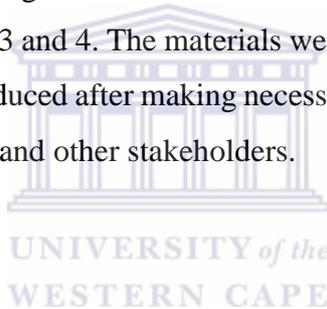
5.7 SUMMARY

Chapter 5 presented the process that the group used to produce the programme components and materials with due consideration for the patients who are the consumers of the educational programme and the context in which it should be used. Some members of the adopter and implementer groups were invited to enable the group to produce an acceptable programme that will fit into the facilities' routines. Some patients were also contacted to determine their preference for programme design. The objectives of the education programme were also considered. Re-looking of the materials with a few patients yielded a positive outcome and was used in modifying the materials. A creative and innovative structured health education programme was developed using steps in intervention mapping after a two-day workshop with health-care professionals and patients. A training workshop on the use of the motivational interviewing framework, communication skills and the use of the health education manual was organised for health-care professionals, using lectures and practical skills development approaches. Chapter 6 provides a detailed description of the health education programme.

CHAPTER 6: STRUCTURED HEALTH EDUCATION PROGRAMME FOR SELF-MANAGEMENT OF TYPE 2 DIABETES
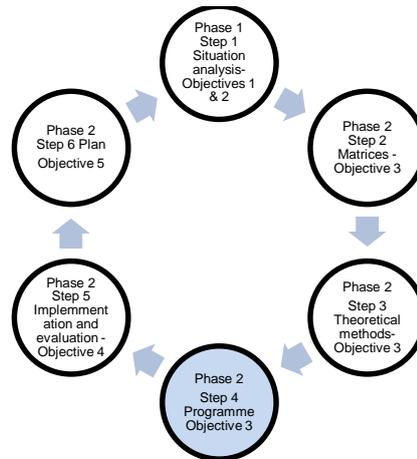
6.1 INTRODUCTION

The education programme that was developed based on the needs of Type 2 diabetes patients is presented with all the modules focused on the details of the content, activities of health-care professionals, the patients and their family members. It is presented in two sections. The first section is focused on the aims, scope and the benefits of the programme and in the second section the programme is discussed in detail.
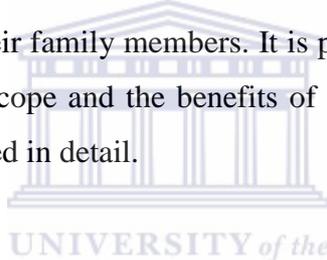
6.2 STRUCTURED HEALTH EDUCATION PROGRAMME FOR SELF-MANAGEMENT OF TYPE 2 DIABETES

6.2.1 Goal of Programme

The goal of the structured health education programme for self-management of Type 2 diabetes (SHESMD) is to develop effective patient self-management (plan, organise, direct and control) of Type 2 diabetes through relevant knowledge, skills and beliefs/values of patients in Edo State, Nigeria.

The overall theme is taking control of Type 2 diabetes.

The objectives of the programme are that by the end of the programme, the patients will:

- Increase their knowledge and understanding of what Type 2 diabetes is;
- Implement a healthy lifestyle: adhere to nutritional therapy, increase physical activity and maintain weight;

- Implement self-management: monitor blood glucose daily or as specified, care of the feet; and use prescribed medication appropriately;
- Manage their stress and use decision-making skills appropriately; and
- Communicate with health-care professionals, community members and utilise problem-solving skills.

The health-care professionals should be able to:

- Utilise the health education manual for in teaching and impacting the patients with Type 2 diabetes;
- Implement current teaching materials and methods in the programme;
- Collaborate with other health care professionals in giving health education to patients with Type 2 diabetes; and
- Communicate with Type 2 diabetes patients and utilise motivational interviewing approach adequately.

6.2.2   The role players in the programme

Health-care professionals involved in offering the programme should be nurses, social workers and dieticians. As the need arises and new developments emerged they may consult other health-care professionals with expertise in Type 2 diabetes. The participants in the programme will be patients with Type 2 diabetes.

There is a clear role differentiation between the health-care professionals and the patients but the dichotomy would not affect the interactions. Patients would have access to the multiple health-care professionals. The teaching manual made available will explicitly explain the roles of the adult learners and the health-care professionals.

Team work among learners is beneficial since they share their knowledge, skills and experiences thereby helping each other's growth in achieving goals. Team work also will be sustained between the patient and the health professionals since they collaborate in achieving care. Group discussions, role-play and engaging in activities will facilitate team work. Participants will be exposed to multi-disciplinary team work and guest will be engaged in some demonstrations in order to expose patients to figures that could motivate modelling.

Patients are expected to meet any of the following eligibility criteria before they can participate in the programme:

- Both old and newly diagnosed Type 2 diabetes patients;

- Patients across socioeconomic groups;

- Patients with co-morbid conditions that could reduce their cognition should be accompanied by their care givers;

- Programme should be on-going whereby those who have attended once should have the opportunity of attending the programme annually because continuous learning is necessary in managing chronic disease (ADA 2010);

- Family members of patients with diabetes will be allowed to attend;

- Patients should be informed of the programme at diagnosis by the health professional with an emphasis on the fact that it is part of their management, so as to stimulate their zeal and interest as they look forward to hearing about the disease and how to successfully manage it;

- All patients with type 1 diabetes are excluded; and

- All patients with cognitive diseases are excluded.

The prerequisite for inclusion criteria in the programme was that patients with Type 2 diabetes were involved in the management of their diabetes outside the health-care facilities and adequate knowledge facilitates informed decisions that impact positively on their health (ADA, 2010).

6.2.3 Underlying assumptions of the programme

For this programme it is assumed that:

- Patients with Type 2 diabetes will be exposed to different teaching methods and demonstrations that will facilitate learning and change in behaviour;

- Patients to internalise a change in health behaviour the health-care professionals need to maximise the patient's intrinsic factors through engaging patients in participation in demonstrations to master skills and giving homework to enable practise outside the health facility to stimulate interest and confidence;

- Patients who take part in demonstrations and practice skills at home may become perfect as behaviour and skills are mastered and becomes self-efficacy;

- Patients will be given adequate information during lectures and group discussions;

- Motivational interviewing, goal-setting, skill acquisition and modelling will be used to create foresight;

- The health-care professionals will motivate participants to exert their self-reflection and self-regulatory process to influence their outcomes;

- Health-care professionals will motivate participants to demonstrate skills and master it through home works and goal directed learning using motivational interviewing;

- Nurses and other health-care professionals would give adequate and relevant information to patients to facilitate behaviour change and give practical demonstrations to improve on patient skills to perform activities without depending on care givers;

- Behaviour change communication will modify the patients' beliefs, attitudes, perception, thinking and behaviour through the use of tailored messages and a supportive environment;

- Knowledge, skills and insight into the health problem would be gained through dialogue and persuasion, since the educator views health as the individual's responsibility;

- Knowledge cannot be seen (Hunt, 2003), but it can be observed since it affects an individual's actions and reactions to the environment;

- Attitude, skills and self-efficacy be developed;

- Outcome expectations are met; and

- Motivation of participants through the use of motivational interviewing to set achievable goals should be utilised by health-care professionals to facilitate behaviour change.

6.2.4 The role of Motivational Interviewing

The decision to change behaviour depends on the patient and not on the health care professional. Although the professional may initiate a need for change, the motivation to change is inherent in the patient. Motivational interviewing is a patient-centred, therapeutic style developed for helping individuals work through ambivalence and maintain change Miller (1984) cited in (Miller & Rose, 2009). It is defined as "a collaborative goal-oriented style of communication with particular attention to the language of change, which is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reason for change within an atmosphere of acceptance and compassion" (Miller & Rollnick, 2012: 38). The style involves conversations between a health-care professional and a patient in order to address the uncertainty about change enable the patient to convince the self to change based on his/her principles and interests, which may be contrary to the conventional health education where a client is persuaded to change behaviour. The philosophy emphasises the partnership between professionals and their patients and eliciting patients' internal motivations (Pollak, Childers, & Arnold, 2011). The health-care professional

214

collaborates and engages patient in change talk in order to guide the patient to motivate himself/herself as he/she gains understanding and gives reason for his/her concern and also argues for change.
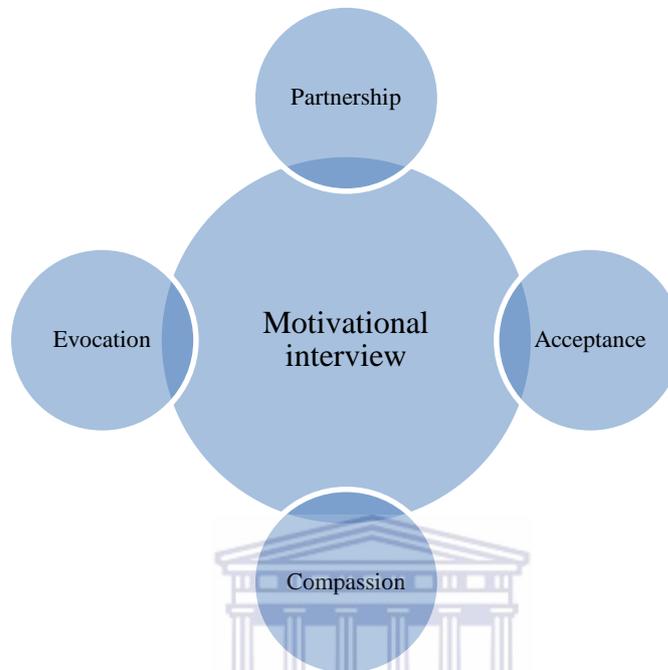
Figure 6.1 Four components of motivational interviewing

6.2.4.1 Components of motivational interviewing

*Partnership***:** Motivational interviewing is a collaborative conversation between the health-care professional and the patient since the education involves working with the patient. It is an active conversation between two experts bringing in expertise from the medical field and the patients expertise from his experience about his life, interests and the disease. There is a dialogue since the care professional explores for information during which time there is activation of experience to gain an understanding of the situation, which is a key condition for behaviour change to occur (Holmström & Röing, 2010). The professional uses good listening skills to understand the patient's life and see the world through him/her without superimposing views, perceptions and/or visions.

*Acceptance***:** The counsellor displays an attitude of acceptance of what the client brings or says about himself/herself, which denotes trust. According to Carl Rogers (1986) cited in (Miller & Rollnick, 2012), acceptance contains four conditions, namely absolute worth, accurate empathy, autonomy support and affirmation. These conditions are client-centred, conveying

acceptance since health-care professionals show respect for the patient's worth, recognises his/her as a person and supports his/her autonomy to make choices with accurate empathy for his/her situation. Patients' strength and efforts are appreciated by the health professional by giving positive feedback.

*Compassion***:** Compassion is defined as the humane quality of understanding suffering in others and wanting to do something about it through the care rendered (Youngson, 2011). The use of patient-centred care may build trust and improve personal involvement of care professionals and the engagement of the patient, thereby improving compassionate care. The practice of empathic communication with the patients is instantly rewarded by the changed quality of relationship with the patients (Youngson, 2011), although empathetic communication may not have been the practice in the health facilities. However, through the training and use of motivational interviewing, communication is assumed to improve. However, studies have shown that compassionate care reduces anxiety and improves adherence to management regimens (Lown, Rosen & Marttila, 2011).

Evocation: Evocation is the process of calling forth the self-motivation of the patient while the health professionals help patients reflect on the advantages and barriers (Pollak et al., 2011) through health education knowledge and understanding that gives insight as well as rationalisation to set goals. Patients are likely to change when they articulate their goals, beliefs and ideas for a change rather than health-care professionals imposing the same (Deci & Ryan, 1987, cited in (Pollak et al., 2011). The use of reflective statements and summarising techniques may help in reducing resistance since autonomy is supported and intrinsic motivation is elicited.

6.2.4.2 Methods of motivational interviewing:

Four processes are involved in motivational interviewing and these include engaging, focussing, evoking and planning.

*Engaging***:** This is the process in which a helpful connection and working relationship is established. This is a very important aspect of the conversations since it tends to predict retention and outcomes based on the patients rating of the quality of the working relationship (Crits-Christoph, Gibbons, Hamilton, Ring-Kurtz & Gallop, 2011). Engaging is an approach of ensuring patients' active participation in their care as included in the patient-centred care with the health-care professional, utilising listening skills because the patient is engaged in interaction. Health-care professionals would engage the patients through history-taking to gain

an insight into the patient's needs and interests. Engaging process may not confirm its proper place with the first visit since it could take some time to be established, as trust is built and the patient is now ready for discussion.

Focussing: This stage depends on the process of engaging which leads to a focus on the actual need that has necessitated the visit or what the professional's agenda is. The process helps in clarifying direction toward where one is to move.

Evoking: This is the process of eliciting the patient's own motivation for change. The individual's personal change is required with active participation in the process. The individuals' personal voice for change is heard (Sobell &Sobell, 2008). When a patient only requests a direction for change, it is important that the request is granted and they can therefore move to planning.

Planning: The patient directs the process of planning care with the health-care professional's guidance. As the individual's motivation reaches a point of readiness, he/she begins to talk more about when and how to achieve the change. The conversation includes activities and topics that will enhance behaviour change, because planning encompasses formulating a plan of action and a commitment to change. The health-care professional utilises the listening skills as he/she elicits patients' own solutions while promoting their autonomy of decision-making. The plan is revisited subsequently when goals are achieved. These processes will be utilised by the health-care professionals in actively engaging patients in their care during the individual counselling approach.

Steps of motivational interviewing: The process of motivational interviewing consists of four steps of expressing empathy, developing discrepancy, rolling with resistance and supporting self-efficacy (Miller & Rollnick, 2004), which are intended to prevent the persuasion problem that occurs when the professional and the patient interact during the stages of behaviour change. The flow of motivational interviewing shows the process of conversation and the pattern of conversation to achieve the goal of motivating the patient to a change talk. There is a period of engaging with a clear focus when they proceed towards goal-setting for consultations. The process is iterative because they both move back and forth in the processes after achieving a change goal; they may re-engage at various points to either change the focus or enlarge it. The educator's use of a different motivational style and/or training is mandatory because it is found to increase the outcome's success (Vader, Walters, Prabhu, Houck & Field, 2010).

Communication skills: The practice of motivational interviewing involves the use of some communication skills that are client-centred and they include asking questions, affirming, reflective listening, summarising, informing and advising. These skills are related and the skills used during a conversation depend on the stage being negotiated.

Asking questions: The health-care professional engages the patient in open-ended questions to enable conversation that allows patient to discuss issues relevant to the discussion and to reflect and elaborate. The professional will have a good understanding of the client and their frame of reference, as well as strengthening the relationship because they find clear direction.

Affirming: The health-care professional respects the client's capacity for growth and change, as well as the voluntary choice of change when the patient voices the intention and makes plans for a change. Affirming statements and questions are directed to the participant to show interest and concentration (Miller & Rollnick, 2004). It is the patient who produces a change since it is the patient's effort, strength and resources that are relied upon and this is acknowledged by the health-care professional, with an emphasis on the intentions, abilities and good intentions for behaviour change.

Reflective listening: This method is used by the professional to make guesses about patients' statements for deep understanding and by clarifying whether or not the guesses made were accurate. The patient again hears the statement being made, which are his/her thoughts and feelings but they are expressed in different words by the professional, thus keeping the conversation open for a longer time as they talk and explore.

Summarising: This is done at the end of the conversation to confirm what the patient has said, because summaries are reflections for confirming what a person has been saying. In engaging and focussing processes, summary promotes understanding and shows the professional's commitment to the conversation and during planning summarising draws together the patient's motivations, intentions and plans for behaviour change.

Informing and advising: During motivational interviewing, it is not an avenue for information or persuasion, but there are occasions when patients may seek out directions. It is appropriate to heed to such plea because the patient has a right to information. Additionally, the health-care professional should understand the patient's needs and their learning capability in order to use this skill with permission. These communication skills should be used purposefully to help the patient move in the direction of behaviour change so as to enable self-management and glycaemic control. Motivational interviewing will be used by health-care professionals during

individual counselling and as a tool for patient-centred care. Studies have reported positive health outcomes in patients' health with the use of motivational counselling technique (Chlebowy, El-Mallakh, Myers, Kubiak, Cloud & Wall, 2014 ;Miller, Oates, Brooks, Shintani, Gebretsadik & Jenkins, 2014).

Motivational interviewing is used as a counselling process with basic principles and techniques involving the health-care professional and the patient. The principles are expressing empathy; developing discrepancy, rolling with resistance, problem-solving and supporting for self-efficacy (Rollnick, Miller, Butler & Aloia, 2008). A conducive environment that favours a change using the principles of motivational interviewing is created when the health-care professional demonstrates an understanding of the patients' problem through empathy with genuine interest in the patient's problem. A patient is helped to develop discrepancy when gaps between the behaviour and the positive outcome of a self-managed life of diabetes are explored. Once the patient gains insight into the problem, then the patient begins to work towards a change of behaviour. With the patient's insight and move for a change, argument is avoided and they move to rolling with resistance, which involves accepting reality. The health-care professional invites the patient to enter into the process of problem-solving when they collaborate with the active participation of the patient to set smart goals and take own decisions to map out plans to achieve the goals. A health-care professional supports a patient's self-efficacy by motivating and monitoring for adherence.

6.2.5 Context and duration of the programme

The programme was planned to be offered in the two health-care institutions. SHESMD is a five-week programme to be taken weekly for two hours. It is to be taken separately from the normal health talk and therefore should not be considered to be a replacement nor a substitute, but a compulsory programme for all diagnosed patients and this must be explained to the patients as part of the management for their diabetes at the time of diagnosis. However, patients should be encouraged to attend the course annually after completion of the initial course. Since becoming a manager of health is a lifetime commitment, a single education programme will not sustain and effectively help in self-management for a life time.

6.3 PRINCIPLES UNDERPINNING THE PROGRAMME

Development of the programme could not have been done in isolation since behavioural changes were expected and therefore many principles of learning and education were employed. Various principles of learning provided guidance at the different stages of the programme's development, from the developmental stage to the point of evaluation. The principles applied in the stages were principles of adult learning by Knowles (1980) (Chapter 1) and it was applied during the content of the programme and other appropriate principles and approaches in health education. Principles of adult learning and teaching needed to be applied during offering of the content of the programme (Table 6.1).

Table 6.1: Application of Knowles andragogy to the health education programme for self-management

Knowles' Andragogy Theory	Applications to the programme
Adults' needs are considered as they want to learn what is useful and beneficial.	The objectives and goals of the programme are targeted at improving quality of life, teaching are tailored to their needs in order to stimulate learning activities that should be easy to perform. The content of the programme should be pertinent to their present and future needs.
Adults' self-concept of being a self-directed individual in their learning activities.	The participants should be fully engaged in the programme as they should actively participate at each step of learning. They should be motivated to learn to carry out skills and would not be taught to memorise but should be doing demonstrations of skills. Their interests should be considered and would direct individual counselling as information should be given to the patients but the patients would suggest the decision for a change. Approaches to change through self-determination should be encouraged.
Learner's experiences are important therefore must not be ignored.	Individual's experiences with the disease should be considered in teaching and self-management of the disease will strengthen their empowerment and self-determination. The presenters of the programme should acknowledge that patients with Type 2 diabetes have diverse experiences, knowledge and interests which could be further enhanced through individual counselling and own goal-setting.
Adult learners are goal oriented.	The programme will impact knowledge and problem-solving, decision-making and communication skills which will enable patients to make informed decision in their management of diabetes, thus enhancing their quality of life as they engage in healthy behaviour. The content of the programme will be stimulating, timely and accurate, appropriate and relevant to the patient's current and future need.
Motivation is both intrinsic and extrinsic in adult learners.	Health-care professionals will use the motivational interviewing framework in eliciting intrinsic and extrinsic motivation in participants, such as using praises and rewards. Reasons for their learning and acquiring of self-management will be given at every stage of the programme. Interesting topics with reading materials and pictorial designs that will appeal to their senses and relevant will be used.

6.3.1 Active learning

Different teaching approaches will be employed with less emphasis on lecture method but using other methods that will facilitate participants' involvement such as group discussions, role-play, demonstration and teach back and allowing participants to evaluate the programme after each session.

Adults have various reasons for engaging in learning, their interests will be revealed through interaction with health-care professionals. Learning is subjective and will be made active since adults are engaged in different activities and demonstrations during the programme. Their prior knowledge will be built on to facilitate learning. Group discussions and questions and answers approaches will increase adults' engagement in learning.

Participants have some expectations and goals to be achieved at the end of the programme, which must be actualised. The programme should be taught since it was proposed, relevant knowledge, skills should be acquired. The learning should affect attitude of the learners. The programme goals and objectives will be made known to the patients, modules will be taught as planned utilising different approaches in teaching. Assignments will be given and tools needed to actualise the purpose of the programme will be solicited for through advocacy group.

