University of Venda

A MODEL TO SUPPORT ADULT PATIENTS LIVING WITH DIABTES MELLITUS IN THEIR SELF-CARE MANAGEMENT AT COMMUNITY HEALTH CENTRES IN LIMPOPO PROVINCE, SOUTH AFRICA.

By

Selina Motsharine

A dissertation submitted in fulfillment of the requirements for the degree of

Doctor of Philosophy (Ph.D.)

Student NO: 11640996

Department of Advanced Nursing

School of Health Sciences

University of Venda

Promoter	*Co-Promoter*	*Co-Promoter*
Dr. Ndou ND	**Prof Ramathuba D. U**	**Dr. Netshisaulu K.G.**

??JUNE 2023

DECLARATION

I, Motsharine Selina (Student number 11640996), hereby declare that the thesis entitled **"A model to support to *support adult diabetes mellitus patients at the community health centres of Limpopo Province, South Africa*"**, is my original work and that all the sources that I have used or quoted have been indicated and acknowledged using complete references, and that this work has not been submitted before for any other degree at any other institution of higher education.

Signature: …….. Date: 24 JUNE 2023

DEDICATION

My gratitude goes to God Almighty who strengthens me to complete this study. His grace prevailed throughout until the completion of this dissertation. He is indeed a faithful God.

I dedicate this thesis to all people who supported me throughout the course of my study:

- My Husband: Pastor Ndou Ntsieni Wilson
- My daughter: Mufunwa
- My mentor: Dr Vhuromu Elisa Naledzani
- My mother: Motsharine Johanna Thinavhuyo

ACKNOWLEDGMENTS

- The Highest God, who gave me strength
- Participants, who shared with me valuable information
- Dr. Ndou N.D, my promoter, for motivation and guidance
- Prof Ramathuba DU and Dr. Netshisaulu KG for co-supervising the study
- Professor Mavhandu-Mudzusi for co-coding data
- Mr Magidi P, for editing my dissertation
- Dr. Vhuromu E, for the incredible support
- My sisters, Mukwevho L, Manenzhe G, Mulaudzi G, and Shandukani S for support
- My daughter Mufunwa for being my source of inspiration
- My husband, Pastor Ndou NW for his patience and love

ABSTRACT

Introduction: Global management of diabetes mellitus is guided by the World Health Organization and International diabetes guidelines. Global literature revealed different strategies that are used in the management of diabetes mellitus, with diabetes self-care management education, and support as an integral component worldwide. Support of patients living with diabetes mellitus in self-care management is imperative to reduce and delay diabetes complications.

Purpose: The purpose of this study was to develop a model to support adult patients living with diabetes mellitus in self-care management at the community health centres of Limpopo Province, South Africa**.**

Setting: The study was conducted in the community health centres of the Vhembe and Mopani Districts of Limpopo Province, South Africa.

Phase 1 - Research Methodology: This study employed a qualitative, exploratory, contextual, descriptive design. The study population consisted of patients living with diabetes mellitus, professional nurses, and family members. A non-probability, purposive sampling was used to select the community health centres, professional nurses, patients, and family members. A semi-structured in-depth interview, using an interview guide, was used to collect data from the patients. Central questions were used to collect data from the professional nurses and family members. Sample size of participants were determined by data saturation. Data was analysed using Tesch's open-coding method.

Ethical principles and measures to ensure trustworthiness were considered.

Findings: The following major themes emerged from data analysis:

- Self-care practices,
- Challenges experienced by patients living with diabetes mellitus, and
- Support expressed by patients living with diabetes mellitus.

The findings of the study revealed ineffective support of patients by family members and professional nurses in diabetic self-care management.

Phase 2 - Concept Analysis: The concept of ''support'' was identified from data analysis conducted in Phase 1. The findings of study in Phase 1 revealed the support of patients living with diabetes mellitus as a challenge to professional nurses, and family members. The findings

prompted the researcher to analyse ‘‘support’ ’as fundamental concept of the study guided by Walker and Avant (2019) concept analysis method.

Phase 3: Model Development and Validation: Development of a model was guided by the objectives of the study as stated in Chapter 1, analysed concept, and Orem’s self-care deficit theory. Validation of a model employed a qualitative approach, using semi-structured in-depth interviews. Validators included professional nurses, operational managers, family members, patients with diabetes mellitus, and consultation with diabetic educators.

Conclusion: The findings of this study demonstrate insufficient support of adult patients living with diabetes mellitus. Challenges such as lack of resources and insufficient information about diabetes mellitus were found as some compounding factors affecting self-care management and support of adult patients living with diabetes mellitus.

Keywords: Adult, Community Health Centres, Diabetic Mellitus, Model, Patients, Support.

ABBREVIATIONS AND ACRONYMS

ADA	American Diabetes Association
CHCs	Community Health Centres
CVD	Cardio-vascular disease
DHIS	Department of Health Information System
DM	Diabetes Mellitus
DoH	Department of Health
DSME	Diabetes Self-Management Education
DSMES	Diabetes Self-Management Education and Support
IDF	International Diabetes Federation
PAD	Peripheral Artery Disease
PHC	Primary Health Care
SA	South Africa
SANC	South African Nursing Council
SMBG	Self-monitoring of Blood Glucose
SEMDSA	Society for Endocrinology, Metabolism and Diabetes of South Africa
WHO	World Health Organization
WIL	Work Integrated Learning

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

STUDY OVERVIEW

1.1. Introduction

Diabetes mellitus (**DM**) is a chronic multisystem disease that is more prevalent across the world and is placing increasing demands on healthcare systems. Globally, there has been an increasing emphasis on the involvement of patients in the management of chronic diseases by making educated decisions regarding lifestyle modifications linked to exercise, healthy diet, medication, and self-care monitoring of blood glucose levels. Effective management of diabetes mellitus requires the support of patients living with diabetes mellitus, adherence to treatment and recommended lifestyle behaviour, and lifestyle modification (Muchiri et al. 2019).

The efficiency of diabetes mellitus management also requires professional nurses to provide ongoing self-care management education to support both patients living with diabetes mellitus and their family members. Muchiri et al. (2019) and Bonger et al. (2018) indicated that poor support results in most patients living with diabetes mellitus not adhering to treatment and the recommended lifestyle. The emotional and practical support provided through teaching and training of patients living with diabetes mellitus, and family members who stay with the patients can positively affect the outcome of the disease. This study aims to develop a model to support adult patients living with diabetes mellitus in self-care management at the Community Health Centres (**CHCs**) of Limpopo Province, S.A.

1.2. Background of the study

This section discusses the background of the study.

1.2.1. General background and data-based literature

According to Powers et al. (2020) diabetes mellitus is a complex condition that demands daily decision-making on the part of the patients. Diabetes Self-Management Education and Support (**DSMES**), delivered by professionals using best practice methods, have a significant impact on the ability to carry out these responsibilities effectively. The clinical, psychological, and behavioural aspects of diabetes are all improved by DSMES. To promote the execution of personal goals and have a positive impact on outcomes, DSMES offers the foundation of ongoing support. Power et al. (2020) indicated that the number of people suffering from diabetes mellitus who receive DSMES is notably low, regardless of its obvious benefits and worth. Therefore,

professional nurses should make sure that DSMES is continually delivered to patients living with diabetes mellitus. It is specified that when providing **DSMS**, professional nurses should consider the patient's burden of disease management, their level of self-care competency, and of family support. Patients' performance of self-care management behaviour should be monitored continuously by professional nurses (Powers et al. 2020).

According to Aschner (2017), the International Diabetic Federation (**IDF**), as the leading figure in the diabetes community worldwide, suggested the following recommendations to support patients living with diabetes mellitus in self-care management:

- The use of medication to control diabetes mellitus.
- Anti-obesity drugs.
- Bariatric surgery for obese patients.
- Mandatory blood glucose monitoring for patients on insulin.
- Education programs for patients at the time of diagnosis at the primary health care level.
- Lifestyle changes including exercises and diet for overweight and obese patients.
- Avoiding smoking cigarettes and alcohol intake.
- Screening for depression.
- Screening for chronic complications such as retinopathy, nephropathy, peripheral neuropathy, macro-vascular disease.
- Referrals of a patient to the multidisciplinary specialised team.

In addition, to support patients living with diabetes mellitus, the American Diabetes Association developed the standards for the management of diabetes mellitus. The standards include obesity management, continuous glucose monitoring, pharmacologic methods for hyperglycaemia management, Cardio-Vascular Disease and risk management, microvascular complications, and foot care are all aspects of managing one's lifestyle that should be considered (CARE 2018).

Recognising the challenges of managing diabetes mellitus, the American Diabetes Association further commends that all patients diagnosed with diabetes mellitus should be supported with diabetes self- care management education that is adjusted culturally to the languages, beliefs, values, and customs of the groups at the time of diagnosis, and to receive ongoing support for self-care management as required (Cunningham et al. 2018). Despite the developed interventions to support patients in diabetes self-care management in America, literatures show that some patients view DSMES by family members as helpful and others as unhelpful (Pesantes et al. 2018). Pesantes et al. (2018) concurs with Bisnar (2017) when indicating that support by family

members motivates diabetes mellitus patients to adhere to self-care management, thus reducing diabetes-related complications. Therefore, the professional nurse as the educator must be persistent in conveying information to support diabetes mellitus patients in self-care (Bisnar 2017).

DSMES is recommended to achieve a significant impact in reducing high blood glucose levels. In America, another study has shown no significant impact of DSME on the effective management of diabetes mellitus in African American individuals who are living with the disease. In contrast, other studies revealed blood glucose reductions when implementing DSME (Cunningham et al. 2018).

In America, the significance of diabetes mellitus self-care management support was acknowledged by diabetic patients who alluded to the support that was provided by family members and friends. The support included reminders to take medication, support with meal preparation, and encouraging patients living with diabetes mellitus to participate in exercises. The assistance and support provided helped patients to make necessary behaviour modifications to better manage diabetes mellitus (Byers et al. 2016).

The literature revealed that, in Iraq, self-care management education and support that is provided to patients living with diabetes mellitus contributed a major role in the management of diabetes mellitus by reducing blood glucose levels (Asgharzadeh et al. 2016). Furthermore, a study conducted in Saudi Arabia attests that a regular education program was an effective supportive approach to improving blood glucose levels amongst type 2 patients living with diabetes mellitus. After diabetes self- care management education support was provided to patients living with diabetes mellitus, significant reduction of high blood glucose levels was identified (AL-Shahrani 2018).

> Although DSME is available and recommended globally, a study conducted in Iraq displays that self-care management protocols because of the absence of educational programs that support patients in self care management (Alsaleh, et al 2021). It is indicated that patients received diabetes self-care management education support from other patients with diabetes mellitus or internet sites. It is further specified that due to poor support patients did not adhere to healthy eating habits, physical activity, and anti-diabetic medication (Mikhael et al. 2019). The absence of diabetes mellitus educational programs, and non-adherence to daily self-care guidelines by diabetes mellitus patients in Iraq may be an indication of inadequate support of patients living with diabetes mellitus.

In Sub-Saharan Africa, a study about self-care management of patients living with type 2 diabetes mellitus revealed that although self-care management education and support were introduced, patients with diabetes mellitus rarely monitored their blood glucose levels, and they rarely do physical activities. Patients do not constantly follow the recommended healthy diet and are non-compliant with diabetic medication. Patients' knowledge regarding diabetes management is poor, they use traditional or herbal medicines to treat diabetes mellitus (Stephani et al. 2018). This made the researcher have a question regarding the type of support provided to patients living with diabetes mellitus in the CHCs of Limpopo Province, S.A.

Affusim and Francis (2018) agree that family support is the main determinant of adherence to life-modification behaviour by patients living with diabetes mellitus. When they recognise and obtain support from professional nurses and family members, they feel accepted, respected, and wanted by other individuals. The patient's well-being quickly increases and takes a positive attitude toward diabetes mellitus. The findings of the study conducted by Adeniyi Adeyi et al. (2015) showed poor support to patients living with diabetes mellitus by medical doctors; it is indicated that diabetic education was given by the medical doctors and nurses. Nevertheless, some patients were disappointed that doctors were always in a hurry to prescribe medication. Some patients reported that professional nurses and medical doctors counsel them about the control of diabetes mellitus, but they felt that the advice was not practical (AdeniyiAdeyi et al. 2015).

Support for patients living with diabetes mellitus is of paramount importance. This is confirmed by the findings of a study conducted in Ethiopia (Chali et al. 2018). The findings show that support of patients living with diabetes mellitus by family members and professional nurses determine the adherence of patients to self-care management practices. Patients without support are more likely to have poor self-care practices than those who have support. Therefore, support is considered a guiding force that reinforces patients living with diabetes mellitus to follow the management guidelines for better self-care management practices (Chali et al. 2018).

In South Africa, the diabetes mellitus expert committee developed the Society for Endocrinology, Metabolism, and Diabetes of South Africa (**SEMDSA**) guidelines for the management of diabetes mellitus in 2017. The guidelines include diabetes self- care management education and support, prevention and treatment of foot problems in diabetes, self-monitoring of blood glucose, drug therapy- adherence, diabetic kidney disease screening, diabetic eye disease, and screening for diabetic retinopathy (Webb 2018). Despite the efforts that South Africa is doing to support the management of diabetes mellitus, patients in South Africa showed inadequate information concerning the management of diabetes mellitus, and they struggle to adhere to diabetes mellitus

management guidelines. It was indicated that patients complained about insufficient support from family members (Muchiri et al. 2019). Most of the patients with diabetes mellitus do not do self-monitoring of blood glucose levels. Few patients do kidney and eye screening (Motsharine 2018).

To manage diabetes mellitus in Limpopo Province, South Africa, the Department of Health (**DoH**) employed the educational interventions approach for patients and their families. Most of the interventions are done in community-based primary care, diabetes special care, and hospital settings. The structured programs are offered in community-based primary care, in diabetes special care, and in a non-clinical setting, planned group sessions with professional facilitation and sometimes with additional individual, and self-help sessions for patients with poorly controlled diabetes. The ad-hoc educational interventions are offered in groups in the waiting area and during individual consultation meetings with the health care provider. Some ad-hoc educational interventions had written guidelines to which providers refer for information, pamphlets, and booklets which are mainly written in English, (Dube et al. 2015).

Despite the above educational approaches that are there to support patients living with diabetes mellitus in self-care management, most of the patients in Limpopo Province do not have adequate information regarding diabetes mellitus self-care management, and do not comply with self-care management practices. Shilubane et al. (2016) also reflected that most of the patients living with diabetes mellitus showed poor management practices of foot care and annual eye check-ups. Some patients believed that diabetes mellitus can be cured, and some did not believe that a healthy diet helps in the management of the disease.

The findings of the study conducted in SA, by Mutyambizi et al. (2020) further demonstrated that patients' compliance with the diabetic self-care management practices such as exercising, eating healthy foods, and taking medicine was poor. Whereas Mphasha et al. (2022) established that patients living with diabetes mellitus do not take their medication as prescribed. The findings of a study conducted by Alhaiti et al. (2020) show that patients with diabetes mellitus who receive support from family members in self-care management are more likely to adhere to diabetic self-care management practices, resulting in good health. This is supported by the findings of a study conducted by Mwila et al. (2019) who showed that patients with type 2 diabetes mellitus who had support from family, have good health and are more content than those that do not have the support, and contrary, patients who do not get family support experience a life of distress. Findings of the study conducted by Mphasha et al. (2022) in one of the districts of Limpopo Province, discovered that patients living with diabetes mellitus were supported by family members concerning food, exercise, and collection of medication Mphasha et al. (2022) further supported

that family support is associated with good diabetes outcomes, while a lack of it is associated to diabetes complications.

1.3. Problem statement

The researcher is a nurse educator in one of the nursing colleges of Limpopo Province, South Africa. When she accompanied the student nurses to the hospitals for Work Integrated Learning (**WIL**), she observed a number of patients living with diabetes mellitus who are admitted with diabetic emergencies. The researcher further observed the admission recurrence from the Vhembe District's two-hospital medical units' admission registers in three consecutive months and found that it was of high concern. Table 1.1 shows the three months' consecutive admissions of patients living with diabetes mellitus in the two hospitals of Vhembe District.

Table 1.1: Admissions of patients with diabetes emergencies

	January 2019	February 2019	March 2019
Hospital A Medical unit			
Hyperglycemia	17	18	20
Hypoglycemia	12	10	13
Diabetic Ketoacidosis	15	12	14
Hospital B Medical unit			
Hyperglycemia	14	16	17
Hypoglycemia	15	13	14
Diabetic Ketoacidosis	14	13	13

Recurrence of the admission prompted the researcher to explore the support provided to patients living with diabetes mellitus by family members and the health centre's professional nurses. According to Bennich et al. (2017), family support has implications for the patient living with type 2 diabetes mellitus, and the implications include adherence to the recommended lifestyle and the general well-being of the patient which result in blood glucose level that is within normal ranges (Bennich et al. 2017). In addition, Werfalli et al. (2020) indicated that support from the family members is associated with adherence to diabetes self-care management by patients living with diabetes mellitus. Bennich et al. 2017 recommended that interventional studies should be done to assess family support and professional support through educational interventions, with the goal of enhancing the wellbeing of type 2 diabetes patients and their families. Therefore, founded on this background, the researcher deemed it fit to explore the self-care management support of patients living with diabetes mellitus by professional nurses and family members, and to develop

a model to support adult diabetes mellitus patients at the CHCs of the Limpopo Province, South Africa. In South Africa, CHCs are institutions where diabetic services and support of patients living with diabetes mellitus regarding diabetic self-care management is provided, with the aim of controlling and maintaining the blood glucose levels within normal ranges; hence preventing diabetic emergencies, onset of diabetes mellitus complications and recurrent hospital admissions.

1.4. Research question

The research question is the whole plan for collecting data and attaining solutions to the research question. It is a clear, concise, interrogative statement that is worded in the present tense, including one or more variables. It is expressed to guide the implementation of studies. (Grove & Gray 2019). The study was guided by the following questions:

1.4.1. Patients living with diabetes mellitus

- What are the self-care management practices of adult patients living with diabetes mellitus at the CHCs of Limpopo Province, South Africa?
- What are the challenges faced by adult patients living with diabetes mellitus in self-care management?
- What type of support is needed by adult patients living with diabetes mellitus in self-care management?

1.4.2. Professional nurses

What is the type of support that professional nurses provide to adult patients living with diabetes mellitus?

1.4.3. Family members

What is the type of support that is provided by family members to adult patients living with diabetes mellitus?

1.5 Study purpose and objectives

1.5.1. The purpose of the study was to develop a model to support adult diabetes mellitus patients in their self- care management at the community health centres of Limpopo Province, South Africa.

Objectives of the study are arranged in three phases as indicated in figure 1.

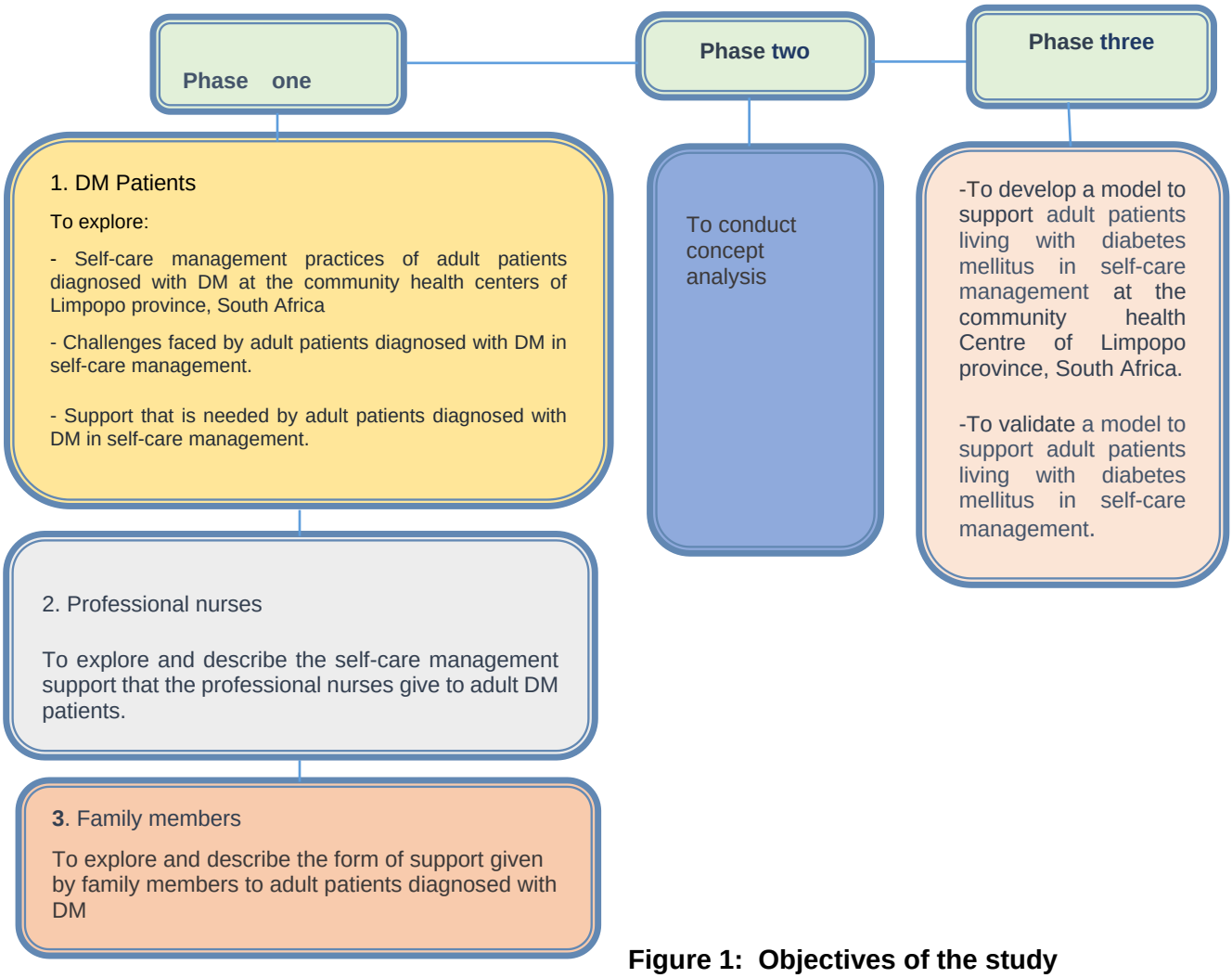


Figure 1: Objectives of the study

1.6 Theoretical framework

A theory is an abstract generalisation that offers a methodical explanation for the relationships between phenomena. (Polit & Beck 2017). However, according to Rocco et al. (2022) a theory is an explanation seeking assumption or set of ideas, especially one that is based on general principles unrelated to the subject being explained. It is a well-considered explanation for observations of the natural world that is developed using the scientific method and incorporates several facts and hypotheses, or it is a set of concepts intended to explain something, especially one that is based on general principles different from the objects to be described. Theories allow researchers to integrate observations and findings into an orderly scheme (Polit and Beck 2017). The researcher adopted Orem's theory of self-care deficit in nursing. Orem's self-care deficit theory is considered an exceptional theory of nursing, and it is amongst the most commonly used theories in nursing. This theory includes three interrelated theories namely: the theory of self-care, the theory of self-care deficit, and the theory of the nursing system. The theory of self-care deficit is composed of basic concepts, namely: self-care, self-care agency, and therapeutic self-care demand.

1.6.1 Orem’s theory of self-care deficit

Orem's self-care deficit theory comprises three interrelated theories namely: self-care, self-care deficit, and therapeutic self care demand (George 2011). Orem's theory concludes that the maintenance of optimal health and wellness is achieved through self-care. Self-care is the ability of individuals to care for themselves and those who need care. Orem outlines the professional nurse's role as a support person, educator, and provider of a safe and therapeutic environment for the patients. In this study, professional nurses' responsibility is to support patients living with diabetes mellitus in self-care management by educating them about diabetes mellitus and self care management. The researcher used the self-care deficit theory to develop a model to support adult patients living with diabetes mellitus in self-care management at the CHCs in Limpopo Province, South Africa.

In this study, support of patients living with diabetes mellitus implies that the professional nurses at the CHCs assess and establish the self-care needs, as well as identify self-care deficits related to diabetic self-care management practices; such as consuming an unhealthy diet, inability to monitor blood glucose levels, a lack of exercises, controlling weight, feet care, and eye care deficit. Based on the assessment done, the professional nurses develop a nursing care plan to eliminate the identified self-care deficit or need. To effectively support adult patients living with diabetes mellitus in self-care management, professional nurses should plan continuous education

for patients regarding diabetes mellitus self-care, and guide and support patients during follow-up visits at the CHCs. Figure 1.1 illustrates Orem's self-care deficit theory.

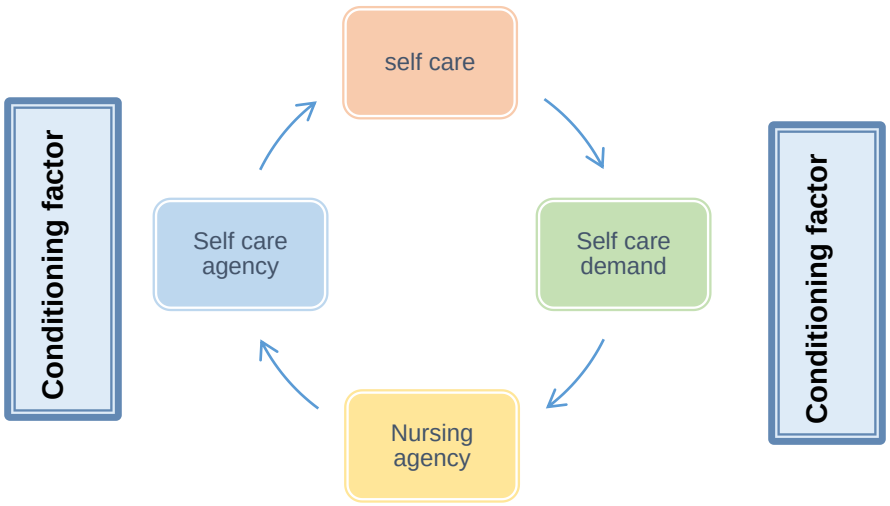


Figure1: Orem's self-care deficit theory (adapted from George (2011)

Self-care

According to Orem, self-care is the maintenance of health and wellness in the context of the environment, health, and nursing (George 2011). This is the care which a person performs for themselves or their dependents on an autonomous basis to maintain health. It is the practice of engaging in actions that one initiates to sustain one's life, health, and wellness (George 2011). In this study patients living with diabetes mellitus need to be active in identifying their self-care needs and decide to manage those needs independently with support of professional nurses and family members. Orem's self-care theory is one of the most comprehensive theories of self-care, which offers a useful therapeutic roadmap for planning and applying effective self-care into practice. According to Orem, professional nurses can assist patients to regain their capacity to care for themselves by giving direct care and compensating educational support anytime this capability is compromised in them. Orem claims that the nurse's job has been expanded to include that of a change agent and facilitator. A person with diabetes mellitus should participate in all stages of the control and treatment of diabetes and be able to perform diabetes self-care activities which includes self-monitoring of blood glucose, adherence to a healthy diet, and exercise for management of diabetes mellitus. This theory guided the researcher to explore the self-care management practices.

Self-care agency

Self-care agency is defined as the complex acquired ability to meet one's continuing requirements for care that regulates life processes, maintains and promotes the integrity of human structure, functioning and human development, and promotes well-being (George 2011). According to (George 2011), self-care agency is the developed abilities and capacities for self-care by people. Adults are typically capable of taking care of themselves. Age, educational attainment, health condition, and environmental factors are basic conditions that have an impact on people's capacity to engage in self-care tasks. Adults take care of themselves in most situations (George 2011). Therefore, for adult patients living with diabetes mellitus to be able to manage DM effectively, they need professional nurses to educate them about diabetes mellitus and diabetic self-care management practices as stipulated in the SEDMSA (2017) diabetes guidelines.

Nursing agency

According to George (2011), the principle of nursing agency connects nursing science and nursing practice in Orem's self-care deficit nursing theory. Nursing agency refers to the ability or power of the professional nurse to establish patient care systems (Alligood & Tomey 2010). Through engaging in nursing care activity and growing their self-care agency, professional nurses can identify and meet the self-care needs of patients living with diabetes mellitus. This theory guided the researcher to explore and describe the self-care management support that professional nurses provide to adult patients living with diabetes mellitus. Professional nurses support patients by educating them about diabetes mellitus, and diabetic self-care management practices such as blood glucose monitoring, healthy diet, exercises, weight control eye care, and foot care.