6.3.2 Principles of health education

The following principles of health education were found useful in developing the methods and approaches used in communicating information to the patients.

Health education should be based on needs: This health education programme was developed based on a situation analysis that addressed the purpose of the programme. It was also established as it was necessary to change the traditional method of patient education to a more relevant educational approach in order to actively involve patients in their self-management of their disease. Health education should be tailored to the patients' needs and interest (Peek, Harmon, Scott, Eder, Roberson, Tang & Chin, 2012). and health educators should be knowledgeable about the needs of the target group to enable individualised interventions using different approaches to reach the patients. The patients' needs and interests were identified during the situational analysis. Individual differences will be considered, especially learning abilities. Individual counselling will enable one-to-one discussions, where patients will be engaged in dialogue to enable disclosure and a collaborative care plan tailored to the patients' identified needs and preferences. Health education tailored to patients needs empowers the patients (Funnell, 2010).

Multi-disciplinary approach is needed for behaviour change: Based on the fact that a community of shared knowledge allows for effective shared teaching, a multi-disciplinary approach has been shown to create understanding of human behaviour. The programme incorporates the use of a multi-disciplinary team of health-care professionals to impart knowledge, skills, and beliefs/values and also motivates patients to strive for behaviour change through goal-setting.

Effective communication: Communication has been described as the vehicle through which human interactions and relations are developed and sustained (Draaistra, Singh, Ireland & Harper, 2012). Effective channels of communication between the provider of education and the individuals would facilitate achieving the aim and allow feedback. Good communication empowers patients (Holmström & Röing, 2010). Although health professionals are professionally and clinically trained for the performance of their roles, many professionals have poor interpersonal communication skills (Herrier, Gardner & Meldrum, 2006) and thus effective communication skills are essential to achieving the programme's goal. Patients are treated as equals and are respected and adequate information is made available with the professionals showing an interest in the patients' problems. The patient-provider relationship is important because studies have found that it improves adherence and satisfaction with care among patients and caregivers (Ciechanowski, Katon, Russo & Walker, 2014).

Health education is based on scientific findings and knowledge: Health educators should have scientific knowledge of the evidence of intervention and they should practice what they teach as health-care professionals. Health-care professionals that will be involved in the programme will be trained in motivational interviewing to aid their practice.

The language of teaching should be suitable for the learning group: The language used in teaching and communication should be suitable to the learner (Wurzbach, 2002). Due to cultural diversity, professionals will need to be conversant in their patients' common language. Reading materials and leaflets will be written in 4th grade language and easy to read language (Mayer & Villaire, 2009) and interpreters are expected to attend the programme with patients in cases where language might be a barrier.

6.4 BENEFITS OF THE EDUCATIONAL PROGRAMME

The following are benefits of the programme:

- Benefits to the patient

Patients will be empowered with knowledge and skills for efficient self-management of Type 2 diabetes in order to prevent or delay complications and improve quality of life. This will probably reduce the economic burden and improve the patient's psychosocial being.

- Benefits to the family

Improved self-management of Type 2 diabetes by the patient could help in prevention and early diagnosis and improve the prognosis of the disease. Family members will experience less stress and improved psychosocial health. They will participate in caring for their loved ones. The self-management programme may reduce the potential for other members of the family becoming diabetic as there will be improved lifestyle such as diet for the family.

- Benefits to the health facilities

Informed patients could have lesser urge to use of health institutions if they better trained in their self-management of the disease.

The success of self-management of patients in managing their disease could lead to satisfaction of health-care professionals' with regard to success stories.

The programme could enhance collaborative multi-disciplinary teamwork in promoting the programme of self-management of Type 2 diabetes among patients.

- Benefits to the society

The attendance of the programme can create awareness in the community of the availability of support to community members with Type 2 diabetes.

6.5 CURRICULUM OF STRUCTURED HEALTH EDUCATION FOR SELF-MANAGEMENT OF TYPE 2 DIABETES

The curriculum consists of teaching and activities for a period of five weeks for patients with Type 2 diabetes and such sessions will be conducted a day other than the patients' clinic days to enable both the patients and the health-care professionals to create ample time for the activities.

The content is structured and is developed holistically and all the modules are important and compulsory since they are geared towards facilitating teaching creativity, providing an

understanding of diabetes as a disease, demonstrating skills and encouraging active participation through prompt practice to enable skills mastery.

SHESMD is organised in modules to enable adequate teaching of relevant topics thereby motivating patients' active participation in their care. The programme is organised in health-care institutions in Benin City. The language depends on the educational standard of the patients, but the use of Pidgin English is advocated due to multiple tribes involved in order to reach out to all the patients and especially those patients with poor educational background.

SHESMD is unique and focused on patient-centred care, it motivates patients' active participation and collaboration with health-care professionals in all the modules, is a multi-disciplinary collaboration in the care of patients with diabetes and has facilitated a change in the hospital paradigm from the traditional method of education to patient-centred care using a motivational interviewing framework in counselling and goal-setting. The education programme is not a replacement for the facility's normal routine however it is a mandatory structured education class for all patients with Type 2 diabetes, especially those who are newly diagnosed, to enhance their disease coping skills. SHESMD is based on the IDF and ADA's global guideline for Type 2 diabetes. The programme will be conducted on a day other than the clinic attendance days and will be conducted in a quiet environment without distraction to facilitate assimilation, demonstration and counselling.

6.6 PROGRAMME ASSESSMENT

Subsequent to suggestions by health-care professionals and the data analysis results that revealed a need for a change in the method of health education, assessment of the educational intervention will be practical and contextual. An informal approach using formative assessment will be adopted by the health-care professionals and the participants through patient assessments (Table 6.2).

Formative assessment is a two-way process whereby the patients also use assessment-based evidence to change how they perform or learn. It involves identification of conceptual misunderstandings and attempts to correct them through a cooperative approach by the professionals and the patients. Self-assessment is done and may necessitate some form of adjustment. Active participation is encouraged and prompt practice and assignment approaches

are also utilised. Black & William (1998) conducted a meta-analysis with a suggestion that students are triggered to learn through formative assessment (Popham, 2011).

Formative evaluation is an on-going evaluation process throughout the planning steps of the programme because members of the planning group move iteratively to check for mistakes and omissions and make amendments. Additionally, Popham (2011) reported that the formative assessment process is used for programmes that are at the planning stage so that they can be well focused to ensure success.

Critical cross-field outcomes from the patients:

Patients should be able to:

- Collaborate with health-care professionals in the teaching of self-management of Type 2 diabetes as they discuss their needs and interests;
- Communicate effectively with health-care professionals, group members and members of the society and must be assertive;
- Identify and solve problems without intimidation in their environment;
- Carry out self-management skills effectively, which should reflect on their glycaemic control and quality of life;
- Monitor self for signs of disease and glucose level to facilitate glycaemic control; and
- The learning sections provided content and framework guidelines for the programme and patients were expected to be expert managers of their care at different levels after attending the educational programme.

6.7 LEARNING SCOPE AND SEQUENCE

The components of the educational programme are divided into five modules covering the change objectives. The themes from the results of the qualitative analysis of the situation analysis, literature support and the suggestions made by the participants informed the programme and the following content was included:

- An overview of diabetes;
- Dietary modification, physical activity and weight management;
- Self-monitoring of blood glucose, foot care and adherence to medicine regimens;
- Stress management and coping behaviour; and

- Communication and collaborative care with health-care professionals and continuous hospital management.

Group methods and individual counselling are the approaches utilised for all groups of patients and educational materials are given to motivate patients to learn actively and to serve as reminders. Individualised assessment of patients is carried out on the first contact and their health history, diabetes knowledge, self-management skills and social support are ascertained and their physical and cognitive abilities are recorded.

Table 6.2: Specific outcomes and assessment criteria of the programme

Specific outcome	Assessment criteria: The patient should be able to:
1. Describe Type 2 diabetes and its acute complications	- state types of diabetes - indicate the symptoms of Type 2 diabetes - state the risk factors and complications of Type 2 diabetes - indicate management hypoglycaemia
2. Demonstrate skills of managed nutrition therapy planning and a range of exercises	- explain how diet is used to control diabetes - state the combination of local foods used for dietary control - specify local foodstuff to be avoided in the control of diabetes - identify increased physical activity and provide examples - select a range of physical exercises for their own use - state the appropriate weight range for the patient - state different ways of controlling weight - specify the complications of weight gain for diabetes
3. Monitor blood glucose and manage diabetes with the result of blood glucose Foot care Adhere to medication Discuss the effect of traditional medication on health	- indicate an acceptable range of blood glucose - state the importance of blood glucose monitoring - demonstrate skills of self-monitoring of blood glucose - state the problems associated with not caring for the feet - demonstration of the skills of examination and foot care - indicate knowledge of the prescribed drugs - state importance of drug adherence - indicate the effect of traditional medicine on their health
4. Demonstrate ability to recognise stress, use techniques learned adequately and cope effectively with diabetes	- identify sources of stress - enumerate effects of stress - generate variety of stress management techniques - identify the needs for social support - reduce and maintain low stress due to diabetes
5. Communicate and actively participate through collaboration with health-care professionals State the benefits of continuity of care	- name health-care professionals that they can communicate with about their health conditions - disclose their health problems and perceptions to the health-care professionals - demonstrate active participation and collaboration with health-care professionals - define goal-setting and give examples of defined goals - state the importance of continuing care

Table 6.3: Module 1 Concept of diabetes

Topic	Sub-topics	Performance objectives	Teaching method	Teaching materials	Outcome expectations
Diabetes	Diabetes and types	Explain the concept of diabetes Describe the types of diabetes	Health-care practitioner gives lecture on disease process	Use of computer-aided lectures showing the disease process Posters Literature material containing information on Type 2 diabetes Literature materials on self-management skills	Express that knowing about diabetes is a step needed in adherence to care Expect that by being vigilant to note symptoms, one will be able to get prompt health-care. State that knowing risk factors can help to prevent diabetes Expect that early treatment can improve outcome
	Symptoms of Type 2 diabetes	Describe symptoms of Type 2 diabetes			
	Causes and risk factors of diabetes	Describe causes and risk factors			
	Complications of diabetes 2	State the complications			
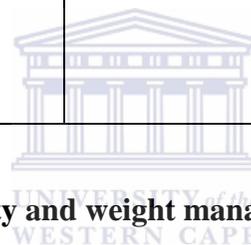
Table 6.4: Module 2: Dietary modification, physical activity and weight management

Topic	Sub-topics	Performance objectives	Teaching method	Teaching materials	Outcome expectations
Self-management of Type 2 diabetes	Diet control	Explain how consumption of diabetic diet helps glycaemic control	Lecture Skills demonstration Group and individual discussions Role-play Prompt demonstration	Goal-setting chart Typical diet chart Computer-aided lectures Educational material on diet Assignment on a diet plan of locally available food consumed three days of the week Chart showing different exercise regime Educational material on physical activity Goal-setting chart	Adequate dietary modification will positively affect blood glucose and prevent complications Patients monitor behaviour using goal-setting chart Patients demonstrate the ability to perform skill for self-management Acquired skills are changed to habits Patients rehearse skills at home to enhance competence
	Local diet	Identify local diet and state costs in terms of money, choice			
	Timing of diet and control of craving	State the different time for diet			
Physical activities	Types of activities	Describe suitable different physical exercises.			

Duration of activities	Outline durations for the exercises				Demonstrate the ability to increase physical activity
Contra-indications for exercise	Name the contra-indications				Maintain the habit of increased physical activity

Table 6.5: Module 3: Self-monitoring of blood Glucose, foot care and adherence to medication

Topic	Sub-topics	Performance Objectives	Teaching Method	Teaching materials	Outcome Expectations
Monitoring of blood glucose with own glucometer	Benefits of self - blood glucose monitoring	State the advantages of self- blood glucose monitoring	Health-care professionals give lecture on SBGM Practical demonstration and prompt practice Teaching of record keeping	Glucose meter Notebook for recording Blood Sugar range chart Educational material on SBGM	
	Range of blood glucose	Specify range of blood glucose			
	Self-use of glucometer	Use glucometer accurately			
Care of feet	Examination of the feet Foot care	Identify areas to be examined Identify methods of caring for feet	Lecture examination of the feet Demonstration of foot care	Educational materials	Expected that examination and care of feet will encourage practice
Adherence to medication	Knowledge of medications Maintain adherence Reject traditional medication	Identify the drugs, dose effects State effects	Lectures on use of drugs, adherence, traditional medication, side effects	Educational materials Educational materials Practical demonstrations	Expected that knowledge of medications will increase adherence and improve the insight into actions of traditional medication

Table 6.6: Module.4: Management of stress and problem-solving

Topic	Sub-topics	Performance objectives	Teaching method	Teaching materials	Outcome expectations
Management of stress	Concept of stress	Identify sources of stress	Lecture on stress management Demonstration of methods of stress management Computer-aided lecture Prompt practice of skills learnt by the patients Prompt practice of method by patients Lectures on problem solving Lecture on family support and the benefits Demonstration of problem solving techniques Role play problem solving	Goal-setting chart Educational material on stress management Computer Projector	Identification of sources of stress can improve coping with the disease Enumerating effect of stress will motivate management of stress Generating stress management techniques will increase adherence
	Effect of stress on diabetes	Enumerate effect of stress on diabetes patients			
	Stress management techniques Family support in self-management of diabetes Problem solving techniques	Generate variety of techniques of stress management and problem solving Discuss various usefulness of the family in social support			

Table 6.7: Module 5: Self-management of diabetes through adequate communication with health-care professionals

Topic	Sub-topics	Performance objectives	Teaching method	Teaching materials	Outcome expectations
Communication in Type 2 diabetes management	Communication	Describe effective communication.	Computer aided lecture. One-on-one counselling of patients Health-care professionals communicate with patients using cell phone	Computer Projector Cell phone	Patient will communicate effectively will health-care professionals Patient will be more relaxed with the health-care professionals thus enhancing collaboration
	Means of communication	Identify different modes of communication.			
	Use of cell phones and one-on-one counselling	Interact with health-care through cell phones, on one-on-one counselling and during consultations			

Table 6.8 Meaning of Icons indicated in the programme

	Activity
	Questions and answers
	Individual counselling
	Reading
	Group discussion
	Assignment
	9-inch plate method used for diet
	Nutrition managed diet
	Description of glucose meter
	Demonstration of use of glucometer
	Cell phone and mobile technology applications
	Increased physical activity

6.8 MODULE 1 CONCEPT OF DIABETES (TABLE 6.3)

Purpose of the module: The purpose is to enable patients to acquire knowledge and an understanding of diabetes on their Type 2 diabetes.

Process outcome: Patients will acquire knowledge of diabetes that will enable them to monitor the disease effectively and prevent complications.

Expected learning outcomes: At the end of the module patient should be able to:

- State types of diabetes;
- Indicate how the symptoms of type 2 diabetes will be monitored;
- State the risk factors of type 2 diabetes;
- Indicate how complications of type 2 diabetes will be managed; and
- What daily activities are planned to manage hypoglycaemia.

Time needed for the session: Two hours (15 minute for group discussion, 45 minutes lecture session, 20 minutes for questions and answers, 30 minutes for individual counselling and 10 minutes for conclusion).

Teaching delivery methods: Lectures, computer-assisted lectures, group discussions.

Teaching delivery materials: Educational materials or hand-out, posters and flipchart or chalk board.

Study unit 1.1: Overview of diabetes and the different types.

Study unit 1.2: Signs and symptoms of Type 2 diabetes, screening and normal blood glucose range.

Study unit 1.3: Causes of Type 2 diabetes and risk factors and prevention of Type 22 diabetes.

Study unit 1.4: Complications of Type 2 diabetes with the emphasis on management of hypoglycaemia and hyperglycaemia.

Content: Definition of diabetes, types of diabetes, Type 2 diabetes, the disease process, signs and symptoms, causes and risk factors and complications, with an emphasis on hypoglycaemia and hyperglycaemia, management of hypoglycaemia and hyperglycaemia, prevalence of diabetes, prevention of diabetes, screening, normal blood glucose range, range of plasma glucose for patients with Type 2 diabetes, its effect on patients with Type 2 diabetes and management of diabetes.

Introduction: Welcome the participants and introduce the programme and its purpose. Ask a few questions to enable programme facilitator to know patients'' prior knowledge, perceptions and beliefs about diabetes.

 Group discussion: Divide into groups of eight to 12 individuals discuss what they know about diabetes and their fears and beliefs about diabetes.

Overview of diabetes: It is the seventh leading cause of death world-wide and an estimated 387 million people have diabetes in the world and the disease affects 3.7 million people in Nigeria, which is the highest population of diabetes sufferers in Africa. It is a disorder that affects the breaking down of carbohydrates, fats and proteins due to the problem of insulin secretion or/and the action, thereby causing an accumulation of excess sugar in the blood. This is due to poor action of the insulin secreted by the pancreas to act on the muscles, adipose tissue and liver, all of which have become insensitive to the action of insulin. In an individual without diabetes, after eating, carbohydrates are broken down into glucose, which is the main source of energy. Insulin is a hormone secreted by the pancreas and it helps absorb glucose into the cells of the tissues where it is needed and excess is stored in the liver and muscles in the form of glucagon. The pancreas stops the secretion of insulin as the level of glucose in the blood decreases. In a state of Type 2 diabetes, there is poor action of insulin secreted and/or insufficient production of insulin, which leads to accumulation of glucose in the blood.

Types: There are three major types of diabetes:

- Type 1 diabetes is common among children and adolescents;
- Type 2 diabetes is prevalent among adults and the elderly, commonly between the ages of 45-65 years, but it is now being detected in children and the young adult age group;
- Gestational diabetes is onset of diabetes during pregnancy only, caused by hormonal changes and usually resolves after six weeks of delivery;
- Other specific types of diabetes include genetically defined diabetes, or related to other diseases and drugs; and
- Intermediate hyperglycaemia, formerly known as pre-diabetes, is also referred to as IGT or IFG and is a stage whereby the individuals' blood glucose is higher than the normal, but not high enough to be classified as diabetes, with the range at the higher limit of normal blood glucose reading, i.e. ->100mg/dl-125mg/dl.

Signs and symptoms: Excessive thirst, frequent urination, excessive eating, weight loss, tiredness and blurred vision are all signs and symptoms of diabetes. They develop gradually without individuals feeling sick and therefore it may go unnoticed for many years because the individual may attribute symptoms to other conditions until complications develop.

Causes and risk factors: The cause is unknown with many causal factors associated with the risk factors, such as behavioural environmental and genetic factors.

Environmental factors include:

- Lifestyle practices such as obesity, high waist to hip ratio, physical inactivity, poor dietary habits such as eating foods that are high in carbohydrates, consuming a fatty diet, imbibing artificially sweetened drinks, over eating, alcoholism, smoking, and stress; and
- Ageing and poor sleeping patterns.

Genetic factors are:

- Positive family history related to presence of genes; and
- Babies born by women with gestational diabetes.

Screening: Screening for diabetes can be done using:

- FBS - normal fasting blood glucose is 4.5- 7mg/dl 80-100mg/dl;
- HbAlc - the normal is 5mmol-6.5mmol and it is the average blood glucose in the past 12 weeks or three months;
- The goal is less than 7.0mmol in patients with diabetes;

- The OGTT; and
- Random blood glucose (RBS).

Complications: Complications can affect various organs in the body such as:

- Brain - causing depression;
- Heart - causing hypertension, heart disease and stroke;
- Kidneys - causing kidney failure;
- Reproductive organs - causing poor erectile function;
- Poor resistance to infections;
- Teeth - dental diseases;
- Eye - diseases causing blindness;
- Feet - foot ulcers with poor wound healing and amputation;
- Hypoglycaemia; and
- Death.

Prevention: Diabetes can be prevented using different simple lifestyle measures or in delaying the onset of diabetes. People should:

- Attain and retain a healthy body weight;
- Be physically active by reducing sedentary life-styles through regular movement - at least 30minutes of regular exercise at least fives a week;
- Eat a healthy diet with reduced sugar and fat intake and consume more vegetable and fruit;
- Avoid tobacco use and reduce alcohol intake;
- Submit to regular screening for diabetes, especially from age 45, but earlier in families with a history of diabetes; and
- Live a moderate or stress-free lifestyle.

Management: There is no known cure for diabetes and it is a lifelong disease, but patients can be adequately managed by the collaborative team efforts of health-care professionals and active participation, collaboration and cooperation of the individual with diabetes. This can be achieved through:

- Early diagnosis of diabetes and adherence to treatment;
- Behaviour modification through reduction in alcohol consumption and cessation of smoking, dietary control, increased physical activity, blood glucose self-monitoring, moderate blood glucose control and blood pressure control;
- Foot care;
- Screening for eye problems twice a year;
- Stress management and rest;
- Maintaining a normal body weight;
- Keeping regular health appointments.

These measures will maintain blood glucose and prevent or reduce the development of complications, thereby enhancing quality of life.

*Hypoglycaemia***:** Hypoglycaemia is a complication of diabetes associated with a sudden and sharp reduction in the level of blood glucose (<70mg/dl) in individuals with diabetes taking them below the normal level and thereby affecting the patient.

Causes:

- Administration of large dose of insulin injection or oral medication;

- Inadequate intake of food after administration of insulin;
- Rigorous exercise that facilitates using up more glucose; and
- Medication.

Signs and symptoms: Early signs are anxiety, sweating, tremor or shaking movement, palpitations, nausea, hunger, and pallor.

The brain may be starved of glucose essential for proper functioning therefore symptoms such as headache, mild confusion leading to abnormal behaviour, unconsciousness,

seizure and coma and/or death may occur if the patient is not attended to timeously.

Management: All individuals with diabetes should be taught the management of hypoglycaemia, which should also be taught to their family members so as ensure that help is available when needed.

At the early stage of hypoglycaemia, patients should:

- Eat food containing simple carbohydrates, such as one to two cubes of sugar or one tablespoonful of sugar or a half bottle of Coke or its equivalent;
- Sit quietly or lie down to have some rest:
- Do a blood glucose check after 15 minutes; and
- Rest.

If symptoms continue, the patient should repeat the sugar intake and take a snack or a meal.

In severe cases where individuals are becoming confused and/or unconscious then it requires the aid of other persons, therefore family members should be taught to recognise signs of hypoglycaemia and be able to give treatment. Oral therapy should not be administered once the patient is unconscious. Help should be summoned and the patient should be sent to the hospital. If symptoms are recurrent patients should consult their practitioners for a change or reduction of regimen.

Hyperglycaemia: Hyperglycaemia is an abnormal increase in the level of blood glucose, taking it above the normal range. It is a life-threatening condition that is a medical emergency.

Causes are:

- Stress, trauma, surgery, lack of adequate control of diabetes due to using low doses of insulin, not injecting insulin properly;
- Not following the diet regimen, lack of exercise and illness; and
- Medication and poor adherence.

The signs and symptoms of hyperglycaemia are not easily detected until the glucose level is above 180mg/dl, therefore it is important that patients check their glucose level regularly and also to adhere to management.

Signs and symptoms are:

- Frequency in urination, excessive thirst, tiredness, blurred vision and severe headache; and
- Nausea and vomiting, sweaty smell on the breath, difficulty in breathing and dryness of the mouth; and weakness, confusion and eventually unconsciousness.

Serious symptoms may manifest if a patient has not solicited medical advice. The individual is admitted to the hospital where the physician takes up the care of the patient as an emergency case.

ctivities

Questions and Answer and teach back session. Encourage patients to ask questions about topics taught and provide accurate, short answers. Ask a patient to teach back the topic for the day in order to evaluate assimilation and content retention.

I*ndividual counselling* of patients by all care professionals using a motivational interviewing framework and setting achievable goals with the patients. Health-care professional may give individual patient assignment to enable achieving targeted goals. Goal setting sheets are used during counselling (Table 6.9).

Assignment 1.1. Materials given on diabetes, causes and complications should be discussed at home with family members and friends. A member of the family should give a brief written description of what was learnt from the take home materials to ensure participation and support.

Telephone call and shortage message system. The nurses use telephone calls and SMSs during the week to reach out to the patients and remind them of their self-management activities.

Summary. The health-care professional concludes the day's activity by summarising all that was done and reminds patients of the benefits of completing the programme and motivates them to tell others about diabetes.

6.9 MODULE 2: GENERAL METHODS OF MANAGING TYPE 2 DIABETES THROUGH A HEALTHY DIET (TABLE 6.4)

Aim: To equip patients with the knowledge, skills, beliefs/values to manage nutrition therapy, which will enable attaining and maintaining glycaemic outcome, a reduction in lipid profile,

maintaining normal blood pressure and reducing and maintaining weight in order to prevent complications.

Process outcome: Patients will be able to plan and implement their diabetic diet planning and be able to direct themselves to undertake daily different exercises.

Expected learning outcomes: At the end of the teaching the patient will be able to:

- Explain how he/she diet is planned and implemented to control diabetes;
- State how the combination of local food that can be used for dietary control is monitored daily;
- Specify local foodstuff that must be avoided in the control of diabetes;
- Define increased physical activity and give examples of how daily programme is organised according to own activities and responsibilities in the family;
- Select a range of physical exercises for their own use;
- State the appropriate weight range for the themselves and how they plan to self-direct their weight;
- State different ways of controlling weight; and
- Specify the complications of weight gain for the diabetes.

Time needed for the sessions: Two hours (10 minutes for the group discussion, 40 minutes for the lecture, 15 minutes for demonstration and planning of meals, five minutes role-play, 30 minutes for individual counselling, 15 minutes for questions and answers and five minutes for conclusion)

Teaching delivery methods: Lectures, computer-assisted lectures, group discussion, role-play, demonstrations and prompt practice.

Teaching delivery materials: Educational materials or hand-outs, posters and flipchart or chalk board.

Study unit- 2.1: Nutrition management**.**
Study unit 2.1: Local foodstuff for diabetes.
Study Unit 2.3: Increased physical activity.
Study Unit 2.4: Weight maintenance.

Content: Food groups, dietary planning and available food stuff, reasons for a meal plan, planning a diabetic diet using locally available diet, use of meal plan to control diabetes, glycaemic indices, lipid control, alcohol consumption, timing of meals, eating out and snacks. Increased physical activity; goals, benefits, duration and timing of exercise, types of exercise suitable for diabetes, contra indications to exercising and maintenance of manageable weight will be discussed.

 Group discussion on dietary modification and weight management. Discussion should be focused on what they eat and how it is eaten, exercises done and challenges they encounter.

Background (Dietician): Self-management is a method in the management of diabetes in which the individual with diabetes actively cares for him/herself in order to cope well with the disease and prevent complications. Dietary modification means changing food patterns by adhering to a specified diet that enables glycaemic control. Diet plays a significant role in the management of diabetes, even in the case of pre-diabetes. Diet is used in any of the following three methods used in the management of diabetes:

1. Diet and exercise;
2. Diet and oral hypoglycaemic medication; and
3. Diet and insulin.

Although dietary modification is an essential component of successful diabetes management, the ability to follow the meal plan proves to be the most challenging aspects of diabetes care. Increased physical activity is crucial in self-management as it helps the body in maintaining blood glucose.

Food groups: The main food groups are carbohydrates, protein, fats and vitamins and minerals and are found in most of the locally available foods. Carbohydrates are the main source of energy. Proteins help in repairing the tissues and cells. Fats are protective. Vitamins and minerals help the immune system.

Carbohydrates: Carbohydrates are found in foods such as cassava, garri, akpu, all yams, rice, semolina, semolina, pasta, Irish potatoes and sweet potatoes, guinea corn, millet, all species of corn, wheat, cocoyam, plantain, sugar, bread, sweets, cookies, cake, ice cream, snack foods such as chips, crackers, snack bars, chocolate and fruit.

Protein: Chicken, fish, crayfish, crab, beef, bush meat, stock fish, beans, eggs, milk, cheese and locust beans are all proteins.

Fats: Palm oil, vegetable oil, margarine, butter and fatty beef are all sources of fat.

Vitamins and minerals: Green leafy vegetables, carrot, cabbage, lettuce, green pepper, cucumber, tomatoes, onions, garlic, eggplant and fruits such as mangoes, oranges, pawpaw, watermelon, grapefruit, tangerine, garden eggs, lemon, soursop, pineapples, guava, banana are all sources of vitamins and some also contain minerals.

Managed nutrition therapy: Managed nutrition therapy (MNT) is a process of providing nutritional care for patients with diabetes and the behavioural modifications recommended for the care. A healthy diet in people with diabetes is one that is rich in fruits, vegetables, lean protein and healthy fats. It is necessary for people with diabetes to monitor what they eat, when they eat and how they eat since all these affect glycaemic control.

Locally available food: The food that is eaten in the family is also suitable for patients with diabetes and they therefore do not need a special diet. Factors such as personal and cultural preferences, lifestyle, age, individuals' needs and their readiness to change should be considered before recommending nutrition therapy. Whole grain foods that are full of fibre should be chosen because fibre keeps blood sugar in control while giving a feeling of satiety. A highly nutritious diet consisting of a variety of food groups should be eaten every day, including:

- Carbohydrates: Whole grains, rice (locally produced rice, e.g. Ekpoma rice or brown rice), plantain flour, wheat flour, pap, bread (wheat bread), yam (preferably the yellow yam boiled with the peelings), unripe plantain, semolina, sweat potatoes (boiled with the peelings). Carbohydrates are nutrients that impact on blood glucose the most and therefore patients should consciously monitor the quantity and their impact on the blood glucose.
- Protein: Fish (both dried and fresh), chicken (without skin), crayfish, snails, crab, bonga fish, beans, locust beans, rabbit, cheese, peanut butter, tofu, low-fat milk (Three Crown milk, Dano Slim milk), almond, walnuts and lean beef without fat. Patients should not eat the skin or the organ meat because they contain a lot of fat that is not suitable for the heart.
- Fats: Nutrition therapy is tailored to the patients' requirement with due consideration to age, lipids level and comorbidity. Reduce fat consumption to 20-30% of total fat. Reduction in weight, increased physical activity and controlled blood glucose can modify the plasma lipid level. Patients should eat a variety of soya bean oil, olive oil, palm oil, coconut oil and other sources of fat from vegetable sources, avoiding animal fat.
- Vegetables: As already mentioned. Vegetables help to keep the stomach full.
- Fruits: All natural fruits can be taken moderately.
- Salt: Should be eaten in low quantity and Maggi stock cubes, Knorr stock cubes should be reduced. Locust beans and crayfish are good sources of salt. Although patients with diabetes can use the recommended 2,300mg/day quantity of salt it is appropriate to reduce the quantity due to the risk of heart disease. Patients with hypertension should further reduce the quantity of salt intake.
- Fluid: Water intake is good to keep hydrated and it is good for health. Fluid is also needed during exercise periods.

Breakfast should contain lower carbohydrates high protein and saturated fat, since consuming a high quantity of carbohydrates in the morning tends to increase blood sugar.

The following should be avoided:

- Artificial sugar, sweets, baked food such as cakes, pies, white bread, sweeteners, sweetened beverages such as Milo and Bournvita; tea can be taken, but coffee should be avoided;
- Sweetened drinks such as Coca-Cola, 7-up and other gassy sweetened drinks, artificial fruit juices, all brands of malt; they should only be taken in hypoglycaemic states and not more than half a glass should be taken; and
- Fried food, such as fried plantain (ripe) chips and fried yam; boiling is a better alternative.

Time - When to eat: Eating at regular intervals will help to maintain and control glycaemic levels and maintaining the quantity of food eaten also prevents hypoglycaemia (low blood glucose):

- Eat three regular meals consisting of breakfast, lunch and supper;

- Avoid starving because in this state the body breaks down stored glucose to utilise (patients should only fast according to their beliefs but they should not starve on a daily basis and not for too long);
- Regular meal times are advised such as 7:00a.m.-7:30a.m. (breakfast), 12:30 pm-1:00p.m. (lunch) and 5:00p.m.- 6:30p.m. (supper);
- Snacks such as cracker biscuits and fruit should be taken at least twice daily (2-3 hours after a meal) and should be eaten in between meals and not with meals; and
- Meals should not be delayed if the patient wishes to avoid hypoglycaemia and starvation.

Quantity of food - How much to eat: In patients' environments the locally produced food may be difficult to calculate therefore the method used in measuring the quantity is the plate method. Patients should eat a small quantity of food at a time to ensure that the food can be digested and metabolised without much increase in the blood sugar, at most 180mg two hours after a meal (post-prandial).

Reasons for a managed nutrition therapy: Adhering to a diet plan:

- Reduces the amount of excess glucose in the blood, which also reduces the amount of insulin needed;
- Reduces the calories consumed, which will lead to maintenance of weight, weight loss and a reduction in body fat; and
- Increases the sensitivity of the tissues to insulin, because fat that is naturally resistant to insulin has been reduced.

Use of a meal plan to control diabetes: Monitoring carbohydrate intake is essential in enabling patients to control the blood glucose. This can be achieved as follows:

- Carbohydrate counting is done using the standardised method to count the quantity of carbohydrates to be consumed, for example most women should have about 30-45 g and most men should have about 45-60 g of carbohydrates per meal (a slice of whole wheat bread is 15g);
- An experienced base estimation depends on the experience of the individual with the effect of the food sources on the health or blood sugar. People with diabetes who have been adherent to their diets and monitor their glucose can estimate the effect of food on their blood glucose;
- The plate method is simple and easy to understand by all categories of people and therefore it will be chosen for teaching this group because Nigerian local food has not achieved a standardised measurement, people cannot afford scales due to poverty and the level of education is low, which may affect any measuring methods.
  The plate method advises the following:
- A 9-inch plate is required;
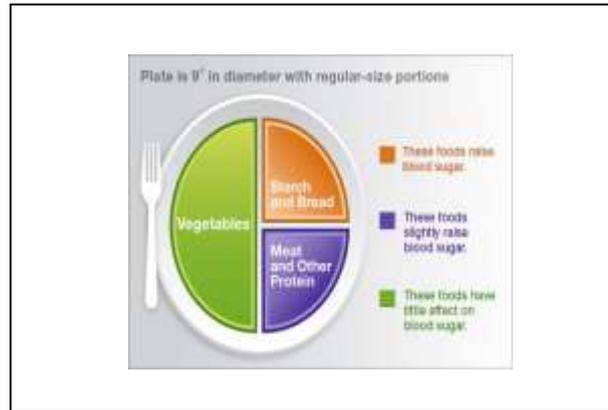
9-inch plate used for plate method

- Divide the plate into equal halves/portions;
- Fill a portion with non-starchy vegetables to provide fibre, vitamins, minerals and volume to meals, thereby ensuring good satisfaction and it does not raise blood sugar and also reduces weight;
- Divide the remaining portion into two equal portions;
- Fill a portion with carbohydrates and only the specified carbohydrates should be eaten in a reduced quantity, such as eight table spoons of rice or a portion the size of an individual's fist; and fill a portion with lean proteins since proteins are necessary for cell and muscle repair, help in tissue building, boost immunity and keep the stomach full. ***Alcohol consumption:*** Alcohol should be taken sparingly and should not to be consumed daily since it increases the glucose level.
- Excessive alcohol causes delayed hypoglycaemia especially in those on insulin injections.

Family members' involvement should be encouraged to:

- Partake in nutrition therapy in order to motivate the patient;
- Eat same menu with the patient;
- Support the patient by eating at table with the individual; and
- Becoming involved in the care and selection of food.

Eating out: Individuals should be motivated to socialise with others and not keep indoors as this is usually a sign of depression due to their health status and poor understanding of their disease:

- Be moderate in all activities whether eating, physical activity, or consumption of alcohol;
- Sweetened drinks in form of juice should not be taken or only taken sparingly;
- Organise get together with family members and encourage providing healthy food, drinks and snacks; and
- Individuals and family members could eat out after identifying restaurants where healthy food is served.

 Demonstration by the dietician **and planning of meals with patients**:

> - Breakfast 7:00a.m.-7:30a.m.
>   i. 5 level dessert spoons of raw pap or ogi with 11/2 cups of moimoi or 3 big balls of akara or 6 desert spoons of cooked beans;
>   ii. 3 slices of whole wheat bread with Lipton tea and milk (low fat milk), no sugar with egg (one boiled egg) or with fish stew; and
>   iii. 2 slices of boiled yam and fish or crayfish stew.
> - Snack (midmorning snack) 10:00a.m.
> 3 cracker biscuits (Jacobs and Bisca) or 1 slice of whole wheat bread with bread and tea (no sugar).
> - Lunch 12 noon to 1:00p.m.
>   i. 10 dessert spoons of amala with vegetable or okra soup with fish, chicken or lean meat;
>   ii. 8 dessert spoons of boiled rice (native rice or brown rice) and vegetable stew with fish or chicken; and
>   iii. 2 fingers of unripe plantain boiled and vegetable soup with fish.
> - Snack (mid-afternoon snack) 3:00p.m.-4:00p.m.
> 1 piece of fruit: apple, orange, pawpaw, garden eggs and banana.
> - Supper 6:00p.m.-7: 00p.m.
>   i. 2 wraps of agidi and vegetable soup and chicken or fish;
>   ii. 2 small balls of cocoyam boiled and eggplant sauce; and
>   iii. 10 dessert spoons of beans and 5 level desert spoons of raw ogi or pap.
> - Snack (bed time snack)
> 3 cracker biscuits or a slice of bread and tea (no sugar) and milk (low fat).

Increased physical activity (Nurse and sports coach)

Increased physical activity is crucial since it is key to managing Type 2 diabetes in order to achieve glycaemic control and prevent or delay complications. Patients should:

- Reduce sedentary lifestyles since regular and constant movement is beneficial at all stages of diabetes, even in those patients who are obese or those who are lean; and
- Switch some of their sitting time to standing, as it could benefit their heart and metabolism.

Benefits of increased physical activity are:

- Reduction in blood glucose level reduction in the amount of insulin needed to normalise blood glucose, as the system uses a different chemical process in the absorption of glucose;
- Increased insulin sensitivity;
- Increased life span;
- Reduction in the risk of early death from heart disease and other health problems;
- a mood boost, as it reduces stress and improves sleep;
- Lowered risk of developing certain cancers;
- Increased cardio vascular fitness and reduced blood pressure; and
- Reduced weight.

Duration and timing of exercise regime:

- 30 minutes daily for at least five days a week (150 minutes);

- Activities can be broken down into shorter periods of at least 10 minutes three times a day; and
- 30 minutes a stretch, or broken down as desired and depending on the stamina and strength of the individual.

Exercise can be engaged in any time the individual feels like being active and feels reasonably energetic. The following should be considered:

- Exercise should take place in the morning, afternoon, or evening;
- Exercise should start gradually and the pace and time should be increased as the individuals grow accustomed to it;
- Safety should be observed during the exercise and exercising at night or in the dark should be avoided;
- Exercise should not take place after a meal but rather at least two hours after meal;
- Snacks should be taken during exercise to keep energy levels balanced, especially if exercise exceeds a continuous 60 minutes; and
- Exercise should not take place in the hot sun it is preferable to engage in exercise during cooler and less humid times of the day.

Types of suitable exercises are:

- Brisk walking, dancing, stair climbing, yard work, gardening, cycling, increased household chores and swimming; and
- Resistance training exercise can be undertaken depending on the individual's health status and their abilities.

Contraindications:

- All patients should inform their physicians before engaging in increased physical activity to enable assessment of the health status for the exercises;
- Also when an individual stops these activities for any reason for some time the physician should be notified before resumption;
- The aged, patients with cardiac diseases, renal problems and other physical disabilities are not allowed to engage in strenuous physical activities; and
- Exercise should not occur when FBG is 180mg/dl and above or when it is below 74mg/dl.

Demonstration of exercises by the sports coach while patients participate actively to facilitate role-modelling
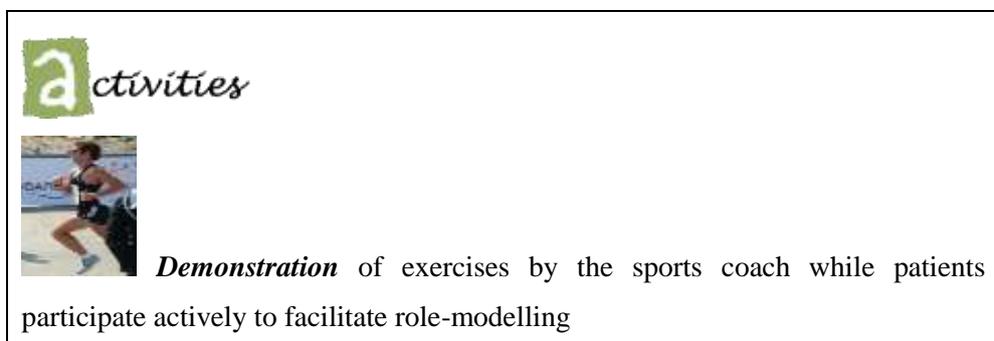
Weight maintenance

This is also important in the management of diabetes and therefore patients' BMI is important.

- Body fat has a negative impact on insulin sensitivity.

Patients should be motivated to reduce weight through:

- Diet modification; and
- Exercise.

Patients should maintain a suitable weight that can be managed physically and physiologically.

Effects of overweight and obesity:

- Heart complications like hypertension, Type 2 diabetes and psychological effects.

Role Play: ask for two volunteers, preferably a man and a woman, to act the role of a woman helping to discourage the husband from eating a large bowl of pounded yam with a bottle of beer.

Time allowed - 5 minutes.

She should be seen giving emotional support and understanding to motivate behaviour change.

Individual counselling session: Using motivational counselling the dietician counsels patients and through active patients' participation, they are motivated to set achievable goals to enable a target for nutrition therapy.

Questions and answer and teach back session- Encourage patients to ask questions about topics taught and give accurate short answers. Ask one of the patients to teach back the day's discussion in order to evaluate understanding and content retention.