Self-care demands

Self-care demands are the complete set of self-care actions that must be followed for a specific amount of time to fulfil the necessary conditions for self-care while employing appropriate approaches and related operations and procedures. It is based on intentional, deliberate behaviour displayed by certain members (George 2011). Therefore, patients living with diabetes mellitus should intentionally adhere to or follow all the diabetic self-care management practices such as self-blood glucose monitoring, healthy diet, medication, weight control, exercises, eye care, and foot care as stipulated in the guidelines for diabetes care (SEMDSA 2017). This theory

guided the researcher to explore self-care management practices of adult patients diagnosed with DM at the CHCs of Limpopo Province, South Africa.

Self-care deficit

Self-care deficit is the inability of a person to perform self-care activities because of restrictions including the provision of assistance and care given by self-care agencies to individuals, who are complete, partial, or incapable of performing self-care (Alligood et al. 2010). Makofane (2019) indicated patients living with diabetes mellitus have a deficit regarding self-care management, therefore patients living with diabetes mellitus require support from professional nurses. Therefore, diabetic education should be initiated during diagnosis of diabetes mellitus, and continue during follow-up visits. Professional nurses should serve as agencies to facilitate the proper optimal care of patients with diabetes mellitus. This theory guided the researcher to explore the support that is needed by adult patients diagnosed with diabetes mellitus regarding self-care management. Therefore, according to Orem, nursing care is necessary when an adult is unable to provide himself or herself with continuous effective self-care.

According to (George 2011) Orem identified five ways to support others: acting for and doing for others; guiding others; supporting others; offering an environment that fosters personal development in relation to meeting future demands; and teaching another. Orem suggested that a nursing process approach should be used to address patient's deficit in self-care management before defining the roles of the patient or nurse to meet the demands for self-care.

1.7 Paradigmatic perspective

A paradigm is described as the best structure for observing something, comprehending how it shapes the philosophy, and takes into account how other people see and interpret it. (Kankan 2019). Chinn and Kramer (2015) however, describe a paradigm as a worldview or broad frame of reference that directs knowledge development; it implies rules or criteria for evaluating the value or worth of a discipline's methods for producing knowledge as well as its procedures and outcomes. According to Sánchez et al. (2019) paradigm refers to theories concerning how knowledge is produced and disseminated within a specific society or community are known as paradigmatic opinions. When conducting research, a research paradigm assists the researcher in better understanding the subject being studied and in choosing the best method to use.

Pragmatism and interpretivism approaches were used because the researcher wanted to collect data regarding support of adult patients living with diabetes mellitus in a real-world situation and

context using interviews to collect data from participants and observing the non-verbal cues of the participants. The researcher sought to resolve the identified problem. Data was collected in community health centers of Vhembe and Mopani district and experiences of the participants were considered essential.

1.7.1 Pragmatism

Pragmatism is a philosophical tradition that considers words and thought as tools and instruments for prediction, problem solving, and action, and rejects the idea that the function of thought is to describe, represent, or mirror reality. Instead, pragmatists develop their philosophy around the idea that the function of thought is as an instrument or tool for prediction, action, and problem solving (Ormerod 2021).

Pragmatism was used to enable the researcher to identify the support provided to adult patients living with diabetes mellitus by family members at home and professional nurses at the CHCs. The pragmatic approach focuses on producing information or something that can be used and implemented in the actual world. In pragmatism, the study is outcome-based. To generate new information in this study, the research questions regarding the support of adult patients living with diabetes mellitus were considered crucial. Therefore, in pragmatism, the emphasis is placed on communication and meaning building to develop practical answers to societal challenges (Kaushik & Walsh 2019; Starke et al. 2021).

1.7.2 Interpretivism

Interpretivism approach is based on naturalistic approach of data collection such as interviews and observations (Awasthy 2019).The foundation of interpretive research is the idea that human experiences and social settings influence social reality. Interpretivism involves the researcher interpreting elements of the study. The interpretivism method is subjective and concentrates on the meticulous gathering and analysis of subjective material that is then presented in a narrative form. In qualitative research, the interpretive process of data coding is highly recognised, articulated, and celebrated (Williams 2019). Participants in this study were involved in describing the meaning of their experiences in diabetic self-care management and support. The data gathered for this study was analysed using the interpretivism method. The information collected from the participants was considered reliable because it was collected from patients who are living with diabetes mellitus, family members who stay and support the patients at home, and professional nurses who provide diabetic care at the CHCs. A central question and an interview guide using semi-structured interviews were used to collect data from the

participants. The study's main components are methodological, axiological, ontological, and epistemological phenomenon.

1.7.3 Methodological

The study used an interpretative-based methodology. The study employed a qualitative approach with explorative, descriptive design. The support model's development is also supported by theoretical framework (Orem self-care deficit theory).

1.7.3.1 Axiological

When conducting a reseach, ethical concerns must be considered, as well as the study's values and judgments (de Roo 2021). Ethical considerations were ensured, written consent form was obtained from partcipants, participation of participants was voluntary. participant's confidentiality was maintained by using codes instead of names of participants. The axiological presumption was action-oriented and attempted to connect research to practice. The study's primary objective was to develop a model to support adult diabetic patients in self-care management practices, which in this case, was practice oriented.

1.7.3.2 Ontological

Ontology is viewed as context-specific knowledge about the reality under study and participants' perceptions of what is true, as well as the way the researcher defines reality and truth. (Chatterjee et al. 2021). The study was carried out at the CHCs, where support of patients living with diabetes mellitus is done by professional nurses. To conduct this study, the researcher met with patients living with diabetes mellitus, their families, and professional nurses at the selected community health centers of Mopani and Vhembe districts to explore the support of adult patients living with diabetes mellitus, recorded the interviews, took field notes, and captured the nonverbal cues

1.7.3.3 Epistemological

The philosophy of knowledge or comprehension is known as epistemology. It is concerned with how the mind connects to reality and deals with the types of knowledge that are sufficient and valid. Furthermore, it looks for relationships between the study participants and the researcher. (Polit and Beck 2017). This study used an interpretive approach. As a result, qualitative research was conducted to explore the realities, descriptions, and experiences of participants regarding the support of adult patients diagnosed with diabetes in self-care management. The researcher was able to gather and interpret sufficient information regarding the support of adult patients living with diabetes mellitus in the selected CHCs.

1.8 Rationale of the study

Several studies have been conducted on diabetes self-care management in Sub-Saharan Africa. Stephani et al. (2018) conducted a study that reviewed self-care management of diabetes. Society of endocrinology metabolism and diabetes in South Africa guidelines for the management of type 2 diabetes were also developed in 2017, (SEMDSA Guidelines, 2017). South Africa is currently using those guidelines in the management of diabetes mellitus. The literature revealed that patients living with diabetes mellitus rarely monitor their blood glucose, rarely adhere to physical activity, and rarely adhere to recommended diet, and medication as indicated in the (SEMDSA Guideline, 2017). During the literature review, the researcher did not find a study that was conducted on support of adult patients living with diabetes mellitus in self-care management in Limpopo Province, South Africa. The researcher, therefore, deemed it necessary to develop a model to support adult patients living with diabetes mellitus in self-care management at the CHCs of Limpopo Province, South Africa.

1.9 Delineation of the study

The study focussed on support provided by professional nurses and by family members to adult patients living with diabetes mellitus. The study was conducted in the selected community health centers in the Vhembe and Mopani districts of Limpopo province.

1.10 Significance of the study

The importance of a study determines its significance. The importance of the study is based on the recognised problem, and it refers to the contributions and impact of the study on a research field (Brink et al. 2018; Polit & Beck 2017). It also indicates who gains from the research findings, how it supports the importance of your work, the impact it has on your field of study, how it adds to new information, and how it will help others. This study will contribute to diabetes mellitus nursing care and management, nursing education and nursing research knowledge.

1.10.1 Diabetes mellitus care and management

The findings of the study and recommendations may improve support of adult patients living with diabetes mellitus in self-care management, resulting in a reduction of the onset of diabetes mellitus-related complications and mortality rate. The support model may guide the family members on how to support adult patients with diabetes mellitus concerning self-care management practices, consequently, improving their well-being. A model may improve the patients' support by professional nurses, resulting in reduced diabetes complications and

workload. The findings may influence the DoH's authority to improve the guidelines that may be used in the effective support of adult patients living with diabetes mellitus at the CHCs of Limpopo Province, South Africa.

1.10.2 Nursing education

Findings of the study may add information that may be used in updating nursing course content and general nursing science curriculum. In addition, the findings may provide information to be used for staff development, through in-service trainings.

1.10.3 Nursing research

Findings of the study may add to the body of knowledge regarding the support provided to patients diagnosed with diabetes mellitus in self-care management. Furthermore, the results of the study may inspire researchers to conduct further studies on support of patients living with diabetes mellitus and self-care management. These findings may assist the researchers and healthcare practitioners to reassess how self-management support is provided in the primary health care enviroment.

1.11 Definition of terms

1.11.1 Adult

Adult refers to any person over 18 years' children act of 2005. In this study, adult refers to a person who is above 18 years of age living with diabetes mellitus.

1.11.2 Community Health Centres

Community health centres are defined as healthcare organisations that actively engage and collaborate with community stakeholders to provide a variety of accessible, comprehensive, and integrated services based on primary healthcare principles that address the underlying causes of adverse health outcomes for people, families, and communities (Nagel et al. 2021). In this study community health centre is a healthcare organisation that provides access to comprehensive primary and preventive care.

1.11.3 Diabetes mellitus

Diabetes mellitus is a chronic multisystem disease associated with abnormal insulin synthesis; impaired insulin use, or both. (Lewis et al. 2017). In this study, diabetes mellitus refers to a condition that occurs when the body is not producing sufficient insulin or using it properly resulting in elevated blood glucose levels.

1.11.4 Model

A model is a symbolic representation of concepts or components, together with the relationships relating them. It represents an idea with the aid of symbols or diagrams. It assists researchers in organising their thoughts regarding a circumstance, occurrence, or group of people. (Polit & Beck 2017; Brink et al. 2018). In this study, a model refers to a diagram that symbolise how adult patients living with diabetes mellitus should be supported in the CHCs of Limpopo Province, South Africa.

1.11.5 Patient

Any individual who is awaiting medical attention or receiving it is referred to as a patient (Bernam et al. 2008). In this study, a patient is a person diagnosed with DM who receives diabetic services at the CHCs in Limpopo Province, South Africa.

1.11.6 Support

Support is the verb form of assist, encourage, or approval. (Oxford English Dictionary 2022). In this study, support shall mean encouraging and educating patients living with diabetes mellitus about self-care management of their condition.

1.12 Research methodology

This study employed a qualitative, exploratory, contextual, and descriptive design. The study was conducted in the CHCs of the Vhembe and Mopani Districts in the Limpopo Province, South Africa.The study population consisted of adult patients, professional nurses, and family members. A non-probability, purposive sampling was used to select the CHCs, professional nurses, patients, and family members. The researcher employed a qualitative approach to explore and describe in detail the support of adult patients. As a result, the study site, population, sampling procedure, sample size, pre-test, data collection through interview methods, and data analysis, are all described along with the research method and design used. This study is divided into five phases: The objectives of the study displayed in Figure 1.2 were achieved. A detailed methodology is discussed in Chapter 3 of this study.

1.13 Structure of the dissertation

The study encompasses eight chapters, arranged as follows:

Chapter 1: Introduction and background of the study

The chapter discussed the background, rationale, significance of the study, problem statement, purpose and objectives of the study, research questions, theoretical framework, definition of concepts, brief description of research methodology, structure of the dissertation and summary.

Chapter 2: Literature review

This chapter discusses the literature review based on Phase 1 objectives which focused on the self-care support of patients living with diabetes mellitus and support provided to patients living with diabetes mellitus by professional nurses and family members.

Chapter 3: Research methodology

Chapter three is in phase one of the study, it discusses the study approach, design, study population, sampling and sample of districts, CHCs and participants, pre-test, data collection and data analysis, ethical considerations, and measures to ensure trustworthiness.

Chapter 4: Data presentation analysis, interpretation and discussion

Phase 1 also include chapter four of this study. This chapter discusses the analysed data, discussion and interpretation of the findings through controlled literature.

Chapter 5: Concept analysis

This chapter is in phase two of this study, and the chapter discusses concept analysis using Walker and Avant (2019) and Chinn and Kramer's (2015) methods. The concept of ''support'' was analysed.

Chapter 6: Development and evaluation of a support model

Chapter 6 forms phase three of this study. This chapter discusses the development of a model to support adult patients living with diabetes mellitus guided by Dickoff (1968).

Chapter 7: Model validation

Model validation is phase four of this study. This chapter discusses validation of the model, the method used to validate the model, and the results of validation. The justification and contribution of study to body of knowledge was also discussed.

Chapter 8: Summary, limitation, recommendations, and conclusions

This chapter provides the summary of the study, the limitations, the recommendations and conclusions.

1.4 Summary

This chapter provided a succinct explanation of the study introduction and background; introduced the study challenge, and then provided the problem statement, which specified the study's main areas of interest. The chapter went on to detail the purpose of the study as well as its significance, which was meant to close gaps in the academic literature. The study's purpose and objectives, as well as the research questions were all clearly stated. A description of the theoretical framework underpinning the study was given. Key concepts have been defined. The chapter essentially identified problems that the later chapters built upon and rationally answered. The focus of Chapter 2 will be the literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter 1 discussed the outline of the study. This chapter provides an overview of the literature that is pertinent to support adult patients living with diabetes mellitus. The universal existing literature regarding the support of adult patients in self-care management is discussed. A literature review serves to justify further study by giving the researcher access to current knowledge and concepts on the subject (Senyo et al. 2019). Milota et al. (2019) outlined a literature review as a methodical process that includes reading deeply, critically evaluating the sources, and reviewing the publications themselves. A literature review is a critical analysis, synthesis, and meaningful development of an argument rather than a list of what has been written by authors or academics. A literature review compares, evaluates, and analyses past studies to avoid duplication and pointless repetition (Santos et al. 2022).

Traditional narrative literature review was used to review the current information about support of patients living with diabetes mellitus. The researcher needed a solid foundation to comprehend what was already known, and it was important to underline the need for further research. The approach was also chosen to discover knowledge gaps concerning the support of adult patients living with diabetes mellitus in self-care management. The following stages of the literature review were used: input (literature search), throughput (processing the literature), and output (writing the literature review) (Grove & Gray 2019). The technique for narrative literature was suitable for identifying, evaluating, analysing, and interpreting the existing body of knowledge regarding the support of patients living with diabetes mellitus. This kind of review helps the researcher compile and synthesise a large body of literature about the support of adult patients living with diabetes mellitus. The relevant literature reviewed in this study included local, national, and international literature. The viewpoints of numerous researchers were scrutinised and studied to arrive at a realistic depiction of the identified problem.

2.1.1 The purpose of the literature review

The purpose of literature review was to provide answers to questions about the existing knowledge on what is known about the support of adult diabetes mellitus patients in self-care management. The literature review gave a further explanation for the proposed study and introduced the researcher to the phenomenon's context.

2.1.2 How the literature search was conducted

The researcher identified and reviewed the publications that were found to be relevant to the topic of study. Primary and secondary sources were explored. To gain a comprehensive understanding of the support provided to adult patients living with diabetes mellitus, general literature research was conducted. The researcher consulted and looked into a variety of sources, including textbooks, articles, journals, unpublished and published doctoral theses, diabetic guidelines, and online research publications. The source of literature included electronic databases for professional journals like EBSCOhost, Google Scholar, MEDLINE, PUBMED, and Science Direct.

2.1.3 Strategies for conducting literature search

The strategies used to search the literature were keywords and complex search (Grove & Gray 2019). In this study, scanning entailed a cursory glance at the keywords relevant to support of adult patients living with diabetes mellitus. The following keywords were used throughout the literature search: Self-care management and practices of diabetic patients, support of diabetic patients, and nurses' roles in helping diabetic patients, support of families of diabetic patients, challenges faced by adult diabetic patients, and support of adult diabetic patients at primary health care centres, were among the keywords selected for the literature review's search. Complex search using Boolean operators three words AND, OR, and NOT with the identified concepts for literature search (Grove & Gray 2019). Boolean operators three words included

- "diabetes AND support",
- "diabetes AND family support" OR "assistance by family",
- "patients living with diabetes mellitus AND support by professional nurses" OR "support at the community health centre",
- "diabetic AND self-care" OR "patient living with diabetes mellitus'',
- ‘‘self-management",
- "diabetic self-care AND challenges" OR "self-care management problems",
- "family members NOT supporting patients living with diabetes mellitus", and
- "professional nurses NOT supporting patients with diabetes mellitus".

Published studies about the support of adult patients living with diabetes mellitus in self-care were reviewed. Literature was reviewed to answer the following questions:

Diabetes mellitus patients

- What are the self-care management practices of adult patients living with diabetes mellitus at the CHCs of Limpopo Province, South Africa?
- What are the challenges faced by adult patients living with diabetes mellitus in self-care management?
- What type of support is needed by adult patients living with diabetes mellitus in self-care management?

Professional nurses

What is the type of support that professional nurses provide to adult patients living with diabetes mellitus?

Family members

What is the type of support is provided by family members to adult patients living with diabetes mellitus?

2.1.4 Self-care management practices of adult patients living with diabetes mellitus

Diabetes self- care management practices involve engagement in recommended behavioural activities such as healthy eating, medication adherence, being active, monitoring, reducing risks, problem-solving and healthy coping, which are all necessary for the successful management of diabetes mellitus (Adu et al. 2019). Diabetes self-management in important to patients living diabetes mellitus, it can reduce blood sugar levels, delay diabetes complications, mortality rate, and healthcare costs, as well as weight in people with excess weight (Nikoviotis and Ringas 2021). Support of patients by professional nurses through self-care management education is crucial to the management of diabetes mellitus, because it increases patients' self –care knowledge and practice, which in turn improves clinical and psychosocial outcomes as well as quality of life (Tamiru et al. 2023).

Diabetes self-care management practices are a changing process in the development of knowledge by patients diagnosed with diabetes mellitus. The common routine self-care management practices in diabetes mellitus is handled by patients and/ or family members. The practices include healthy eating, physical activities, measuring blood glucose, and adherence to diabetes medication. All these practices contribute to positive blood glucose control, minimising

diabetes-related complications and improving the patients' quality of life. In addition, the supportive role of the professional nurse is essential for maintaining patients' self-confidence which results in a successful behaviour change. In her theory, Orem indicated that professional nurses are the self-care agencies who identify and meet the needs of patients (Alligood & Tomey 2010).

The literature revealed self-care practices deficit in most of the individuals diagnosed with diabetes mellitus concerning the recommended diabetes self-care management practices. Findings of the study conducted by (Formosa & Muscat 2016) in Malta America revealed that patients diagnosed with diabetes mellitus demonstrated self-care deficit, specifically in adhering to exercises, medication, diabetic diet, wound care, and blood glucose management. In contrast, a study conducted in Asia, Nepal revealed that patients living with diabetes mellitus followed a prescribed diabetic diet, adhere to feet care, medication monitored their blood glucose levels regularly, whereas patients failed to adhere to regular exercises because they lacked motivation (Thaba 2018).

The findings of a study conducted in India show that patients living with diabetes mellitus adhere to self-care practices advice such as a diabetic diet, foot care, adherence to medication, and regular blood glucose monitoring as advised, whereas physical activity/exercises practice was poorly adhered to (Abijith et al. 2015). A study conducted in Indonesia by Opoku-Addai Ramadhaniyati and Parliani (202) revealed that some patients living with diabetes mellitus do not follow good diabetes self-care practices, some consume sweets, food rich in carbohydrates, and do not exercise. Nevertheless, patients adhered to routine monitoring of blood glucose and taking the medication regularly.

The findings of the study in Indonesia agree with the findings of the study conducted by Pamungkas et al. (2020) who found that patients did not adhere to the recommended healthy diet and physical activities due to lack of time. In support, Aschalew et al. (2019), indicated that poor self-care practices among diabetic patients in Ethiopia were associated with patients' poor social support. Wulandari et al. (2021) indicated that most of the patients do not adhere a to healthy diet because of difficulties in resisting their cravings, and they do not adhere to regular exercises. However, the older and current studies still show poor self-care management practices among adult patients living with diabetes mellitus.

2.1.5 Challenges faced by adult patients diagnosed with DM in self-care management.

Challenges are things unusual and demanding that call for a substantial amount of effort and determination. Cultural prejudices, a lack of resources, difficulties in modifying one's lifestyle, a lack of family support or conflicting demands, the perception of the quality of the service, and mental health problems were among the challenges that are faced by patients living with diabetes mellitus (Whittemore 2019).

The findings of the study conducted in America by Dickinson (2018) revealed poor support as a challenge faced by patients living with diabetes mellitus. The findings showed that patients were not happy with the language that was used by healthcare professionals when visiting institutions that provide diabetes mellitus healthcare services. They feel uncomfortable when being judged, blamed, or labelled as people with chronic diseases every day during follow-up visits (Dickinson 2018). The findings are supported by Whittemore (2019) who indicated that professional nurses' insensitivity to patients' illnesses and concerns result in distress and discouragement of patients.

On the other hand, a study conducted in Canada revealed that challenges faced by adult patients living with diabetes mellitus included social isolation, the barrier to accessing and preparing diabetes recommended diet based on a limited budget. The study outlined social isolation and depression of patients living with diabetes mellitus because of lack of a spouse and restricted funds which impact negatively on how they eat, hence, discouraging them to adhere to self-care management practices (Chan et al. 2015). These findings concur with the findings by Muchiri et al. (2019) who outlined that individuals living with diabetes mellitus feel isolated because of diabetic restricted diet that prevents them from enjoying food with other people.

Stiffler et al. (2014) specified that another challenge is how healthcare professionals inform a person about the diagnosis and management of diabetes mellitus during the time of diagnosis may negatively affect the way how the person will manage diabetes mellitus. In Indonesia, Pamungkas et al. (2020) cited that inadequate education about diabetes mellitus and lack of a role model in diabetes self-care management is also a challenge to patients living with diabetes mellitus. The conflict brought by sabotage of patients regarding strict diabetic diet by family members also was raised as a challenge to effective diabetes self-care practices among adult patients living with diabetes mellitus.

In addition, the literature revealed a lack of resources, such as blood glucose monitors, as another challenge that was reported as a barrier to achieving optimal diabetic self-care management. A study conducted in Mexico by Whittemore et al. (2019) showed that patients living with diabetes

mellitus had some difficulties in affording healthy diets, medication, and supplies, such as glucometer strips. Healthy foods for patients with diabetes mellitus were said to be costly and were not prioritised in families with low income. Lifestyle modifications such as changing to eating a healthy diet and exercising were reported as a challenge. In South Africa, O'Brien et al. (2020) confirmed lack of resources is an obstacle to effective diabetes self-care management. Orem's theory of self-care deficit outlines the professional nurse's role as a support person, educator, and provider of a safe and therapeutic environment for the patient (George 2011). Nevertheless, the current literature revealed one of the challenges that patients living with diabetes mellitus face, to be poor support from some professional nurses, family members, and the government.

2.1.6 Support needed by patients living with diabetes mellitus in self-care management

Patients living with diabetes mellitus need psychosocial, ongoing diabetic education for them to manage diabetes mellitus effectively. A study conducted in Saudi Arabia specified that family support of patients diagnosed with diabetes mellitus is imperative to their psychosocial aspect. It involves support of patients in critical times such as during the diagnosis of diabetes mellitus; encouragement and supervision of patients in diabetic self-care practices, therefore, promoting adherence to self-care practices that result in good blood glucose control (AlHaidar et al. 2020). According to Miller and DiMatteo (2013), for patients to adhere to self-care management, they need support from family members. Miller and DiMatteo (2013) outlined that family members and social support are important aspects that promote diabetic patients' adherence to diabetes self-care management.

Additionally, findings of a study conducted in the United Kingdom further revealed that there is a need for patients living with diabetes mellitus to be provided with psychosocial support through the integration of mental health professionals into the diabetes care team (Nazar et al. 2016). However, the findings of the study of Nazar et al. (2016) show that there was lower support for patients with diabetes mellitus concerning guidance, supervision, emotional support, and self-care management practices such as exercise, and support with a healthy diet (Nazar et al. 2016).

In support, Didarloo et al. (2016) indicated that patients' ongoing support through education yields positive changes in self-care management of diabetes mellitus, such as good blood glucose levels control. The findings of the study conducted in Iran by Mohebi et al. (2018) concur with the findings by Didarloo et al. (2016), who revealed that people who are diagnosed with diabetic mellitus who get support from their families and friends are most likely to achieve good blood glucose control because of their adherence to self-care behaviours.

2.1.7 Support of patients living with diabetes mellitus by family members

The family members' support of patients living with diabetes mellitus helps the patients to control their blood sugar levels, deal with stress and sadness, and promote the adoption of healthy lifestyle choices. Findings of a study conducted in Nigeria showed that most patients diagnosed with diabetes verbalised good support from family members, which resulted in the good management of diabetes mellitus and quality of life (Ido-Ekiti et al. 2016). In addition, Pamungkas et al. (2017) indicated that family members provide emotional support, help patients with problem-solving and solving emotional distress and provide diabetic patients with information about diabetes mellitus. Furthermore, the findings of a study conducted in Iran revealed that people who are diagnosed with diabetic mellitus and who get support from their families and friends are most likely to achieve good blood glucose control because they adhere to self-care behaviours (Mohebi et al. (2018). In contrast to supportive behaviour by family members, (Mayberry & Osborn 2012) showed that family members have been unsupportive and sabotaging to relatives diagnosed with diabetes mellitus, which led to poor adherence to diabetes self-care practices and poor blood glucose management.

The reviewed literature shows that there is both non-supportive and supportive behaviour toward patients diagnosed with diabetes mellitus by family members. It is indicated that to enhance good support, diabetes self-care management education and support has been traditionally provided to both patients diagnosed with diabetes mellitus and family members (Powers et al. 2015). Therefore, family members should be educated on how to support diabetic patients in self-care management. Rintala et al. (2013) outlined that family members should be educated about diabetes mellitus management for better understanding to be able to support their members who are diagnosed with diabetes mellitus.

2.1.8 Support of adult patients living with diabetes mellitus by professional nurses

Professional nurses play an important role in supporting people living with diabetes. According to Smyth (2021) professional nurses do not only help to administer medication, such as life-saving insulin, but they also offer important health and psychological advice to the family members living with diabetes mellitus and help them tackle the daily challenges that diabetes mellitus bring. Moreover, they frequently create networks of community support that many people with diabetes rely on for advice and reassurance.

The findings of a study conducted by Nikitara et al. (2019) revealed that professional nurses play a significant role in assisting patients with the management of diabetes mellitus. For example,

they provide diabetic education to family members who stay with patients who are diagnosed with diabetes mellitus. They are referred to as advanced caregivers, and as such, they are involved in the management of medication for patients with diabetes mellitus. Professional nurses play a significant role in screening patients for diabetes complications. They are involved in screening for complications of the foot and eye problems. Additionally, they act as motivators for patients by offering psychological support. They also advocate for quality care of patients living with diabetes mellitus (Nikitara et al. 2019).

Pamungkas et al. (2020) agreed that professional nurses support patients living with diabetes mellitus by educating them about diabetes mellitus. It was discovered that nurses' roles in the treatment of diabetes were diverse and challenging. To support patients living with diabetes mellitus, professional nurses reported taking part in a variety of activities, including patients support, health promotion and prescribing, and other inter-professional tasks (Alshammari et al. 2021).

2.2 Legal framework that guide professional nurses in patients support

According to Clarke (2016), professional nurses in South Africa are well-trained and qualified to provide nursing care in a variety of settings, including the CHCs. Therefore, professional nurses at CHCs are authorised by the statutory health council, the South African Nursing Council (**SANC**), to practice their profession within the legal margins of the country. As practitioners who understand the health status of the population in South Africa, professional nurses at the CHCs have the responsibility to ensure the health and well-being of adult patients living with diabetes mellitus. The following legal framework binds and guide the nurses to act responsibly and be accountable for all their nursing actions concerning the care of other patients including adult patients living with diabetes mellitus.