Assignment 2.1: Draw up a diet plan for three days using locally available foodstuff.

Assignment **2.2:** Increase your physical activity this week (at least 30 minutes) and record dates, times and type of exercise done in the notebook.
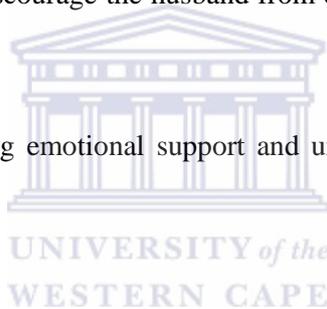
Telephone calls and SMSs will be used to remind clients of the lessons and those patients with individual assignments are motivated to complete them.

6.10 MODULE 3: GENERAL-MANAGEMENT OF TYPE 2 DIABETES (NURSE) (TABLE 6.5)

Aim: To equip patients with knowledge of self-monitoring of blood glucose and medication.

Process objective: Patient will be able to monitor blood glucose and manage diabetes according to the result of the blood glucose assessment.

Expected learning outcomes:

- Indicate an acceptable range of blood glucose;
- State the importance of blood glucose monitoring;
- Demonstrate skills of self-monitoring of blood glucose;
- State the problems associated with not caring for the feet;
- Demonstration of the skills of examination and foot care;
- Indicate knowledge of the prescribed drugs;
- State importance of drug adherence; and
- Indicate the effect of traditional medicine on patient health.

*Time needed for the session***:** Two hours (15 minutes for the group discussion, one hour for the lecture, 20 minutes for demonstrations and practice, 20 minutes for questions and answers and five minutes for conclusion)

Teaching delivery methods: Lectures, computer-assisted lectures, group discussions, demonstrations and prompt practice

Teaching delivery materials: Educational materials or hand-outs, posters, flipchart or chalk board, glucometer kit and mirror to demonstrate feet examination.

Study unit 3.1: Self-monitoring of blood glucose.
Study unit 3.2: Own foot care.
Study unit 3.3: Adherence to medication.
Study unit 3.4: Effect of traditional medicine on patients with diabetes.

Content: Range of blood sugar level, goals of home glucose monitoring, use and care of glucometer, proper use of finger sticks, techniques of blood glucose monitoring, target blood glucose control, examination of the feet, foot care, medication name, dose, intended therapeutic response, allergy and side effects, management of allergy and side effects, storage and disposal of drugs and materials, use of traditional medicine among patients with diabetes and effect on the patient.

 Group discussion of self-monitoring blood glucose, care for the feet and the different groups of traditional medicine used for diabetes

Lecture (Nurse): Self-monitoring of blood glucose is a process whereby a patient with diabetes checks the level of glucose in the blood at home at a time specified by the health-care professionals.

Factors may increase blood glucose level are:

- Poor adherence to diabetic diet;
- Poor physical activity;
- Inadequate medication either oral hypoglycaemic or insulin;
- Side-effects of other medications; and
- Poor health due to illness, injury, pain, surgery, stress and dehydration.

Factors that could reduce blood glucose level are:

- Inadequate diabetic diet taking reduced quantity with fewer carbohydrates;
- Excess dosage of medications both oral and insulin;
- Side-effects of other medications used for other ailments;
- Alcohol intake; and
- Excess physical activity either for longer periods than advised or very rigorous forms of exercise.

What should the blood glucose levels be?

Before meals - 80-110mg (after 8-12 hours fast overnight).
2 hours after the start of a meal - less than 180mg/dl (ADA, 2012).
Try to remember last blood glucose reading; was it within the normal range?

Range of blood sugar level. The range of normal blood glucose according to WHO (2012) is 80mg/dl- 110mg/dl.

Goal of SMBG: To improve the glycaemic control of people with diabetes and their clinical outcomes through individual monitoring of blood glucose and making necessary adjustments.

Use of SMBG TO:

- Monitor health progress of a patient with diabetes;
- Enable adequate treatment of the individual;
- Allow for adjustment of medication, especially patients on insulin;
- Educate patients about their conditions, especially in a care programme;
- It can be used for assessment as it is used for objective feedback on the impact of behaviour modifications;
- Empower patients on self-management, collaborative care and active participation in care;
- Stimulate interest in self-management;
  - Enable and support individualised and tailored care; and
  - Make decisions about diet and physical activity.

Description of Glucometer:

Individuals are advised to use their personal glucometer and to give reasons why it should not be shared.

- To prevent the spread of blood borne infections such as hepatitis B virus, hepatitis C virus and HIV/AIDS.

Therefore, glucometers should not be shared but if there is a need to use it for others, then:

- Finger sticks should be changed;
- Metres should be cleaned and disinfected between each patient according to manufacturer's instructions; and
- Gloves should be worn and hand washing should be performed (CDC, 2014).

The nurse introduces the patients to the metre by showing the various parts of the glucometer.

Blood glucometers consist of:

- A power button;
- A strip insert section;
- The screen;
- A lancing device;
- Lancets and
- A test strip.

Patients are encouraged to examine the device and to ask questions

When to test:

- In the morning after an eight-hour overnight fast, preferably with the last snack eaten at 9:00p.m. The test can then be done between 6:00a.m.9:00a.m. due to the body breaking down stored glucose, because any testing done later than this will occlude the result test and it should not be done after 9:00a.m.
- One to two hours after food, and those on insulin injections;
- Before each meal for patients on insulin injections; and
- As directed by the care giver.

Demonstration of self-monitoring of blood glucose

Procedure: Example is an Accu Check Glucometer:

- The glucometer is placed on a flat surface,

- Hands must be washed;

- Put the test strip into the strip insert section; place the lancets in the lancing device;

- Clean the chosen finger with antiseptic lotion;
- Prick the finger with the lancet sticks;
- Drop the blood on the test strip;
- Watch for the result that will appear on the screen after 10-15 seconds;
- Read the result;
- Enter result in the log book; and
- Remove the used strip and discard; the machine is self-regulated so it comes on and goes off automatically.

Each manufacturer has different procedures for testing, therefore the manual must be read and patients should be informed of the procedure to ensure accuracy.

NOTE: All patients should practice blood glucose monitoring at least twice before leaving the venue.

Factors that will enable normal blood glucose level are:

- Adherence to managed nutrition therapy;
- Increased physical activity;
- Adherence to medications;
- Stress management; and
- Stable health

Individuals should set a targeted goal of blood glucose that is within the normal range, which that they should strive to attain.

Care or the feet (By the Nurse):

- It is important to practice foot care due to the complications that can arise from diabetes;
- Diabetes can reduce the feeling in the feet and incur pain due to its effect on nerves;
  It could also reduce blood flow to the feet and cause numbness; and
- Daily foot care and good blood glucose will reduce or eliminate the chance of sores and amputation.

*How to care for the feet***:** This should be done daily.

- Inspect feet daily in the morning before putting on shoes and socks. Check the back of the heels, the sides, toes, in between the toes and the soles of the feet for sores, blisters, redness, corns, a decrease of sensation and pain. Use a mirror to view the soles adequately and ask family members to help check. Note any abnormality.

247

- Wash feet daily in warm soapy water to remove debris and irritants and dry with a clean towel. Use lotions on the feet, apply talcum powder or corn starch to keep in between toes dry.

- Wear clean and soft socks and shoes that fit accurately. Wear the right size shoes that support feet and allow feet enough room. Wear shoes at all times to prevent injury and falls. During exercise, wear comfortable shoes, never walk barefoot.

- If possible, trim nails with a nail clipper or cutter after washing and drying and do not use a razor blade to prevent injuries. Use nail files to direct the growth of the nails. Family members could also help to cut the nails. Do not cut corns but report to the doctor.

- Exercise the toes by wiggling for 5 minutes two to three times daily. Move ankles regularly to allow good blood supply do not cross feet for too long a time and endeavour to raise feet when sitting for a long period. Be more active to improve blood supply to the feet.

- Report any abnormality to a care provider and request for checking of the feet for pulses and sensation at least once a year.

- Taking care of diabetes by adhering to diet, medication and maintain targeted blood glucose.

Adherence to medication (By the Nurse)

This is the ability of the individual to follow the prescribed drugs accordingly. People with diabetes are treated with oral medications or insulin injections, with an emphasis on the time and the dosage, but in most cases once patients leave the presence of the care professionals they do not act as advised.

Reasons for medications:

- For the management of diabetes;
- To prevent complications; and
- To manage co-morbid diseases.

Actions of the medications TO:

- Increase tissue sensitivity to insulin;
- Tenable the release of insulin; and
- Reduce blood sugar level.

Medication name: Patients should know the name of the drugs they have been given.

Dose: Patients should know the dosage and can be quoted so as to help the individuals in a time of emergency, which could be due to a reaction that needs an antidote. When next patients visit their pharmacist, they should ask for the name of the medication and the dosages. The

dosage of the medication should be maintained as prescribed to ensure optimal level in the blood stream always in order to ensure efficacy.

Patients should buy medications from reliable pharmacies to forestall use of adulterated medications that could be poisonous.

Allergy and side effects: Some of the common side effects of medications are:

- Hypoglycaemia;
- Gastro-intestinal problems such as nausea and diarrhoea;
- Skin reactions; and
- Weight gain.

Management of allergy and side effects: Management of hypoglycaemia as discussed in module 1.

Method of administration: Oral medication is taken orally but patients on insulin injection need to maintain the method as prescribed or else the action of the drug will be diminished. Subcutaneous injections should be given with the insulin needles and used as directed in the health facility.

ASK: Patients to mention the signs and symptoms of hypoglycaemia and discuss the management of hypoglycaemia.

Patients should report side effects to health-care professionals immediately for a possible change of regimen.

Patients on insulin injections may also have hypoglycaemia. Highlight reasons for not using syringes with others as discussed previously.

Storage and disposal of drugs and materials:

- Stored in a locked up cupboard or any safe place out of reach of others;
- Insulin should be refrigerated at the right temperature; and
- Discard syringes properly to prevent exposing others to hazard.

Patients should keep a log book of the medications, time and dose.

Across the counter drugs and medication should be discouraged and patients are advised to visit the health facility whenever they are sick. Patients should be discouraged from using traditional medicine and herbal medications, emphasising their effect on the organs, especially the liver and the kidneys.

Complementary therapy and Traditional Medications(NURSE)

These are medications is the popular term for health and wellness therapies that have typically not been part of medicine prescribed in the health facilities. Complementary means treatments that are used along with medications that are prescribed in the hospital.

Activity: Ask patients to mention those they have used and those other ones they know.

Lecture: Give examples of the popularly used complementary medications and traditional medications patients use, for example chewing and drinking bitter leave water, abiri.

Discuss digestion of the product and the after effect.

Side effects or the complications that can arise due to use of the complementary medications:

- The kidneys
- The heart
- The progress of diabetes
- The liver and the general system

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Individual counselling session*:* Using a motivational interviewing approach, individual counselling is done by all care professionals depending on patients identified or felt needs. Set goals for targeted blood glucose level and medication adherence through patients' active participation and collaboration.

Questions and answer and teach back session: Allow time for patients to ask questions on the topics taught and concerns from the previous modules. Give answers to questions until they are clarified. Ask a patient to teach back the topics taught to evaluate their knowledge and ask an individual to perform SBGM.

Assignment 3.1*:* Examine feet using the method taught in the class and record with dates.

Assignment 3.2- Monitor blood glucose three times - Sunday, Tuesday and Friday for those on oral hypoglycaemic agents and daily for those on injections and record on the chart with dates and time or as advised by care provider.

Assignment 3.3: Plan three days diet using available foodstuff, record in note book and indicate time for meals and snacks.

Summary: Summarise all the topics taught and remind patients of the next section, venue and time.

Telephone calls and SMSs: These will be used to remind clients of the lessons and those patients with individual assignments are motivated to do them if reminded.

6.11 MODULE 4 MANAGEMENT OF STRESS (TABLE 6.6)

Purpose: To equip patients with knowledge and skills of managing own stress and improve psychosocial health.

Process outcome: Patient demonstrates ability to recognise own stress, use techniques learnt adequately and cope effectively with challenges around Type 2 diabetes.

Expected learning outcomes: Patient will be able to:
- Identify sources of own stress;
- Enumerate effects of stress;
- Generate a variety of stress management techniques;
- Identify the need for social support; and
- Reduce and maintain low stress due to diabetes

Time needed for the session: Two hours (15 minutes for group discussion, 30 minutes for the lecture, 40 minutes for individual counselling, 15 minutes for demonstrations and practice, 15 minutes for questions and answers and 5 minutes for conclusion).

Teaching delivery methods: Lectures, group discussion, demonstration and prompt practice.

Teaching delivery materials- Educational materials or hand-outs, posters and flipchart or chalk board

Study Unit: Unit 4.1: Concept of stress and sources of stress in patients with diabetes.
Unit 4.2: Effects of stress on patients with diabetes and signs of stress.
Unit 4.3: Stress management techniques and living positively with diabetes.
Unit 4.3: Social support in the management of diabetes.

Content: Definition of stress, types of stress, signs of stress, sources of stress, effect of stress, management of stress using different techniques, social support and diabetes.

Group discussion on types of stress experienced by the patients, sources and management. Involvement of family members in their care
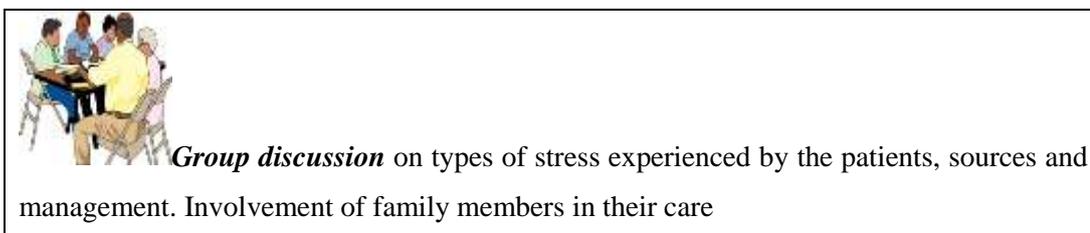
Definition of stress: Stress is a state of mental or emotional tension as a result of difficult or very demanding situations or difficulties that causes worry or emotional tension.

Effect of stress on the general system of the body:

- Body is prepared to take action known as fight or flight response;
- The heart beat increases;
- There is an increased pulse;
- The pupils are dilated;
- Levels of different hormones increase, thereby affecting various organs;
- A lot of stored energy is released to the cells in readiness for action against the danger;
- In people without diabetes, the body returns to normal after the stressful situation; and

- In people with diabetes the insulin level is not sufficient to enable excess energy back to the cells, so blood glucose levels rise because of the extra glucose in the blood.

Types of stress: There are different types of stress namely acute, episodic and chronic stress.

- Acute stress - arises suddenly from demands and pressures of past problems and future problems. In small doses stress can be energising, for example preparing for examination or a woman in labour, but becomes exhausting when it is too much and for a long period.
- Episodic acute stress - in this situation the individual is always undergoing stress, in a rush and always late. Personality type has been identified with the stress. People who suffer from this type of stress are prone to disease.
- Chronic stress - the individual is constantly experiencing stress that wears him down continuously. The stress can destroy body, mind and lives, which is the stress of never-ending troubles that people experience every day. The individual never sees a way out of the situation and no hope of getting a solution and therefore becomes used to it and sees it as part of life and forgets that the stress is there. This type of stress builds up in the individual and kills through heart attack, stroke and mental and psychological problems. Example of this stress is mental or emotional stress, the body will continue pumping hormones continuously therefore the blood glucose is always on the increase and the stress is in the mind. People react to situations differently, so stress is subjective.

Signs and symptoms of stress:

- Cognitive signs are low self-esteem, poor judgment and concentration
- Behavioural signs are excessive eating or poor eating habit, neglect of responsibilities such as own-care, social withdrawal, alcoholism, smoking, drug abuse
- Physical signs are feeling of pains, constipation, nausea, rapid heartbeat and pulse, chest pain
- Emotional signs are anxiety, agitation, worrying, irritable, feeling lonely

Sources of stress- this can be either through

- Physical such as traffic jam, work overload, poor weather, injury;
- Mental sources such as emotional problems, marriages, finances, health problems such as diabetes, HIV and AIDS, cancers; and
- Attitudes about the illness, diabetes related quality of life due to complications, anxiety, expectations for medical treatment, finance, social problems.

Signs of stress: Stress can affect the body, feelings, thoughts and behaviour of an individual and the effect differs among individuals. Some of the signs are:

- Worry, anger, irritability, depression, inability to focus and headaches;
- Poor sleeping patterns, weight gain or loss and muscles become tense;
- Poor appetite or stomach upset and back pain; and
- General body weakness and cold.

Effect of stress:

- It increases the level of blood glucose either as a result of neglect of self-care by the individual, engaging in abnormal behaviours such as smoking, alcoholism and may also be due to the effect of hormones on blood glucose;
- Hypertension, psychosocial problems and illness of different sources;
- Mental illness, poor coping with issues of life, and obesity; and

- Diabetes and heart disease.

Management of stress: this can be done by using different techniques, but the individual must realise that he/she is undergoing stress in order to deal with the stressors.

Stress can be prevented or reduced by:

Planning activities ahead;
- Deciding which tasks need to be done first and who is to perform it; and
- Taking note of events that are stressful and preparing for stressful events.

Ways to manage stress are:

- Noticing causes of stress and when stress occurs;
- Taking time to relax alone and with family members and friends;
- Getting actively involved in with surrounding activities such as community development, social activities, church activities and eating healthily;
- Talking to friends, family and religious or spiritual leaders;
- Making changes by identifying the cause of the stress and changing the situation or behaviour in order to deal with the stress;
- Exercising that can take the form of walking or any activity that is enjoyable, such as dancing, since this will reduce anxiety and depression and helps the brain to deal with stress.
- Deep breathing is a technique that counters the effect of stress by reducing the heart rate thereby lowering blood pressure and can be done for 5-20 minutes at least daily; it can be accomplished by taking a deep breath through the nostrils in a sitting or lying position with the eyes closed, slowly breathing, inhaling through the nose and exhaling through the mouth, all the while experiencing a feeling of the air moving round the body as the movement of the air is focused upon;
- Using distractive and pleasurable activities such as a new hobby or craft, since will help reduce stress, because the time and energy is used on more profitable ventures as the focus on stress is reduced;
- Laughing, remembering exciting moments lighten the stress and boost the brain, watching interesting movies, listening to enjoyable music and reading magazines, books and the word of God;
- Being positive by appreciating God's blessings, praying, recounting the good deeds, family and work, showing gratitude, cancelling all negative thoughts and worries and being grateful for the opportunity of life;
- Celebrating accomplishments;
- Reaching out by talking to others through face-to-face discussions or phone, sharing problems with others where suggestions are made, advice is given and the individual develops new perspectives through the interaction; and
- Progressive relaxation whereby one learns to relax tense muscles by sitting or lying down and learns to murmur relaxing words such that the mind is at peace, the head is cool and they have good thoughts of past experiences so that the body can block stress.

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> ***Demonstration*** of some of the stress management techniques by the nurse and practice by the patients.

Family support in diabetes: Family members are a significant source of social support for all patients with chronic disease. They could either play a positive or negative role in the care of patients with diabetes as they facilitate or interfere with self-care activities. Also family members can cushion the effect of stress if they are integrated into the care and therefore adequate knowledge of the disease and self-management should be given to them to enhance support and collaborate with health-care professionals.

Types of support given by the family: Emotional support, financial support, informational support, appraisal support, or instrumental support make it possible for patients to perform self-management activities.

Family involvement entails:

- Sharing knowledge of diabetes with family members;
- Engaging in supportive behaviour, such as exercising with family members;
- Dietary modification through eating healthy food with diabetes patient in order to motivate and reduce stress and minimise giving meals different to that of the family;
- Refraining from criticising the patient and motivating them instead of arguing with them;
- Family members should show empathy because diabetes is a source of frustration and fear to the patient and therefore family members should be involved to reduce stress;
- Always providing emotional support exercising patience in dealing with diabetic patients;
- Being aware of their risk to develop diabetes due to genetic factors and therefore they should seek screening and understand the prevention mechanisms;
- Offering financial support, such as refilling the medications and buying appropriate diet items; and
- Serving as medication partners since they act as reminders and help in adherence to medication.

Therefore, patients with diabetes are advised to disclose their diagnosis to family members and trusted friends so as reduce their stress of having to bear the burden of diabetes alone.

Coping Style: Different individuals deal with stress differently and how an individual deals with stress is their coping behaviour. According to the ADA (2013), there are two methods individuals use in coping with stress, they are problem-solving attitude and talking to themselves.

Problem-solving skills

Individuals face many problems daily, but with chronic illness the patient faces more problems as they learn to live with the disease. The ability to confidently solve a problem is the key to success. The purpose of learning the skill is to help individuals handle problems effectively with the goal of breaking down problems into segments and to spend less time on problem-solving.

There are five basic steps in solving problems, they are:

- Defining the problem by identifying the source or causes of the problem to enable dealing with the real problem and this can be achieved by examining the problem from different perspectives;
- Generating alternatives and this can be achieved by evaluating information and situations that can be achieved via communicating with others;
- Evaluating and selecting alternatives can be realised by analysing the alternatives and critically thinking of the benefits and consequences of alternative solutions and once the most appropriate decision has been made the individual will feel relieved;
- Resolving the problem involves the activities to implement the chosen solution and review the outcome; and
- Examining the result to enable the continuous use of the technique as you monitor the outcome

Social support and diabetes: In patients with diabetes, stress could be seen as a daily occurrence that patients may have to live with due to the chronic nature of the disease and self-management of the disease leading to psychological and social stress. There are ways individuals can reduce the stresses and achieve emotional wellbeing. Support groups are group of people with similar problems who meet to share experiences and help each other to live positively with the disease.

Effects of a support group:

- Help people with diabetes understand that they are not alone;
- Learn from other people how they have been coping with the problem;
- Lighten the burden of diabetes;
- Advocacy to government to provide materials for use;
- Non-governmental associations reach out to them to give aids such as glucometers;
- Teach members about new issues in diabetes care; and
- Provide social support to each other, such as good interaction and role-modelling.

The Diabetes Association of Nigeria (DAN) in the tertiary health facility is a viable support group, they meet on the first Friday of the month, from 12:30p.m. – 3:00p.m.. They encourage reaching out to other people to join the association.

 Individual counselling session: Patients should be seen by all professionals, depending on the felt needs of the patients. The care professionals have counselling sessions with the patients and set achievable goals with them and patients actively participate. Assignments may be given in order to ascertain how the targeted goals will be achieved.

 Questions and answer and teach back session: Allow patients to ask questions and express their concerns on topics taught that and in any previous modules.

Give answers to patients' questions until they are satisfied. Ask a patient to teach back the topics taught to evaluate their assimilation and understanding. Ask a patient to demonstrate any of the stress management techniques.

Assignment 4.1: Identify sources of stress this week and the coping method used.

Assignment 4.2: Monitor blood glucose thrice this week, on Sunday, Tuesday and Friday and record in the chart with date and time.

Assignment 4.3: Engage in exercise with a family member thrice this week and record in the logbook.

Telephone calls and SMSs: will be used in reminding clients of the lessons and those patients with individual assignments and poor glycaemic control are motivated on adherence

6.12   MODULE 5: GENERAL MANAGEMENT THROUGH ADEQUATE COMMUNICATION WITH SELF AND HEALTH-CARE PROFESSIONALS AND OTHERS IN THE COMMUNITY (TABLE 6.7)

Aim: To improve professional and patient interaction through effective communication and collaborative care.

Process outcome: Patients communicate through self-talk and actively communicate during collaboration with health-care professionals.

Expected patient outcome: Patients will be able to:

- Practice self-talk around focusing on correct managing their disease on a daily basis
- Demonstrate active communication and collaboration with health-care professionals;
- Practice monthly goal-setting to manage their disease and give examples of self-defined goals;
- Identify the health-care professionals that they can communicate with about their health conditions;
- Disclose problems with self-management of their health problems and perceptions with the health-care professionals verbally
- State the importance of continuing follow-up visits to the clinic.

Time needed for the session: Two hours (10 minutes for group discussion, 30 minutes for the lecture, 30 minutes for individual counselling, 10 minutes for role play, 20 minutes for questions and answers

and teach back and 20 minutes for conclusion)

Teaching delivery methods: Lectures, computer-aided lectures, group discussions, demonstrations and prompt practice, role-play and individual counselling

Teaching delivery materials: Educational materials or hand-outs, reference to websites, downloadable mobile applications on communication such as chat rooms posters and flipchart or chalk board.

Study unit 5.1: Self-talk and communication with health-care professionals.

Study unit 5.2: Active communication and collaboration with health professionals.

Study unit 5.3: Self- goal-setting to make informed decisions.

Study unit 5.4: Continuing attending follow-up visits by keeping appointments.

Content: Communication techniques of self-talk, ways of communication with health-care professionals, steps to set own achievable goals, making informed decisions around the disease and in social relationships and importance of continuing follow-up visits.

Introduction to day's lesson:

Group discussion: Communication with yourself and health professionals, ask patients to discuss what annoys them about their providers, the methods, their level of participation and expectations from their communication with health professionals. Discussion with family and friends and their decision-making skills.

Lecture: Communication is the process of exchange of information either by speaking, writing, telephones and other means to reach a mutual understanding in order to create and share meaning.

Communication with self or self-talk: This is a method of talking to yourself internally which enables internal problem solving, evaluation of self and others, resolution of internal conflicts and planning for the future. It is a health behaviour which places a high value on health.

Importance of self-talk:

- It reduces stress;

- It helps in problem solving and resolution of internal conflicts;

- Helps in planning for the future;

- Helps an individual to communicate effectively with others; and

- It helps to build a better relationship with the self.

Types: It can be positive self-talk or negative self-talk. The positive self-talk has good implications for mental and physical wellbeing.

How to communicate with the self: Notice when no one is talking to you as it is an inner dialogue. Examine the facts. Start a talk with yourself and use only present tense making it personal by using I or call your name. Talk to your self and enjoy the conversation internally. Think less and feel more. The talk triggers one for action and influences behaviour. During self-talk:

- Use positive affirmations;

- Become more optimistic by applying the positivity to yourself and believing in yourself; and

- Be kind to yourself by practicing a daily self-management routine. Do not allow yourself to become exhausted but manage any stress early.

Communication within the health-care facility: Effective communication between patients with diabetes and the health-care professional is required to ensure good medical care. Poor communication may lead to medical error in diagnosis and treatment. Patients are encouraged to actively participate in their care by providing information that directs the care.

Importance of good communication:

- Improves a patient's health;

- Reduces time spent in the physicians' office;

258

- Improves patient adherence to treatment;

- It increases knowledge and control of symptoms; and

- It increases patient satisfaction.

Types of communication:

- Verbal communication is the oral expression of self and may be articulated through vocabulary that exhibits clarity, humour, relevance and timing and it is commonly used in the health facilities between professionals and the patients;

- Non-verbal communication is the use of body language during conversations, such as nodding, facial expressions, body movement, posture and gait, touch, staring and meta communication; and

- Written communication is practiced by health-care professionals during interactions with patients and in most instances patients may not understand the communication but are given instructions on where to go with it or what to do with the information.

How to communicate with the provider:

- The patients should be proactive in their self-management of the disease, discuss problems with the provider accurately and should be truthful. They should know what to say and discuss it in clear language without distraction or irrelevant information;

- The patient should be friendly, relax, smile when necessary and be assertive. They should prepare their questions before the appointment and after the encounter with the physician they should ask these main questions so as to have a good understanding of their state of health;

    - What is the identified problem?
    - What do I need to do to reduce the problem?
    - What are the benefits of doing this?

- Patients should be involved in their care by suggesting the type of treatment that they feel works better for them and they should be discussing side effects of previous medications or changes in condition after certain medications; and

- Patients should seek out information about the present treatment and possible side effects that could be expected and health practitioners should make suggestions of referral to other care professionals.

Collaboration with health-care professionals through setting of achievable goals to enable effective self-management is an important aspect of patient-centred care. Patients should participate in goal-setting as they determine the target to attain based on the information given to help them make decisions on how to achieve the goals and the time frame. Adherence is also important.

Making informed decisions within the health-care facility and in social relationships. Patients with diabetes who have been adequately prepared with knowledge of the disease and skills of self-management should be able to make informed decisions in any situation without having to totally depend on the care provider. During appointments with the provider, information is given and based on the knowledge about the care and treatment modalities informed, decisions will be made, even outside the health facility.

Continuing care support

Diabetes is a lifelong ailment that requires monitoring by health professionals in order to achieve quality of life (ADA, 2010b). The progression of the disease exposes patients to various forms of complications and therefore continuity of care is necessary in order to detect early complications. No cure has been found for the disease, therefore updating of the treatment regimen is necessary. Patients are encouraged to keep appointments with care professional and to always call at the health facility whenever they are ill.

NOTE

Patients should visit the clinic when they battle to manage the following themselves:
- Vomiting which is persistent despite self-management and replacement with fluid ;
- diarrhoea;
- Have an FBG above 240mg/dl even with medication;
- When blood glucose is persistently above targeted range despite adherence to self-care; and
- Have a prolonged fever for more than 24 hours.

Demonstration: A patient is asked to join the nurse for a demonstration of a patient-provider communication with an emphasis on the active participatory role of the patient in goal-setting.

Individual counselling: Using motivational interviewing counsel patients and set specific achievable goals as desired with the patients where necessary action plan sheet (Table28)

Questions and answer and teach back session:- Patients are allowed to ask questions on all the topics that have been taught and other areas of concern. Accurate answers must be provided.

Telephone calls and SMSs: are continued for monitoring patients and reminding them of their responsibilities in their self-management.

Summary of the modules: Recap all that has been accomplished through the five weeks, noting the benefits of each lesson. Patients should be informed of the necessity of updating their knowledge and skills annually by attending the programme and those who feel they need to extend their time could see the coordinator (nurse) for details. They are informed of the continuity of the telephone service line to attend to their concern and needs.

Table 6.9: Goal-setting and action plan sheet for use by health-care professional during counselling

Date of appointment Current status	Goals
Weight: Height: Body mass index: Waist circumference:	Weight reduction? Yes /No If yes how much a week? How? Eat less/increase physical activity/both
Which of these increased physical activities do you do? a. Brisk walking b. Bicycling c. Strenuous physical work d. Increased house work e. Something else: How long does your daily physical activity last:	Increase physical activity? Yes/No If yes, How? How long will the physical exercise last?
What do you eat regularly in a day? Breakfast: Snack: Lunch: Snack: Dinner: Snack: Time:	Eat less or differently? Yes? No If yes what do you want to change? Breakfast: Snack: Lunch: Snack: Dinner: Snack: Time:
What do you drink on an average daily? Soft drink: Alcohol: How many bottles/ cans?	Drink less? Yes? No If yes, what do you want to change? Soft drinks: Alcohol: How many bottles/cans?
Do you smoke? Yes: No: If yes, what? How many packets a day?	Do you want to stop smoking? Yes/No If yes, how?
Discussed with:	Patients name/Case file No

6.13   TRAINING FOR HEALTH-CARE PROFESSIONALS

Effective implementation of the programme requires competency and initiatives by the health-care professionals and the patients. Although, report show that implementing patient-centred approach is always difficult since professionals find it difficult to move away from traditional patterns (Robinson et al., 2008), a workshop was organised to train professionals in practical applications in the use of motivational interviewing and communication skills to facilitate acceptance and change from traditional routine.

The programme is set out to teach the health-care professionals good communication skills and specifically motivational interviewing, to help improve their counselling skills, enhance their communication and build trust. Effective communication such as small group discussions and role-play sessions between patients will increase their interest and participation.

Health-care professionals have to be made receptive to the self-management, accommodating aspects of the programme and developing their individual counselling skills and therefore a training workshop was organised for health-care professionals. This was done to enable them to acquire knowledge and the skills necessary for implementation of SHESMD.

The following was done:

- A six-hour long workshop was organised prior to the evaluation study, with the focus on motivational interviewing, communication skills, goal-setting and the use of the health education programme manual; and
- A resource person was invited from the Counselling Unit of the Faculty of Education, University of Benin, Benin City.

The training consisted of lectures, discussions, demonstrations, prompt practice and role-play. Health-care professionals were given a file folder with materials on the topics and information on the study.

The motivational materials included scenarios and examples of dialogues between professionals and clients and information on the process and techniques of counselling. Practical demonstrations were taken to ensure competency in using the framework. The health education programme manual was discussed by the researcher

with an emphasis on the approaches used, because there is a change in the culture and routine of the facilities and therefore to ensure effective implementation the programme has to be used as planned. It was an exciting ceremony because health-care professionals had the opportunity of working together as a team and sharing experiences while practicing together.

The training programme is presented in Box 1

Box 1: One-day training programme for health-care professionals

A one-day training programme for health-care professionals
Purpose of the training: To enable health-care professionals to acquire knowledge and skills of motivational interviewing and communication skills and to expose them to the educational manual for Type 2 diabetes.

Purpose of the training: To enable health-care professionals to acquire knowledge and skills of motivational interviewing and communication skills and to expose them to the educational manual for Type 2 diabetes.

Process outcome: Health-care professionals will acquire skills that will enable the implementation of the programme.

Expected learning outcomes: At the end of the workshop health-care professionals should be able to:
- State the elements of motivational interviewing;
- describe the process of motivational interviewing;
- State principles and techniques of motivational interviewing;
- Discuss some communication skills;
- Discuss the process of goal-setting;
- State the strategies used in goal-setting; and
- Demonstrate individual counselling utilising motivational interviewing.

*Time needed***:** Six hours a day lectures (four hours), demonstrations (one hour), role-play (15 minutes), discussions (20 minutes), questions and answers (15 minutes), summary (10 minutes), break (10 minutes for snacks, 20 minutes for lunch).

Teaching delivery methods: Lectures, demonstrations, prompt demonstrations, group discussions, role-play, questions and answers

Teaching delivery materials: Computer-aided lecture, written materials and compulsory textbook for reading.

Study unit 1: Motivational interviewing.
Study unit 2: Communication skills.
Study unit 3: SHESMD manual.

Content: Motivational interviewing, description, elements, process, principles and techniques. Communication skills with an emphasis on those used in counselling, Goal-setting, professionals' responsibilities, clients' responsibilities, strategies used in goal-setting and the benefits.

Introduction of the topics was done and a group discussion was held before lecture was given to ascertain health-care professionals' previous knowledge. There were demonstrations and prompt practice by health-care professionals.

Breaks were observed for snacks and lunch.

Activities: Demonstrations were given by the resource person on counselling techniques and goal-setting was performed with the one of the participants as counselee. Prompt practice by professionals using colleagues in practicing, role-play was acted on communication between health-care professionals and patients with diabetes at the health facilities.

Questions and answers section.

Summary of the lectures, closing remarks and departure.

Exercise: Compulsory reading:
- Hand-out materials on motivational interviewing;
- Hand-out materials on communication skills; and

- Reading material: Ryan, R. M., Patrick, H., Deci, E. L. & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. *European Health Psychologist, 10*(1), 2-5.

6.14   THE EXPECTED OUTCOME OF THE PROGRAMME

A patient who acquired knowledge of diabetes and self-management skills through active participation in the management of their care, through the process of decision-making and collaborative care from the multi-disciplinary team members, should be competent in self-management. Therefore, the expected outcomes include:

- Controlled plasma glucose, which should be maintained during the programme and subsequently after the programme; the glycaemic control should be maintained over time because lifestyle modification has a positive effect on the glucose level (Yuan et al., 2014). The plasma glucose reading of _<100mg/dl-125mg/dl (WHO 2010).

- Improved knowledge of diabetes as a disease and components of self-management.

- Skills in self-monitoring of blood glucose and the disease process.

- Reduction in the frequency of admissions.

- Autonomous self-management reducing dependence on health-care professionals.

- Increase in physical activity.

- Reduction in stress and depression.

- Increase in quality of life.

- Improved communication within the health facility and in the community.

6.15   SUMMARY

The SHESMD was described with applicable principles of adult learning and health education. The specific lessons and the methods to be used in teaching and activities of both the health-care professionals and the patients were delineated.

SHESMD consists of five modules with specific outcomes to enable assessment of the programme effectiveness in achieving the goals. The modules reflected on were:

- Module1: Overview of diabetes.

- Module 2: Self-management 1 with emphasis on managed nutrition therapy, increased physical activity and weight management.

- Module 3: Self-management 2 dealt with SMGB and foot care.

- Module 4: Stress management and adherence to medication.

- Module 5: Communication with self and health-care professionals.

Various activities were engaged in by the health-care professionals and the patients as well as role models and family members. Icons were used to illustrate the various activities in order to specify the importance of the activities. The patient-centred collaborative approach is expected to have an impact on the patients' knowledge, skills and quality of life. Health care professionals were trained on the use of motivational interviewing to enhance their skills in counselling

Chapter Seven describes the pilot study and evaluation of the programme.

CHAPTER 7: EVALUATION OF THE PROGRAMME
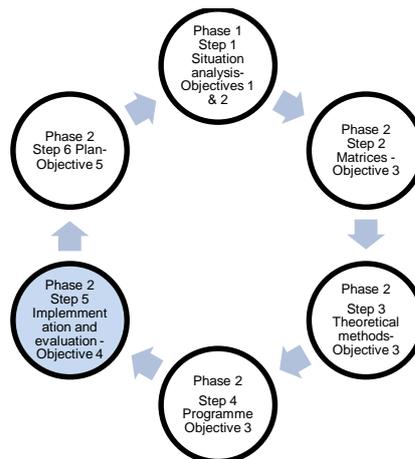
7.1 INTRODUCTION

This chapter discusses the evaluation of the programme provided by health-care professionals who have been trained in the use of motivational interviewing. The participants in the programme were patients with Type 2 diabetes and consisted of a control group and the intervention group that was introduced to the programme for 5 weeks with adequate monitoring of FBS in the laboratory. The evaluation had both quantitative and qualitative phases. The quantitative phase was a quasi-experimental study and involved the collection of demographic data, anthropometric data of weight and height. The use of post programme evaluation participant interviews was to determine the effects of the programme on the patients.

7.2 PILOT STUDY

The objective was to evaluate the programme with regards to the effectiveness of the programme in achieving the objectives. The pilot study was carried out at the tertiary and secondary health institutions that participated in the programme development during October 2014. The Centre for Disease Control's modified evaluation framework (Centers for Disease Control and Prevention, 2011) was used. The framework consists of six steps that were systematically used to guide the evaluation phase. The following steps were accomplished, namely engage stakeholders, describe programme, focus the evaluation design, gather credible evidence and present and justify findings and feedback to stakeholders.

7.2.1 Engage stakeholders:

The stakeholders were actively involved in all processes of programme development. Health-care professionals and patients with Type 2 diabetes collaborated with the researcher in the development of the programme and implementation.

7.2.2 Programme description

The intervention was a five-week programme consisting of two-hour long weekly interactive sessions offered by a multi-disciplinary team of nurses, dieticians and social workers. See Chapter 6 for a detailed description of the programme. Participants had the educational programme as planned with the content, activities and duration maintained.
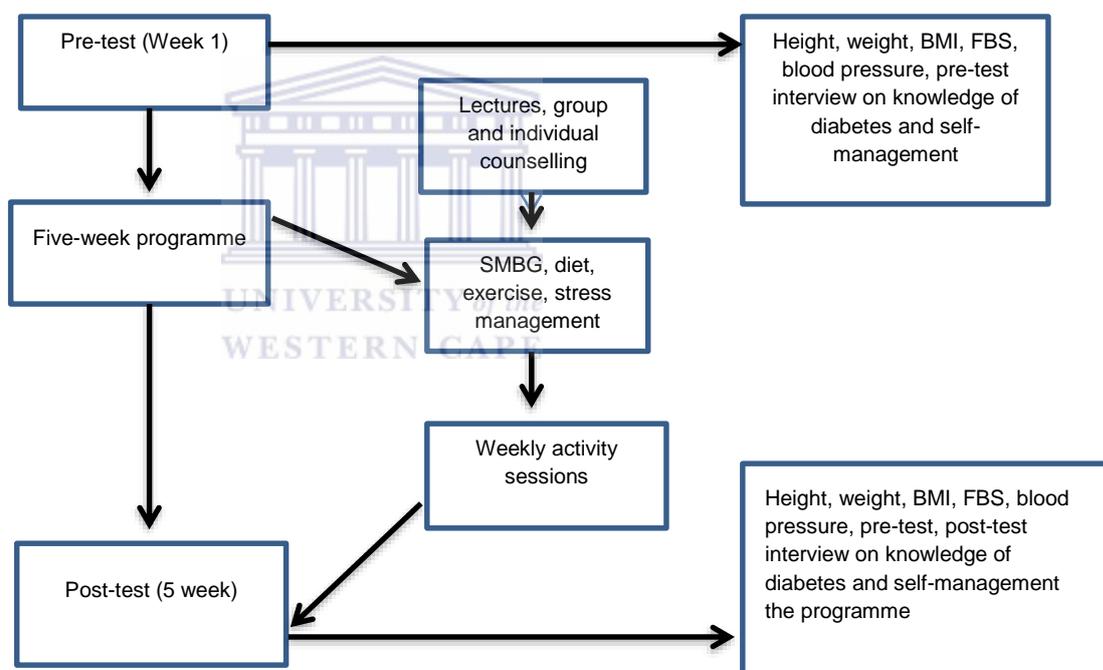
Figure 7.1: Evaluation measure for SHESMD programme.