2.2.1 The Constitution of the Republic of South Africa, Act No. 108 Of 1996

The Constitution of the Republic of South Africa (1996) Section 27(1) (a) stipulates that every person has the right to health care, which includes counselling, health information, treatment, and rehabilitation, as well as patient responsibilities for their health, including any necessary treatment or rehabilitation procedures. This implies that adult patients living with diabetes mellitus has the right to be supported by professional nurses at the CHCs, they should receive counselling about diabetes mellitus, diabetic medication, diabetic education/information, and be educated about their responsibilities concerning self-care management and practices. This further denotes that

professional nurses should support patients in self-care management while focusing on each patient's individuality and uniqueness, to provide high-quality patient care.

2.2.2 South African Nursing Council (SANC) Rules and Regulations R2598 as amended

A provision for the scope of practice of several categories of nurses, including registered professional nurses, is made under the South African Nursing Council Rules and Regulation R2598. The Scope of Practice of a registered professional nurse (R2598) requires a registered professional nurse to make the nursing diagnosis of the health needs of patients living with diabetes mellitus, counselling, provision, and execution of diabetic nursing care to meet the need of a patient or group of patients. Where necessary, they must do a referral to a registered person such diabetologist, medical doctors and nutritionists.

2.2.3 SANC Rules and Regulations R387 as amended

The SANC Rules and Regulations (R387) stipulate the acts and omissions under which the SANC may take disciplinary actions against a registered professional nurse. The registered professional nurse may face disciplinary action by the SANC if he or she acts wrongly, incompetently, or neglects to provide the patients with the care that is considered essential. These actions may include failing to make a diagnosis, treatment, nursing care, teamwork, referral, patient advocacy, wrong patient identification, and failure to maintain clear and precise patient records. This implies that when providing diabetic care to patients living with diabetes mellitus at CHCs, professional nurses should be able to assess patients for their self-care deficit, and healthcare needs, as well as plan, and execute nursing care appropriately to prevent diabetic complications that may result in a higher mortality rate. They should also be able to advocate the need for resources for patients' management, collaborate with nutritionists and doctors, and refer patients for additional management. If they do not follow the nursing council's guidelines, registered professional nurses who are in charge of providing care for patients living with diabetes should be held accountable.

2.3 Summary

This chapter discussed the relevant reviewed literature and included background information on the support of adult patients living with diabetes mellitus. The literature was discussed focusing on self-care management practices, challenges faced by adult patients living with diabetes mellitus in self-care management, the support needed by adult patients diagnosed with diabetes mellitus in self-care management. It also discussed the support provided to adult patients with diabetes mellitus by professional nurses, the support provided by family members to adult patients diagnosed with DM, and legal framework that guide the support of patients by professional nurses.

The study was conducted in four phases. The design and methodology will be discussed per phase., chapter three and four is discussed in phase one of the study. InPhase two is discussed in chapter five, chapter six forms phase three, whereas chapter seven is phase four of this study. the third chapter, the methodology employed to explore the support provided to adult patients living with diabetes in the Vhembe and Mopani Districts of Limpopo Province is discussed and described in chapter three and four of phase one.

CHAPTER 3

RESEARCH METHODOLOGY

PHASE ONE

3.1 Introduction

Chapter 2 discussed the literature review, with a special focus on how to support adult patients living with diabetes mellitus in self-care management and practice. The research approach that was used to carry out this study is described in detail in this chapter. This chapter describes the study method and design in detail that led to the development of a model to support adult patients living with diabetes mellitus in self-care management.

According to Polit and Beck (2017) research methodology refers to the logical processes taken by the researcher when using scientific methodologies and procedures to investigate a certain phenomenon. In addition, de Vos et al. (2017) define the research methodology as a systematic procedure for conducting a study. In this chapter, the study site, population, sampling procedure, sample size, pre-test, data collection methods, data analysis, measures to ensure trustworthiness, and ethical considerations are all described along with the research method and design used. This study was conducted in three phases.

3.2 Phase one

Phase one comprises of chapter three and four of this study. This phase involves the implementation of research design and methods employed to achieve the objectives of the study. In this phase the data collected from study participants was analysed and lead to the development of a model to support adult patients living with diabetes mellitus in their self care management. It focused on achieving the following objectives:

Patients living with diabetes mellitus

- To explore self-care management of adult patients living with diabetes mellitus at the CHCs of Limpopo Province, South Africa.
- To explore challenges faced by adult patients living with diabetes mellitus in self-care management.
- To explore support is needed by adult patients living with diabetes mellitus in self-care management.

Professional nurses

- To explore and describe the support that professional nurses provide to adult patients living with diabetes mellitus.

Family members

- To explore and describe the type of support provided by family members to adult patients living with diabetes mellitus.

3.3. Study setting

The research setting is the physical location, and conditions in which data collection or a research study is carried out (Shahabuddin et al. 2020). In this study, a background that provides in-depth information about the area in which the study was conducted is described. The readers get a comprehensive understanding of the research site from the information provided here in this chapter.

The Limpopo Province is situated in the north of the republic of South Africa. It is one of the nine South African provinces. Limpopo Province is north of Gauteng Province, Mpumalanga Province is bounded by Limpopo province to the north, and Northwest is bounded by Limpopo Province to the northeast. It also shares borders with the republics of Mozambique in the east, Zimbabwe in the north, and Botswana in the west. There are five districts in Limpopo Province namely Mopani, Capricorn, Vhembe, Waterberg, and Sekhukhune (Limpopo Provincial Government Department of Health vote 7 annual performance plans, 2017/18).

The province is comprised of 452 clinics, 25 CHCs, 30 districts hospitals, five regional hospitals, and two tertiary hospitals. Eight CHCs were used in this study; that is, four CHCs in Vhembe District and four in the Mopani District. The researcher chose the health care centres because they offer health care services to patients with different chronic conditions including diabetes mellitus. Doctors visit the health care centres for review of patients including those living with diabetes mellitus. Adult patients living with diabetes mellitus are accompanied by family members or independently visit the CHCs for follow-up treatment as scheduled. Professional nurses at the CHCs give health education to patients on diabetes self-care and diabetic medication during follow-up visits. The following schematic diagram, Figure 3.1 shows the map of CHCs in the Vhembe and Mopani Districts.

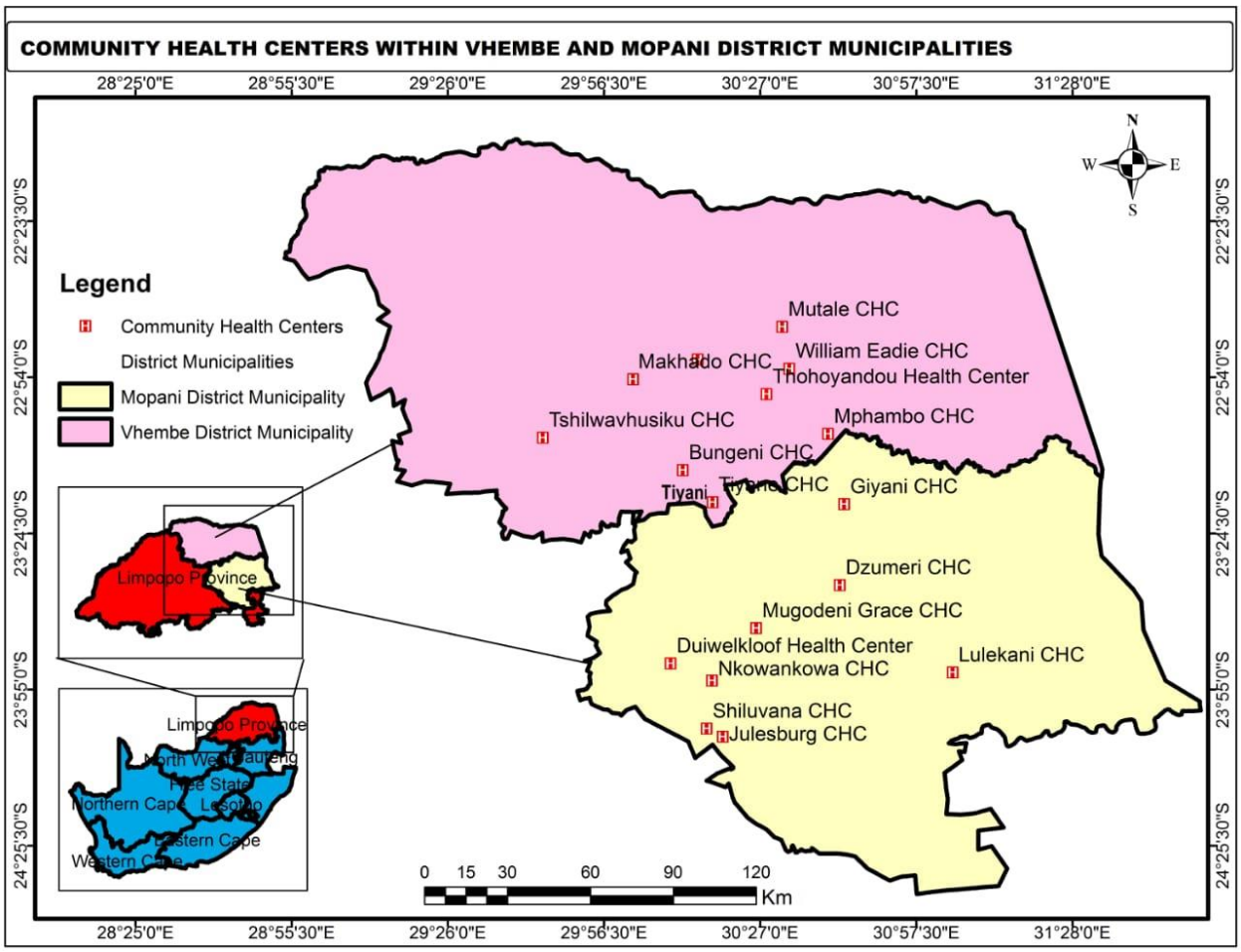


Figure 0.1: The adapted map of Vhembe and Mopani Districts, Community Health Care Centres, (LDoH 2016).

3.4 Research approach

According to de Vos et al. (201), the research approach is a method for carrying out a study. The approach primarily focused on the study procedures and methods that were employed to carry out this study. The researcher used a qualitative approach to explore the support of adult patients living with diabetes mellitus in diabetic self-care management and practices.

3.4.1 Research design

According to Polit and Beck (2017), and Awe (2022), research design is the overall plan for addressing a research question, including specifications for enhancing the study's integrity. The researcher used a qualitative, descriptive, and explorative design and the design was appropriate

for the study because it enabled the researcher to explore and describe the support of adult patients living with diabetes mellitus.

3.4.1.1 Qualitative research design

According to Williams (2019) a qualitative research design involves the investigation of phenomena, typically in an in-depth and holistic fashion, through the collection of rich narrative materials using a flexible research design. It encompasses collecting and analysing non-numerical data (for example., text, video, or audio) to understand concepts, opinions, or experiences (Pamarta 2022). It is a flexible, exceptional, and effective method of investigating the emotional responses and personal experiences of the participants. A qualitative, explorative, descriptive, contextual design was used to address the objectives of this study.

Patients living with diabetes mellitus experience different challenges related to diabetes mellitus, therefore the support of patients by family members and professional nurses was best explored and described using a qualitative design The researcher realised that some questions regarding the support of adult patients living with diabetes could not be answered using quantitative research, and can only be studied in real life situations, exploring the meaning, and providing an in-depth understanding of the support provided to adult diabetic patients cannot be quantified.

The qualitative approach allowed the study's participants to be able to describe circumstances and feelings in their own words and their descriptions were context-specific. The researcher focused on how participants interpreted and made sense of their experiences based on the context in which they live, which was considered a kind of social inquiry in qualitative research.

The qualitative research was appropriate for this study as the researcher knew little about the support of adult patients living with diabetes mellitus in self-care management. Consequently, the researcher was fully immersed through in-depth interviews and gained information from participants.

3.4.1.1.1 Exploratory design

Exploratory studies are designed to increase the knowledge of the field of study and are not intended for generalisation to large populations (Swedberg 2020). The exploratory study helped the researcher to discover a relatively unknown research area and to gain new insight into how family members and professional nurses support patients living with diabetes mellitus in self-care practices in the Vhembe and Mopani Districts of Limpopo Province, South Africa.

3.4.1.1.2 Descriptive design

According to Siedlecki (2020), a descriptive study is a study in which the researcher describes and documents' aspects of the circumstances as it naturally occurs. Grove et al. (2017) describe a descriptive design as a design that is used to identify a phenomenon of interest, identify variables within the phenomenon, develop conceptual and operational definitions of variables, and describe variables in a study situation. In this study, there was no intention to establish the cause-and-effect relationship between variables. The researcher collected data in a normal setting where there was interaction with patients living with diabetes mellitus, family members, and professional nurses (Brink et al. 2018). Furthermore, the researcher explored and described the support provided to patients by professional nurse's family members, as it naturally occurs in the CHCs and the home context of patients living with diabetes mellitus.

3.4.1.1.3 Contextual design

Contextual designs are research projects that allow the researcher to be in the actual setting where participants spend most of their time to gain understanding of their situation, focusing on aspects related to the phenomenon under study without losing focus (Maree 2012). This study was contextual in that, the professional nurses and adult patients living with diabetes mellitus were interviewed in the community health centers where support of patients living with diabetes mellitus is provided by professional nurses, and family members were interviewed in the homes were they stay and support their family mebers who are living with diabetes mellitus.

3.5 Study population for phase one

The study population refers to the total number of subjects who meet a specified set of specifications or the total set of relevant cases (Polit & Beck 2017). It is a group of people who share some characteristics. In phase one of this study, population was all patients living with diabetes mellitus who visited CHCs for follow-up treatment, professional nurses who provided health care services to patients living with diabetes mellitus at the CHCs, and family members who stays and assist patients living with diabetes mellitus in self-care management.

In the selected districts diabetes self-care management is influenced by cultural customs and religious beliefs of the patients. Some of the patients who suffer diabetic feet and ulcers believe that they are inflicted by witchcraft. Therefore, patients consult traditional healers for the treatment of diabetic foot ulcers. Other patients diagnosed with diabetes mellitus believe that DM can be cured by traditional medications. Spiritual patients believe that they can be cured through prayers,

anointed water, and oils. Others do not believe that adhering to a diabetic diet can control diabetes mellitus, (Shilubane et al. 2016).

3.5.1 Target population

The target population is the specifically defined large group of numerous cases from which a researcher obtains a sample and to which results from a sample are generalised (de Vos et al. 2017). The target population was patients living with diabetes mellitus who were receiving diabetic health services at the CHCs in the Mopani and Vhembe Districts of Limpopo Province. Professional nurses with two years of experience providing health care service to patients diagnosed with diabetes mellitus at the CHCs in Mopani and Vhembe Districts of Limpopo Province and the family members who stay and assist patients living with diabetes mellitus with self-care management.

3.5.2 Accessible population

According to Stormshak et al. (2019), the accessible population comprises the individuals from which the researchers can draw their conclusions. The accessible population encompassed patients living with diabetes mellitus, family members who live and support patients living with diabetes mellitus with self-care and professional nurses who were willing to participate in the study.

3.6 Sampling and sample

Sampling is the process of selecting a portion of the population to represent the entire population (Majumder & Biswas 2022). To achieve the purpose of the study, the researcher selected the districts, and from the districts, the sample of the study participants was obtained.

A sample is a smaller set of data that a researcher chooses or selects from a larger population using a pre-defined selection method (Polit & Beck 2017).

3.6.1 Sampling of the districts

Limpopo Province consists of five districts namely: Capricorn, Sekhukhune, Mopani, Vhembe, and Waterberg Districts. For this study, Mopani and Vhembe Districts were selected using non-probability purposive sampling. The districts were selected based on the high number of patients living with diabetes mellitus, about 1600 who visit the selected CHCs for diabetic services during followup visits.

3.6.2 Sampling of the community health centres

A sampling of CHCs employed a non-probability purposive sampling. Eight CHCs were purposively selected based on the high number of patients living with diabetes mellitus who visit the CHCs for follow-up treatment every month for patients whose blood glucose levels are not well controlled and every three months for those with blood glucose that is well controlled. Four CHCs in Vhembe District and four CHCs in Mopani District with about 200 patients living with diabetes mellitus were selected (DoH Limpopo province 2019).

3.6.3 Sampling of patients

A non-probability, convenient sampling was used. Patients living with diabetes mellitus who were readily available at each community center were included in the study. Therefore, the sample size was determined by data saturation. Data was saturated when the 15th patient living with DM was interviewed in the sixth community health center.

3.6.4 Sampling of professional nurses

The researcher used non-probability, purposive sampling. Professional nurses who had two years of experience providing diabetic services and were allocated to render services for patients living with diabetes mellitus in each CHCs were used as a sample of the study. Therefore, data was saturated when the 13th professional nurse was interviewed in the fifth community health center.

3.6.5 Sampling of family members

A non-probability purposive sampling was used to select family members who were responsible for supporting patients living with diabetes mellitus in self-care management. Data saturation was reached when only 14 family members were interviewed in the seventh family.

3.7 Inclusion criteria

- **Districts**

The selected districts were included based on high number of patients living with diabetes mellitus. About 1600 adult patients living with diabetes mellitus visited the selected district ‘s CHCs for diabetes mellitus follow-up treatment (DoH Limpopo province 2019).

- **Community health centres**

Eight CHCs were included based on the high number of patients, approximently 1200 adult patients who receive diabetic services in those CHCs (DoH Limpopo province 2019).

- **Diabetic patients living with diabetes mellitus**

Diabetic patients were included based on:

- Being 18 years of age and above;
- Lived with diabetes mellitus for 5 months and above; and
- The availability and willingness to participate in the study.

- **Professional nurses**

Professional nurses were included based on:

- Allocation at the CHCs;
- Experience, two years and above; and
- Professional nurses who provide nursing care services to patients diagnosed with diabetes mellitus so that accurate data is collected.

- **Family members**

Family members were included based on:

- Being 18 years of age and above; and
- Being related and staying in the same house with the patient.
- Explain the form of support you need in the management of diabetes mellitus.

3.8 Data collection

According to de Vos et al. (2018) data collection is a technique the researcher uses to gather information from participants to determine each participant's facts and opinions. Camacho-Otero et al. (2019) indicated that data collection allows the reseacher to gain first-hand knowledge and original insights into the research problem. It entails data collection tools such as surveys, interviews, focus groups, observations, experiments, and technology-based data sources such as mobile applications and web analytics, pretesting of data collection tools, data analysis and data management. The collection of data aids the researcher in drawing valid conclusions regarding the research problem (Menon et al. 2020).

3.8.1 Data collection tool

The researcher used in-depth face-to-face interviews to collect data. Unstructured and semi structured interviews were used.

3.8.1.1 Unstructured interview

According to Bihu (2020), unstructured one-to-one interview, also referred to an as in-depth interview, is a conversation with a purpose. The purpose of using unstructured interviews was not to answer the research questions only, but also to explore and describe the support of adult patients living with diabetes mellitus by family members and professional nurses in self-care management. The in-depth interview was used to elicit information to achieve an understanding of participants' experiences regarding support of patients with diabetes mellitus, and engaged in understanding the responses of participants to questions in a wider context of the interview. Unstructured interviews were used to collect data from professional nurses and family members.

3.8.1.2 Semi-structured interview

The semi-structured interview is an exploratory interview that is most frequently used in the social sciences to collect data for qualitative research or medical purposes. The semi-structured interview allows for discovery with the flexibility to follow thematic trajectories as the conversation evolves, even though it often follows a guide or protocol that is developed before the interview and is centred on a core topic to provide a basic structure (Magaldi & Berler 2020).

Semi-structured, one-to-one interviews were used to collect data from adult patients living with diabetes mellitus. They were used to gain a detailed picture of how adult patients living with diabetes mellitus practice diabetic self-care, and to explore the support that they receive from professional nurses and family members. The interview allowed patients living with diabetes mellitus and the researcher to have a much more flexible conversation; the researcher was able to follow up on particular interesting avenues that emerged in the interview, and patients were able to give a full picture regarding diabetic support and self-care management. The open-ended questions were asked to allow adult patients living with diabetes mellitus to express themselves freely, ensuring that questions are not biased and judgmental, see annexure H. During the interview process, patients were perceived as the experts regarding diabetic self-care practices and diabetic support, and the semi-structured interview allowed patients the maximum opportunity to tell their stories regarding the support they receive from family members and professional nurses.

The following questions were asked:

- **A central question for the professional nurses:**

Kindly share with me the support that you as a professional nurse provide to patients living with diabetes mellitus concerning self-care management.

- **A central question to the family members:**

Kindly share with me the form of support you provide to an adult family member diagnosed with diabetes mellitus.

- **Semi-structured questions for adult patients living with diabetes mellitus:**
    - May you please explain to me how you take care of yourself as a patients living with diabetes mellitus.
    - Kindly tell me about the challenges that you are faced with regarding self-care.
    - Explain the form of support you need in the management of diabetes mellitus.

3.8.1.3 Pre-test of central questions and interview guide

According to Munkanda (2022), a pre-test is done to investigate the possible flaws in the instruments, such as ambiguous instructions or wording, inadequate time limits, as well as whether the variables defined by operational definitions are observable and measurable. A pre-test was done to test the researcher's interview skills. The recording device was tested for proper functioning before use. All central questions and semi-structured questions were pre-tested for clarity. The researcher gained access to participants for pretesting the questions for interview after receiving permission from Vhembe and Mopani districts department of health. The researcher visited the two randomly selected CHCs in Vhembe and Mopani districts to arrange date, venue, time and participants for pre testing of central questions and interview guide with the operational manager and professional nurses.

Two professional nurses and two family members from CHCs in Vhembe and Mopani districts who did not form part of the main study were were used for pretesting the central questions. Two patients living with diabetes mellitus who did not form part of the main study in one of the CHCs in the Mopani and Vhembe district were used to pre-test the interview guide for ambiguity. A written consent was obtained from all participants before conducting the pre-test. The interviews were recorded, transcribed. The resercher identified that some questions were ambiguous, and

the collected data was not rich. The interview guide questions that were ambiguous were edited to improve the subsequent interviews.

3.8.1.4 Data collection process

After receiving ethical clearance from the University of Venda Ethical Committee, permission from the University of Venda Higher Degree Committee, and the DoH Limpopo Province research committee, Vhembe and Mopani District offices, and from selected CHCs. The researcher gained entry to the CHCs by arranging the dates of visits with the managers through a phone call. The researcher recruited participants with the assistance of CHCs managers. Arrangements were made with managers telephonically, namely: recruitment of the participants, date, time, and venue for interviews with professional nurses and patients living with diabetes mellitus. The audio recorder was checked for proper functioning before data collection.

Data was collected from professional nurses and family members using unstructured, in-depth face-to-face interviews coupled with follow-up questions and probing. A semi-structured interview was used to collect data from adult patients living with diabetic mellitus. The researcher collected data with a trained assistant researcher, post graduate student at the University of Venda who speaks the Xitsonga language.

Data collection interviews were first conducted at Mopani District and subsequently followed by Vhembe District. Tshivenda and Xitsonga languages were used to collect data from patients and family members. The English language was used to collect data from professional nurses. Interviews were conducted in a pre-arranged quiet place. To ensure precise capturing of the data, and credibility, and to prevent loss of data, audio tape recorders were used per agreement with the participants. The researcher was not biased and allowed the participants to express themselves freely without judgment. Field note were taken, and observations were made and experiences were documented to minimise loss of data. The interview involved the systematic recording and documentation of responses as well as passionate probing for deeper meaning and understanding of the responses. Each interview took approximately 45 minutes. During data collection, patients were requested to give the researchers contact numbers of their family members who support them in self-care. Family members were contacted to arrange the date, times, and venues for interviews according to their availability and comfort. Data collection from family members was done in the homes where family members and adult patients living with diabetes mellitus stay. The unstructured and semi-structured in-depth interviews with probing,

coupled with the writing of field notes were used to collect data. Data was collected for four months, January and October 2020, February and March 2021, until data saturation was reached.

3.8.1.5 Data management and analysis

Analysis of data entailed exploring, organising, and synthesising raw data as well as analysing and interpreting data to extract its meaning (Sing 2021). The researcher transcribed the collected data verbatim. Data were translated from Tshivenda and Xitsonga language to English language to by language experts. The transcribed data was kept safe on a laptop with a password. The transcribed data was analysed by the researcher using Tesch's eight steps of coding method (Creswell 2017).

1. **Get a sense of the whole**

The researcher read through transcripts and wrote ideas to get a sense of the whole interview. All the transcripts were read to understand the information provided by the participants. The researcher gained a sense of the interviews and broke down the interview into meaningful ideas. The meaningful ideas were recorded immediately as they came to mind.

2. **Choose one interesting interview**

The researcher chose one interesting interview and analysed the underlying meaning of information while writing thoughts in the margins.

3. **Similar topics clustered together**

The researcher clustered all the similar topics together and arrange them into columns as major and unique topics.

4. **Go back to the data**

The researcher checked a list of topics and got back to the data; the topics were abbreviated as codes. Writing the codes next to the appropriate segments of the text helped the researcher see whether new categories and codes were still emerging.

5. **Identification of most descriptive wording for topics**

The researcher identified the most descriptive wording for the topics and turned them into major themes. Major themes were reduced by grouping related topics together. Lines were drawn between the major themes to show interrelationships.

6. Abbreviation of categories

The abbreviations for each category were made and the codes were arranged alphabetically making sure that there is no duplication.

7. Similar data assembled

The researcher made a preliminary analysis by assembling the data material belonging to each category in one place.

8. Data recording

The existing data was recorded and stored safely on a computer with a password. The researcher made a summary of the identified major themes, themes, and sub-themes before sending the data to an independent coder who assisted with coding the raw data. The independent coder coded the data using Tesch's eighth step of the coding method (Creswell 2018). Thereafter, the independent coder and the researcher agreed on the developed major themes, themes, and subthemes that are discussed in chapter four of this study. Table 4.2 display the two major themes, three themes, and twelve subthemes that were developed from data collected from professional nurses. Table 0.1 shows the four major themes, nine themes and twenty four subthemes developed from data collected from patients diagnosed with diabetes mellitus. Table 0.2 shows the two major themes, four themes, and twelve subthemes of data collected from the family members.

3.9 Measures to ensure trustworthiness

According to Amin et al. (2020), trustworthiness is a way of ensuring data quality or rigor in qualitative research. Goodman et al. (2020) indicate that trustworthiness is the degree of confidence the researcher has in their data, and analyses and it is assessed using the criteria of credibility, transferability, dependability, independent coding and conformability.

3.9.1 Credibility

According to Brink et al. (2018), credibility refers to confidence in the truth of the data and the interpretation thereof. The study must be done in such a way that the findings demonstrate credibility. In other words, in the way that the reader will believe them. The researcher strived to establish confidence in the truth of the data and the interpretation of the data. Lincoln and Guba

as cited in Polit & Beck (2017) pointed out two aspects; first, carrying out the study in a way that enhances the believability of findings, and second, taking steps to demonstrate credibility to external readers. Credibility was ensured through triangulation, prolonged engagement in the field, debriefing session, independent coding, member checking.

3.9.1.1 Triangulation

According to Mostafavi (2022); Jentoft and Olsen (2019) triangulation is the use of multiple sources or referents to conclude what constitutes the truth, use of various methods to collect data on the same topic, including various types of samples and data-gathering methods to ensure the validity of the study. The researcher used triangulation during data cllection by using a voice recorder, taking of field notes, and observation of non-verbal cues. The researcher collected data from various participants of the study; data was collected from patients living with diabetes mellitus, professional nurses, and family members.

3.9.1.2 Prolonged engagement in the field

Prolonging engagement is an important step to ensure credibility. This is achieved by investment of enough time in collecting data to have an in-depth understanding of people under study, to test for misinformation and distortions, and to ensure saturation of key categories (Polit & Beck 2017)**.** Credibility was ensured by having adequate time for engaging with the participants in fieldwork for long enough periods. To build trust, the researcher met with the participants to introduce herself and her research assistant, and the purpose of the study was explained. Data was collected for four months, January and October 2020, February and March 2021, until data saturation was reached. The researcher established rapport and trust by immersing herself in the world of the participants which minimised misinformation and distortion of da

3.9.1.3 Debriefing session

The researcher visited the participants before the actual interview to make pre-arrangements briefing session. The researcher would periodically meet with the supervisors to present the study process throughout the the study to reflect on omissions and any biases. Different phases of study were presented with peers who are experts in research, who gave constructive inputs on how scientific research inquiry should be conducted.

3.9.1.4 Independent coding

To ensure credibility, the researcher analysed the collected data, and discussed with the independent coder who is a professor in the University of South Africa. The researcher and the independent coder reached consensus regarding the major themes, themes, and sub-themes.

3.9.1.5 Member checking

According to Candela (2019), member checking necessitates that the researcher follows up with study participants to explain how the findings were interpreted. Allowing participants to correct errors and dispute interpretations of data is one of the purposes of member checking. Member checks help researchers increase the accuracy of their findings, reflect on their topic, and create change. After the findings were finalised and concluded, member checking was done with the participants. The researcher made an appointment to meet with some patients living with diabetes mellitus, professional nurses, and family members who participated in the study to verify the overall interpretation and the meaning of the findings. Member checking assisted the researcher to capture information that was missed during the initial interview. Member checking was also done during validation of the developed support model.

3.9.2 Transferability

The ability of qualitative research findings to be generalised or applied in different situations is referred to as transferability. According to Polit and Beck (2017), transferability refers to the extent to which findings can be transferred or have applicability in other settings or groups. This implies that the study findings give readers or potential researchers assurance that those findings might even apply to various locations and times. To increase transferability, the researcher carefully explained the study background as described in Chapter 1, the key underlying assumptions, and the in-depth description of the context that influenced the research process and its findings. This was done to make it possible for potential researchers to conclude whether the findings of this study are applicable in different situations or times. The researcher collected sufficient and comprehensive data from patients living with diabetes mellitus, family members who stays and assist patients with self-care, professional nurses who provide diabetic care to patients at the CHC's of Limpopo province. The findings were limited to CHCs in Vhembe and Mopani district of Limpopo Province. To select the districts, CHCs, and all of the participant groups, the researcher employed a purposive sampling technique. To collect data from patients with diabetes mellitus, the researcher utilized semi-structured, one-on-one interviews with an interview guide. Central questions were used to collect data from family members and professional nurses. The

researcher in this study further ensured transferability by providing a detailed explanation of the qualitative research methodology, which covers the research design, population, sampling technique, sample size, data collection method, and data analysis.

3.9.3 Confirmability

Confirmability refers to objectivity; the potential for congruency between no less than two free people about the information's accuracy, relatedness, or connotation. It is the extent to which other researchers can review the audit trail and agree that the authors' conclusions are logical. This is equally concerned about employing the data expressed to the information provided by participants and not the researcher's original desires capabilities (Grove & Gray 2019). To ensure confirmability, the study findings were based on the participants' narratives and statements rather than any researcher preconceptions. The researcher made sure that participants shaped the findings more than the researcher did. The researcher double-checked data for objectivity throughout the gathering process. The methodology utilized was thoroughly described by the researcher. Bracketing and epoche was also used by the researcher. In practice, bracketing and epoche are frequently used synonymously. Bracketing and epoche were accomplished to reduce reseacher’s biases. The purpose of bracketing techniques was to reduce the negative effects that preconceptions and presuppositions might have on the study being conducted. Practices that foster curiosity during the epoche allow for the active suspension of presumptions and judgment in a reflective manner (Shufutinsky 2020) The researcher temporarily suspended her, presumptions, judgements and biases regarding the support of adult patients by professional nurses and family members in diabetic care. The data were coded by an independent coder with expertise in qualitative data analysis. The researcher kept safe a written consent forms, audio recorded data, field notes, and transcripts.

3.9.4 Dependability

Dependability refers to the stability (reliability) of data over time and conditions. The dependability question is: would the findings of the study be repeated if it were replicated with the same or similar participants in a similar context? Would its finding be similar? This refers to the stability of data over time (Kings et al. 2020 Dependability was attained by outlining a detailed methodology employed in this study. To achieve this criterion, written consent forms, transcripts, a voice recorder, and field notes that were used to record the interview were kept safe in a personal computer with a password after data analysis. A consensus on the final major themes, themes and sub-themes was reached with the researcher after an experienced independent coder who

was not involved in the study was given the raw data and field notes to independently code the data.

3.10 Ethical considerations

When organising and conducting their studies, qualitative researchers have a moral responsibility to meet the highest ethical standard. Additionally, they must minimise any potential risk to the slightest amount minimal (Creswell & Poth 2016). Research should be based on mutual trust, cooperation, and well-accepted conversation. The fact that human beings are the objects of study in social science brings unique ethical problems. Therefore, the study should get approval and permission to conduct the study from the relevant authorities. Every study is bound to abide by the ethical norms that have been established by law or tradition which stipulates what researchers' responsibilities are to their human subjects, their scientific colleagues, and society, to safeguard the interest of the public (de Vos et al. 201). Ethics are a set of moral principles that are suggested by individual persons or a group of people. They offer rules and behavioural expectations about the most correct conduct towards experimental subjects and respondents, employers, sponsors, other researchers, assistants, and students (de Vos et al. 2018). It is ethics that defines what is not legitimate to do, or what a moral research procedure involves. In this study, all ethical principles were considered and adhered to. Ethical standards were maintained throughout the study.

3.10.1 Permission to conduct the study

The researcher obtained ethical clearance to conduct the study from the University of Venda Ethics Committee. Permission to conduct the study was sought from the University of Venda Higher Degree Committee (Annexure B), the DoH Limpopo Province Research Committee (Annexure F), Vhembe District DoH (Annexure G), Mopani District DoH (Annexure H), and from selected CHCs. Participants ‘consent was obtained as well (Annexure J).

3.10.2 Informed consent

According to Polit and Beck (2017), for participants to give their informed consent, they must be adequately informed about the study's goal, scope, potential questions, use of the results, and safeguards for participants' confidentiality. Participants' right to self-determination can be violated using coercion, covert data collection, and deception. Participants were allowed to choose whether to participate and to withdraw from participating at any time if they feel they cannot continue with the study, without fear of being victimised or penalised (Grove & Gray 2019). The

informed consent form was signed voluntarily after a thorough explanation of the purpose of the study. The participants were guaranteed confidentiality, and their freedom to stop participation without prejudice. The researcher informed the participants whom they can contact for further questions, comments, or complaints.

3.10.3 Confidentiality

Participants were reassured about confidentiality as no personal information will be shared with other people, except for the researcher and supervisors for the sake of the study. No identifying information was entered into the computer. Codes were used instead of correct participants' identities. Biographical information was destroyed quickly. Research findings were described in a way that participants cannot be identified from their responses. The researcher informed the participants that the collected data will be destroyed after three years once the dissertation had been accepted.

3.10.4 Protection of human rights

The protection of human rights in research is imperative in a study. To ensure the safety of human subjects in research, human rights must be protected. Human rights protection in research addresses the ethical responsibilities of the researchers, such as respect for participants, fairness, and justice (Whyte 2019).

- **Principles of justice**

The researcher applied the following principles of justice: the right to fair selection and treatment, the right to privacy, the principle of beneficence, the right to freedom from discomfort and harm, and the right to protection from exploitation. In accordance with the research plan, the researcher fairly chose the participants. Participants were chosen based on the needs of the research, not on their vulnerability or place in society. Individuals were not the target of discrimination or prejudice. Every agreement established with the participants was upheld throughout the study**.**

- **Right to fair selection and treatment**

This aspect concerns the equitable distribution of benefits and burdens of research. The selection of participants was based on research requirements, not on the vulnerability or position of certain people. There was no discrimination nor prejudice against individuals based on culture, social, racial, or sexual orientation. All agreements made with the participants were honoured (Polit & Beck 2017; Grove & Gray 2019).

- **Right to privacy**

Privacy is the freedom people have to determine the time, extent, and general circumstances under which their private information will be shared with or withheld from others. Private information includes a person's attitudes, beliefs, behaviours, opinions, and records. The researcher maintained privacy throughout the study. Privacy was ensured by using codes during data collection instead of using participants' real names (Polit & Beck 2017).

- **Principles of beneficence**

Beneficence is the most fundamental ethical principle in research which imposes the duty of researchers to minimise harm and maximise benefits. (Polit & Beck 2017). The principles cover the following dimensions:

  - **The right to freedom from discomfort and harm**

This is based on the ethical principle of beneficence, which states that one should do good and no harm (Polit & Beck 2017). The researcher minimised the physical harm and discomfort of the participants. Emotional stress was avoided by not asking the participants questions that lead them to reveal sensitive personal information that can cause emotional harm and discomfort. When a participant become upset during an interview, the researcher will end it. If the participant displayed symptoms of distress during the interview, the researcher would provide them with the contact information for the remainder of the study team and remind them that they are welcome to contact any team member if they have any additional questions. Additionally, the researcher would provide a list of phone numbers for counselling or psychological services to the participants. The researcher would speak with the supervisor about the interview. The incident and the actions taken would be recorded in writing.

  - **The right to protection from exploitation**

According to Polit and Beck (2017), the involvement of participants in the study should not place them at a disadvantage or exposed to damage. Exploitation was avoided by not exposing the participants to situations for which they have not been prepared. The interview was conducted within arranged time and venue agreed upon.

3.11 Phase two: Concept analysis

Phase two focused on concept analysis based on the study's findings. Concept analysis is a process of examining the basic elements of a concept. It is ultimately a careful examination and

description of a word or term and its use in the language (Walker and Avant 2019). It is performed to explore a concept's structure and function and to clarify any ambiguous concepts in a theory. Concept analysis was conducted to explore the concept ‘‘support’’ for semantic structure and to clarify the use of the concept in diabetic self-care management, operational definition in this study, and for creation of model to support patients living with diabetes mellitus.

After data analysis the concept of interest was identified and analysed. Concept analysis was conducted on the major categories (concepts) that emerged after data analysis. Based on the procedure for concept analysis by Walker and Avant (2019) the following steps guided the process:

- The researcher selected a concept appropriate to focus on the study.
- The purpose of the analysis was determined.
- The researcher identified the use, characteristics, and connotation of the concept that can be discovered from the dictionaries and literature. The researcher did not limit herself to nursing use of concepts.
- Determination of the defining attributes were read through different instances of the concept, making notes of the characteristic of the concept that appear repeatedly. Thereafter, the researcher decided as to which attributes are the most useful for the aim of the analysis.
- The researcher identified the model case. A model case is a real-life example of the use of the concept that included all the critical attributes of the concept.
- The researcher identified contrary case.
- The researcher identified the antecedents and consequences.
- The definition of the empirical references was done according to Walker & Avant (2019).

The researcher gained a deep understanding of the concepts' attributes. A detailed discussion of concept analysis is done in Chapter five of the study. The concept of "support" was analysed according to (Walker and Avant 2019; Chin and Kramer 2015) steps of concept analysis.

3.12 Phase three

Phase three is the last phase of this study. It is comprised of chapter six (model delevlopment), chapter seven (model validation) and chapter eight (summary, limitations, recommendations, and conclusions) of the study.

3.12.1 Model development

Chapter six is of this study show a developed model to support adult patients living with diabetes in self-care management. Amodel was developed based on the findings of the study. The researcher used the following elements of practice theory as explained by Dickoff et al. (1968): agents, recipients, contexts, dynamics, procedure, and terminus to describe the structure of the model.

Context: The context was viewed from the aspect of the matrix of activity. Context is a setting, location, the physical structure of a unit or medical care, space, time, or structure that constitutes different elements of the situation in which the activity occurs. (Dickoff et al.1968). The context of the model is the CHCs and homes of the patients living with diabetes.

Agent: An agent is a person or any other person/thing who contributes towards the realisation of the goal (Dickoff et al.1968). The agent of the model comprised of external agent (the DoH) and internal agents (professional nurses and family members).

Recipient: A person who receives action from an agent and this activity contributes to a certain goal (Dickoff et al.1968). The recipients for the model comprised of diabetic patients and family members.

Dynamics: These are the power sources for the activity which can be chemical, physical, biological, and psychological for a person or thing to function as an agent, or patient as part of the framework in realising the goal (Dickoff et al.1968). In this study, dynamics were revealed when data was analysed. The dynamics are grouped according to participants of this study; namely: diabetic patients, family members and professional nurses.

Procedure: Refers to how the activity takes place (Dickoff et al.1968). The procedures to be accomplished towards the desired goals are:

- Continuous education of patients living with diabetes mellitus and family members about diabetes mellitus and diabetic self-care management practices.
    - Patient living with diabetes mellitus and family members to be provided with sufficient information about diabetes mellitus and self-care practices.
- Campaigns to empower family members about diabetic management and on how to support a family member who is diagnosed with DM.
    - Family members to support patients living with diabetes mellitus with self-care management practices.

- DoH to supply patients living with diabetes with a healthy diet as well as blood glucose monitors.
    - DoH to supply adequate human and material resource.
- Professional nurses to develop strategies to monitor diabetic self-care practices.
    - There should be in-service training and workshops for professional nurses on diabetic management and diabetes new updates.

Terminus: Terminus is the desired outcome an agent wishes to attain through the procedure; the results to be attained by the agent's action. It is to view activity from the perspective of the endpoint achievement of activity (Dickoff et al. 2008).

3.12.2 Model validation

Chapter seven discuss how the model was validated. Model validation aimed to verify if the support model structure is important, and useful in supporting patients living with diabetes mellitus in self-care management. The model was validated concerning its authenticity and feasibility in the real context. The researcher returned to the study participants to confirm whether what was elaborated on in the actual support model corresponds to what the patients living with diabetes mellitus, professional nurses, and family members experienced in self-care management. Validation was carried out through 10 validators (n=10). The 10 validators were two professional nurses, one doctoral student and one masters' student, two patients, two family members, two operational managers Phd graduates, and two diabetic educators. They were asked to elicit their views and assessments about the extent to which the developed support model reflected the feedback and the response they had offered in the initial data collection phase. The two operational managers and two diabetic educators did not participate in the main study but were also used to validate the support model.

3.13 Summary

This chapter introduced a qualitative approach that was used in the study and a research design that was chosen based on the objectives of the study. The researcher indicated the setting of the study, the population, and how participants were selected. The semi-structured interviews using an interview guide, and a central question that was used to collect data from the participants were delineated. The chapter also outlined how data collection was conducted, analysed, and how ethical considerations were followed and ensured during the study. Chapter 4 presents data presentation, analysis, and interpretation.

CHAPTER 4

DATA PRESENTATION ANALYSIS AND INTERPRETATION

4.1 Introduction

Chapter 3 discussed the methods and design used in this study. This chapter presents collected data, analyses data, and discusses the findings. Before data collection, the purpose of the study was explained to the participants. The purpose of the study was to develop a model to support adult diabetes mellitus patients in self-care management at the CHCs of Limpopo Province, South Africa. Verbal and written consent was obtained from the participants before data collection. The sample included adult patients living with diabetes mellitus, family members who supported with diabetic self-care, and professional nurses who provided diabetic nursing care to patients in the eight CHCs that were chosen for the study. The preferred languages of the participants, Tshivenda and Xitsonga, were employed to collect the data. Central questions were used to collect data from professional nurses and family members. Semi-structured in-depth interviews using an interview guide were conducted to collect the data from participants. The sample size consisted of 42 participants, 15 adult patients living with diabetes mellitus,14 family members and 13 professional nurses. and it was also determined by data saturation.

Data analysis was done using Tesch's eight steps open coding methods. The findings of this study are presented and discussed in this chapter. The findings of the study were interpreted and guided by Orem's self-care deficit theory. Three interrelated concepts namely: self-care, self-care deficit, and nursing systems were used to conclude the findings of the study (George 2011). A literature control was done to validate the findings of the study.

4.2 Demographic data of participants

This section outline participants' demographic data. The participants were identified by codes rather than names, as shown in Table 4.1. Code "P" stands for diabetic patients, "PN" for professional nurses, and "FM" for family members. Demographic information for patients includes age, gender, and duration of the patient living with diabetes mellitus, and treatment, whereas professional nurse includes the duration of providing diabetic health care services at the community health centre. The provided information will assist the readers to understand the source of data.

Table 0.1: Participant's demographic data

Diabetic patients			
Participant's code	**Age**	**Duration of living with DM**	**Treatment**
P1	53	7 years	Tablets
P2	57	17 years	Tablets
P3	54	5 years	Tablets
P4	49	6 years	Insulin and tablets
P5	59	13 years	Tablets
P6	57	14 years	Insulin and tablets
P7	61	10 years	Tablets
P8	56	5 years	Tablets
P9	54	4 years	Tablets
P10	58	4 years	Insulin and tablets
P11	54	11 years	Insulin and tablets
P12	56	8 years	Tablets
P13	55	7 years	Tablets
P14	57	10 years	Tablets
P15	50	11 years	Insulin and tablets
Professional nurses			
Participant's code	Age	Experience in providing health care service for patients living with diabetes mellitus	
PN1	48	11 years	
PN2	58	9 years	
PN3	49	4 years	
PN4	45	8 years	
PN5	54	2 years	
PN6	39	6 years	
PN7	56	11 years	
PN8	42	9 years	
PN9	57	4 years	
PN10	53	11 years	
PN11	51	9 years	
PN12	28	4 years	
PN13	56	8 years	
Family members			

Participants code	Age	
FM1	32	
FM2	34	
FM3	29	
FM4	42	
FM5	48	
FM6	49	
FM7	34	
FM8	42	
FM9	56	
FM10	56	
FM11	32	
FM12	55	
FM13	57	
FM14	43	

4.3 Presentation, analysis, and discussion of the findings and literature control.

The findings of this study covered all the objectives that the researcher had to achieve when exploring the support of adult patients living with diabetes mellitus. Findings are presented in the following tables. Table 4.2 outlines the major themes, themes and subthemes that were developed during data analysis of professional nurses. Table 4.3 outline the major themes, themes and subthemes that were developed during data analysis of the patients living with diabetes mellitus. Table 4.4 outline the major themes, themes and subthemes that were developed during data analysis of family members. Table 4.5 presents the major themes, themes and subthemes that were developed by merging the data from Tables 4.2, 4.3, and 4.4 of this chapter. The major themes, themes and sub themes that were developed were merged based on the similarities of the information that was collected from three groups of the participants namely: Professional nurses, patients living with diabetes mellitus and family members.

Table 0.2: Major themes, themes, and subthemes developed from data collected from professional nurses

Major themes	Themes	Subtheme
Support of patients living with diabetes mellitus	Health education on self-care practices	• *Recommended diabetic diet* • *Measurement of blood glucose* • *Adherence to Medication and care of medication* • *Annual eye examination* • *Proper feet care* • *Recommended exercises* • *Weight control* • *Follow up visits*
	Support of patients and family members	• *Emotional support of patient* • *Education of family members*
Challenges	Challenges related to management of diabetes	• *Uncontrolled blood glucose levels* • *Non-adherence to medication* • *Lack of human resources*

Table 0.3: Major themes, themes and subthemes developed from data collected from patients diagnosed with diabetes mellitus

Major Themes	Themes	Sub-themes
Compliance to diabetic self-care management	Dietary practices	• *Compliance to healthy diet.* • *Compliance to food measurements and eating frequency*
	Adherence to medication	• *Adherence versus non-adherence to medication*
	Physical care	• *Feet care* • *Eye care* • *Exercises* • *Weight control* • *Monitoring of blood glucose*
Challenges experienced by patients.	Barriers to self-care practices	• *Lack of resources* • *Support versus lack of family support.* • *Insufficient information about self-care.*
	Sexual challenges	• *Low self esteem* • *Loss of sexual interest*
	Physical challenges	• *Feet challenges* • *Poor eyesight*
Anticipated support	Types of needed support	• *Patients' education* • *Family members' education* • *Emotional support*
Received support	Support from professional nurses	• *Diabetic education* • *Medical support* • *Emotional support* • *Exercises support*
	Support from family members	• *Medical support* • *Dietary support*

Table 0.4: Major themes, themes, and subthemes of data collected from the family members

Major theme	Themes	Subthemes
Support of patients	Support on patient's self-care management	• *Diabetic diet* • *Medication* • *Monitoring of blood glucose levels* • *Eye care* • *Foot care* • *Exercises* • *Follow up visits* • *Confidentiality* • *Spiritual support*
Support of family members who support adult patients living with diabetes mellitus	Support needed by family members	• *Forums for family members* • *Education of family members about diabetes mellitus* • *Diabetic education Campaigns*

Table 4.5 present the major themes, themes and subthemes of the merged data collected from professional nurses, patients living with diabetes mellitus and family members.

Table 0.5: Merged major themes, themes, and subthemes of Tables 4.2 Professional nurses, 4.3 Patients, and 4.4 family members

Major Themes	Themes	Sub-themes
1. Self-care practices.	1.1 Lifestyle interventions	*1.1.1 Adherence and non-adherence to the monitoring of blood glucose, dietary practice, and medication* *1.1.2 Physical care* *1.1.3 Weight control*
2. Challenges related to diabetic self-care management	2.1 Social challenges	*2.1.1 Lack of resources* *2.1.2 Insufficient information about self-care.* *2.1.3 Poor self esteem* *2.1.4 Sexual challenges*
	2.2 Physical challenges	*2.2.1 A poor sensation* *2.2.2 Painful legs* *2.2.3 Poor eyesight*
3. Support of patients living with diabetes mellitus	3.1 Sources of support	*3.1.1 Professional nurses* *3.1.2 Family members*
	3.2 Types of needed support	*3.2.1 Diabetic education* *3.2.2 Dietary support* *3.2.3 Medical* *3.2.4 Emotional*

4.3.1 Major theme 1: self-care practices

Self-care practices are the practices that individuals initiate and perform to maintain their life, health, and well-being (George 2011). This major theme focuses on the self-care activities of patients living with diabetes mellitus in a home setting and is composed of one theme namely: lifestyle interventions.

4.3.1.1 Theme 1.1: Lifestyle interventions

This theme reveals different lifestyle interventions that patients living with diabetes mellitus should observe and comply with throughout their life. The focus was on monitoring of blood glucose levels, dietary practices, adherence to medication, weight control, exercises, eye care and feet care practices. The theme comprises of three sub-themes namely:

- Adherence and non-adherence to monitoring of blood glucose, dietary practice and medication.
- Physical care.
- Weight control.

4.3.1.1.1 Subtheme 1.1.1 Adherence versus non-adherence to monitoring of blood glucose, dietary practice, and medication.

This sub-theme focuses on adherence and non-adherence to blood glucose monitoring, diet, and medication by patients living with diabetes mellitus. According to Kubica et al. (2017) adherence is the extent to which a person's behaviour of taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a healthcare provider. In contrast, non-adherence is a process in which the patients actively decide not to use treatment or follow treatment recommendations (Pathak et al. 2021). According to Mathew and Tadi (2021), blood glucose monitoring, diet, and diabetic treatment cannot be separated, because before a patient living with diabetes mellitus could eat, he/she should monitor the blood glucose, eat food, and thereafter take medication or instead monitor blood glucose, take medication, and afterward eat food depending on the type of insulin that the patient is using.

Monitoring of blood glucose

Monitoring of blood glucose is among the lifestyle interventions which is particularly important in diabetes management (Jin et al. 2022). It is important for patients living with type 1 or type 2 diabetes mellitus to constantly monitor their blood glucose. The SEMDSA diabetes management

guidelines outlined that patients who inject insulin 2–4 times a day should perform self-monitoring of blood glucose (**SMBG**) at least 3 times a day. In addition, more intensive testing is necessary for certain situations, such as acute illness, periods of poor glycemic control, fasting and in a frequent hypoglycemic situation. For patients living with diabetes mellitus on oral medication, self-monitoring of blood glucose should be done at least 3–5 times a week (Webb 201). Therefore, it is the duty of the professional nurses to check patients' blood glucose levels at CHCs and to teach diabetes patients and their family members or other caregivers how to check their blood glucose levels at home.

Professional nurses

When a patient is newly diagnosed with diabetes mellitus or returns to the community health centre for follow-up care, one of the procedures that professional nurses teach and perform is monitoring of blood glucose levels. The professional nurses explained that they continuously monitor the patients' blood glucose levels during follow-up visits and that every year they monitor blood glucose level for control purposes.

One professional nurse indicated:

> *"We constantly monitor patients' blood glucose during follow-up visits and the blood glucose is controlled every year. When the patient's blood glucose is not well controlled, that is when it is above 7 mmol/L, the patient is removed from the club of patients whose blood glucose is well controlled, and the patient is advised to attend follow up visits monthly."* (PN1, female, 48 years old).

Another professional nurse pointed out:

> *"We teach newly diagnosed patients together with their families on how to monitor blood glucose levels, and advise the patients to do follow-up visits regularly as arranged so that we monitor their blood glucose levels regularly here at the community health centre"* (PN5, female, 54 years old).

This denotes that professional nurses regularly monitor the blood glucose levels of the patients during follow-up visits, and once per year for control purposes. In support of the study findings, Gordon (2019) indicated that appropriate and timely monitoring of blood glucose allows for the successful management of blood glucose that is within normal ranges, preventing diabetic mellitus-related complications.

Patients living with diabetes mellitus

The findings of this study revealed that some of the patients adhered to the practice of monitoring their blood glucose level at home, whereas some could not adhere. The following quotes from the participants support the findings.

One patient indicated:

> *"I check my blood glucose two times a day before breakfast and before supper, but sometimes I check it once a day depending on the availability of needles and blood test strips"* (P6, female, 57 years old).

Another patient said:

> *"I check my blood glucose before and after I exercise to determine whether exercise is safe for me before I exercise. I also measure my blood glucose before and after eating"* (P15, female, 50 years old).

However, while other patients living with diabetes mellitus could monitor their blood glucose in the comfort of their homes, others could not adhere to the monitoring of blood glucose as required. The findings imply that some patients monitor their blood glucose levels constantly. Whereas to some patients, monitoring of blood glucose levels was determined by availability of needles to prick the fingers from which the blood will be obtained for monitoring of blood glucose levels.

One patient said:

> *"I do not monitor my blood glucose at home. I do not have a blood glucose monitoring machine. I do not have money to buy a blood glucose monitoring machine. My blood glucose is monitored by nurses when I go to the clinic to fetch medication"* (P1, female, 53 years old).

Another patient added:

> *"My blood glucose is monitored once a month when I go to collect my medication at the health centre. I do not have glucose monitors at home, and I do not have money to buy a machine that is used to test the blood glucose levels"* (P13, female, 55 years old).

The findings of this study revealed that some patients living with diabetes mellitus were able to monitor blood glucose at home as advised. Some of the patients could not monitor because they did not have blood glucose monitors. Most of the patients had their blood

glucose monitored during the follow-up visits at the CHCs. The socioeconomic context of some patients makes it difficult for them to adhere to self-care practices such as blood glucose monitoring. The findings concur with Tewahido and Berhane (2017); Bonger et al. (2018) who discovered that the majority of diabetic patients did not self-monitor their blood glucose levels at home. Tewahido and Berhane (2017) also provided an overview regarding inconsistency in blood glucose level measurement that has been identified as a major issue in Sub-Saharan African countries. This has been linked to a shortage of glucose testing machines. According to Lewis et al. (2014), self-monitoring of blood glucose enables the patients to make self-management decisions regarding diet, exercises, and medication. Meetoo et al. (2018) outlined that self-monitoring of blood sugar levels can assist diabetic patients to identify hyperglycemia and hypoglycemia and empower them to make changes to enhance their glycemic control.

Family members

Monitoring of patients' blood glucose level at home was not solely the responsibility of the patients. Some of the family members supported the patients by assisting in the monitoring of blood glucose levels only when they are sick. The following statement by family members indicate the support they provided:

One family member said:

> *"My mother monitors her blood glucose levels on her own. I only monitor her blood glucose when she is not well. I monitor her blood glucose levels three times a day, in the morning, during the day and in the afternoon. If her blood glucose level is high, I advise her to drink water to reduce it to normal level"* (FM2, female, 32 years old)**.**

Another family member supported:

> *"I monitor my mother's blood glucose levels once a day, or if she looks ill. I record her blood glucose levels in the diary. I was advised to buy a small diary by nurses, so that I record her blood glucose levels regularly"* (FM3, female, 29 years old)**.**

Though some family members have specified their positive support in monitoring blood glucose levels of their members who are living with diabetes mellitus, it was not the same with other family members. The following quotes from the family members support the findings*:*

One family member responded that:

> *"There is nothing we do to monitor my mother's blood glucose levels. We do not have a machine to monitor blood glucose at home."* (FM6, female 49 years old).