Prior to the evaluation study, health-care professionals were trained in the use of the motivational interviewing framework, communication skills and the health education programme manual. The message, activities, content, timing, methods and approaches were tested to determine their accuracy (McKenzie, Neiger & Thackeray, 2012).The programme content was taught as specified using a patient-centred approach.

Educational materials were provided for the content taught. Telephone calls and messaging was used as reminder of the workshop content and to check on patients who were non-adherent.

7.2.3 Focus of the evaluation design

This was a quantitative study for effectiveness evaluation (Fig. 7.1) and a qualitative study was conducted post intervention.

7.2.3.1 Design

A quasi-experimental design was used for the evaluation of the SHESMD programme before and after design, comparing an intervention and a control group from two outpatient clinics for selected primary and secondary diabetes outcome measures. Simple qualitative post interviews were conducted.

7.2.3.2 Population

Within two weeks 28 participants were randomly recruited from the consultant clinics and divided into intervention and control groups. Fifteen participants in the intervention group were available for the pre-test and the five-week programme, 13 for the post-test (Figure 7.2). The control group had 13 participants for the pre-test and 10 for the post-test, of which five were chosen from each of the two facilities (Figure 7.2).
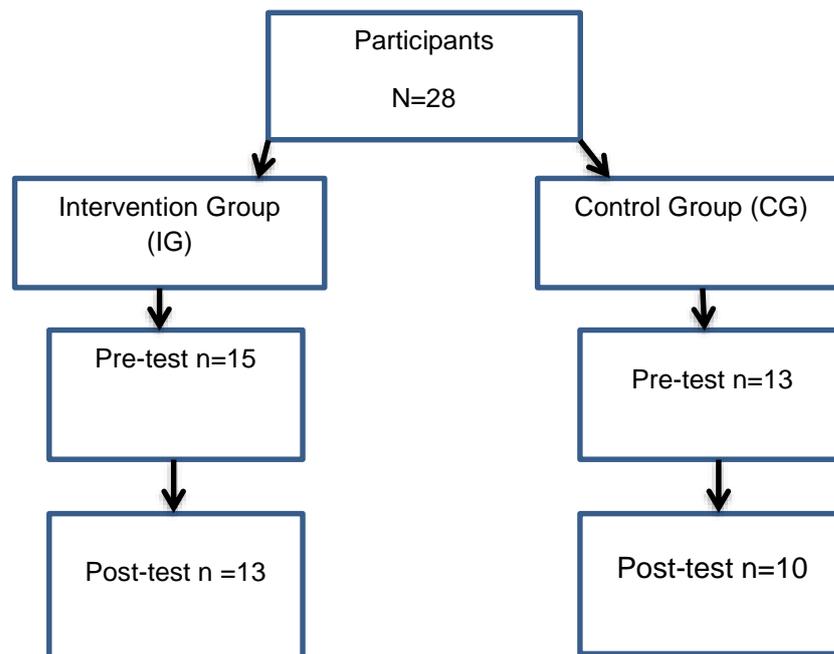
Figure 7.2 Selection and follow up of participants

7.2.3.3 Outcome measures

Patients had a pre-test interview to ascertain their knowledge and understanding of Type 2 diabetes and self-management. Patients' demographic data, anthropometric data of weight and height, which was used to calculate the BMI and FBS were collected pre- and post-programme. Glucometers and all other materials needed to enable home monitoring of blood glucose, practice and adherence were made available to patients. The participants and health-care professionals promptly attended to the various assignments given. A goal-setting action plan sheet and log book for documentation of assignments were made available to the patients during the programme to facilitate record-keeping of goal-setting and blood glucose self-monitoring and other assignments. These were utilised by the participants to record exercises and to note blood glucose test results.

7.2.4   Gathering credible evidence (The Results)
7.2.4.1 Patients' demographics

There were 28 participants in the study. Five participants were lost to follow-up. The average age of the participants was 56.7 years (sd 6.6, range 41 – 64) with nine males (39.1%) and 14 females (60.9%). Although there were more females (80%) in the control group than in the experimental group (46.2%) (Table 7.1), there were no significant differences between the two groups in terms of demographics.

Table 7.1: Demographic characteristics of the two groups

Characteristics	Intervention (N=15)	Control (N=13)	Test	p-value
Age	55.5(6.8)	56.3 (6.1)	U=0.2	P=.821
Male Female	7(46.7%) 8(53.3%)	4(30.8%) 9(69.2%)	X^2 =0.7	P=.390
Senior Certificate Education	8(53.3%)	8(61.5%)	X^2 =1.3	P=.397
Years since diagnosis	8.4(5.7)	8.7(5.9)	U=0.1	P=.927
BMI	27.6(sd 6.6)	29.7(sd 5.5)	U=O.9	P=.387
Fasting blood sugar	157.6(sd 42.3)	159.9(sd 55.3)	U=0.1	P=.964
Systolic blood pressure (mmhg)	134 (sd 14.5)	140(sd 20,8)	U=0.8	P=.467

Independent Samples Mann-Whitney U Test (U) and Fisher Exact Chi-square Tests (X^2)
*Significant p<.05

There was no significance difference in the BMI, FBS and blood pressure measurements of participants in the intervention and control groups at the start of the study (Table 33). Many of the participants (80%) in both the intervention and control groups had poor glycaemic control (FBS> 126mg/dl) at the start of the programme and were overweight (BMI> 25kg/m^2). There were differences in the BMI and FBS after the intervention programme in the intervention group at the post-test measurement, which were more significant in the intervention group than in the control group (Tables 7.2-7.3).

Table 7.2: Results of intervention and control groups after five weeks of education (mean sd)

Intervention (n=13)					
	Pre	Post	Difference	Test	P=value
BMI	27.2(sd 7.0)	26.6 (6.5)*	0.6 (sd 0.7)	W=2.2	P=.025*
Systolic BP (mmHg)	130.8	128.5	2.3 (sd 11.7)	W=0.8	P=.470
FBS(mg/dl)	159.1(sd 45.4)	130.8 (12.6)*	41.3 (sd 35.2)	W=3.2	P=.001*
Control (n=10)					
BMI	30.0 (sd 6.2)	29.8 (6.3)	0.2 (sd 0.4)	W=1.8	P=.113
Systolic blood pressure (mmHg)	138.8 (sd 23)	133.5 (15.7).	5.0 (sd 10.8)	W=1.4	P=.157
FBS (mg/dl)	161.4(sd 63.6)	147.4 (39.1)	14.0 (sd 32.7)	W=1.1	P=.221

Related Samples Wilcoxon Signed Rank Test (W)*Significant p<.05

Before-and-after differences in the BMI and FBS after the education intervention were found within the intervention group but not within the control group (Tables 33 & 34). Similarly, the number of participants with poor glycaemic control (FBS levels > 126 mg/dl) at the post-measurement decreased from 10 to three (67% to 23%) in the intervention group compared to the decrease from eight to seven (80% to 70%) in the control group (Table 7.3). The post-test result showed an improvement in FBS and BMI outcomes in patients following the educational interventions and there was a substantial difference between the intervention and control groups in the FBS post-intervention (Table 7.3).

Table 7.3: Comparison of FBS and BMI pre- and post-difference between the two groups (mean sd)

	Intervention group (n=13)	Control group (n=10)	Test	P=value
BMI	0.6 (sd 0.7)	0.2 (sd 0.4)	U=1.7	P=.101
FBS (mg/dl)	41.3 (sd 35.2)	14.0 (sd 32.7)	U=2.5	P=.012*

*Significant p<.05

7.2.4.3 Discussion of quantitative effectiveness evaluation

The importance of evaluating these programmes is essential and this study aimed to pilot test and evaluates a multi-disciplinary patient-centred, self-management of Type 2 diabetes educational programme at a tertiary facility and a district hospital in Nigeria. The key diabetes outcome measures of FBS, BMI and blood pressure were measured before and after the educational programme for the experimental group, as well as for the control group without education.

The number of patients with glycaemic control at the baseline of this study (24.4%) seems to be comparable with the number (29%) suggested by an African cross-sectional, descriptive study of 2352 Type 2 diabetes patients (mean age 53.0 ±16.0 years with 8.0 ±6.0 years known duration of diabetes) (Sobngwi, et al., 2012).

As indicated by the key outcome measures, good self-management in the intervention group improved significantly from the start of the study in comparison to the control group. It therefore seems that the intervention, which included a multi-disciplinary approach, was effective in improving the key diabetes outcomes for patients with Type 2 diabetes, although there may have been confounding due to the self-monitoring activities.

Specifically, the intervention seemed to significantly improve the glycaemic control of patients over time. Furthermore, the proportion of patients with uncontrolled diabetes decreased and the proportion of patients with glycaemic control increased. This study in Nigeria showed similar results to a study by Gill, Price, Shandu, Dedicoat and Wilkinson (2008), in rural KwaZulu-Natal in South Africa, with both studies finding significant changes in the primary outcome of glycaemic control. This study is similar to an intervention programme carried out in Hong Kong that provided care for all patients attending public consultants' out-patients clinic by a multi-disciplinary team of diabetologist, dieticians, advanced practice nurses, nurses and other allied health-care professionals (Jiao, Fung, Wong, Wan, Dai, Kwok & Lam, 2014). The intervention led to an improvement in HbA1c lipid control, a decrease in BMI and a lower incidence of cardiovascular events. However, similar findings were not confirmed for a group education programme led by health promoters in Cape Town, South Africa (Mash et al., 2014).

7.2.4.4 Experiences after attending the programme

Individual semi structured interviews were conducted with the 23 patients who participated in the pilot study. The interviews included an evaluation of knowledge gained, skills acquired and satisfaction with the programme to determine the effectiveness of the programme in achieving the objective. Participants were asked to describe how the programme (Chapter 6) had affected their self-management of diabetes. There were three main themes that emerged from the post-test interview analysis, namely lifestyle changes, satisfaction and improved psychological wellbeing.

Data collection and analysis steps were similar to those in Section 3.8.

There was reasonable appreciation in the patients understanding of Type 2 diabetes and making lifestyle changes that could affect their self-management and the psychological effect of the programme could be described as overwhelming.

Making lifestyle changes: Participants described some of the activities they were able to change after participating in the educational programme, which could be due to the information received from the multi-disciplinary team of health-care professionals. Participants acknowledged that they obtained new information from the programme, which led to behaviour changes, such as lectures from the nutritionist, social worker and the nurse.

The participants stated that exercise had become easier to engage in and diet management had improved:

> *"I have really benefited from the teaching. I used to eat anything I can find in excess, but now, I eat a little quantity of food with vegetables, snacks and fruits. My blood sugar was always very high but now it is within a good range; I have been exercising; I have lost some weight also…".* (P 2)

> *"The aspect of exercise was also appreciated, because we don't do exercise in our area. I am better informed now…".* (P 8)

Participants also acknowledged that the dietary modification lecture was very helpful:

> *"It has helped me a lot, as they taught us how to manage the disease, what to eat and what to avoid, which I have been working with…".* (P 4)

> *"First, I thank you for bringing the nutritionist, he was really helpful. The food to eat and how to reduce fatty food, eat fruits as snacks, but not with the meal, planned menu with us. I really appreciate you. You shall be successful. I have managed diabetes for a long time, but I have known more than what I have ever known before you were able*

to reach the poor and you came to our level, If we have this programme spread in all facilities in Edo State, then health will improve…". (P 10)

"I now have a better understanding of the disease as most of the things I did not know before are clearer to me, like care of the feet. The lecturer who is a dietician has enlightened me on food. "It has helped me a lot, because most of the food I thought was good for diabetes was not really the best". (P 8)

"I learnt from the dietician a lot. Nigerians do not rest, but we have been taught exercise, stress and rest. The materials are also helpful as they keep reminding me…".
(P 13)

***Psychological wellbeing*:** Some of the participants described how knowledge about stress management had helped in their coping with the management of diabetes and they were glad about the intervention programme:

> *"It has helped me a lot as I can manage the condition without much stress and I feel more confident. I think I now know more about diabetes and I can read it too…".* (P 1)

> *"My sugar level was high before the programme but since the programme it has been well controlled; it was a God sent intervention; I learnt a lot from the nutritionist, which has helped changed my life. I now know what diabetes is, the management and also how to avoid and manage stress...".* (P 5)

The effect of self-monitoring was also important to the patients as they could monitor blood glucose and their general health based on the results of blood glucose self-monitoring:

> *"My blood sugar has gone down compared to before because I try to remember all the talk we had as I read the literature given to us. I can now manage diabetes without fear because I now understand I can test my blood sugar at home and then change my habits…".* (P 6)

> *"The education you have given to us and the instrument for testing has helped us personally to cope with the disease. I have been a victim of diabetes for more than 20 years, but right now the teaching of taking my drugs, my test, has given me good improvement of my diabetes. I can now do those things I could not do before…".* (P 10)

> *It has helped me to a great extent as I can now check myself whenever I want to do anything contrary to the teaching. I can also check my sugar at home and monitor my health so as to control myself. The stress of caring for the diabetes is reduced because I now know more about the disease…".* (P 12)

Satisfaction: The programme's different approaches, such as the provision of educational materials, also helped in self-management and disease coping skills:

"It has helped me a lot there is great difference from what I was and now. I know more about the disease and I have something to read, practice makes me perfect. I have less stress about the disease now…". (P 7)

"There is complete difference between what I was before and what I am now after the programme, before life was just miserable for me, the glucometer, literature intervention, lectures on diet, physical exercise. As I follow them regularly my life has been transformed. The intervention has helped me greatly. Keep the intervention on and continue to help other patients with diabetes…". (P 11)

"It has helped me very well, my mind is at rest. My body is coming back to life. I beg the health government to continue with this programme. It is very good for me. I could not walk or eat before now because I thought that this diabetes will kill me since it has no cure and I thought I was alone until I saw other healthy, happy people who were discussing freely with the health-care professionals and it has helped me to manage myself better…". (P 3)

The need for continuity and regular health education was also highlighted and participants felt the programme should be continued:

"The nurses here do not engage patients in health talk before seeing the doctor it should be continued here now that it has been started with this programme, as it will help patients a lot. It is very helpful because I can now cope better as I know much about the disease, I can now manage the stress of diabetes. I have learnt much about diabetes so my fears are reduced, at least I can eat some of the available food but in smaller amount ..." (P 9)

7.2.4.5 Discussion of qualitative evaluation

The evaluation of the programme showed that knowledge was essential for self-management of Type 2 diabetes. In other intervention studies patients have expressed benefits of additional knowledge (Rise, Pellerud, Rygg & Steinsbekk, 2013). It was reported that general knowledge of the management of chronic diseases correlates to adherence (Adisa, Fakeye & Fasanmade, 2011) as found out in a study with patients with diabetes in Nigeria. The effect of an intervention programme on the psychological health of participants in this programme is congruent with other studies (Fisher, Hessler, Glasgow, Arean, Masharani, Naranjo & Strycker, 2013), as is healthy coping

(Thorpe, Fahey, Johnson, Deshpande, Thorpe & Fisher, 2012). Many researchers have argued that an increase in knowledge does not automatically result in behaviour change (Odili, Isiboge & Eregie, 2011). The use of theoretical approaches in determining behaviour and targeting approaches to the behaviour (Bartholomew, et al., 2011) would have resulted in increased self-management and behaviour change. The need for an educational programme was also emphasised in the experiences and the content could be judged adequate because the participants described the beneficial topics and activities. The completeness and adequacy of the programme could be evaluated from the various experiences received.

The evaluation of the pilot study has shown that knowledge obtained through structured education by a multi-disciplinary team of health-care professionals was used for behaviour changes as well as to improve the participants' psychological health during self-management. The interactions and approaches used also led to participants' satisfaction with the methods, approaches and content of the programme. Participants made a request for such health education programme in the health facilities.

7.2.5   Reflections on the developed programme

The following reflection based on the overall evaluation emerged:

- The health education programme improved patients' knowledge of Type 2 diabetes;

- There was an improvement in self-management, as patients gained insight into the disease and its management;

- Many patients were experiencing stress due to various reasons related to Type 2 diabetes and psychological wellbeing improved;

- In post-interviews it was ascertained that many patients experienced improved glycaemic control and others acknowledged changes in their health outcomes; and

- The programme was considered to be a necessity for this group of patients.

7.2.6   Feedback to stakeholders

Feedback of the results from the evaluation study was communicated to the stakeholders. Health-care professionals were part of the team who carried out the evaluation study, so they were aware of the findings even as the study was on-going.

The patients were informed of their results during the evaluation study. The outcome of the research, which included the study, was communicated to the management of the facilities where the research study was conducted. The result of the evaluation study has been accepted for publication in an international peer review journal.

7.3 LIMITATIONS OF THE EVALUATION STUDY

The evaluation had a number of limitations. The study had a small sample size, some loss due to follow-up, limited outcome measures and a short follow-up time. There are challenges in implementing randomised controlled trials in these settings and quasi-experimental studies are the most commonly used designs in implementation studies where there are practical and ethical barriers to conducting randomised controlled trials (Grimshaw, Campbell, Eccles & Steen, 2000). This study adhered to the criteria for a two-group before and after design, but possible selection bias may exist due to the lack of randomisation. The possible confounding impact of the Hawthorne effect is acknowledged.

7.4 SUMMARY

A programme evaluation study was embarked upon to show the adequacy and effectiveness of the programme while evaluating the process and the outcome on the patients. The evaluation study was carried out with 28 patients from the intervention and control groups. The intervention group that was exposed to the five-week programme had significant changes in glycaemic control compared to the control group after five weeks of exposure. Patients in a post-test interview showed a significant increase in understanding, commitment to self-management, psychological health and satisfaction with the programme. The goal of the programme was met through the adequate execution of the planned programme.

Chapter 8 discusses the plan for adoption, implementation, sustainability and evaluation of the programme.

CHAPTER 8: PROGRAMME PLAN FOR ADOPTION, IMPLEMENTATION, SUSTAINABILITY AND EVALUATION
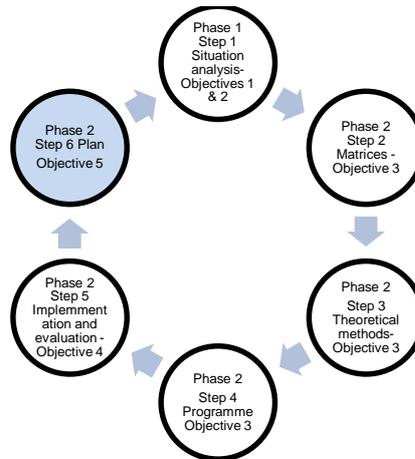
8.1 INTRODUCTION

Programme efficacy and effectiveness can only be ascertained when a programme is used to create the desired health outcome and when knowledge is linked with practice. SHESMD is a research study that needs to be connected to practice through knowledge transition. Therefore, the appropriate adoption, implementation and sustenance of SHESMD are discussed in this chapter, as are the responsibilities of different groups involved in these processes. The plan for evaluation of the process, the outcome of the programme and matrices for the activities expected to be performed by different groups of individuals responsible for adoption, implementation and evaluation were explained. The chapter comprises two sections; section one is a detailed plan for adoption, implementation and sustainability and section two explains the plan for programme evaluation.

The level of implementation of programmes affects the outcomes (Durlak & DuPre, 2008) and therefore the framework for considering programme adoption and implementation and resources to enhance the potential impact of the programme on the target audience, is important. This is the fifth step in IMF and six major tasks are considered. They are:

- Identification of potential programme adopters and implementers;
- Re-evaluation of the programme group for SHESMD use to ensure adequate representation;

- Development of the educational programmes use, outcomes and performance objectives for adoption and implementation;
- Determinants of SHESMD use; and
- Creating matrices for SHESMD use

8.2 IDENTIFICATION OF POTENTIAL PROGRAMME ADOPTERS AND IMPLEMENTERS

Implementers are individuals charged with assisting in the execution of the programme and adopters are also involved in the acceptance of the programme. The situation analysis in the health facilities showed that most stakeholders in the implementation and adoption process of SHESMD included the hospital management board, consisting of all the heads of departments, the assistant directors in charge of the units, nurses, dieticians and social workers. According to Dearing (2008), senior managers input in acceptance and support of implementation is often required; thus they were involved in the programme development in order to facilitate adoption and implementation (Dearing, 2008).

The programme was developed within the health facilities in collaboration with implementers and some adopters, as the researcher worked through all the steps with them. As a result, there was no gap between the research and their normal practice. Additionally, the involvement of a multi-disciplinary team of health-care professionals makes the programme a new innovation planned with behavioural theories so that the research is relevant and appropriate for the needs of the health-care professionals and the patients. The programme also fits with Nigeria's Health Policy (2005), which emphasised the prevention of diseases and the promotion of health, thus facilitating acceptance for the programme (Federal Ministry of Health, 2005). Although some of the adopters and implementers were involved in the planning of the programme, especially during the testing of the materials and evaluation of the programme, it is essential to motivate other members to adopt and implement the programme.