Another family member added:

> *"I do not monitor his blood glucose at home, there is no blood glucose monitoring machine at home. His blood glucose is monitored when he goes to the health centre to fetch medication"* (FM9, female, 56 years old).

The findings therefore show that, some of the family members who had blood glucose monitors at home, monitored the patient's blood glucose levels as required, and according to the availability of monitoring equipment; whereas others could not because they did not have blood glucose levels monitors at home. The above quotations are supported by the findings of the study conducted in Mexico City, which showed that only some participants monitored blood glucose levels and other participants did not monitor their blood glucose due to a lack of blood glucose monitors (Wittermore et al. 2019).

Dietary practices

Dietary practice in patients living with diabetes mellitus refers to eating healthy food and constantly eating a meal at a regular time, (Viswanathan et al. 2019). Dietary practice is an essential component in diabetes self-care management. It includes adhering to the designed dietary and individualised plan per patient needs, with regular monitoring by the registered dietician and diabetologist (Viswanathan et al. 2019). It includes intake of food such as fruits and vegetables, wholegrain, all types of fish, legumes, low-fat sugar-free dairy products, and vegetable fats. In this study, it was established that professional nurses and nutritionists are responsible for advising patients about healthy dietary practices to be followed. The professional nurses explained that amongst the nursing interventions that they provide to patients with diabetes mellitus in the CHCs, nutritional counselling was the most common intervention offered to control blood glucose levels. The findings are confirmed by the following participants:

Professional nurses

The study findings show the primary point of contact with patients at the CHCs is professional nurses. As a result, in the absence of the nutritionists, professional nurses advise patients living with diabetes mellitus about healthy eating so that they are aware of the importance of adhering

to healthy nutrition fundamentals and to choose healthy food in order to keep blood glucose levels within normal ranges. Quotes from professional nurses are used to support the findings:

One Professional nurse said:

> *"In the absence of a nutritionist, I take nutritionist's role of teaching patients about the healthy diet. Patients are also given pamphlets and a picture of a dinner plate that shows how they should measure the meal portions at home before they eat,"* PN2, female, 58 years.

Another professional nurse explained:

> *We teach patients living with diabetes mellitus about the following: the diabetic diet they should eat, to eat porridge that is of their fist size with vegetables, to avoid fats and sugar in their diet, to drink tea without sugar, to eat three times a day, in the morning, afternoon and evening, with snacks in between. Snacks like two slices of brown bread and fruits in between the meals. To avoid large meals and too much starch in the diet*'' (PN6, female, 39 years old).

The professional nurses revealed that they teach patients living with diabetes mellitus about healthy diet. Professional nurses emphasised that patients are equipped with the information that helps them to follow the correct healthy diet, how to measure food before eating and the wrong diabetic diet is discouraged. They further pointed out that patients are referred to a nutritionist so that they get advice regarding healthy diet. The findings are supported by a study conducted in England, where professional nurses indicated that they educate patients about diabetic diet, (Dambha-Miller et al. 2020).

Patients living with diabetes mellitus

The findings show that some patients followed healthy dietary practices as advised by professional nurses and dietitians. Considering avoidance of food that increases the blood glucose levels was important to some diabetic patients. However, some patients did not adhere to healthy dietary practices due to financial constraints. The following quotes from diabetic patients attest to the findings of this study.

One patient indicated:

> ‘‘*I prefer fat free diet, avoiding dairy products. No sugar is added to my food; I get sugar from fruits. I observe the food that I eat to monitor if they increase my blood glucose levels or not”* (P13, female, 55 years old).

Another patient added:

> *‘‘I take food as advised by the professional nurses. I eat at the right time, the right amount of porridge, one piece of meat, two slices of brown bread, and one green apple if it is there’’* (P9, female, 54 years old)**.**

Good dietary practice was mentioned by some patients living with diabetes mellitus. Patients were adhering to healthy diet and times of eating as advised by professional nurses. The findings symbolise that healthy diet was considered vital by some patients. The findings are supported by Werfalli et al. (2020) who found that some patients adhere to healthy dietary practices. In support of healthy dietary practices, Chinaza et al. (2020) indicated that keeping a healthy diet, such as low fat, low-calorie, and very low-carbohydrate diet, is critical in the prevention and management of diabetes mellitus. In addition, Diriba et al. (2020) outlined that the World Health Organization recommends eating a nutritious diet rich in fruits, vegetables, legumes, nuts, and whole grains, as well as consuming less than 10% of total energy from free sugars, 30% of total energy from fats, and fewer than 5 grams of iodised salt.

Even though some family members and patients living with diabetes mellitus confirmed healthy dietary practices. Some patients had difficulties in adhering to healthy dietary practices due to different reasons such as lack of money to buy healthy food, incorrect ways of preparing food, and eating a bulk of food at a time. The subsequent quotes from participants support the findings:

One patient explained:

> *"I do not have enough money to buy fruits and other diabetic food. Salt is added to my food, and little oil is added to my food. Sometimes when my wife cooks, she adds too much salt; when I tell her that she added too much salt, she says the salt is not too much. I eat the chicken without removing the skin because I did not know that I should remove the skin before I eat. I drink coke zero and juice, but I add water to the juice and coke zero before I drink to dilute the sugar. Nurses said I should not eat big portions of porridge. I should eat porridge that is equivalent to my fist, but I am unable*

to do that. I eat more than the recommended portion, especially when I am hungry, I eat a lot. When I eat pap with (guxe, okra) " guxe is type of a vegetable" I eat until my stomach gets full'' (P2 male, 57 years old).

Another patient added:

''*I cannot lie, though I was taught how much I should eat, sometimes I eat more than what I should eat. I sometimes measure the amount of food as instructed by the nurses; the nurses informed me that I should eat food that is of size my fist. If during the day I have eaten more than I should eat, I do not eat supper''* (P8 male, 56 years old).

These findings revealed that though other patients living with diabetes mellitus can adhere to healthy dietary practices, some find it difficult to keep to such practices. Other studies corroborate these findings. In support of these findings, a study conducted in Mexico revealed that some patients with diabetes mellitus had difficulties in affording a diabetic diet (Whittemore et al. 2019). The findings of this study are also like those of a study conducted in Ethiopia, which indicated that some diabetic patients did not follow the WHO recommended diabetic diet (Bonger et al. 2018). The findings are further supported by a study conducted in Greece that also showed that patients with type 2 diabetes mellitus exhibited low compliance to the dietary recommendations for DM (Katsaridis et al. 2020).

Family members

Some family members also confirm that they support diabetic patients to adhere to good dietary practices. The statements from the family members bear out as follows:

One family member said:

"I boil or roast most of the food he eats. I do not put too much salt in his food; I was advised to put a little salt in his food. I give him two slices of bread and soft porridge in the morning at 10h00. He does not drink tea with sugar and drinks plenty of water."(FM4, female, 42 years old)**.**

Another family member affirmed:

''*We buy for him vegetables (muroho) and cook for him other vegetables he eats raw as green salad dressed with fat-free salad dressing. He likes to eat vegetables'' (*FM5, female, 48 years old).

Findings show that family members provide support by buying food for patients living with diabetes mellitus. Some assist by preparing recommended diabetic diet and serving meals to the family members who are living with diabetes mellitus. Amed and Yeasmeen (2016) support the findings of this study explicitly by revealing that family members supported diabetic family members by preparing diabetic-recommended food that assisted in controlling the blood glucose level of their family members who lived with diabetes mellitus. Kristianingrum (2018) further indicated that family support included daily self-care practices which includes healthy diet preparation.

Antidiabetic medication

Common diabetic medication consist of insulin injections and oral hypoglycemic agents. These remain the primary medication in diabetes management (Ng & Gupta 2020). Acquah et al. (2022) indicate that the intake of antidiabetic drugs has beneficial effects on blood glucose regulation. The findings of the study indicate that some of the patients living with diabetes mellitus adhere to antidiabetic medication, whereas some did not entirely stick to it. This is shown by the participants' quotes:

Professional nurses

In South Africa, licensed professional nurses are authorised to prescribe and recommend medication for some ailments and diabetic medication other than insulin injection. They have the responsibility to advise patients living with diabetes mellitus to adhere to diabetic medication. The professional nurses pointed out that though diabetic patients are advised to take medication as prescribed, some patients do not adhere to medication as advised. The following quotations from the participants corroborate the findings:

One professional nurse indicated that:

> *"Some patients do not adhere to the times for taking medication; though we advise them to take medication as prescribed. Some of the patients come for follow-up visits without taking their medication, saying they will take medication when they see cows being released to the forest for grazing"* (PN2 male, 58 years old).

Another professional nurse added:

> *"There are patients who do not follow the doctor's prescription; some patients they take medication using their own discretion. Sometimes we come across patients who take one tablet instead of taking three tablets per day''* (PN5 female, 54 years old).

These findings show that adherence to diabetic medication in some patients is compromised due to different reasons as stated by participants. In support of the findings of the study Atinga, Yarney and Gavu (2018) in their study, found that most of the participants' forgetfulness compromised adherence to medication schedules. The findings of the study differ from the findings of the study conducted in Thailand, where most diabetic patients showed adherence to medication (Jiraporncharoen et al. 2020).

Patients living with diabetes mellitus

One patient indicated:

> ''*I wake up in the morning, prepare a small amount of porridge, and eat; after 5 minutes, I take medication for diabetes mellitus and drink a lot of water. In the afternoon and for supper I eat pap that is equal to my fist with vegetables or one piece of chicken or 2 eggs then take my medication''* (P1, female, 53 years old).

Another patient added:

> *''I wake up in the morning, at 6h30 and prepare breakfast, inject insulin, take medication for hypertension, then continue with my house chores''* (P6, female, 57 years old).

Undesirable findings show that some patients living with diabetes mellitus do not adhere to medication, but they skip medication because they forget, resulting in non-adherence to diabetic medication. Forgetfulness was one of the causes of non-adherence. The following excerpts from

One patient said that:

> *''Because I am old, I sometimes forget to take medication, my grandson is the one who remind me''* (P2, male, 57 years old).

Another patient indicated that:

> *''I take my tablets in the morning and evening after eating, but sometimes I forget to take my medication''* (P13, female, 55 years old).

Family members

The family members play important role in supporting patients living with diabetes mellitus to adhere to self-care practices. The findings revealed that the family members support the patients to adhere to the medication through reminding them when they forget to take medication and monitoring the blood glucose levels.

One family member specified:

> *"I also monitor if she is taking her medication. But she takes the medication on time without assistance, she is not reminded to take her medication"* (FM 2, female, 34 years old).

Another family member alluded:

> *"He takes his treatment in the morning at 7h00 and evening at 19h00 before he eats"* (FM 4, female, 42 years old).

Findings showed that some patients' adherence to diabetic medication was good. Patients living with diabetes mellitus took medication voluntarily, routinely, and at the right time. When patients take diabetic medication, they also take medication for other chronic conditions such as hypertension. These findings concur with the study done by Yin et al. (2019) in China who revealed that diabetic patients take their prescriptions exactly as prescribed.

4.3.1.1.2 Subtheme 1.1.2: Physical care

Physical care is one of the important lifestyle interventions in diabetic self-care management. It includes exercises, feet care, and eye care. The findings revealed that some participants followed some of the physical care practices, while others did not.

Exercises

Exercises are a form of structured physical activity that has been recommended as the key component of lifestyle management for patients with type 2 diabetes and concurrent overweight (Zhao 2021). Exercise is the vital part of lifestyle therapy for the prevention and management of diabetes. Exercise, together with medical nutrition therapy, are cornerstones of diabetes therapy. Adults with diabetes are advised to engage in two to three sessions of resistance exercises per week in addition to at least 150 minutes of moderate-to-vigorous weekly aerobic activity. Regular exercise lowers blood pressure, improves insulin sensitivity and glucose control and optimises the lipoprotein profile in addition to preventing and minimising weight gain. The findings revealed

that some diabetic patients preferred structured exercises such as walking around and jogging. Study findings are supported in the following excerpts by participants.

Professional nurses

Professional nurses also reported encouraging supportive behaviour toward exercises. Professional nurses explain how they support patients living with diabetes mellitus concerning exercise.

One professional nurse indicated that.

> *"I encourage the patients to do moderate exercises such as walking and dancing or exercises they feel comfortable to do"* (PN 5, female, 54 years old).

Another professional nurse supported:

> *"I encourage patients to do exercises according to their ability, importance and consistence throughout their life"* (PN3, female, 49 years old).

The findings of this study showed that although the duration of exercise is not stressed, professional nurses do view exercise as a crucial self-care practice for patients living with diabetes mellitus. The study's findings are corroborated by a study done in England, where professional nurses thought that motivating diabetic patients to exercise was crucial for managing diabetes mellitus. (Dambha-Miller 2020).

Patients living with diabetes mellitus

One patient said:

> *"Now that I cannot run because of my age, I go to the soccer playground to do walking exercises. I walk fast; I walk 10 rounds around the soccer ground with another lady who joined me"* (P6, female 57 years old).

Another patient explained:

> *"Professional nurses advised us to do exercises. We used to do exercises here at the community health centre, but we stopped. Every morning I do jogging with my friend for about 1 hour every day"* (P12, female, 56 years old).

Another patient added:

> *"I sometimes jog for 45 minutes a day on the soccer ground with my friend"* (P13, female 55 years old).

These findings show that some patients living with diabetes mellitus conform to exercises as one of the self-care practices to manage diabetes mellitus. Contrasting to the findings of this study, a study that was conducted in South Africa revealed that some diabetic patients performed exercises poorly due to a lack of motivation (Birkinshaw, 2018; Thabo, 2018). Furthermore, Karthik, (2020) in Chennai, India reported that most patients living with diabetes mellitus did not engage in scheduled regular exercise, instead, they considered ordinary household duties to be regular activities.

Family members

Some good supportive behaviours towards physical activity were also reported by family members. The following quotes from family members corroborate the findings.

One family member said:

> *"My mother does not have both legs, therefore we assist her to exercise the arms, hands, and chest. We do those exercises according to her ability. We do not have a specific time of exercising; she exercises within her capabilities, and if she becomes fatigued, we stop"* (FM3, female, 29 years old).

Another family member indicated that:

> *"We have a bicycle at home that my husband uses for exercise. I always encourage him to exercise using a bicycle. He cycles for an hour every day, which is the only exercise that he does" (*FM4, female, 42 years old).

The findings revealed that some family members are interested in supporting patients living with diabetes mellitus during exercises. Pesantes et al. (2018) corroborate with the findings in this study by outlining that family members encouraged patients to exercise, and some family members escort diabetic patients on walks as part of their efforts to engage in recommended physical activity.

Feet care

According to Qasim et al. (2021), feet care in patients living with diabetes mellitus means washing of feet with water, drying them completely, and applying lotion around the feet excluding in between the toes. Avoiding walking barefoot, always wearing well-fitting socks and shoes or slippers to avoid injury. Daily check for cuts, sores, swelling and infected toenails (Qasim et al. 2021). In patients living with diabetes mellitus, foot care is imperative to prevent foot-related complications such as lower limb amputation Professional diabetic nurses, diabetic patients, and family members who assist diabetic patients with self-care are all involved in feet care of diabetic patients. The findings showed proper and partial feet care in some participants whereas others reported improper practices. The findings are confirmed by participants.

Professional nurses

Professional nurses take responsibility to teach patients living with diabetes mellitus on how to take care of their feet. Patients are advised to bath, to dry their feet thoroughly. They are also advised about the types of shoes they should wear, and to follow safety measures such as inspection of the shoes before wearing and to avoid walking around without putting on shoes to avoid unexpected injuries. Wearing shoes that are excessively tight might cause a blister or other minor wounds that could develop into a life or limb-threatening infection.

One professional nurse responded:

> *“I teach the patients how they should take care of their feet. They are educated to wash their feet with warm water and soap, dry them, and apply body lotion daily. Patients are advised not to walk barefooted to avoid pricks which may result in an injury or wound. We also advise them to avoid wearing tight-fitting shoes. To check the inside of the shoes to identify foreign objects than can injure feet before wearing”* (PN 1, female, 48 years old).

Another professional nurse added :

> *"Patients are educated on how to take care of their feet. Patients with diabetes mellitus develop sores due to poor blood supply to the lower and upper limbs. We teach them how to prevent foot injuries and wounds, not to walk without shoes, and to wear proper fitting shoes”* (PN2, female, 58 years old).

The findings revealed that professional nurses teach patients living with diabetes mellitus measures to take care of their feet daily. Patients are educated on how to prevent foot injuries

and adhere to all measures of foot care. The findings of the study are affirmed by Schaper et al. (2020) who said diabetic patients should be educated to do physical examinations and take care of their feet. Additionally, they should get instruction on several basic guidelines that can be followed to help prevent foot ulcers or their recurrences. For example, checking shoes before putting them on, keeping feet clean, and continuing to take care of their skin and nails (Bus et al. 2020).

Patients living with diabetes mellitus

Responses that show partial feet care practices were observed from other patients living with diabetes mellitus to some patients bathing the feet and application of body lotion was considered as the only practice for feet care. Some patients indicated that they do not have information about safe practices to prevent feet injury. Some were having acceptable information about feet care. The following responses from diabetic patients support the findings on feet care practices.

One patient articulated that:

> *"I bath my feet with soap and warm water, and apply lotion on daily basis, that is all I do to take care of my feet''* (P3, female, 54 years old).

Another patient added:

> *''I bath my feet and dry in between my toes. Nurses have advised me to clean and dry my feet immediately after bathing. I was never advised to avoid wearing tight-fitting shoes''* (P10, male, 58 years old).

A positive response from another patient:

> *''I do massage to my legs once or twice a week. Avoid walking barefoot and avoiding prick injuries by wearing protective shoes when I do gardening. I do not scrub with stones; I dry in between the toes and apply body lotion''* (P15, female, 50 years old).

An undesirable response was recognised from another patient who responded:

One patient said:

> *"I wash my feet and wear boots. I once burnt my feet when I put them inside the hot sand to relieve the burning sensation as instructed by the prophet at Zion Christian Church (ZCC). Sometimes my feet get better if I put them inside hot sand''* (P2, male, 57 years old).

Another patient indicated that:

> ‘‘*I take care of my feet by letting the priest prick my feet to release too much blood to aid with the healing process because my feet are always painful, that is the only thing I do to take care of my feet’’* (P12, male, 56 years old).

The findings show that patients do not have sufficient information concerning feet care. In light of this study findings, diabetic patients should be educated about proper care of feet, to prevent feet complications. The following literature corroborates the findings of this study: in their study, Miikkola et al. (2019) revealed that foot self-care was adhered to and valued by diabetic patients. However, Karthik et al. (2020) conducted a study in Chennai; Hirpha et al. (2020) in Ethiopia; Mohammed et al. (2020) in Saudi Arabia, those studies respectively reported poor foot care among patients living with diabetes mellitus.

Family members

Some family members support patients living with diabetes mellitus with feet care, whereas some did not. Family members who were involved in supporting patients living with diabetes mellitus in the home context were spouses and daughters who stay with their parents. Some family members wash, dry the feet and apply lotion on the feet of their family members who living with diabetes mellitus. They make it a point that they observe the feet for any injuries and wounds. The following quotes from family members confirm these findings.

One family member said:

> *‘‘I help my husband with the washing of feet because he is very sick, he cannot wash. I make sure that he dries thoroughly in between the toes and apply lotion on his feet. Every day I check his feet if he does not have blisters or wounds. If he has developed wounds, I clean the wounds and dress them’’* (FM8. female, 42 years old).

Another family member stated that:

> *"I make sure that my parents bathe their feet, dry thoroughly in between the toes, and apply lotion over the feet except in between the toes. I check their feet for any abnormalities such as sores, making sure that they wear well-fitting shoes, and avoid walking around without shoes to avoid injuries that can result in wounds that will not heal quickly. The water that they use for bathing we make sure that is not too hot to avoid burns as advised by the doctor’’* (FM12, female, 55 years old).

During the interview, the researcher discovered that while some family members have information on how to support patients with regard to foot care, some of the family members lacked insights as to how foot care ought to be performed. The following statements bear the evidence of the findings.

One family member indicated that:

> *"I do not do nothing except to help my mother with bathing her feet and apply body cream or lotion."* (FM1, female, 32 years old)**.**

Family member stated that:

> ‘‘*There is nothing I do to assist in feet care because my husband does not complain of feet problem’’* (FM4, female, 42 years old)**.**

These findings show that not all family members have got knowledge on how to support patients living with diabetes mellitus in taking care of their feet. They further explained that lack of knowledge on how to properly take care of the feet, contribute to a lack of family support towards diabetic. These positive and negative findings are supported by the following literature. The positive findings by Aslan (2021) have specified that family members advise individuals with diabetes about care of the feet, and they also provide support to achieve such care. According to Yusuf (2021), family members do not support their family members who are diagnosed with diabetes mellitus to take care of their feet.

Even though professional nurses teach patients how to take care of their feet, the findings imply that they did not take the time to ensure that the patients understood what they had been taught, because patients took improper care of their feet. Therefore, professional nurses who are in charge of caring for diabetic patients should view patients and their family members as a whole and educate them to anticipating problems that could develop in patients' feet and what they should do.

4.3.1.1.3 Subtheme 1.1.3: Weight control

According to Radwan et al. (2019) weight control is the effort to achieve and maintain normal weight according body mass index through healthy diet and exercises. Careau et al. (2021) indicated that weight control involves keeping a balance between the energy, and calories consumed in food, and calories expended in physical activity. Weight control is one of the lifestyle interventions in the management of diabetes mellitus. In this study, weight control was considered vital by professional nurses, patients living with diabetes mellitus, and family members.

Professional nurses

Professional nurses emphasise the issue of weight control to the patients through constant physical exercise such as gardening, dancing, healthy diet, to manage diabetes mellitus. Consitt (2019) specified that exercise has been found to enhance glucose uptake and insulin sensitivity. The following quotes from professional nurses attest to these results:

One professional nurse confirmed:

> *"We give health education to the patients regarding body weight control. Patients are advised to do exercises such as walking, dancing, and gardening four hours a week, and to use a low-fat and carbohydrate diet"* (PN4, female, 45 years old).

Another professional nurse supported:

> *"I also teach patients about body weight control. Patients are advised to avoid saturated fats and to do regular exercises"* (PN5, female, 54 years old).

The findings of the study revealed that professional nurses advised diabetic patients to control weight through exercises, to manage diabetes effectively. According to Walsh et al. (2019), professional nurses counsel diabetic patients on how to reduce weight through exercises and a healthy diet.

Patients living with diabetes mellitus.

Patients living with diabetes mellitus control their body weight by doing exercises and eating healthy diet as advised and recommended by nutritionist and the professional nurses. They avoid consuming unhealthy diet. The findings were supported by patients as follows:

One patient explained:

> *"I control my weight by exercising. Eating vegetables and fruits, and avoiding fats and carbohydrates. This helps me in the management of my weight. I eat boiled eggs"* (P15, female 50 years old).

Another patient said:

> *"I keep my weight under control by exercising and avoiding cooking oils as well as high-fat meat"* (P14, female, 57 years old).

The findings revealed that patients living with diabetes mellitus are conscious and keen to control weight. Embarking in exercises and avoiding fats and oils in their meal demonstrated a positive

practice toward weight control. Study findings are supported by Halali et al. (2022) in Finland who revealed that some people diagnosed with diabetes mellitus had sought to reduce weight at some point in their lives.

Family members

One family member explained that:

‘‘There are different exercises that I do with her so that she can lose weight and increase blood circulation. At home there are stairs.; I climb stairs with her and walk down stairs at least two times a day. The following day we do hands exercises; hands up, down, to the fore, sideways and to waist level. She places hands on waist level, she bends down and touch the toes. She stands on her toes balancing herself with a couch or chair’’ (FM1, female, 32 years old).

Another family member added that:

‘‘My husband does not like to exercise. What I do is to advice him to walk around after a long time of sitting or sleeping. I always tell him that for him to loose weight, he should exercise everday for 45 minutes. ’’ (FM5, female, 48 years old).

The findings revealed that family members support and encourage patients living with diabetes mellitus to lose weight through exercises. Though some patients do not like to exercise, family members persist and try to make an awareness of losing weight to diabetic patients they stay with. Family members consider exercises as an important practice in the management of DM. In support to the study findings Pesantes et al. (2018) indicate that family members influence diabetic patients’ everyday behaviour to maintain good health, they frequently remind patients to engage in exercises such as walking and climbing stairs to control body weight.

4.3.2 Major theme 2: Challenges related to diabetic self-care management

According to Baporikar (2020), a challenge is something that, by its very nature or character, serves as an invitation to exert extra effort, a demand to explain or justify an action or a problem in a stimulating endeavour. This major theme focuses on the challenges related to self-care management of the patients living with diabetes mellitus. The findings of the study revealed that patients living with diabetes mellitus like other patients living with chronic diseases are faced with challenges related to diabetic self-care management. This major theme is composed of two themes, namely: social challenges and physical challenges.

4.3.2.1 Theme 2.1: Social challenges

Social challenges are those situations or actions that have negative effects on people's lives and in their places of employment. Diabetes mellitus is known to influence the social well-being of patients living with diabetes mellitus (Bhagavathula et al. 2018). This theme is composed of four subthemes, namely: lack of resources, insufficient information about self-care, poor self-concept, and sexual and reproductive concerns.

4.3.2.1.1 Subtheme 2.1.1: Lack of resources

According to Lister (2021), a lack of resources means a lack of time, human resource, and money. This subtheme outlines lack of other essential resources that patients living with diabetes mellitus require to manage diabetes mellitus efficiently. The findings revealed that a lack of resources affects self-care practices and effective support of other patients. Most of the participants lacked money to purchase blood glucose monitors. Self-monitoring of blood glucose levels increases patients' awareness of glucose values, which determines the choice of healthy lifestyles and adherence to diabetic self-care practices. Affording healthy food that is important in the management of blood glucose levels was also found to be a challenge to patients living with diabetes mellitus. The findings also showed that management of diabetes is also hampered by a lack of resources. Instead of having a healthy diet, to some diabetic patients, the option was to eat the same food daily resulting in loss of appetite. This is indicated by participants who responded as follows:

Professional nurses

Professional nurses at the CHCs also confirmed the lack of a blood glucose level monitors as a challenge. They indicated that most diabetic patients do not have the blood glucose monitors at their homes. The following quotes attest to the findings:

One professional nurse said:

> *"Most of the patients that we provide services to do not have blood glucose levels monitors. Because they do not have a glucometer at home, when patients feel sick, they just eat sugar assuming that their blood glucose is low whereas it is high and they end up coming to the health centre with blood glucose that is too high"* (PN1, female, 48 years old).

Another professional nurse indicated that:

> ‘‘*Most of the patients are very poor in this community, they cannot afford to buy healthy food that can help in the management of blood glucose. They do not have blood glucose monitoring machine at home’’* (PN7, female, 56 years old).

In support of the findings of this study, Nachimuthu et al. (2020) in India, found that only a few diabetic patients, including those who were on oral antidiabetic drugs and insulin, were testing their blood sugar levels regularly at their homes. Some patients could not test due to the unavailability of blood glucose level monitors.

Patients living with diabetes mellitus

The absence of blood glucose monitoring machines in patients living with diabetes mellitus homes has also been confirmed. Due to their financial limitations, most patients rely on the community health centre’s professional nurses to check their blood glucose levels during follow-up appointments. The following quotes from the patients support the study's findings:

A patient responded that:

> *‘‘I do not have a glucometer at home. One of the professional nurses once told me that I should buy it at clicks. I do not have enough money*. I also *do not have enough money to buy fruits and other healthy food’’* (P2, male 57 years old).

Another patient alluded that*:*

> *‘‘I do not have a glucometer to monitor my blood glucose level at home. My blood glucose level is monitored once a month by nurses during follow-up visits when I come to collect my medication here at the health centre’’* (P13, female 55 years old).

These findings are supported by the literature. Chan et al. (2015). argue that the majority of people with diabetes mellitus cannot afford to buy food appropriate for managing diabetes, making it extremely difficult for them to adhere to diabetic self-care. A multi-national investigation by Adu et al. (2019) also confirmed that financial constraints result in diabetes patients’ inability to access diabetes clinical supplies and not to eat in line with appropriate dietary recommendations. Gemeda and Woldemariam (2022) further confirmed that the absence of a glucometer at home and unemployment were found to have a significant association with adherence to self-monitoring of blood glucose practice. The family members also confirmed the issue of lack of resources. This is affirmed by participants.

Family members

The lack of blood glucose monitors is acknowledged as a problem by family members who assist diabetic patients with self-care. They rely on the professional nurse to check their blood sugar levels during follow-up visits at the community health centre. The statements that follow lend credence to the family members' responses.

One family member said that:

> *"We do not have a blood glucose measuring machine at home. Now that we are not far from the clinic, we visit the clinic when he is having too much thirst for monitoring of blood glucose, as that was the initial symptom that made him visit the doctor during diagnosis of diabetes mellitus"* (FM5, female, 48 years old).

Another family member added that:

> *"I do not monitor her blood glucose because there is no blood glucose level monitor; her blood glucose is monitored at the community health centre when she goes to collect medication"* (FM13, female, 57 years old).

The findings from the family members showed that there is a lack of blood glucose measuring monitors at their homes. This results in family members failing to assist with measuring the blood glucose level of their members who are diagnosed with DM. Family members rely on professional nurses to monitor the blood glucose level of the patients during follow-up visits at CHCs. The above quotes are supported by the findings of a study conducted in Mexico City, which showed that other participants did not monitor their blood glucose due to a lack of blood glucose monitoring machines (Wittermore et al. 2019).

4.3.2.1.2 Subtheme 2.1.2: Insufficient information about self-care

The findings of this study revealed that the information that the patients are given regarding diabetic self-care practices is insufficient. This subtheme discusses the insufficient information on diabetic self-care practices. Some patients living with diabetes mellitus showed inadequate information regarding healthy diet, foot care, and eye care. The following findings attest to inadequate information about self-care specifically on a healthy diet. Findings are confirmed by the participant's extracts:

Professional nurses

The professional nurses revealed that they teach patients living with diabetes mellitus about healthy diet. They emphasised that patients are equipped with the information that helps them to follow the correct healthy diet, how to measure food before eating and the wrong diabetic diet is discouraged. They further pointed out that patients are referred to a dietitian so that they get advice regarding healthy diet. Subtheme 1.1.1 discussed the findings on how professional nurses support diabetic patients concerning healthy diet. Nevertheless, some patients lack adequate knowledge about a healthy diet. Sufficient information about a healthy diet helps diabetic patients to manage their weight, blood glucose levels, and heart disease risk factors such as high blood pressure and cholesterol.

Patients living with diabetes mellitus

Patients living with diabetes mellitus had inadequate information regarding healthy diet. The professional nurses advised the patients to use soft drinks that contribute increasing blood glucose levels. The findings are supported by excerpts from the patients.

One participant said:

> *"I drink one cup of coke zero added with a little bit of water. I also drink any type of juice (smiling), professional nurses said I can drink 100% juice''* (P2, male 57 years old).

Another patient put it this way:

> *‘‘I drink sprite zero and a diluted 100 percent juice. The professional nurses advised me to use those drinks''* (P14, female, 57 years old).

The findings showed that some professional nurses are giving erroneous and insufficient information regarding healthy diabetic diet. According to Khan et al. (2019), 100% fruit juice is discouraged by the health organisations due to its high sugar content; 100% fruit juice is associated with sugar-sweetened beverages.

Family members

Some family members did not have sufficient information on how to support patients with diabetes about a healthy diet. They prepare and serve patients living with diabetes mellitus unhealthy food which could lead to high blood sugar levels and poor diabetes mellitus management. Family members provided the following response, which support the findings:

One family member indicated that:

"I mostly give her food without too much of sugar. Though sometimes I give her food that contains sugar. I gave her sugar containing food without the knowledge that they contain sugar. Porridge like Morvite I gave her because of lack of knowledge that it contains sugar. Today in the morning I gave her Morvite. The nurses just told me today that I should not give her Morvite. I thought the sugar in side Morvite porridge is not much for diabetic person, but today I know that the sugar in Morvite porridge is not good for diabetic people. When I go to town I always buy her fruits. Sometimes she craves other foods. Therefore, if I buy yoghurt for my children, I also give her because she craves for it" (FM1, female, 32, years old).

Another family member said that:

"My sister cook food for herself; she does not want other people to cook for her. She does not like the way we cook food because we add somethings that she said she is not allowed to eat, things such as fats, salt and spices. The reason why I do not cook or prepare food the way she wants is because I do not have information regarding how I should prepare food for her" (FM 10, female, 56, years old).

Family members have a vital supportive role in the management of chronic diseases. In this study, the findings revealed that some family members who stay with diabetic patients do not have sufficient information on how to effectively support their family members who are living with diabetes. According to Yusra and Waluyo (2022), it is critical to inform family members about the diabetes mellitus and its management, affirm family members support-giving experiences, teach them different stress-reduction techniques, and assist them in making future plans on how to manage diabetes. Involving family members by educating them about diabetes mellitus and on how to support those who are living with diabetes is imperative. Including family members in educational initiatives may help diabetes patients feel supported, foster healthy family habits, and encourage diabetes self-management. Apart from insufficient information regarding a healthy diet to consume, diabetic patients had inadequate information concerning feet care and eye care.

4.3.2.1.3 Subtheme 2.1.3: Feet care

The findings revealed that some patients displayed deficient and incorrect information about feet care practices. Unacceptable and unsafe practices were displayed by some patients living with diabetes mellitus. Some patients do not have correct information about care of feet because the practices that they execute when taking care of their feet, are inappropriate. These findings are evidenced by the statements from participants.

Professional nurses

Professional nurses educate patients living with diabetes mellitus on how to take care of their feet. Subtheme 1.1.2, “care of feet” discussed how professional nurses support patients regarding feet care. Patients are educated to wash their feet with warm water and soap, dry them, and apply body lotion daily. They are also taught not to walk barefooted to avoid pricks which may result in an injury or wound, to avoid wearing tight-fitting shoes, and to check the inside of the shoes to identify foreign objects than can injure feet before wearing.

Although professional nurses have indicated that diabetic education is provided to patients and family members, the findings of the study showed that some patients living with DM and family members have insufficient information regarding self-care management practices to be followed in the management of DM. Family members and patients displayed deficient information concerning feet care. This may impair the effective prevention and delay of diabetic complications such as diabetic foot, ulcer or wounds that take time to heal. In support to the findings of this study, Pourkazemi et al. (2020) found that there was insufficient information about feet care and practice concerning foot care were poor in most patients with diabetes. This infers that continuous education of diabetic patient and family members regarding feet care should be done by professional nurses.

Patients living with diabetes mellitus

Some patients showed poor foot care. The way that patients took care of their feet was improper and harmful to their feet. Some patients treated diabetes-related foot complications by adhering to religious practices. The quotes that follow bolster findings:

One patient expounded that:

> *"I put them inside the hot sand to relieve the burning sensation as instructed by the priest at Zion Christian Church (ZCC), after putting my feet on hot sand, the following day the blisters appear on my feet''* (P2, male 57 years old).

Another patient explained that:

> ''*I take care of my feet by letting the priest prick my feet to release too much blood to aid in the healing process because my feet are always painful, that is the only thing I do to take care of my feet''* (P12, male, 56 years old).

Another patient added that:

> *"My feet are very painful. I do not know how to take care of my feet, the pain frustrates me, and I tried different analgesics they do not work''* (P8, female, 56 years old).

In support of this feet care findings, Sari et al. (2020) indicated that a study conducted in Indonesia revealed that foot self-care behaviour and knowledge about foot care were poor among people living with diabetes mellitus.

Family members

As much as diabetic patients lack adequate information about feet care, family members also lack the information necessary to execute feet care on diabetic patients, hence they did not do anything about it. A poor response concerning feet care was obtained from the family members.

One family member indicated that:

> *''I do not do anything to help my mother with regard to feet care. She washes her own feet and applies body lotion. I only assist her with monitoring of her blood glucose. She does not like pricking herself; I am the one who pricks her and obtain blood. She does everything on her own. I only cook for her and remind her to take medications as aviced by the professional nurses at the communuity health center''* (FM10, female, 56 years old).

Another family member said.

> *"I do not do anything except to help her with the bathing of her feet and apply body cream or lotion. The professional nurses did not advise me on how to take of my mother's feet. May you please explain to me how I should take care of her feet?''* (FM1, female, 32 years old).

The findings show that patients living with diabetes mellitus and family members do not have sufficient information regarding care of feet. This is evidenced by the incorrect practices that the patients do to manage the feet problems. The SEMDSA guidelines on managing and prevention of diabetic foot complications recommended diabetic patients to receive information on proper foot hygiene practices. Family members also revealed that they have insufficient information on how to support diabetic patients with feet care. The findings are consistent with Solan et al. (2017), and Akhtar (2018); who found that patients living with diabetes mellitus did not have enough understanding of or practices for caring for their feet. In contrast, Werfalli et al. (2020) indicated that patients with diabetes are more informed about self-management practices involving foot care.

4.3.2.1.4 Subtheme 2.1.4: Eye care

Eye care services include eye examination, protecting eyes from direct sunlight by using sunglasses and an umbrella, healthy diet, and adherence to medication. Specialists in eye care such as ophthalmic nurses, optometrists and ophthalmologists are crucial in the early identification and prompt treatment of diabetes-related eye conditions such retinopathy, glaucoma, and cataracts. In this study, inadequate information regarding eye care was outlined by the participants. Though professional nurses have pointed out that they teach patients about eye care, patients and family members do not have adequate information about eye care. Some patients living with diabetes mellitus and family members indicated that they did not get advice from professional nurses regarding eye care practices. The following citations corroborate with the study findings:

Patients living with diabetes mellitus

Patients with diabetes mellitus should follow certain self-care routines, including eye care. According to the study's findings, some patients never bothered to go see an ophthalmologist or ophthalmic nurse for an annual eye check-up because they do not realise how crucial eye care is for someone who has diabetes mellitus.

One patient said that:

> *"I never went for an eye examination because I did not know that I should do that. No one advised me to visit the eye doctor for an eye examination. Why should I go for an eye examination?"* (*P*10, male, 58 years old).

Another patient indicated that:

> *''There is nothing I do to take care of my eyes. My eyes do not have any problem so far. No one advised me to visit the eye doctors or eye sister for an eye examination''* (P14, female, 57 years old).

Family members

In this study some family members did not know how to support the patients with eye care. They were not informed about the measures for eye care that should be taken into consideration, such as routine annual eye examination of patients living with diabetes mellitus. Some family members thought eye care is only done when one is having eye problems. The findings are supported by family members' narratives.

One family member said that**:**

> *"I do not know how to assist my mother with eye care, because she never had a problem with her eyes. Previously she was instilling eye drops medication that she was given while she was complaining of a painful eye."* FM6, (female, 49 years old).

Another family indicated that:

> *''There is nothing I do to support my mother with care of her eyes. Sometimes she complains of poor vision. I did not know that I should take her to the eye care practitioners for an eye examination''* (FM7, female, 34 years old).

The study findings show that patients living with diabetes mellitus and family members do not have adequate information regarding eye care. Therefore, for family members to be able to support diabetic patients with eye care effectively, they must be educated by professional nurses at the CHCs. Eye care includes an annual eye examination which is important since it helps in the early identification and treatment of eye complications. Study findings are the same as of study conducted in Ethiopia which showed that the use of eye care services among diabetic patients was low (Zhou et al. 2022). The findings of Murchison et al. (2017) contrasts by indicating that diabetic patients in the USA, Philadelphia adhered to recommended eye care services.

4.3.2.1.5 Subtheme 2.1.5: Poor self-esteem

The self-esteem is how we perceive our behaviours, abilities, and unique character. The degree to which an individual feel understood by other people (Cohen et al. 2016). The findings showed that some diabetic patients have a poor self-concept. These outcomes are evidenced by participants who pointed out the subsequent statements:

Patients living with diabetes mellitus

The findings show community's perception of patients living with diabetes mellitus as being useless, this contributes to their low self-esteem. Due to the sexual dysfunction brought on by diabetes mellitus, some male patients living with diabetes mellitus distance themselves from other people because they feel they have lost their manhood.

One patient explained that:

> *''There are many things that make friends happy, but now that I have my issues ("diabetes") I no longer enjoy my friend's companionship. I always stay at home because there is nothing more to enjoy outside the home. You will hear people saying, a man living with diabetes mellitus is dead because his manhood is no longer functioning. It hurts''* (P4, male, 49 years old).

Another patient said that:

> *''Another issue is that the community think that people living with diabetes are not mentally sound because they believe that diabetes mellitus affects our mind, and they look down on us because they trust our manhood no longer works. The community needs to be educated to respect us as human beings*'' (P13, male, 55 years old)**.**

Another patient added that.

> *''I do not want to be led into anger nor not to be forced to think of dying because of the wrong things that people say against diabetic patients. Other people would say do not listen to a diabetic person because the blood glucose is in her/his head''* (P3, female, 54 years old).

The results outlined that participant were labelled as not mentally stable because of diabetes and were disrespected by some community members. The attitude of the community made some

participants feel alienated. Kato et al. (2020); and Kokoszka et al. (2022) support the findings, they indicated that they have identified that patients with diabetes had low self-efficacy and low self-esteem, which was linked to depressive mood. Patients living with diabetes mellitus typically suffer low self-esteem and despondency (sadness, unhappiness, misery, and despair), which can have a detrimental effect on managing diabetic self-care.

4.3.2.1.6 Subtheme 2.1.6: Sexual dysfunctions

Rahmanian et al. (2019) defined sexual dysfunction as a heterogeneous combination of disorders that is characterised as a major disorder in one's ability to react to sexual response or sexual pleasure. This subtheme focuses on the concern of patients regarding the loss of sexual interest. The findings revealed that some patients are concerned about the loss of sexual interest. The following assertions back up the findings:

Patients living with diabetes mellitus

Not every patient living with diabetes mellitus experiences sexual problems. However, sexual dysfunction is more likely to occur in people with diabetes. It is one of the complications of diabetes and results from high blood sugar, high blood pressure, and high cholesterol level (Yuan et al. 2022). Sexual dysfunction is amongst the other challenges faced by patients living with diabetes mellitus in this study. Some patients complain of loss of sexual interest and need a support to be able to deal with the challenge.

One patient explained:

> *‘‘The main challenge with diabetes mellitus is loss of sexual interest towards women. That is the challenge I am faced with. There is no one to assist me to regain sexual interest. Years back, one nurse who was working here at the clinic, wanted to help me. She wanted to refer me to a person who will help me, unfortunately, that nurse left the clinic before she could refer me. I could not get any other person to assist me’’* (P4, male, 49 years old).

Another patient said:

> *‘‘The challenge is that I do not have sexual interest. But I am an old lady, I do not worry much about the loss of sexual interest’’* (P5, female, 59 years old).

The findings showed that some patients living with diabetes mellitus suffer sexual challenges, as a complication of diabetes mellitus. Diabetes increases the likelihood of sexual dysfunction issues

in both men and women living with DM resulting from erectile dysfunction. The biggest source of concern among some patients in this study, particularly males, was loss of libido. Women also experience loss of sexual interest, but they did not seem to worry much about it. The sexual challenge is supported by Bongongo et al. (2019) who found that most male adult diabetic individuals around the world, including South Africa, suffered erectile dysfunction. Rahmanian et al. (2019) further revealed that there is a high prevalence of sexual dysfunction in women with type 2 diabetes. According to Barbagallo (2020), sexuality in female diabetic patients is still taboo, and sexual dysfunctions are underappreciated while being one of the long-term problems in both sexes.

4.3.2.2 Theme 2.2: Physical challenges

Diabetic patients have physical challenges related to diabetes mellitus complications. Therefore, this theme focuses on the physical challenge experienced by adult diabetic mellitus patients. This theme consists of two subthemes namely: poor sensation of the lower limb and poor eyesight.

4.3.2.2.1 Subtheme 2.2.1: The poor sensation in the lower limb

The poor sensation of the lower limb is associated with peripheral diabetic neuropathy, a common microvascular complication of diabetes mellitus (Zhu et al. 2021). The findings of the study revealed that most of the diabetic patients had poor sensations in their lower limbs. The findings are confirmed by participants who pointed out the following evidence.

Professional nurses

Some patients approach the community health centre complaining of foot-related issues such as loss of sensation, sore legs, foot injuries, and wounds, even though professional nurses admitted that diabetic patients are educated on how to take care of their feet. The findings are corroborated by quotes from professional nurses.

One professional nurse said that:

‘‘*Ok, most of patients living with diabetes mellitus visit complaining of paifull legs or poor sensation of the feet. Though we prescribe analgesics for them to treat the pains,we also educate them about what causes pains and loss of sensation; they the do not understand. Therefore, we refer them to the podiatrist who examine feet for sores, cuts, blisters, good circulation, and he also cut the toe nails of other patients, and prescribe the treatment for patients who have feet infections”*(PN1, female,48 years).

Another professional nurse explain that:

‘‘Patients are educated on how to take care of their feet. Most of the patients living with diabetes mellitus who visit the community health center have wound problems, loss of sensation and complains of painfull legs. We treat the wounds that do not need referal by cleaning and dressing, providing analgesics to relieve pain and teach the patients to prevent foot injuries by avoiding walking without shoes and to wear proper fitting shoes ’’(PN2, male, 58 years old).

Patients living with diabetes mellitus

The study findings revelead that patients living with diabetes mellitus have feet challenges. Over time, diabetes may result in nerve damage known as diabetic neuropathy, which can pain and tingle and cause diabetic patients to lose feeling in their feet Omar et al. (2022).

One patient said that:

> *“I cannot feel my legs sometimes; at times I feel pain in my arm or leg, and when it gets worse, I consult the doctor who usually tells me that the pains are caused by diabetes mellitus. I therefore no longer visit the doctor concerning such complaints”* (P6, female, 57 years old).

Another patient indicated that:

> *‘‘The challenge I have is a painful leg. The pain is sharp as if it is a needle prick. Sometimes my legs do not feel when I touch them”* (P9, female, 54 years old).

Family members

According to the study's findings, family members have confirmed that patients living with diabetes mellitus do express concerns about their feet, including painful legs and a loss of sensation. Some family members are concerned since they are unsure of what is causing these feet problems.

One family member said that:

> *‘‘My mother said her legs are painful. She feels like her legs are pricked by needles. She gets tired quickly therefore she decided to stop jogging exercises. She tried using medication like panado to treat the pain, but the medication does not alleviate the pain”* (FM2, female, 34 years old).

Another family member indicated that:

> *''Exercising sometimes become difficult especially when he complains of painful legs, and sometimes he complains of slight loss of sensation. It disturbs me because I do not know what is making his feet to be painful and loose sensation at times"* (FM4, female, 42 years old).

The findings imply that feet challenges were common among patients in this study. Patients living with diabetes mellitus, family members and professional nurses attested to this finding. Some patients complained about pains like needle pricks in their arms or legs and poor sensation in the lower limbs. The following available literature supports the findings; According Cristian and Remus (2018), diabetic patients had a significantly increased frequency of neuropathy. The findings are further supported by Vibha et al. (2018) and Maiya et al. (2018) who described the prevalence of diabetic sensory neuropathy as being frequent among people with diabetes mellitus. The findings imply that some patients in this study have the common DM complications such sensorimotor neuropathy or peripheral neuropathy which typically strikes the legs and feet before the arms and hands. According to Lewis et al. (2014), neuropathy affects hands and feet bilaterally and is characterised by loss of sensation, abnormal sensation, pain, and paresthesia. Therefore, patients with such complication need support.

4.3.2.2.2 Subtheme 2.2.2: Poor eyesight

Poor eyesight was a challenge to some patients living with diabetes mellitus. It is caused by poor management of blood glucose levels. High blood glucose levels may lead to blurred vision/poor eyesight, retinopathy, cataracts, and glaucoma (Kovacova & Shotliff 2022). The findings are supported by patients' quotations.

Professional nurses

The professional nurses voiced out that they have a challenge regarding patients living with diabetes mellitus who end up having poor vision because they do not visit the CHCs as advised. Some professional nurses think patients need more support concerning adherence to medication and healthy diet. The findings are supported by the following quotes from the professional nurses:

One professional nurse explained that:

> *''We have challenges of patients living with diabetes mellitus who do not want to come for follow-up visits. Some patients have a problem of denial. They do not accept the fact that*

they are diagnosed with diabetes mellitus. Those are the patients that end up coming to the health centre having diabetic complications such as blindness. It is very sad to see such patients coming to seek help when they are already blind'' (PN5, female, 54 years old).

Another professional nurse said that:

''We have a challenge of patients whose blood glucose are not well controlled; their blood glucose is found to be always high, and they complain of poor vision, and painful legs. I think they need more support with regard to management of diabetes mellitus, more specifically, support concerning adherence to medication and healthy diet'' (PN7, female, 56 years old).

Patients living with diabetes mellitus

Findings revealed that, poor eyesight is common in some patients. Diabetes mellitus may cause the eye lens to enlarge, which could result in blurry vision (Kumar & Lin 2022). Some patients visit the doctors for eye check-up once a year because of poor vision.

One patient said that:

''*I visit an eye doctor once a year, for an eye check-up, because I usually experience poor vision''* (P11, female, 54 years old).

Another patient said:

''I do visit the clinic and doctor for eye check-ups every year because my eyes do not see clearly'' (P8, female, 56 years old).

According to the study findings, it was established that some patients living with diabetes mellitus have poor vision. Poor vision is a common diabetic complication in diabetic patients and it is caused by high blood glucose. The findings corroborate with findings of Beede et al. (2020) who specified that in Thailand patients living with diabetes mellitus had low vision or eye blindness.

Family members

Family members demonstrate their commitment by helping patients living with diabetes mellitus with self-care management. They take on the duty of caring for a member of the family who struggles with eyesight by helping them bathe and check the body for injuries. The family members' responses below support the findings:

One family member said:

> ‘‘*Currently I am not working, as I had quitted my job so that I can take care of him because he is now having poor vision. There is no one to assist him to bath and move around except myself’’* (FM4, female, 42 years old).

Another family member explained that:

> *“I no longer visit. Though there is a helper at home I cannot leave him with her. If I am bound to go out for a visit, I go with him. The other way of helping him is to monitor all the changes that might happen on him, because he cannot see clearly. He cannot see even the sores that develops from his body. I must tell him because he cannot see. His cleanliness is my responsibility, bathing his body, assisting him to bath where he cannot reach’’* (FM8, female, 42 years old).

The findings imply that poor vision is common amongst patients living with diabetes mellitus, and it is a challenge to professional nurses, patients living with diabetes mellitus and family members. Therefore, it is important to provide educational support to patients about eye care, to delay or prevent eye complications. The findings are supported by a study conducted by Wen et al. (2020) in Northeast China who pointed out that people living with type 2 diabetes had a significant prevalence of impaired vision and blindness.

4.3.3 Major theme 3: Support expressed by patients living with diabetes mellitus

This major theme focuses on the self-care management support that patients living with diabetes mellitus anticipate receiving from professional nurses and family members. It is composed of two themes, namely: source of support and types of support.

4.3.3.1 Theme 3.1: Source of support

Source of support means a place, person, or a thing from which supply, aid, or support originates or can be obtained (Hornby 2018). In this study, sources of self-care management support that were identified by patients comprised of patients support from professional nurses and family members.

4.3.3.1.1 Subtheme 3.1.1: Patients support from professional nurses

Patients living with diabetes mellitus explained that they need support from professional nurses. The expected support included continuous education of patients and family members about diabetes mellitus. Patients indicated that they anticipate receiving constant interactive support from professional nurses and family members. This is the kind of support in which patients are

educated paying attention to professional nurses, posing specific questions, absorbing pertinent information, and focusing on their learning requirements about DM. The following statements from diabetic patients support the findings.

One patient said that:

> ***"****The professional nurses used to teach us about diabetes mellitus and diabetic diet. They are no longer teaching us, and it has been a long time. I would like diabetic education to be continuously disseminated"* (P1, female, 53 years old).

Another patient added :

> *"I want to be educated about diabetic mellitus, and my feet problems. Professional nurses used to teach us about diabetes as a group in the morning before they give us treatment. They should continue to do it the way they were doing it before"* (P8, male, 56 years old).

Although professional nurses have indicated that they give diabetic health education, most of the patients reiterated the need to be educated about DM. The findings indicate that patients living with diabetes mellitus would like DM education to be continuous. Literature supports the necessity of continuous DM education. De la Fuente Coria et al. (2020) indicate that continuous diabetes education combined with support sessions by nurses, results in the good management of blood glucose levels. According to a study conducted in Saudi Arabia, the psychosocial aspect of a patient diagnosed with DM is dependent support that entails patient support during diagnosis, as well as continuous encouragement and supervision of self-care practices (AlHaidar et al. 2020).

4.3.3.1.2 Subtheme 3.1.2: Family members' support

Patients living with diabetes mellitus identified family members as the primary source of support. They specified that for them to receive effective support from the family members, they would like the family members to be educated on how to provide support to the patients with diabetes mellitus in the home environment. Additionally, family members are interested in learning how to support diabetic patients at home. Some family members verbalised the following:

One family member said that:

> *"I need to be educated on how to take care of my husband with diabetes; how to cook a healthy diet for him. I am responsible of reminding him about taking the medication and remind him about follow updates at the CHCs"* (FM9, female, 56 years old).

Another family member indicated the following:

> *"I will be grateful if professional nurses could also assemble us here at the community health centre and educate us on how to prepare food for our family members who living with diabetes mellitus"* (FM12, male, 55 years old).

The findings imply that patients living with diabetes mellitus view professional nurses and family members as their support system in diabetic self-care. Family members are more concerned that the professional nurses should educate them on how to support a family member who has diabetes mellitus. Family members' education is crucial in the management of chronic conditions. An Indonesian study supports the findings by specifying that family members' engagement is crucial in supporting diabetic patients with self-care management. (Ligita et al. 2020). Studies in Thailand further confirm that teaching family members to promote diabetic self-care is an effective method of managing DM (Viet Hung et al. 2020).

4.3.3.1.3 Subtheme 3.1.3 Professional nurse's support

Professional nurses indicated that they do not only help with administration of medication, they also offer crucial physical and psychological guidance to aid people in overcoming the daily difficulties that a lifelong chronic condition can bring. The professional nurses' statements, which follow, support the findings:

One professional nurse confirmed the findings by explaining that:

> *"I play a significant role in assisting patients in managing their condition as a professional nurse. I take on the responsibility of inspiring patients living with diabetes mellitus, and when necessary, provide psychological support. The use of a blood glucose monitors to check blood sugar and track diabetes, the use of diabetes medication, including how to self-administer insulin shots, the recognition of low and high blood glucose symptoms and what to do if they occur, and checking feet for wounds that might need medical attention, are all things that professional nurses teach diabetic patients"* (PN1, female, 48 years old).

Another professional nurse again confirmed by saying that:

> "*We educate patients about diabetes mellitus either individually or in groups since we have found that some patients comprehend how to monitor their blood glucose more effectively in a group session. Patients have a variety of needs, and we try to help them to meet those needs. We try to provide solutions where necessary. Some patients have financial difficulties*'' (PN5, female, 54 years old).

The findings denote that the professional nurses play a complex role in supporting patients living with diabetes mellitus in the management of diabetes mellitus. In the current study, professional nurses took part in a variety of activities targeted at delivering comprehensive, diabetic patient-centred care. Rosli et al. (2022) concurs with the findings of this study; they indicated that professional nurses believed that caring for patients with diabetes mellitus is a complex role that need a shared responsibility that is related to diabetic patients' responsibility to maintain their health. As a result, they considered patient involvement, empowerment, and patient-centred care as crucial components of managing diabetes mellitus.

4.3.3.2 Theme 3.2: Types of support

Types of support is the second theme that emerged during data analysis. This theme is composed of four sub-themes namely: diabetic education support, blood glucose monitors, emotional support, and dietary support. Participants indicated that there is a need for them to be supported through diabetic education, diet, medical requirements, and emotional.

4.3.3.2.1 Subtheme 3.2.1: Diabetic education support

Patients reiterated that they would like continuous education about diabetic mellitus related issues to be done. They indicated that professional nurses should educate them about diabetes mellitus issues as they use to do previously. The following quotes from the patients support the findings.

Patients living with diabetes mellitus

One patient said:

> *"Professional nurses use to teach us about the diabetic diet. They are no longer teaching us, and it has been a long time. I would like the health education to be done again"* (P1, female, 53 years old).

Another patient indicated that:

> *"I would like the nurses to educate me about how I should take care of myself as a diabetic patient because I do not have sufficient information on how to take care of myself"* (P3 female, 54 years old).