Programme adoption is defined as the decision to make full use of an innovation or a programme (Bartholomew et al., 2011). SHESMD is a new programme developed to increase patients' knowledge and behaviour change, as well as environmental change at the health facilities. The programme requires a change in the normal routines of the

health-care professionals, as more providers will be involved in the care of the patients with diabetes and the time and methods of delivering health education will also be altered. Therefore there is need for the programme to be adopted by the organisation as well as professionals and patients.

Rogers' (1995) Diffusion of Innovation Theory viewed the process of adoption as a classic bell curve, with five categories of people as adopters, namely innovators, early adopters, early majority adopters, late majority adopters and laggards (Rogers, 1995). The theorist also posits that the spread of innovations follows five stages, namely gaining of knowledge, persuasion to use the innovation, decision to use the innovation (which is the adoption decision), implementing and sustaining the innovation as it is integrated into the routine of the facility (Rogers Everett, 1995). This shows that adopters and implementers may belong to any of the categories, with some showing early support and others holding firm to their beliefs (or due to their personality) may delay their supporting. The planning group will utilise this process to identify the groups to which the adopters belong through personal interaction and then selling the programme to them by lobbying the early adopters to influence others.

Communication plays an important role in diffusion of an idea and therefore effective communication will be initiated with all the adopters via personal interactions and lobbying. Additionally, health-care professionals could explain and demonstrate aspects of new programme during the traditional health talks, with emphasis on important parts of the programme, to gain the support of the patients. The adoption and implementation of the programme will be grounded on the diffusion of innovation framework using the different stages. Diffusion is a social process involving interpersonal relationships and it could help to change or modify rigid attributes held by adopters and implementers (Rogers, 2003). The mass media may be utilised in the knowledge phase, since the intention is to reach a large group of people in order to create awareness of the problem and how it could be prevented. Interpersonal communication through interviews, discussion and lobbying could be used at different stages.

Health-care professionals require skill-building training in counselling using the motivational interviewing framework to motivate patients and collaborate in goal-setting. There is a paradigm shift in the method of health education and therefore workshops to train and update knowledge is mandatory to enable the implementation

279

of SHESMD as planned (Domitrovich, Bradshaw, Poduska, Hoagwood, Buckley, Olin, . . . Ialongo, (2008). Additionally, the fidelity, completeness and duration of the programme are crucial. However, due to their participation in the different stages of developing the programme and the evaluation study, participants should be convinced of the programme's effectiveness, which could motivate the implementation of the programme as stipulated.

Sustainability of a programme is defined as the continued use of some programme components or the activities for the prolonged achievement of the desirable programme and population outcome (Scheirer & Dearing, 2011). Sustainability entails the maintenance and institutionalisation of the programme to ensure its survival (Bartholomew et al., 2011). Sustenance can only be determined after a thorough evaluation of the programme for efficacy and effectiveness. The programme can move through a process of integration into the organisational routines to ensure continuous existence. Sustainability could be influenced by the processes that occur during the implementation phase, however the researcher does not envisage much rigour, because the stakeholders were participants during the development phase and the financial implication is low because the health education programme is cost-effective (Powers et al., 2015).

8.2.1 Performance objectives for adoption, implementation and sustainability of the programme

The performance objectives for the adopters and implementers include the management board, assistant directors in charge of units and the health-care professionals being involved in the implementation and adoption of the programme and are as follows (Table 8.1):

Table 8.1: Performance objectives for programme adoptions and implementation: Management board, assistant directors and health-care professionals

Adoption and implementation outcomes	Performance objectives
1. Management board members will support programme adoption and implementation	1.1 Create commitment to innovations within their organisation 1.2 Show commitment for the programme to assistant directors, nurses, dieticians and social workers 1.3 Provide resources (funds, materials such as computers, projectors) for implementation of the programme
2. Assistant directors in charge of the different departments and housing the health-care professionals will support implementation of the programme	2.1 Encourage health-care professionals in programme implementation by incorporating it into the unit's schedule 2.2 Provide resources and guides (venues, resources, time) to enable implementation 2.3 Create supportive environment in the unit through motivation and cooperation and involve other members of staff 2.4 Facilitate training programme for professionals
3. Health-care professionals will participate in a training workshop on motivational interviewing	3.1 Participate in the workshop actively to improve on knowledge and skills 3.2 Effectively utilise acquired skills in the implementation of the programme
4. Health-care professionals will involve patients with Type 2 diabetes in the programme to support their acquisition of skills for self-management	4.1 Create and maintain a safe environment for the programme 4.2 Facilitate the programme in a non-didactic approach 4.3 Apply patient-centred collaborative method during the sessions with the patients 4.4 Utilise various teaching methods in actualising the objectives of the programme
5. Health-care professionals will facilitate the implementation and sustenance of the programme through adequate adherence to fidelity, completeness and duration of the programme	5.1 Adhere to the principles and guidelines of the manual 5.3 Active multi-disciplinary team for health education is formed 5.2 Facilitate the completion of all the modules specified

Additionally, the objectives for the management board and other stakeholders were developed during the planning stage for sustainability, with emphasis on the programme's core element (Scheirer, 2013) (Table 8.2). Management staffs, heads of units and health-care professionals play essential roles in sustaining the programme, they are involved in implementation, which affects the outcome of the intervention on the patients and this may translate to the result of the process and efficacy evaluation. In order to sustain SHESMD, activities leading to successful evaluation and integration of the education programme were planned and are reflected on the table for matrix of change objectives (Table 8.3).

Table 8.2: Programme use outcome and performance objectives for sustainability of the programme for the management board, assistant directors of units and health-care professionals

Sustainability outcome	Performance objectives
1. Management board members will support programme for sustenance	1.1 Show continuous commitment to the programme to assistant directors, nurses, dieticians and social workers 1.2 Provide resources (funds, materials) for evaluation of the programme. 1.3 Formulate policies for continuation of the programme. 1.4 Include training of professionals in their plans
2. Assistant directors in charge of units will include the activities for the sustenance of the programme in their job description	2.1 Include it in the unit's budget 2.2 Prepare for evaluation of the programme 2.3 Show continuous support for the programme by providing resources
3. Health-care professionals will show dedication in performing the curriculum activities and tell others about the programme	3.1 Adhere to the curriculum activities 3.2 Have an active team of professionals 3.3 Form a formidable support group for patients with diabetes 3.3 Form a programme development committee in order to evaluate the programme

8.2.2 Determinants of programme adoption, implementation and sustainability

There are certain factors that can influence the performance of the objectives necessary for the adoption, implementation and maintenance of the programme. The core processes for applying theory and evidence, such as brainstorming, literature review and posing questions were used by the group to identify the determinants of programme use. Determinants identified were knowledge, self-efficacy in skills, attitude and outcome expectations of the programme. These constructs have been extensively discussed in Chapters 3 and 5.

A matrix of change objectives (Table 8.3) was developed specifying the determinants of behaviour and performance objectives for the adoption, implementation and sustaining the programme in future.

Table 8.3: Matrix of change objectives for programme adoption, Implementation and sustainability

Performance Objectives	Knowledge	Attitude	Skills and self-efficacy	Outcome expectations
Adoption				
Management staff decides whether SHESMD will meet the needs of the patients	Increase the awareness of the programme among management staff Explain the outcome of the programme on the patients and the facilities	Review the SHESMD and react positively to it		Expect that using SHESMD will have positive health outcomes and enhance quality of life
Management staff decide to adopt SHESHD	Describe how SHESMD compares to others with its added qualities	Review the SHESMD and react positively to it		Expect that with collaboration of the health-care professionals in planning the programme then acceptance by staff will be easier.
Implementation of SHESMD programme				
Management staff provide resources (funds, materials such as computers, projectors) for implementation of the programme	Explain resources and materials needed to support active education of patients	Review the list for materials and react positively to the list		Describe how the provision of the resources (funds and materials) demonstrate support for SHESMD
Heads of units work with health-care professionals to implement SHESMD	Describe components of implementation plan and incorporate it into units' work schedules	Express positive comments towards the programme	Express confidence in being able to organise plan with health-care professionals	Expect that SHESMD will benefit the facility and the unit
Heads of units create supportive environment and facilitate training	Describe the need for a training and motivation for change	Describe the added work of SHESMD as being worth it		Expect that the training will improve staff efficiency
Heads of Records make documentation forms for patient counselling available in the unit.	Review samples of forms and work with professionals to make adaptations	Review documentation forms as a useful tool to measure patients' self-management and adherence	Demonstrate confidence at being able to design tool	Expect that better evaluation of adherence will be achieved through use of tool
Heads of units encourage and assist in training of health professionals	Describe what is needed for the training to ensure good implementation	Describe the need for training to acquire skills and competence		Express training will ensure proficiency and efficiency of staff and this will improve patients' health outcomes

Performance Objectives	Knowledge	Attitude	Skills and self-efficacy	Outcome expectations
Health-care professionals collaborate to evaluate patients' educational and self-management needs	Describe methods of evaluating patient education and self-management Identify needs and prioritise needs	Describe situation analysis as being worth it	Express confidence in collaborative team work and situation analysis	Express that being aware of patient needs will ensure that use of SHESMD is tailored to their needs
Health-care professionals undergo training workshop to enable implementation	Describe the need for motivational interviewing, counselling skills and goal setting	View training workshop as a useful process of implementation		Expect that skills will increase efficiency and satisfaction
	Describe knowledge and skills acquired from the workshop	Display positive attitude towards the workshop	Demonstrate skills and competence in counselling and effective communication	Expect that knowledge and skills acquired will enhance quality of care
Health professionals utilise acquired skills in the implementation of the programme effectively	Explain the health education programme's criteria implementation	Display positive attitude towards the programme, as seen in active participation	Demonstrate skills and competence in counselling and effective communication with patients	Expect increase in adherence to self-management
	Describe goal-setting form and log book and where it can be found	Describe forms as useful and accurate for the purpose	Display confidence in use of forms with the patients	Expect that programme documentation will enable team members to reinforce self-management
Health-care professionals use the education programme protocol with patients with completeness and fidelity	Describe the protocol and the resources needed to accomplish teaching	Describe the paradigm shift as worth it and rewarding	Demonstrate working with patients competently using the programme	Expect that the use of the education programme will improve self-management skills
	Describe how education programme is to be used		Demonstrate confidence at being able to give health education using the protocol and collaborative team work	Expect that improved self-management will result in positive health outcomes and improved quality of life
Maintenance and sustainability				

Performance Objectives	Knowledge	Attitude	Skills and self-efficacy	Outcome expectations
Management staff provide resources (funds, materials) for evaluation of the programme	Describe the need for process and outcome evaluation of SHESMD and resources needed	Review resources and materials needed for evaluation		Expect that evaluation of SHESMD will allow for change and sustenance
Management staff formulates policies for continuation of the programme and training of professionals in the plan for the facility	Describe the benefits of SHESMD to the patient and the health facility, therefore professionals need training and workshops	Describe method of training of health-care professionals periodically		Expect that professionals will be committed and also experience job satisfaction
Heads of units include SHESMD in the unit budget and Prepare for evaluation of the programme	Describe the purpose of evaluation and the resources for evaluation			Expect that evaluation will assist in knowing the effectiveness of the programme
Heads of units write SHESMD into care path and staff training protocols	Outline knowledge and skills needed to implement education programme and the need to integrate it into the care path	Show positive attitude to training of staff by facilitating workshops and recommending staff for sponsored education programme		Expect that inclusion will contribute to continuation of programme use
Health-care professionals have an active team of professionals, which is involved in planning for evaluation	Describe the importance and the effect of team work on evaluation and integration of SHESMD into their routines	Express favourable comment towards team work and programme evaluation	Demonstrate skills in collaborative care and team approach, which facilitates evaluation and integration of programme	Expect that the outcome of evaluation will enhance sustenance
Health-care professionals form a formidable support group for patients with diabetes	Describe the importance of social support groups in chronic illness	Display positive attitude towards the flourishing support group	Demonstrate skills of group formation and maintenance	Describe the added advantage of support groups to patients and the facility

The impact of SHESMD on the positive health outcome and quality of life in patients with Type 2 diabetes depends on the effectiveness of the programme. Additionally, the accurate implementation of the programme to ensure that patients with diabetes are adequately exposed to the intervention is equally important. The programme was developed systematically with the use of IMF to ensure effectiveness consequently,

the activities planned for adoption, implementation and sustenance are focused on guaranteeing that the programme's fidelity is maintained.

8.3 EVALUATION FOR FUTURE PROGRAMMES

In any future evaluation of the programme, the issues expected to be addressed are programme description, programme outcomes, effect questions, matrix-based questions, process questions, development of indicators and evaluation design. Each of these issues is now examined.

Evaluation is the empirical investigation that is focused on determining the effects of the programme, including its effectiveness and the efficacy. During the programme development there was some form of process evaluation for some aspects, but at this point the major concern is on evaluating the programme's outcome on the patients, the health facility and society in order to determine the efficacy and effectiveness of the programme. The result will give clues as to the utilisation and sustenance of the programme and provide feedback to improve the programme.

Programme evaluation should be a joint effort with the participation of stakeholders, so that the result can be used (Patton, 2008). The institution evaluation and research committee, patients, health-care professionals and those that may be appointed by the health institutions will participate in the programme's evaluation process.

8.3.1 Programme description (SHESMD) for future implementation

The intervention is a five-week programme of two-hour weekly interactive sessions with a multi-disciplinary team of nurses, dieticians and social workers. The programme is delivered in modular form consisting of various contents that will improve the patients' understanding of diabetes and skill for self-management of the disease. Nurses, dieticians and social workers will engage patients in lectures, group discussions, demonstration of skills and role-plays in order to communicate information and skills adequately. Patients will participate actively in all phases of the programme since they will be engaged in group discussions, prompt acting, role-play, individual counselling, question and answer sessions and home assignments. Peer

teaching and support by patients who have participated in the programme will also be utilised. The role of the family was also emphasised and therefore during the fourth week of the programme they are advised to attend with a family member who participates in their care.

SHESMD is an interactive process whereby patients are motivated to communicate with health professionals about their care while actively participating in the planning of their management (Chapter 6 for detailed programme). Health-care professionals would engage patients in individual counselling using a motivational interviewing frame work in counselling and goal-setting. A goal-setting action plan sheet and a log book for documentation of the assignment are made available. Family members are encouraged to actively participate in the care since they are expected to do some forms of exercise with the patient and to document it. Telephone calls and messaging is used as reminder of all that is done in the workshop. The programme is a structured education programme mandatory for all patients with Type 2 diabetes and also they are expected to attend annually for updates, evaluation and monitoring. The programme is developed as a complementary activity to the normal health teaching of the facilities. The programme should be integrated into the normal routines of the health facilities.
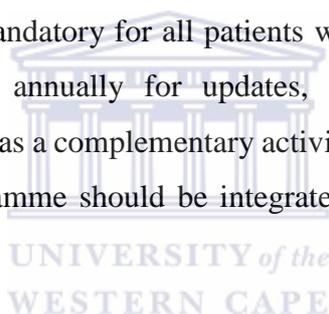
8.3.2   Programme outcomes and effect questions

An outcome is defined as a result. Eigenmann, Colagiuri and Australia (2007), describe an outcome as the end result of the utilisation of health-care services. Health education in diabetes care focuses on enabling the patient with diabetes to acquire knowledge, acquire skills, to develop confidence and motivation to carry out self-management behaviours and to acquire problem-solving and coping skills to mitigate barriers to self-management (Funnell, Anderson, Austin & Gillespie, 2007). When looked at on a continuum, the outcomes can be seen as being composed of immediate, intermediate, post-intermediate and long-term (Table 8.4).

Table 8.4: Outcomes continuum

Immediate outcomes	Intermediate outcomes	Post-intermediate outcomes	Long-term outcomes
Learning Knowledge Skill acquisition Problem-solving skills Self -monitoring of blood glucose Medication administration (including insulin) Perceived barriers to adherence Coping skills	Behaviour change Physical activity Diet Smoking Regular visits	Improved clinical indicators Weight Lipid levels Foot lesions Blood pressure Blood glucose BMI Neuropathy	Improved health status Quality of life Outpatient utilisation

*Adapted from Norris et al. (2002)

The effect evaluation of the programme will involve measuring some parameters during the recruitment stage, such as BMI using (height and weight), blood pressure and FBS of both the controlled group and the intervention group, in order to compare the parameters that will be checked throughout the programme and afterwards, to determine the effect on the patients' health status.

8.3.3 Matrix based questions

The effect evaluation would be a quantitative study using a self-made questionnaire, because no such questionnaire was available in Nigeria, nor was there a validated questionnaire that was applicable to the Nigerian context. The questionnaire is based on SHESMD's content. From the matrix derived earlier in the development stage, some questions will be asked to guide the evaluation

These questions include the patients' ability to:

1. Identify the types of diabetes;

2. Identify the symptoms, risk factors and complications of Type 2 diabetes;

3. Describe the prevention of Type 2 diabetes;

4. Describe the diet suitable for Type 2 diabetes patients;

5. Plan nutrition therapy menu with locally available food;

6. State the advantages of physical activity in diabetes management;

7. Perform physical activity forms of exercise;

8. State the duration of daily physical activity and the different activities to be engaged in;

9. State the advantages of monitoring blood glucose regularly at home;

10. Use the glucometer accurately and know the range of normal blood glucose;

11. Explain the recording of glucose reading accurately;

12. Identify the range of blood glucose level;

13. Identify the sources of stress;

14. Acknowledge the value of using a variety of stress management techniques;

15. Generate alternative methods of psychosocial adjustment to daily life;

16. Display stress coping behaviour;

17. State goals for self-management tailored to their immediate needs;

18. Interact with health-care professionals during consultations;

19. Participate actively in management and goal-setting; and

20. communicate with health professionals via cell phone.

8.3.4 Process questions

The process refers to the activities carried out as part of the effort to implement the programme. It encompasses the how programme is to be implemented. Issues involved here include how well the programme worked with respect to patients' participation, health practitioners' commitment and programme implementation according to the plan. Thus, the process questions relevant at this point in the programme are:

- Did the programme work as planned?
- Was it easy getting patients to participate in the programme?
- Did the professionals use the specified counselling techniques?
- Was the intervention implemented as planned?
- Did health-care providers cooperate in the implementation of the programme?

Health-care professionals will be observed to determine whether or not the programme is being implemented as planned and to ascertain the difficulties encountered. Additionally, a questionnaire will be used to ascertain the implementation of the programme, problems encountered and suggestions from health-care professionals. Patients who participate in the programme will be asked to complete users' process evaluation questionnaires to determine the quality of the programme and their satisfaction with the programme. The questionnaire consists of multiple choice

289

questions and some open-ended questions for clarification of information that is lacking and also for suggestions for possible improvements to the programme (Table 8.5).

Table 8.5: User evaluation questionnaire sample topics

Topic	Number of items	Example of questions
Content	6	Were you satisfied with the information you were given? a) very satisfied b) satisfied c)dissatisfied d)very dissatisfied
Skills	6	How are you satisfied with the skills you learnt? a) very satisfied b) satisfied c)dissatisfied d)very dissatisfied
Time	2	How would you assess the time spent for the programme a) accurate b) should be longer c) shorten the time
Revisit	2	Are you planning to attend the programme again a) yes b) no
Recommending to others	2	Will you recommend the programme to someone else with diabetes? a) yes b) no
Suggestions	1	Do you have any suggestion to improve the programme?
Demographic: age, gender, occupation educational background, duration of diabetes	5	
Total	22	

8.3.5   Development of indicators

The indicator is defined as any unit of information that can reasonably measure progress toward the achievement of a result or outcome (Eigenmann et al., 2007). These indicators are related to the health of people with the specific condition one is focused on. For this study the indicators would include:

- BMI using height and weight, blood pressure and fasting blood glucose;
- Application of knowledge acquired;
- Confidence in decision-making;
- Level of physical activity;
- Medication adherence;

290

- Motivation for behaviour change;

- Improvements in intermediate outcomes that result from improvement in metabolic control;

- Patients' accounts of their experience of services;

- Patients' perceptions of their own health and well-being;

- Patients' perceptions of how much they feel they are involved in, educated about and manage their own care;

- Patients' perceptions of whether or not they feel more confident that they can manage their condition;

- Patients' perceptions of changes in their quality of life;

- Patients' stories to understand the broader changes that self-management support brings;

- Patients' perceptions of whether or not they feel listened to and that services respond, as a means of measuring system responsiveness;

- Changes in health-care utilisation patterns when self-management support is provided effectively; and

- Reduction in visits to the health facilities.
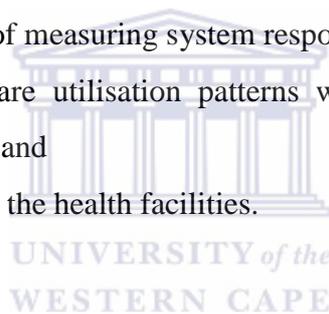
The programme success may be assessed at many points during the implementation of the programme. One can examine whether:

- Patients' knowledge and self-efficacy have increased;

- Patients' health-related behaviours have changed;

- Disease control has improved;

- Patients' health outcomes have improved;

- Patient satisfaction has improved;

- Utilisation has decreased and patient productivity has improved; and

- Health-care costs have decreased.

8.3.6 Evaluation design

Evaluation design is the logic behind or the plan for conducting an evaluation. It is a blueprint for how programmes are evaluated (Sartorius, 2013). The areas for evaluation are the programme's process and the outcome. Process evaluation is done to determine whether or not the programme is implemented in the way it is supposed to be implemented. Evaluation includes:

- Satisfaction;
- Reach;
- Quality of material; and
- Perception of the programme.

Impact evaluation will be done to determine the knowledge and skills acquired by patients subsequent to exposure to the educational programme

8.3.6.1 Outcome evaluation

The choice of the design depends on the evaluation questions on impact and outcome that are to be addressed; a randomised controlled trial or quasi-experimental design is recommended, with participants to be assigned randomly to the intervention and control groups. It will involve the use of a comparison group and an intervention group. The design is represented in Figure 8.1.
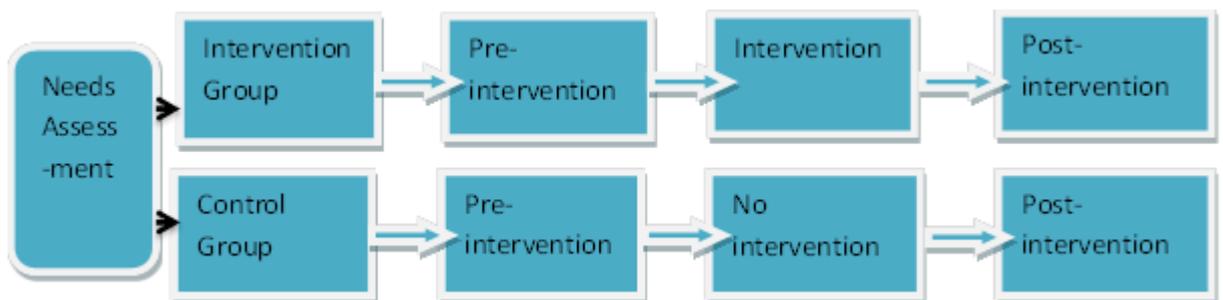
Figure 8.1: Study design and data collection flow chart.

Thereafter the participants will be approached to participate in the programme implementation in the two health facilities. Patients will be exposed to the intervention for two hours for five consecutive weeks and their routine consultant care. Two groups will be constituted in each health facility to serve as the intervention and the control groups. The control group will be exposed to their routine clinic health talk only. And the intervention group will be exposed to the routine health talk and the educational

programme. Pre-intervention measures will be collected and post-intervention measures will also be collected post programme implementation

8.4 SUMMARY

The plan for adoption, implementation and sustainability was developed to allow for adequate transfer of research to practice in the health facilities involved in the programme development. The recommended plan for evaluation of the programme for process acceptance and efficacy of the programme was also developed because the degree of acceptance and efficacy determines the sustenance.

In Chapter 9, the conclusion, limitations, unique contributions to the research and nursing profession and suggestions for other probable research based on the findings from this research will be discussed.

CHAPTER 9: SUMMARY, LIMITATION, RECOMMENDATION AND CONCLUSION

9.1 INTRODUCTION

This chapter is a summary of the research on the development of a health education programme for self-management of Type 2 diabetes (SHESMD) in Edo State, Nigeria. The key findings, the limitations of the study and recommendations for further research are included in this chapter.

9.2 KEY FINDINGS FROM THE RESEARCH

1. The context of diabetes in Nigeria highlights the need for effective intervention in diabetes management. The prevalence of Type 2 diabetes is on the increase globally, with Nigeria having the highest number of people with diabetes in Africa region of the WHO region. A large proportion of these people have intermediate hyperglycaemia.

2. Patients with diabetes Type 2 know and understand diabetes as a sickness superficially and tacitly but they find the self-management of Type 2 diabetes both challenging and expensive. As a result, the health-care professionals are burdened with the problem of the patients' non-adherence to self-management of diabetes of Type 2 diabetes.

3. The current method of providing health or patient education is ineffective and may have contributed to the superficial knowledge of diabetes Type 2 and its management. The traditional patient education method was used in teaching the patients with Type 2 diabetes. This education method is passive with minimal communication between the nurse and the patients. The health-care professionals acknowledged their role in the health education of patients with diabetes but had a weak focus on self-management education. The content of the teaching was superficial, unplanned, clinical disease-centred, prescriptive, unstructured and not

tailored to the needs of the patients with Type 2 diabetes. The consultant clinics were usually the primary point of the patient's contact with care. These clinics were crowded and busy and therefore may not be conducive to structured patient education.

4. Based on the reviewed literature review the recommended management of Type 2 diabetes is self-management approaches to behaviour modification. These include diet, increased physical activity, adherence to medication and self-monitoring of blood glucose, all of which are recommended for patients with Type 2 diabetes (ADA, 2014b). According to the recommendation of ADA (2013b), self-management education for patients with diabetes should be given using a client centred approach with the patient actively collaborating with the multi-disciplinary health-care professionals in the care.

5. A nurse led structured health education programme for self-management of Type 2 diabetes (SHESMD) was developed based on the needs of the patients through collaborative participatory research with health-care professionals and patients. This was done by actively applying the experience, knowledge and creativity of all stakeholders using the systematic intervention mapping framework which is underpinned by three behaviour change theories. Various approaches were used in communicating information to the patients who were actively involved in all the activities of the programme.

6. The following were used to adapt the programme to the low resource environment of Nigeria: 1) The programme being conceptualised as a nurse-led multi-disciplinary programme with the multi-disciplinary team was only made up of nurses, dietitian and the pharmacist and therefore; 2) Materials for teaching were sourced and adapted to the environment. 3) Staffs were trained on motivational interviewing, communication skills and the use of the SHESMD teaching manual to change the focus from traditional patient education to patient health education. The workshop and the collaborative development of the manual enabled the health-care professionals to update their knowledge and skills. This will facilitate the adoption, implementation and sustainability of the programme.

7. The importance of pretesting and the evaluation of programme are essential to implementing new programmes. The programme was pre-tested using an evaluation study at the secondary and tertiary health facilities using quasi experimental design to compare two groups. One group received the intervention and one did not. The focus of the evaluation studies should be on the process and outcome evaluation.

8. The programme was effective in reducing the key diabetes outcome indicators of fasting blood sugar. The post test results showed that the programme was effective as there was a significant change in the glycaemic control of the intervention group compared to the control group that was not exposed to the programme. Participant's post-test interviews showed considerable lifestyle changes, satisfaction with the programme and improved psychological wellbeing in the intervention group.

9. Literature reviewed showed that most research studies are not utilised in the practice area due to the lack of preparation for the implementation and evaluation processes. Therefore, plans for adoption, implementation and sustainability (Steps 5 & 6) of the programme were made with matrixes showing different activities to be performed by adopters, implementers and maintainers of SHESMD. Recommended evaluation using randomized control groups with applicable questions was suggested.

9.3 LIMITATIONS

There are a number of limitations in the study. The study was restricted to the health-care facilities in Edo State and therefore may not be generalised or transferred to other sites and settings. The qualitative design may not be transferable to other health-care facilities rather this was done to have rich contextual in depth understanding of the experiences of the patients with Type 2 diabetes in their own environment. Transferability in this study depended on logical meanings rather than statistical inferences as there was a saturation of method and data.

The study was conducted as a prerequisite for a PHD programme and was therefore limited by human and financial resources. Upon reflection on the complex and

evidence based intervention mapping framework and the processes involved in the study, the magnitude of this research requires more human and financial resources as well as time to include more facilities and patients. The evaluation study limitations were discussed in Chapter 7.

9.4 UNIQUE CONTRIBUTIONS OF THIS STUDY

To the best of the researcher's knowledge, the study provides a number of unique contributions to the field of health education management of Type 2 diabetes in low resource settings.

Firstly, the study provided an improved in depth understanding of the nature of the patient's understanding of diabetes Type 2. Patient's knowledge of diabetes is mostly measured quantitatively. This study, through this qualitative research design, aimed to determine the patients' understanding of diabetes through their narratives. The semi-structured interviews showed how much the patients know about diabetes despite their exposure to health talks, facilitating the researcher's understanding of the problem with the method used in giving health education. The findings of this qualitative exploration of the patients' understanding of diabetes illustrates the superficial, experienced based tacit knowledge of diabetes and this provides a new view on the quality of health education provided by nurses.

Secondly, this is the first structured health education programme, which is patient and tailored to the needs of the patients, developed in Nigeria according to the recommendations of American Diabetes Association. This programme also demonstrated the challenges of following international guidelines in low resource settings, showing a slimmed down multi-disciplinary programme, nurse led and with resources adapted to the context of the setting.

Thirdly, the use of a structured evidence based framework such as intervention mapping framework, underpinned by behavioural theories for training of staff and a participatory approach is also unique. The collaboration between the health-care professionals was also a unique development. Although health-care professionals usually work together in the health facilities in some capacity, in this instance the programme was jointly planned with a common goal and the process of development

of evaluation was also jointly performed. This approach is a novel contribution to knowledge in Nigeria as regards to any health education programme development.

Fourthly, the programme was evaluated using an experimental design. To the best of the researcher's knowledge this is the first evaluation or evaluation of a structured diabetes self- management education programme in Nigeria.

9.5 RECOMMENDATIONS

The major recommendations that emerged from the study will be discussed as applied to health services, nursing practice, nursing research and nursing education.

9.5.1 Federal Ministry of Health

Based on the evidence of this study, it is important for the Federal Ministry of Health to support and endorse the implementation of structured health education programmes such as SHESMD to enable patients have adequate knowledge and understanding of diabetes and self-management and problem solving skills.

9.5.2 Health Facilities

The researcher recommends the adoption and implementation of SHESMD in health facilities in Edo State as the researcher is optimistic that the health education programme will improve knowledge and competency of the health-care professionals in health education as well as increase adherence and satisfaction with care among the patients.

9.5.3 Nursing practice

Nurses need to keep abreast with new approaches in the management of diabetes, therefore regular workshops and training is suggested for professional development of all cadres of nursing.

Patients with Type 2 diabetes could be given materials for self-management as part of their medications on diagnosis which could be replenished regularly to motivate adherence and commitment therefore there is need for patient advocacy group by the nurses.

9.5.4   Nursing education

The study provided evidence that the traditional method of care has been found ineffective and that nursing education and nursing practice should move to teaching a different model of health education which is patient-centred, multi-disciplinary, participatory and based on evidence.

9.5.5   Nursing research

Nursing research in the area of health education and Type 2 diabetes is required as well as more research in the Nursing science discipline in Nigeria.

Future research in health education could focus on a larger, more rigorous evaluation study in different urban and rural settings. This would confirm the effectiveness of the nurse-led multi-disciplinary patient diabetes self-management education programme for consideration of wider implementation. The research study only implemented the first four steps in the intervention mapping framework namely: situation analysis, performance objectives and matrix, selecting theory-based methods and practical strategies and programme development. Future research will be necessary for steps five and six of the intervention mapping which are implementation and evaluation of the programme.

9.6 CONCLUSION

The burden of Type 2 diabetes is enormous for the affected, the family and the society. Health education for self-management plays a critical role in the management of patients with Type 2 diabetes. This study provides evidence that a structured nurse-led multi-disciplinary health education for self-management programme for patients with Type 2 diabetes improved the outcomes of diabetes for participants in selected tertiary and secondary health institutions in Edo State, Nigeria. The health education for self-management programme has also demonstrated that health care professionals could collaborate in caring for patients with Type 2 diabetes to ensure improve quality of life.

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313

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APPENDICES

Appendix 1

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

UNIVERSITY *of the*
WESTERN CAPE

30 October 2013

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by: Mrs JA Afemikhe (School of Nursing)

Research Project: Development of Health Education program for self-management of type 2 Diabetes in Edo State, Nigeria.

Registration no: 13/9/37

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

A place of quality,
a place to grow, from hope
to action through knowledge

Appendix 2

HOSPITALS MANAGEMENT BOARD
EDO STATE OF NIGERIA
P. M. B. 1009
BENIN CITY

Our Ref: A 732 / 94

Your Ref: Date: 31st December, 2013

Mrs. Juliana Ayafegbeh Afemikhe
University of the Western Cape,
Private Bag X17,
Bellville 7535,
South Africa

APPROVAL TO USE THE CENTRAL HOSPITAL, BENIN CITY FOR YOUR RESEARCH WORK TITLED: DEVELOPMENT OF HEALTH EDUCATION PROGRAM FOR SELF MANAGEMENT OF TYPE II DIABETES IN EDO STATE, NIGERIA

I am directed to refer to your application on the above mentioned subject and to convey the approval of the Ag. Director of Hospital Services / Chief Executive, Edo State Hospitals Management Board to you for you to use the Central Hospital, Benin City for your Research Studies on the above mentioned topic.

You are to note that only audio tape recording will be permitted, please.

J. O. OMOGUN

for: Ag. Director of Hospital Services / Chief Executive

354

Appendix 3

UNIVERSITY OF BENIN TEACHING HOSPITAL
P.M.B. 1111 BENIN CITY NIGERIA

Telephone: 052-600418
Telegram: UNITECHOS, BENIN
Telex: 41120 NG
Website: ubth.ng.org.

CHAIRMAN: PROF. M. BRIGGS
MBBS (Lagos), FWACS, FMCOG, FRCOG, OON, JP
E-mail: sthermaa2003@yahoo.com; esthermaa2009@ubth.org.

CHIEF MEDICAL DIRECTOR: PROF.M.O. IBADIN *MBBS, FMC (Paed), FWACP*
MBBS (Benin), FMCP, (Paed) M.S, (IMMUNOLOGY & IMMUNOCHEM)
E-mail:mikobadin@yahoo.com;mikobadin@ubth.org

CHAIRMAN, MAC Dr. A.O. OGBEMUDIA
MBBS, FWACS (Ortho/Trauma)
E-mail: alfredoghogho@yahoo.com; alfredoghogho@ubth.org

DIRECTOR OF ADMINISTRATION: E.B. KOYENIKAN Esq.
LL.B (Hons), B.L. CIIPM
E-mail: officeoftheda@ubth.org

ETHICS AND RESEARCH COMMITTEE
CLEARANCE CERTIFICATE

PROTOCOL NUMBER: ADM/E 22A/VOL V 1081

PROJECT TITLE: "DEVELOPMENT OF HEALTH EDUCATION PROGRAM FOR SELF
MANAGEMENT OF TYPE 2 DIABETIES IN EDO STATE, NIGERIA".

PRINCIPAL INVESTIGATOR(S) AFEMIKHE, JULIANA AYAFEGBEH

DEPARTMENT/INSTITUTION: DEPARTMENT OF COMMUNITY AND HEALTH SCIENCES,
UNIVERSITY OF WESTERN CAPE, SOUTH AFRICA.

DATE CONSIDERED DECEMBER 13TH, 2013
DECISION OF THE COMMITTEE: APPROVED
REMARK:
CHAIRMAN: PROF. M.N. OKOBIA SIGNATURE & DATE........... 13/12/13

SUPERVISORS: PROF. N. MBOMBO
DECLARATION BY INVESTIGATOR(S)
PROTOCOL NUMBER (please quote in all enquiries)
To be completed in four and three copies returned to the secretary, Ethics and Research committee, Clinical services and
Training Division, University of Benin Teaching Hospital Benin City.
I/We fully understand the conditions under which I am/we are authorized to conduct the above mentioned research
and I/We undertake to resubmit the protocol to the Ethics and Research Committee.

Signature.................................. Date........16/12/13...........

355

Appendix 4

UNIVERSITY OF THE WESTERN CAPE

CONSENT FORM

FOCUS GROUP CONFIDENTIALITY BINDING FORM

Title of Research Project: Development of Health Education Programme for Self-management of Type 2 Diabetes in Edo State, Nigeria

I confirm that I have read and understood the information on the above study and a description of the study has been given to me in the language that I understand. I therefore, willingly decide to take part in the study and understand that my participation is voluntary. My questions about the study have been answered and I understand that confidentiality will be maintained. I am free to withdraw at any time from the study without any penalty or effect on my care. I agree to be audio-taped during my participation in the study. I will not disclose any information that was discussed during the group discussion.

Participant's name…………………………………………..

Participant's signature………………………………….

Witness's name…………………………………………..

Witness's signature…………………………………..
Date…………………………………………………………

Should you have any questions or problems you have experienced related to the study please contact the study coordinator.

Study coordinator's name: Prof. N. Mbombo,

University of the Western Cape, Private Bag X17, Belville 7535, South Africa.

Telephone: +27(0)21 959 3932/2271, Cell: +27 72 2656 084

Email:nmbombo@uwc.ca.za

UNIVERSITY OF THE WESTERN CAPE

CONSENT FORM

Patients Semi structured Interview

Title of Research Project: Development of Health Education Programme for Self-management of Type 2 Diabetes in Edo State, Nigeria

I confirm that I have read and understood the information on the above study

and a description of the study has been given to me in the language that I

understand. I therefore, willingly decide to take part in the study and

understand that my participation is voluntary. My questions about the study

have been answered and I understand that confidentiality will be maintained.

I am free to withdraw at any time from the study without any penalty or effect

on my care. I agree to be audio-taped during my participation in the study. I

will not disclose any information that was discussed during the group

discussion.

Identification number…………………………………………..

Participant's signature………………………………………..

Date……………………………………………………………

Should you have any questions or problems you have experienced related to the study please contact the study coordinator.

Study coordinator's name: Prof. N. Mbombo,

University of the Western Cape, Private Bag X17, Belville 7535, South Africa.

Telephone: +27(0)21 959 3932/2271, Cell: +27 72 2656 084

Email:nmbombo@uwc.ca.za

Appendix 6

Qualitative Data Analysis

Phd in Nursing
Juliana Afemikhe

THIS IS TO CERTIFY THAT

Dr. Annie Temane has co-coded the following qualitative data:

32 Individual Qualitative Interviews

For the study:

"DEVELOPMENT OF HEALTH EDUCATION PROGRAM FOR SELF MANAGEMENT OF TYPE 2 DIABETES IN EDO STATE NIGERIA"

I declare that the candidate and I have reached consensus on the major themes, categories and codes reflected by the data during a consensus discussion. I further declare that adequate data saturation was achieved as evidenced by repeating themes.

Annie Temane

M.A.Temane (D.Cur; Research Methodology)

annie.temane@gmail.com

Appendix 7

ISABELLA MORRIS

Editor

M.A. Writing – University of the Witwatersrand

1E Westlake Drive, Lakeside, 1609
081-0468501

13 November 2015

TO WHOM IT MAY CONCERN
University of the Western Cape
South Africa

Dear Sir/Madam,

CERTIFICATE OF EDITING - JULIANA AYAFEGBEH AFEMIKHE

I hereby confirm that Juliana Ayafegbeh Afemikhe's dissertation entitled

"**DEVELOPMENT OF HEALTH EDUCATION PROGRAMME FOR SELF-**

MANAGEMENT OF TYPE 2 DIABETES IN EDO STATE, NIGERIA" for the

University of the Western Cape was edited by me during November 2015.

Sincerely

Isabella Morris
Editor

Associate Editor - SA PROFESSIONAL EDITORS GROUPo

Demographic Data for patients with type 2 diabetes   Identification number---

Age---------

Sex   M-----   F-----

Marital Status-------

Tribe--------------

Educational qualification Primary------

                                  Secondary------

                                  Diploma-------

                                  University Degree-------

                                  None-------

Occupation------

Duration of diabetes----

Smoking status----   Yes----   No------

Interview Questions for the interview guide

1 What do you know about diabetes and what does it mean to you?

   2. How do you manage your diabetes at home?

   3. How did you get to know about diabetes?

   4. What are the problems that you encounter in the process of managing this disease?

   5. Do you have any suggestions?

- Repetition of the original question;
- Silent probe, namely the researcher maintaining a long pause that is communicated as an indication that the participant should continue because the moderator is listening;
- Use of complementary questions that are not directive and open-ended, for example "what was your reaction?"; and
- Use of affirmative comments such as "Uh-Hum" and "Okay".

Appendix 9

Demographic Data for health-care professionals- Used for focus group discussions and participant observation

Identification number--

Age---------

Sex   M-----   F-----

Educational qualification   Diploma-------

University Degree-------

Higher degree

Profession------

Duration of years in the section:

Question guide for participant observation

- What was the nature of health talks that nurses gave to patients with Type 2 diabetes?

- What are the approaches used in the process of health education?

- What was the level of communication between patients and professionals and between the patients?

Appendix10

Question guide for focus group discussions

The open question was:

How is it for you to educate Type 2 diabetes patients?

Sub-questions:

What do you focus on during health talk to patients with Type 2 diabetes?

Why do you give these patients health talk and what do you want to achieve?

What are the challenges you encountered with giving of health talks to patients with Type 2 diabetes?

What are your future suggestions?

Probing questions

Tell me more…

What do you mean?