Professional nurses indicated that they teach patients living with diabetes mellitus about diabetes-related issues. They indicated that there should be continuous patients education on diabetes mellitus related issues: The subsequent quotes from the professional nurses affirm the findings:

Professional nurses

One professional nurse said:

> "*I think patients need continuous health education about diabetes mellitus. I suggest that doctors, dietician and professional nurses should intermittently teach the patients about diabetic-related issues and their management during every follow-up visit"* (PN3, female, 49 years old).

Another professional nurse supported:

> *"The support that I think patients living with diabetes mellitus need is to be given continuous education about diabetes mellitus. These patients need to be reminded about what diabetes mellitu is, and the management of the condition. According to me, patients seem to forget or ignore some of the self care management practices they should follow. Continuous education will help them not to forget or to be ignorant".* (PN9, female, 57 years old).

The findings further revealed that patients living with diabetes mellitus would like to get continous education about DM. Same aplies to some professional nurses; they specified that diabetic education should be continuous. Professional nurses acknowledged that they do not have sufficient DM information to teach diabetic patients. They feel outdated because the DoH is no longer taking them for DM in-service training. Some professional nurses expressed that for them to able to support diabetic patients effectively, they need to be educated about changes and new information/updates about DM.

One professional nurse indicated that:

> *"The department of health should do to what it used to do previously, that is,*

organising in-service training for nurses regarding the management of chronic conditions such as DM, so that they can be able to support DM patients appropriately" (PN12, male, 52 years old).

Another professional nurse said:

"I also think that the nurses should be educated or attend in-service training about the management of DM. Nurse managers no longer organise the in-service training for us; it has been a while without having diabetes mellitus workshops" (PN13, female, 56 years old).

Another professional nurse added :

"As professional nurses who provide diabetic health care services, we also need to be educated about DM. I suggest that in-service training be conducted regarding the management of diabetes mellitus. When new updates about diabetes mellitus are available, we should be given the information immediately. New guidelines or policies regarding diabetes management should be communicated to us" (PN2, female, 58 years old).

The findings of the study revealed that professional nurses at the CHCs would like continuous staff development which include DM in-service trainings to be reinstated by the DoH. The researcher believes that the active involvement of patients, family members, and professional nurses in diabetes mellitus management may improve diabetic self-care management. According to Alotaibi et al. (2018), the lack of adequate in-service training of health care providers such as professional nurses, is a prevailing obstacle to diabetes self-care. The findings are further supported by a study conducted in Limpopo, South Africa by Sechabe et al. (2019) who found that professional nurses would like to be trained in diabetes care so that they can have confidence when providing care to patients living with diabetes mellitus. In addition, a study conducted by Letta et al. (2021) revealed that most of the health professionals who engaged in diabetes care had no supplementary training on diabetes management; nurses reported a lack of the most updated information on diabetes.

Family members who stay with patients living with diabetes mellitus were concerned about being excluded from diabetic education,workshop and campaigns even though they play a vital role in supporting their members who live with chronic conditions such as diabetes mellitus. The following statements attest to the findings of the study:

Family members

One family member explained*:*

> *"I think people living with diabetes mellitus need to be educated about diabetes and self-care management. I suggest diabetes mellitus workshops should be conducted for both patients and family members who are taking care of a member diagnosed with diabetes" (*FM 14, female, 43 years old).

Another family member explained:

> *"I think the department of health should arrange a place where we are trained or workshopped on how to take care of family members who are diagnosed with diabetes mellitus. I search for information on how to help my parents from other people who know because there is no one to teach us about diabetes mellitus. I want to take care of my parents having the correct information"* (FM12, female, 55 years old).

Another family member said:

> *"Nurses or doctors should arrange a gathering for us so that we can be given information regarding diabetes mellitus because we learn some of the things regarding diabetes from patients. We get stressed when taking care of people living with diabetes, we also think that they will die"* (FM8, female, 42 years old).

The findings of the study suggest that diabetic education and campaigns should include family members as the main caregivers in family settings. Baig et al. (2015) indicated that health education of family members about diabetes mellitus and management is important; it helps in reducing the strain that they may experience when taking care of members diagnosed with diabetes. Luthfa and Ardian (2019) in Indonesia, outlined that family empowerment is an important nursing intervention that assists in supporting family members living with diabetes mellitus and also results in successful diabetes self-care management. These findings are further supported by Kolb (2021) who said, there should be a platform where family members living with diabetic patients discuss their experiences, concerns, and limitations regarding the support of a family member who is diagnosed and living with DM.

4.3.3.2.2 Subtheme 3.2.2: Dietary support

According to Evert et al. (2019) a diabetic diet is a component of quality diabetes care, including its integration into the medical management of diabetes. Patients living with diabetes mellitus need to access a healthy diet to manage diabetes mellitus effectively. The findings are confirmed by family members and professional nurses restated the subsequent declarations:

Professional nurses

Professional nurses supported the family members' idea of involving the government in assisting patients by providing them with healthy food parcels. The professional nurses outlined that most of the diabetic patients that receive diabetes mellitus health services are from poor families, therefore it is difficult for them to afford healthy food. This is what professional nurses had to say:

One professional nurse said that:

> *"If the government can provide patients living with diabetes mellitus with healthy food parcels, it will be a great relief. Most of the patients are very poor in this community, they cannot afford to buy healthy food that can help in the management of blood glucose"* (PN7, female, 56 years old).

Another professional nurse stated:

> *"The government should introduce a temporary financial assistance or grant and welfare service for patients living with diabetes, more specifically, those who are not employed so that they buy healthy food for themselves"* (PN12, male, 28 years old).

Patients living with diabetes mellitus

The provision of healthy diet or food parcels by the government was raised as a necessity by some professional nurses, including patients living with diabetes mellitus who do not afford to buy healthy food as advised by dieticians and professional nurses. The following is what the patients had to say:

One patient indicated that:

> *"I do not have enough money to buy fruits and other diabetic food. I wish our government can provide us with healthy food parcels. It is not easy to afford a healthy diet"* (P2, male, 57 years old).

Another patient said:

> *"Another thing is, I think if the Department of Health can provide us with healthy food, it will be of great help because it is not easy to afford healthy diet. I think eating healthy will help in the good management of blood glucose"* (P13, male, 53 years old).

Family members

One family member explained that:

> *"It is very difficult to have most of the things that are necessary to assist people who are diagnosed with diabetes mellitus if one is not working; because most of the things need money. If the Department of Health can manage to provide people who are diagnosed and living with diabetes mellitus with healthy food parcels will be of great help because it is a struggle to get healthy diet those individuals who cannot afford to buy"* (FM13, female, 57 years old).

Another family member said:

> *"To be honest, I would like the government to supply us with healthy food parcels such as fruits and vegetables because we do not afford to buy healthy food"* (FM14, female 57 years old).

In this study, family members and professional nurses viewed the provision of healthy food parcels to patients living with diabetes mellitus by the government as a solution for those patients who cannot afford to buy. According to Evert et al. (2019), eating healthy food can help one to lose weight or maintain a healthy weight, which can also improve blood glucose and reduce the complications of diabetes in the heart, kidneys, and eyes.

4.3.3.2.3 Subtheme 3.2.3: Blood glucose monitors

Family members and professional nurses reiterated that patients living diabetes mellitus should be provided with monitoring equipment such as a glucometer and blood glucose test strips. According to the World Health Organization (2019), medical equipment is used for the specific purposes of diagnosis and treatment of disease or rehabilitation following disease or injury. The subsequent testaments corroborate the findings:

Professional nurses

Professional nurses indicated that patients living with diabetes mellitus cannot afford to buy blood glucose monitors and that they should be provided by the DoH as this will assist the patients to monitor and keep their blood glucose levels within normal ranges. This is what they believe:

One professional nurse indicated that:

> *''The Department of Health should supply patients living with diabetes mellitus with blood glucose monitoring machines because most of the patients do not have the machines. The provision of blood glucose monitoring machines will assist patients in monitoring their blood glucose every week at home. If the blood glucose is not within normal ranges, they will try to follow the correct diet and adhere to medication''* (PN2, female, 58 years old).

Another professional nurse said:

> ''*The Department of Health should support by providing blood glucose monitoring machines for patients who do not afford to buy so that patients can be able to monitor the blood glucose at home''* (PN13, female, 56 years old).

Patients living with diabetes mellitus

Patients living with diabetes mellitus also confirmed a need for the DoH to provide the blood glucose monitors, for them to be able to monitor the blood glucose level at home. They indicated that they cannot afford to buy the blood glucose monitor. The quotations from diabetic patients support the findings.

One patients pointed out that:

> ''*I would like the Department of Health to supply us with blood glucose monitoring machines so that we can be able to monitor the blood glucose levels at home''* (P1, female, 53 years old).

Another patient indicated that:

> ''*The Department of Health should provide us with blood glucose monitoring machines because I cannot afford to buy. I also like to monitor my blood glucose at the comfort of my house, but I cannot. I have to the health centre to get my blood glucose monitored''* (P2, male, 57 years old).

Family members

Family members brought up and reaffirmed the DoH's provision of glucose monitors. They argued that the price of the monitors prevented patients living with diabetes mellitus and their families from purchasing them. Due to financial limitation, they are unable to purchase monitors despite professional nurses' advice. This is supported by the following responses:

One family member explained:

> *''I take care of my husband. I am not working; it is not possible to buy blood glucose monitors more often due to lack of funds because every year one should buy a new machine; these machines expire to work after a year. Another thing is blood glucose test strips get finished very quickly, especially because my husband tests his blood glucose three times a day. The strips are too expensive, they cost about R250, and there are only 50 strips in a container; they get finished before the end of the month. The government should assist by providing us with blood glucose monitoring machines and test trip. It will be of great help''* (FM4, female, 42 years old).

Another family member said:

> *''The Department of Health should provide patients living with diabetes mellitus with blood glucose test strips because they are expensive for a person who is not working''* (FM3, female, 29 years old).

Another family member added:

> ''*Professional nurses should to talk to the health managers in the district to buy blood glucose monitoring machines for patients who cannot afford to buy them. Patients will be able to monitor their blood glucose at home especially when they are not feeling well''* (FM13, female, 57 years old).

The findings imply that the professional nurses, patients living with diabetes mellitus and family members would like the DoH to provide the patients with diabetes with blood glucose levels monitors. Lack of blood glucose affects the effective support of patients in self-care practices, as it is crucial for diabetes individuals to monitor and maintain a normal blood glucose level. The availability of blood glucose monitors will enable patients to self-monitor their glucose levels outside of health facilities. Glucose self-monitoring guides patients' decisions on treatment, nutrition, and physical activity, and is specifically used to adjust insulin dosages; ensure oral medication is adequately controlling glucose levels and monitor potential hypoglycemic or

hyperglycemic incidents. Self-monitoring of glucose for people living with diabetes mellitus has allowed patients to take control of their disease and consequently directly affect the outcomes related to it (Olczuk & Priefer 2018).

4.3.3.2.4 Subtheme 3.2.4: Emotional support

Emotional support involves showing empathy, compassion, and genuine concern for others. It is one of the basic needs of a person (Garcia et al. 2023). The study findings show that for patients living with diabetes mellitus need emotional support from professional nurses and family members to cope well with diabetes mellitus and to manage diabetes effectively.

Professional nurses

The professional nurses provide emotional support to patients during diagnosis of diabetes mellitus. They encourage patients to adhere to the self-care practices as advised. Professional nurses affirm the findings of the study.

One professional nurse said that:

> ''*At the time of diagnosis, we provide emotional support to* patients living with diabetes mellitus *because that is the period when they require more support to manage their condition*'' (PN1, female, 48 years old).

Another professional nurse said that:

> *''Being told you have diabetes can be unexpected. Initial emotions include shock, feeling overpowered, and even wrath. I counsel and encourage patients living with diabetes mellitus to take care of themselves by adhering to self-care practices because, often, these feelings pass after a while and diabetes becomes a fact of life''* (PN3, female, 49 years old).

Patients living with diabetes mellitus

Patients living with diabetes mellitus indicated that they require emotional support and to be advised on how to handle emotional issues. They need support from professional nurses and family members rather than being labelled as mentally disturbed. The following patients' comments provide support to the findings.

One patient explained that:

> ***"****We need nurses to support us on how to handle emotional issues; to prevent anger; how to be handled well by our family members at home. This will help us not to be led into anger, and not to be forced to think of dying because of what people say about diabetic patients. People sometimes would say do not listen to diabetic persons because they are sick when we speak out they say the blood glucose is in our head''* (P3, female, 54 years old).

Another patient said:

> *''You will hear people saying, a man living with diabetes is dead because his manhood is no longer functioning. It hurts. We need to be supported on how to handle such issues*'' (P4, male, 49 years old).

Family members

Family members support patients emotionally; the support helps the patients to be resilient, and cope well with diabetes mellitus and its management. Some family members encourage patients to talk when stressed. The findings are confirmed by the participants.

One family member said that:

> ''*We also provide him emotional support. The support we provide helps him to maintain self-management habits. He takes his medication and observes the diet recommendations of professional nurses and dieticians because he is managing his condition well. The psychological stress associated with diabetes mellitus is alleviated through emotional and spiritual support that we give him, which also relieves tension. His coping skills and resilience are also improved, which makes him more determined to manage the disease*'' (FM5, female, 48 years old).

Another family member said that:

> *''I urge my mom to express her emotions to me since it helps her to decompress emotionally. I advise her to let us know how and when she needs our assistance since sometimes the individuals in her life, like my father, make her feel more stressed*." (FM6, female, 38 years old).

The findings indicate that emotional support of patients living with diabetes mellitus is vital, it help the patients cope well with diabetes, therefore, promoting good management of

diabetes mellitus. The findings are supported by Kalra et al. (2018) who said that immediately after the diagnosis of diabetes mellitus, it is critical to recognise and assist patients with psychosocial issues because it may influence their capacity to adapt or assume the proper level of responsibility for self-care. By addressing the psychological needs, diabetes outcomes are improved in terms of improved glucose control. The study findings posit that because of their condition, some patients living diabetes mellitus are undermined, demoralised, and not respected by the family members and some members of the community. This results in sadness and anger in diabetic patients. Therefore, findings showed that patients would like the professional nurses to intervene through educating the community on how to support people who are living with diabetes mellitus.

The researcher concludes that individuals who are living with any chronic condition including diabetes mellitus experience emotional difficulties, hence, hurting them emotionally adds more psychological problems. Kalra et al. (2018) also indicated that psychological difficulties are most common in diabetic patients, and they frequently harm their well-being and social lives. As a result, emotional care for patients living with diabetes mellitus is essential. Werfalli et al. (2020) alluded that a cohesive and supportive family may provide diabetic patients with an opportunity to talk about their feelings and uncertainties than a family that does not have solidarity. Diabetes is a long-term metabolic illness that affects a person's physical, social, mental, and psychological well-being. Therefore, emotional support is crucial because people with diabetes suffer feelings of sadness, anxiety, and rage that have an impact on their health and general quality of life.

4.3 Summary

This chapter focused on the presentation and discussion of the study findings. It presented the interpretation of data collected from adult patients living with diabetes mellitus, professional nurses who provide diabetic nursing care services to patients living with diabetes mellitus, and family members who stay and assist their family members who are living with diabetes mellitus in the CHCs of Limpopo Province. The findings of the study showed that there is insufficient support of adult patients living with diabetes mellitus by professional nurses and family members. The insufficient support includes poor educational support regarding the self-care management practices of patients by professional nurses, which results in some patients not having sufficient information concerning self-care management practices, such as adherence to healthy diet, feet care, eye care.

Socioeconomic status also contributes to poor self-care management practices. Lack of financial resources makes it difficult for some patients living with diabetes mellitus to afford to buy blood glucose monitors for monitoring blood glucose levels at home as required. Financial constraints contribute to a lack of a healthy diet, as patients could not afford to buy fruits and vegetables. All these challenges result in patients living with diabetes not adhering to self-care management practices as stipulated in the SEDMSA diabetes guidelines. The professional nurses revealed that for them to be able to support patients living with diabetes mellitus effectively, they need in-service training and to be updated about new information concerning diabetic management. On the other hand, some family members were concerned about not being informed about care and support that they should provide to their members who are living with diabetes mellitus, therefore they would like to be educated on how to support their members who are living with diabetes mellitusThey would like the professional nurses to organise diabetic campaigns that include how family members support patients living with diabetes mellitus in the home context.

The findings further indicate that emotional support of patients diagnosed with diabetes mellitus is vital. It helps the patients cope well with diabetes, hence promoting good management of diabetes mellitus. The findings are supported by Kalra et al. (2018) who said that immediately after the diagnosis of diabetes mellitus, it is critical to recognise and support patients with psychosocial issues because it may influence their capacity to adapt or assume the proper level of responsibility for self-care management. The study findings posit that because of their condition, some patients with diabetes mellitus are demoralised by their family members and some members of the community. This results in sadness and anger in patients living with diabetes mellitus. Consequently, findings showed that patients would like professional nurses to intervene by educating the community on how to support people who are living with diabetes mellitus.

The researcher concludes that individuals who are living with any chronic condition, including diabetes mellitus, experience emotional difficulties, hence, hurting them emotionally adds to more psychological problems. Kalra et al. (2018) also indicated that psychological difficulties are most common in patients living with diabetes, and they frequently harm their well-being and social lives, as a result, emotional support for patients is essential. Werfalli et al. (2020) indicated that a cohesive and supportive family may provide patients living with diabetes mellitus with an opportunity to talk about their feelings and uncertainties than a family that does not have solidarity. Chapter 5 discusses the concept analysis.

CHAPTER 5

CONCEPT ANALYSIS

PHASE TWO

5.1 Introduction

Chapter 4 presented data analysis and discussed the findings of the study, the data analysis yielded major themes, themes, and subthemes. Concept analysis forms phase two of this study. This chapter examines concepts that surfaced during data analysis. According to Walker and Avant (2019), concept analysis is a process of operationalising a phenomenon so that it can be used for theory development or research measurement that evolves, never fixed, but creates a useful understanding of the shared meaning of a concept within a specific context. The analysis clarifies and refines the concepts (Chinn & Kramer 2015). Concept analysis is further described as a complex conceptual formulation of experiences that are extracted from life experiences and clinical practice of research (Chinn & Kramer 2015).

The concept of ‘‘support" was established from data analysis. Patients living with diabetes mellitus and family members reiterated support with self-care management as a challenge. The findings of this study revealed that there is support for adult patients living with diabetes mellitus by family members and professional nurses, however, the support is insufficient. Some family members stated that they are not informed on how to support patients who are living with diabetes mellitus, hence the ineffective support. Patients reported that, although they receive diabetic medication regularly from the community healthcare centres, they no longer receive ongoing health education about diabetes mellitus and diabetic self-care management. As a result, patients with diabetes mellitus consider the support not sufficient. The study's findings revealed that sufficient support for diabetic patients and family members is needed in the Vhembe and Mopani Districts of Limpopo Province.

5.2 Defining the concept

The word "concept" is derived from the Latin word "conceptus," which meant to receive, take it in, or conceive. (Muenzer 2021). According to Chinn and Kramer (2015) the term "concept" refers to a complex formulation of experience or the totality of what is perceived from the outside world, including objects, other people, visual images, colour, movement, noises, behaviour, and interactions. a concept or idea that is directly conceived or intuitive. The synonyms of 'concept' in

Merriam-Webster's dictionary are ‘idea’, ‘conception’, ‘thought’, ‘notion’, and ‘impression’. The synonyms of the word ‘concept’ are explained according to Merriam-Webster’s dictionary:

Idea: this may apply to a mental image or formulation of something seen or known or imagined, to a pure abstraction, or something assumed or vaguely sensed.

Thought: is more likely to imply the outcome of thinking, deliberating, or practicing meditation than of visualising.

Notion: denotes a concept that cannot be fully clarified by study or investigation, and it may also suggest arbitrary or accidental.

Impression: refers to a thought or concept that emerges right away as a response to some sensory stimuli.

5.3 Concept analysis

According to Savolainen (2020) conceptual analysis is a technique that treats concepts as classes of objects, events, properties, or relationships. Concept analysis is also defined as the foundation of the theory development and leads to the expansion of the body of nursing knowledge (Rafii 2020). During concept analysis the reseacher identify and describe the circumstances under which anything or phenomena is categorized under the concept in question. The aim of employing conceptual analysis as a method of research is to improve comprehension of the manner in which specific concepts are (or could be) utilized for communicating ideas about a subject of interest (Savolainen 2020).

Whereas Walker and Avant 2019 define concept analysis as a systematic language exercise used to identify key characteristics. Clarifying confusing concepts in theories and proposing a precise operation that represents their theoretical foundation are the two main objectives of concept analysis (Walker & Avant 2019). Concept analysis is important in nursing because concepts are crucial when discussing concepts in nursing research. Finding, analysing, and describing concepts that describe phenomena is the main objective of concept analysis or concept development. Information about concepts becomes vague, ambiguous, and challenging to understand without this clarification. A concept analysis can be used to define concepts precisely for research or the development of instruments, as well as to clarify and refine concepts in theory, practice, and research. There are several nursing-related applications for concept analysis. These comprise, but are not restricted to, finding gaps in nursing knowledge, evaluating the utility of concepts that seem to be similar, ensuring that a concept's definition and application are accurate,

and delineating concepts that appear to have a variety of meanings (Young et al. 2020). In this study concept analysis was carried out since it is a useful tool for nurses performing research and the researcher sought to provide a precise, clear theoretical and practical description of the concept ‘’support’’ and how it should be utilized in this study. The identified concept was examined using Walker and Avant's (2019) steps as a guide. The following procedures are recommended for concept analysis (Walker & Avant 2019).

- Selection of the concept.
- Determination of the purpose of the analysis.
- Identification of the use and characteristics of the concept.
- Determination of the defining attributes.
- Identification of model case.
- Identification of additional cases, related cases.
- Identification of borderline, related, contrary, invented, and illegitimate cases.
- Identification of the antecedents and consequences.
- Definition of the empirical referents.

5.4 Selection of the concept

According to Walker and Avant (2019), the hardest part of the process is selecting the concepts; it should be done cautiously to prevent selecting concepts that can only be understood through examples. The researcher selected a concept from an area of interest that was related to the model being developed in this study and looked at the concept that accurately describes the participant's experiences. As a result of data analysis, the concept of "support" in diabetes self-care management was empirically discovered as a gap and core idea to be analysed. Support of adult diabetic mellitus patients by family members and professional nurses was found to be challenging. Support of patients living with diabetes mellitus by family members and professional nurses was among the elements that the participants thought may help them to manage diabetes mellitus effectively. The concept “support” was selected since it is the concept of interest in this study, and findings of this study showed that majority of patients living with diabetes mellitus did not get adequate support from professional nurses and family members. As a result of the detected gap, "support" was regarded by the researcher to be a crucial concept to analyse. The quotes that reflect support of adult patients living with diabetes mellitus were repeated throughout data collection:

One patient mentioned that:

‘‘I do not visit the doctor or nurses for an eye examination because I do not know that I should do that; I was not advised to visit eye practitioners for an eye examination. Since I was diagnosed with diabetes mellitus in 2005, I never experienced any eye challenges. My blood glucose only rises if I hear about close relative dying, or when I'm angry. We need nurses to support us on how to handle emotional issues; how to handle anger; to teach our family members how to assist us as people who are living with DM, not to be led into anger, and not to be forced to think of dying because of what people say about diabetic patients. People sometimes influence others not to listen to people living with diabetes mellitus, because when we speak out, they say the blood glucose is in our heads". (P7, male, 54 years old).

Another patient revealed that:

> *‘‘My wife sometimes puts too much salt and oil, when I tell her to reduce, she does not conform to what is expected. Maybe she needs to come here to the clinic so that professional nurses can teach her how to prepare food for me. I will be grateful if professional nurses could also assemble our spouses here at the clinic and educate them on how to prepare food for us’’***.** (P13, male, 53 years old).

One professional nurse said:

> *‘‘We have a shortage of staff here at the health centre. The department of health should hire more professional nurses. Shortage of staff causes us to omit some important interventions we ought to do for diabetic patients, for example, we can ‘t give health education, and sometimes there is no nurse to take blood samples for patients' medical review. It is hectic. The diabetic clubs that are here at the health centre were supposed to have moved to the community, but we are stuck with clubs that need our attention whereas we are short-staffed"*. (PN1, female, 57 years old).

Based on what the patients living with diabetes mellitus, family members, and professional nurses had to say, the researcher discovered that the support given to patients living with diabetes was insufficient to improve diabetes self-care management. Even though some professional nurses claim to educate both family members and diabetic patients about diabetes mellitus and its management, support remains a challenge in the Vhembe and Mopani Districts of Limpopo Province.

5.5 Determination of the purpose of the analysis

The purpose of concept analysis, according to Walker and Avant (2019); Chin and Kramer (2015), is to provide a definition, explain the concept's meaning, and understand the concept's significance; essentially, to establish boundaries and prevent getting completely lost throughout the concept analysis process. In this study, the purpose of concept analysis was to analyse the concept of "support" in the study context namely: community health centre and home context. Therefore, to have a better understanding of how the concept “support” is perceived, concept analysis was conducted and the following outcomes were accomplished:

- The concept of "support" was analysed.
- The characteristics and use of the concept " support’’ was clarified.
- Development of theoretical definitions that helped to develop the model for support of adult diabetic Mellitus patients in self-care management at the CHCs of Limpopo Province.

5.6 Identification of the use and characteristics of the concept

It is critical to identify all uses of the concept. The researcher used different sources from the literature review to define the conceptual meaning of “support”, as directed by (Walker and Avant 2019). The definition of the concept was clarified using dictionaries, periodicals, articles, and textbooks. The concept was studied for potential future research and to see how it was utilised in the literature available at the time (Krammer & Chinn 2015). In this study, the concept "support" means support of patients living with diabetes mellitus by professional nurses and family members, by making it appoint that diabetic patients to adhere to diabetic self-care practices.

5.7 Definitions of concepts

Mosby's dictionary of medicine, nursing, and health professions (2013) define support as sustaining, holding up, or maintaining in a desired position or condition. Whereas (Stevenson, 2010) defines support as follows: to bear all or part of the weight, give assistance, encouragement, or approval to, be actively interested, to be capable of sustaining. According to the Merriam-Webster dictionary, it is indicated that support is about assisting a person by one's presence, giving moral or psychological support. Stevenson (2010) defines the term support as follows:

- Assist
- Help

- Comfort
- Provide
- Approve

According to Merriam-Webster.com Dictionary support mean to assist/help, bear, follow, and to provide for. Figure 5.1 illustrate the meaning of support according to Merriam-Webster.com Dictionary.

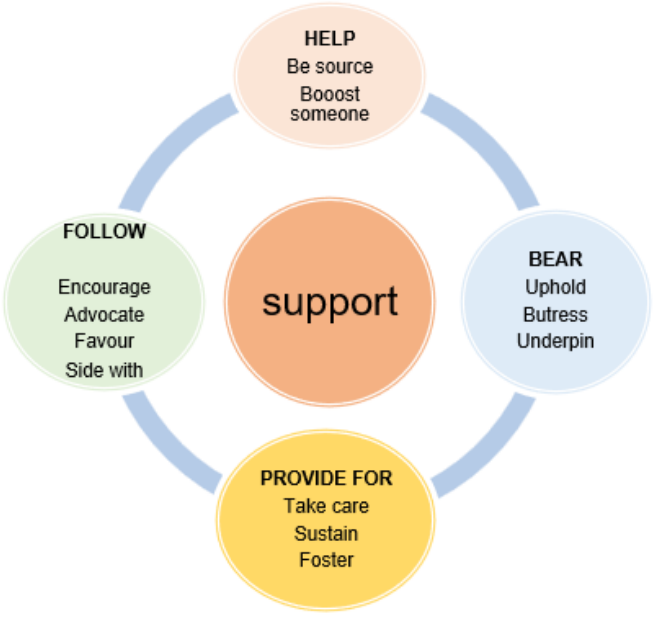


Figure 0.1: Meaning of support

Support in this study refers to the support of adult patients living with diabees mellitus by family members concerning diabetic self-care management practices such as administration of diabetic medication, healthy diet, blood glucose monitoring, regular exercise, eye care, and foot care. It also includes education of patients living with diabetes mellitus about diabetes mellitus and diabetic self-care practices. According to Simane-Netshisaulu (2018), support involves being there for someone and offering them moral and emotional support. It refers to the provision of services to individuals to enhance, promote, preserve, or regain their mental, physical, emotional, spiritual, and/or social well-being in the context of health care (Simane-Netshisaulu, 2018). Johnston and Terp (2019) identified three sorts of support that provide emotional support, namely: empathy, a hug, and consoling.

Emotional support: Emotional support aids in enhancing psychosocial functioning, such as lowering stress and boosting acceptance of one's feelings. In this study, the emotional support of patients living with diabetes mellitus by professional nurses and family members will help patients to cope with diabetes mellitus and effective management of diabetes.

Physical support: Physical support includes assistance from a family member who is disabled, as well as challenges with physical health such as health examinations, diets, or everyday activities. For example, helping with toileting, eating, and moving around their environment. In this study, the researcher believes that physical support provided by professional nurses and family members regarding healthy diet, feet care, eye care, and exercises, is important for the effective management of diabetes mellitus.

Material/instrumental support: This refers to offering support that is tangible. For example, transportation to doctor's appointments, childcare so that parents can work, and housework help so that the family can spend time together are all examples of material support. It also includes assistance with improving access to sufficient financial resources. Support also includes help with improving access to sufficient financial resources. Financial assistance is imperative to patients who are living with diabetes. Lack of financial assistance makes patients living with diabetes struggle to buy healthy food and blood glucose monitoring equipment. This lack of finance has a negative impact on effective management of diabetes mellitus by adult diabetic patients.

Informational support: Information support entails aiding in knowledge improvement through oral or written materials provided online, in print, or on video, resulting in improved self-care decision-making. In this study, information support is profound. Patients with diabetes and family members should be informed about diabetes mellitus and its management. Professional nurses should promote awareness about diabetes mellitus through radio, television, CHCs, diabetes mellitus campaigns, and the distribution of informational brochures to patients and the family members who care for them.

Effective management of DM requires patients living with diabetes mellitus to be supported emotionally, physically, and materially, and to be educated about diabetes mellitus and its management.

The literature on the concept of support was reviewed with a concentration on how it is applied or used in the field of health care, in general, legal, military, and medical to gain a more in-depth understanding of the concept. The concept support was explored from the books, journals, and dictionaries written in English. During the literature search, only publications describing support

were included. All books and journals that did not describe the concept support were omitted from the study.Table 0.1: Illustration of a literature review for the concept “support”.

Source	Year	Field	Application of the Concept
Simane- Netshisaulu	2018	Health care	Assisting people to advance, enhance, protect, maintain, or restore their mental, physical, emotional, spiritual, and social well-being.
McIntosh	2013	General	To bear the weight of, especially from below; keep from falling, sinking, or slipping: Pillars support the roof. To offer help or advice regarding (a product or service)
Lea et al.	2020	General	To provide assistance, encouragement, or approval to someone's actions, as well as a means of enabling that person to endure, supply strength, encourage, offer assistance, or speak in favour of
Merriam Webster	2020	Military	To endure bravely or quietly: Bear To promote the interests or cause of To uphold or defend as valid or right: Advocate
Segen's Medical Dictionary	2011	Medical	The offering of assurance, acceptance, and encouragement during stressful moments is referred to as a nursing intervention in the classification of nursing interventions.
Bell	2014	Sociology	Anything that aids in the adoption and enforcement of a policy
Thomas	2013	Religious	To bear one another’s burdens, and so fulfil the law of Christ(Galatians 6:2)

The synonyms of support according to Collins English Dictionary (2014) are:

- Uphold: to sustain, maintain, preserve, defend, and promote.
- Advocate: to uphold or defend as valid or right.
- Back: to advocate, champion, support, and uphold.
- Assist/help: to act with.
- Bear: to bear mean to endure or quietly.
- Corroborate: to provide substantiation.
- Maintain: to pay the cost of.
- Comfort: to keep from fainting, yielding, or losing courage.
- Champion: a person who fights for, or speaks in support of, a group of people or a belief.

5.8 Determination of the defining attributes

According to Walker and Avant (2019), determining ideas and a theories' attributes is the cornerstone of concept analysis. The term “attributes of the concept” refers to a collection of characteristics that are frequently associated with the concept under study and provide the researcher with a clearer understanding of it. The researcher created a list of the repeating characteristics of the concept to define the attributes using literature identified dring search. The researcher explained the discovered concept of “support”. The following are some of the features of the concept of “support”.

Support is defined as providing assistance, encouragement, or approval to someone's actions, as well as a means of enabling that person to endure, supply strength, encourage, offer assistance, or speak in favour of (Lea et al. 2020). In this study, “support” refers to providing assistance, encouragement, and strength to patients living with diabetes mellitus when employing planned self-care practices.

The findings of this study demonstrated that some family members and professional nurses have indicated that they support diabetic patients with self-care practices. Nonetheless, the support that is provided to diabetic patients is ineffective. Some professional nurse provides insufficient information regarding self-care practices to diabetic patients. Some family members do not have sufficient information on how to support a member who is living with diabetes mellitus, and they are not actively involved in supporting patients with self-care practices. The ineffective support of diabetic patients was confirmed as follows:

One family member said:

“I do not do anything regarding the care of her eye and feet, except to help her with the bathing of her feet and applying body cream or lotion. The professional nurses did not advise me on how to take care of my mother feet. May you please explain to me, how I should take care of her feet?” (FM1, female, 32 years old).

One patient indicated:

“I do not monitor her blood glucose because there is no machine, her blood glucose is monitored at the clinic when she goes to collect medication. She does not do exercises. I also do not even think of encouraging her to do exercises. There is nothing I do to assist her with foot care or eye problem. She does not complain of foot problems or eye problems. I did not get advice concerning both eye and foot care” (FM13, female, 57 years old).

In the management of diabetes mellitus, support might be beneficial. Using an organised intervention to provide assistance, encouragement, and strength to those living with diabetes mellitus may result in the desired outcomes. Based on Walker and Avant (2019), any concept analysis should, in general, have more than one defining characteristic. Appropriate attributes should be selected to analyse the concept. Therefore, based on this principle, providing assistance, encouragement, and strength to diabetic patients during self-care management practices is a crucial distinguishing attribute of the concept of “support”. Figure 5.2 shows the attributes of “support”. The clarifications of those attributes are listed below.

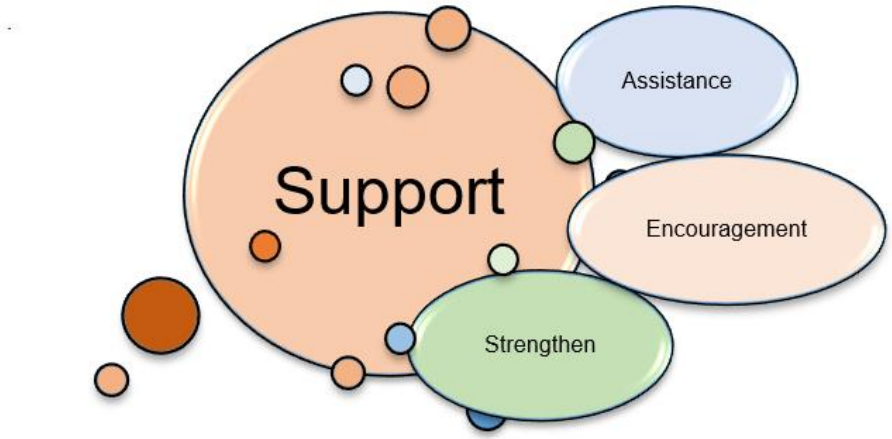


Figure 0.2: Attributes of support

5.8.1 Assistance

The word assistance was explored. According to Stevenson, (2010), the word assistance is used as follows:

- Help
- Support
- Aid
- Backing

Orem's self-care deficit theory of nursing supports that the maintenance of optimal health and wellness is achieved through self-care. According to Alligood et al. (2010), the inability of a person to engage in self-care activities is due to limitations. Assistance should be provided by self-care

providers to people who are completely, partially, or unable to engage in self-care. In this study, assistance refers to supporting adult patients living with diabetes mellitus who are incompetent in performing self-care management practices. Emotional support and health education about diabetic self-care practices are the support that professional nurses provide to patients living with diabetes mellitus. Family assistance of patients involves preparation of a healthy diet, help with taking medication, monitoring of blood glucose, exercises, feet care, reminding or accompaniment of patients during follow-up visits to collect medication, and for eye care.

5.8.2 Encouragement

According to Lea, et al. (2020), the synonyms of concept encouragement are:

- Reassurance
- Help
- Inspiration
- Cheer
- Praise
- Reinforcement
- Boost

In this study, encouragement refers to inspiring, stimulating, and motivating adult patients living with diabetes mellitus to adhere to diabetic self-care management practices. Encouragement of patients should be done by professional nurses during the diagnosis of diabetes mellitus and continue during follow-up visits. Family members who stay and take care of the patients should play a role in motivating the patients to adhere to self-care practices. According to Orem (1980) as cited in George (2011), self-care is the maintenance of health and wellness in the context of the environment, health, and nursing. Patients need to be encouraged to be active in identifying their self-care needs and decide to manage diabetes mellitus self-reliantly with support from professional nurses or/and family members.

5.8.3 Strengthen

Meriam Webster, thesaurus online dictionary, describes strengthen as follows:

- Reinforce
- Fortify
- Support
- Toughen

- Make stronger.

Strengthening of patients on diabetes self-care management should be done through health education, and emotional support to improve psychosocial functioning, reduce stress related to the diagnosis and lifestyle modification and increase a positive attitude toward self-care practices.

5.9 Identification of model case

Walker and Avant (2019) described a model case as an example of the use of the concept that demonstrates all the defining characteristics or attributes of the concept. A model case may be constructed by the researcher or maybe an actual case from real life. The researcher identified a model case that illustrated and explained a real-life example of the concept's application and included all the concept's important features guided by (Walker & Avant 2019). All the features of the concept were integrated into a real-life scenario. They helped the researcher in organising ideas regarding the characteristics or defining features of the concept of interest. The following model case was identified:

"I support my mother by making sure that we eat the same healthy diet she eats as adviced by the nutritionist. We eat a salt-free and sugar-free diet together with her so that she does not feel alienated. One pot is cooked for all of us, and we are comfortable with doing that. I plan my routine to cater to my mother's needs in relation to DM managent. I make sure that she eats and takes her medication at the right time as advised by the doctors and nurses. My mother does not have both legs, she was amputated; therefore, we assist her to do exercises of the arms, hands, and chest. We do those exercises according to her ability, we do not have a specific time for exercising, and if she gets tired we stop. We support her psychologically. We pray with her. We tell her not to stress much about her condition, and that all is well. I monitor her blood glucose level once a day, and when she looks ill. I record her blood glucose in the pocketbook that I was advised to buy by professional nurses" (FM3, female, 29 years old).

In this scenario the researcher identified the following attributes of support: Assistance, encouragement, and strengthening of patients living with diabetes by a family member with regard to self-care management. The family member (the daughter) explained how she supports her mother with diabetic self-care management in a home context as advised by dietician and professional nurses. In this case assistance is shown by a family member who ensure that her mother (patient living with diabetes mellitus) eats, take medication at the right time as adviced, and helping her with exercises. Eating same food with the mother that is salt free and sugar free so that she doesn't feel alienated is an attribute of encouraging the patient to abide to healthy

diet. The patient's spiritual and psychological health is further strengthened through prayer and encouragement by family members, Therefore, the researcher assumes that the involvement of family members in diabetic self-care management results in the effective support of adult patients living with diabetes mellitus.

5.10 Identification of a contrary cases

Walker and Avant (2019) revealed that an analysis cannot be finished until all defining attributes are separate from one another and the model case, and have divided contrast additional cases into borderline, related, contrary, invented, and illegitimate cases. Borderline cases are those that reflect some but not all the attributes of the concept; they are somewhat inconsistent. They help the researcher clarify thoughts about the defining or attributes of the concept of interest. Walker and Avant (2019) defined related cases as instances of concepts that are similar to the concept under study but lack crucial characteristics and are connected to the main concept in some other way. Related cases show similar ideas to the main concept but differ slightly when examined closely. Contrary cases are described as clear examples of “not the concept”; it informs the researcher of the attributes that the concept ought to contain (Walker & Avant 2019). The researcher compared the defining properties to determine whether extra characteristics or attributes should be applied to the concept of interest. In this study the researcher discovered the following characteristics that help to strengthen the contrary case. One patient said:

‘‘I think there should be support groups for people living with diabetes mellitus. At the health centre, there is no specific day to render services to patients living with diabetes melltus. We are not given a forum where we can talk about the challenges we are faced in relation to DM. Healthcare facilities should have professional nurses who attend to patients living with with diabetes mellitus only. Most patients are losing their lives because they do not understand diabetes mellitus and they deny to be amputated because they are not informed why their body parts should be amputated. Maybe if we have forums for people living with diabetes mellitus, we will get information regarding the causes of limb amputations before it even becomes a nightmare to us. Family members should be taught how to live in harmony with a person who is diagnosed with diabetes mellitus. They sometimes think that people living with diabetes mellitus are unmanageable, more specifically when they must prepare a separate meal for us. I suggest that support groups for family members should also be formulated wherein family members will be educated on how to support us (patients living with diabetes mellitus)’’ (P15, 50 years old).

This scenario shows a contrary case of support, it reflects that family members and professional nurses do not provide assistance, encouragement, and strength to individuals living with diabetes mellitus. In this situation patient living with diabetes mellitus expressed concern about the lack of time allotted by professional nurses to attend to patients living with diabetes mellitus, as well as the fact that patients living with diabetes mellitus are not provided a platform to discuss their glitches in the CHCs. The patient further indicated that she feels that patients living with diabetes mellitus should be educated about the DM and its complications, that lead to amputation of limbs. Family members who live with individuals who have diabetes mellitus should be taught how to live in harmony or to support family members who are living with diabetes mellitus. The patient additional suggested that support groups for family members should be formed wherein family members can be educated on how to support people with diabetes mellitus. As a result, people living with diabetes mellitus will be effectively supported in self-care management.

5.11 Identification of the antecedents and consequences

Antecedents are defined as aspects or events that precede the occurrence of the studied concept (Walker & Avant 2019). The Oxford English Dictionary defines antecedent as somebody or something already existing or occurring, particularly as the reason why something later exists or occurs. Chinn and Kramer, (2015) referred to experiences that are identified before other concepts as antecedents' concepts. The antecedents and consequences of the concept of "support" were discovered through a literature review.

5.11.1 Antecedents of support

Antecedents are defined as the events or attributes that must arise before a concept's occurrence (Walker & Avant 2019). According to Chinn and Kramer (2015), antecedents are experiences identified before other concepts. The antecedents for support, when developing a model referred to those aspects that preceded the process of developing a model. In this study, antecedents are those factors that facilitate the occurrence of support. They helped the researcher to identify the underlying examinations about the concept of support. The following antecedents were found to be important for developing a model to support adult patients living with DM in self-care management at the community health Centre of Limpopo Province, South Africa: relationship and trust, empathy and sympathy.

5.11.1.1 Relationship and trust between professional nurses, family members and patients living with diabetes mellitus.

One of the most important aspects of developing long-lasting relationships with patients and family members in the healthcare sector is trust (Nandyal et al. 2021). Trust is characterised as a steadfast faith in the reliability, truth, competence, or strength of someone or something (Gregory & Austin 2021). The professional nurse-patient relationship in the healthcare system relies on trust. Patients are more likely to adhere to treatment regimens if they can trust professional nurses. There are numerous strategies to win patients' trust. This includes being open and truthful and maintaining confidentiality (Gregory & Austin 2021. According to Lin et al. (2022), the most common strategy employed by nurses is to establish trust with the patient by listening carefully to and interpreting their needs and complaints. Therefore, patients with diabetes mellitus need to trust that the professional nurses at the CHCs have their best interests in mind and that they give them accurate information and high-quality diabetes care. The professional nurses must have trust in their patients' honesty while discussing their symptoms and compliance with prescribed care. A lack of trust can result in misunderstandings and mistrust. To handle adult diabetes mellitus patients' care effectively, there should be a relationship with trust between professional nurses, adult diabetic patients, and family members. To build trust, professional nurses should make sure to spend time getting to know diabetes patients and their caregivers or family members to foster trust. Find out about their past medical history and present health issues.

Be straightforward and honest with the patients and family members regarding diabetic care. Professional nurses should not attempt to conceal information or minimise possible risks of diabetes mellitus. Instead, they should explain what will happen and provide patients with the knowledge they need about diabetes mellitus, to help them make the health-related decision. Effective communication enables professional nurses to have a positive relationship with patients and family members. Good patient-professional nurse communication results in better health outcomes. Professional nurses should communicate with the patient like an adult conveying respect using formal language. Do not rush the patients but allow them time to digest what is being said about diabetes mellitus and its management and try speaking more slowly to address their concerns (Asan et al. 2021).

Consider caregivers' or family members as "hidden patients" as it can be challenging for patients to remember everything that was addressed during a visit. Family members as caregivers deal with a variety of emotional, material, and physical difficulties. Along with balancing their own lives and families, they frequently help patients living with diabetes mellitus with personal care,

transportation, and housework. Many also administer drugs, injections, and other therapies, and they may want counsel or direction on how to do so. Improving treatment adherence requires establishing a good relationship with the patient. Lin et al. (2022) indicated that a professional relationship is associated with cooperation, an emotional commitment between the nurse and the patient, and common goal setting. Nurses can help patients improve their understanding and change their attitudes toward their condition to increase medication adherence. Therefore, good relationships and trust between professional nurses, family members, and diabetic patients are the foundation for effective support in diabetes mellitus self-care management.

5.11.1.2 Empathy and sympathy

One of the key characteristics for building the therapeutic relationship between a nurse and a patient is empathy (Moreno-Poyato et al. 2021 According to Olokundun et al. (2020) empathy is the ability to understand things from another person's perspective, a way of seeing the world from a patient's point of view. It is the ability to empathise with and understand the reasons behind the experiences and feelings of another. Empathy is the ability to see, comprehend, and share other people's perspectives without passing judgment. In comparison, sympathy is the formal expression of feeling compassion, sorrow, or pity for the hardships that another person encounters. Professional nurses at community health care centres should put themselves in patients' shoes, demonstrate that connection, and act on that understanding to enhance diabetic care without judging the patients.

To support adult patients living with diabetes mellitus, empathetic professional nurses should understand the patients' needs, putting the patients at ease to discuss their problems and concerns regarding diabetes mellitus. Patients with health concerns ranging from diabetes to cancer have exhibited better outcomes from empathetic nursing care (Moudatsou et al. 2020). Lin et al. (2022) indicated that to deal with a patient's emotions and gain their trust, nurses should demonstrate empathy, listen, and accept behaviours.

A lack of empathy in professional nurses negatively impacts patient care, hence poor diabetic self-care management support. Without empathy, patient treatment is less effective and can leave those receiving medical care feeling frustrated, neglected, and confused about their treatment. Empathy is vital in almost every aspect of daily life. It permits us to have compassion for others relate including friends, loved ones, co-workers, and strangers, and it has a large beneficial impact on the world. According to Mphasha et al. (2022), close family members, such as spouses and children of patients, are affected by the changes in patients' health brought by diagnosis.

Therefore, professional nurses should be empathetic to family members and empower them on how to provide support to diabetic patients. In providing support to patients, family members are expected to share certain responsibilities of diabetes management. Families can provide support relating to driving or transporting patients to healthcare facilities for the collection of medication, including consultations (Mphasha et al., 2022).

5.11.2 Consequences of support

Events or occurrences that can happen because of the existence of a concept are known as consequences. These events or incidents frequently inspire new concepts or directions for research on specific concepts and are generally called “outcomes of the concept” results (Walker & Avant 2019). Both antecedents and consequences aid in the refinement of important attributes by providing a better knowledge of the context in which the concept is commonly utilised (Walker & Avant 2019). The results of support are consistent with the purpose of the study. In this study, consequences of “support” in self-care management of individuals living with DM when applied to this context refers to adherence to diabetic self-care management practices, delayed onset of diabetes complications, good quality of life, and prolonged life. Figure 5.3 illustrates the identified consequences of support for adult patients living with diabetes mellitus, and a description of each consequence follows under the figure.

Figure 0.3: The consequences of effective support

5.11.2.1 Adherence to diabetes mellitus self-care management practices

Adherence to self-care management is imperative for the effective management of diabetes mellitus. Support of patients living with diabetes through diabetic education and its management by professional nurses is important. Family members' support concerning daily self-care management practices improves patients' adherence to self-care practices. Diabetes patients must undertake self-care to keep their condition under control and avoid complications (Bonger et al. 2018). It is important for patients living with diabetes mellitus to adhere to exercises, prescribed diabetic medication, recommended diabetic diet, self-monitoring of blood glucose, feet care, and eye care to delay diabetic complications.

5.11.2.2 Delayed diabetes mellitus complications

The goal of diabetes mellitus management is to normalise the blood glucose level and to prevent or delay the complications of diabetes. The glucose level control depends on the adherence of diabetic patients to self-care management practices. An individualised teaching program providing information for diabetic patients on the prevention of complications of diabetes mellitus is important. Support of diabetic patients by professional nurses and family members may result in delayed acute complications such as diabetic ketoacidosis, hyperglycaemic hyperosmolar state and hypoglycaemia, and chronic complications such as coronary artery disease, stroke, feet ulceration or amputation, retinopathy, nephropathy, neuropathy, and erectile dysfunction.

5.11.2.3 Good quality of life

Diabetic complications negatively impact the quality of life and cause disability, which may affect an individual's capacity to manage diabetes and well-being. Physical symptoms such as fatigue, pain due to neuropathy, depression over the loss of health and diabetic-related complications, and lifestyle changes affect the quality of life. Support of patients living with diabetes mellitus by professional nurses and family members will keep patients' blood glucose within normal ranges, without diabetes complications, and improve their quality of life (Werfalli et al. 2018).

5.11.2.4 Prolonged life

According to Aikaeli et al. (2022), microvascular and macrovascular complications are the main contributors to morbidity and mortality in patients with DM. Microvascular complications include myocardial infarction, stroke, peripheral vascular disease, and diabetic foot. There is an increase in mortality in patients diagnosed with macrovascular complications. Delayed diabetic

complications will result in prolonged life (Aikaeli et al. 2022). Table 5.2 shows the terms, attributes used, antecedents, and consequences for support.

Table 0.2: Terms, attributes used, antecedents, and consequences for support

Terms	Attributes	Use	Antecedents	Consequences
Support	Assistance	The provision of help that is necessary for the health, and protection of someone. The action of providing or supplying something for use	• Relationship and trust between professional nurses, family members, and diabetic patients. • Professional nurse's sympathy and empathy.	- Improved adherence to self-care management practices. - Controlled blood glucose within normal ranges. - Delayed early onset of diabetes complications. - Improve the quality of care.
	Encouragement	The action of giving someone support, confidence, or hope inspiring, stimulating, and motivating		
	Strengthen	To make something stronger or more effective		
Adult	Mature	Fully developed physically, fully grown, 18 years and above.		
Diabetes mellitus	Hyperglycaemia	For an excess of glucose in the bloodstream.		
Patients	Ill-health	A condition of inferior health in which some disease or impairment of function is present.		
	Complaint	An illness or medical condition or a statement that something is unsatisfactory or unacceptable.		
Self-care	Self-reliance	Reliance on one's power and resources than those of others.		
	Self-control	The ability to control oneself one's emotions and desires, especially in difficult situations.		
Management	Planning	The process of making plans for something.		
	Controlling	To determine the behaviour or supervise the running of.		
	Achieving	To successfully bring about or reach a desired objective or results by effort, skill, or courage.		
	Outcomes	The way a thing turns out, a consequence, results.		

5.12 Defining the empirical referents

According to Walker and Avant (2019), the last phase in a concept analysis is to identify the empirical referents for the defining attributes. Empirical referents are classes or categories of actual phenomena that demonstrate the occurrence of the concept itself by their existence or presence. As concept analysis comes to an end, a decision of whether to measure the concept or ascertain its presence emerges. They are useful when creating instruments because they theoretically connect to the concept's foundation and add to the instrument's construct validity and content. In many cases, the defining attributes and empirical referents will be identical (Walker & Avant 2013). The following were identified as empirical referents for support: diabetes standards, guidelines, and policies regarding the management of diabetes mellitus. Table 5.3 illustrates empirical referents and their indicators.

Table 0.3: Empirical referents for effective support

Empirical referents	Indicators
SEMDSA 2017 Guidelines for the Management of type2 diabetes mellitus American Association of Clinical Endocrinology Clinical Practice Guideline (2021) type 2 diabetes Management in adults at primary care level (2014)	• Society for Endocrinology, Metabolism, and Diabetes of South Africa (SEMDSA) guideline for the management of type 2 diabetes mellitus available at the community health centre. • Evidence of identified and recorded diabetic self-care deficit per individual patient. • Community Health care centres to possess records of patients living with diabetes mellitus who were educated about diabetes mellitus using SEMDSA guidelines during diagnosis, initial visit, and subsequent visits. • Evidence that diabetes self-management education and support (DSMES) is patient-centred and receptive to individual needs and values; and non-discriminatory towards cultural, ethnic language, socio-economic and educational differences. • Proof that DSMES is managed by accredited healthcare professionals who have been appropriately trained in the execution of evidence-based principles. • Community Health care centres to possess records of family members who were educated on how to support members living with diabetes mellitus according to SEDMSA guidelines.

	• Adherence to self-care management practices resulting in improved blood glucose control and reduced or delayed diabetes complications.
Diabetic education	• A recorded year plan reflecting nurses' in-service training or workshops about diabetes mellitus. • A recorded year plan reflecting recurrent DM self-care management and family support awareness campaigns. • Pamphlets about diabetes self-care practices are readily available at CHCs. • Evidence of counselling reports for patients who needed emotional support. • Evidence of enhanced patients' knowledge regarding diabetes mellitus. • Improved quality of life and healthy coping. • Behaviour change or life style modification as a key outcome.
2022 National Standards for Diabetes Self-management Education and Support	• Support of DSMES services. • DSMES team. • Delivery and design of DSMES services. • Person-centred DSMES. • Measuring and demonstrating outcomes of DSMES services.
Adherence to diabetes self-care practices	Patients adhere to the following self-care practices: • Healthy diet. • Routine blood glucose monitoring. • Medication adherence. • Physical exercise. • Healthy coping.

5.13 Summary

Chapter 5 presented the theoretical and empirical analysis of the concept "support". Walker & Avant's (2019) steps for concept analysis were used to analyse the concept. The concept was defined, distinguished, and clarified using several sources. The uses, attributes and characteristics, antecedents, consequences, and empirical referents were determined. The concrete perspective was based on developing a model to support adult diabetes mellitus patients in self-care management at the CHCs of Limpopo Province, South Africa. Support is defined as sustaining, holding up, or maintaining in a desired position or condition (Mosby's dictionary of medicine, nursing, and health professions, 2013). The concept support was analyzed to clarify its use, meaning, and to have a better understanding of how the concept support is perceived and applied when assisting adult patients living with diabetes mellitus in their self-care management. Support in this study refers to the support of adult patients living with diabetes mellitus by family

members concerning diabetic self-care management practices such as administration of diabetic medication, healthy diet, blood glucose monitoring, regular exercise, eye care, and foot care. It also includes professional nurses' education of patients living with diabetes mellitus about diabetes mellitus and diabetic self-care practices. The concept support has implications on health education of patients living with diabetes mellitus at both the clinical level and academia and on policies regarding diabetic self-care management. Implications of support on:

- **Health education at clinical level**

  Support of patients living with diabetes mellitus and family members through diabetes health education inform them about diabetes mellitus and its management. Health education provided by professional nurses at the community health centers through diabetes mellitus campaigns, and the distribution of informational brochures promote awareness about diabetes mellitus radios and television.

- **Academia**

  The nurse educators at tertiary institutions should educate the student nurses on how to support patients living with diabetes mellitus, and about its importance. Equipping professional nurses with sufficient knowledge regarding support of patients living with diabetes mellitus may contribute much in reducing the onset of diabetic complications and premature death.

- **Diabetes mellitus management policies/guidelines**

The professional nurses who provide diabetic health care services to patients at the community health centers should apply diabetes mellitus management guidelines appropriately. Adherence and application of the stipulated guidelines by professional nurses may possibly help to achieve effective support of patients living with diabetes mellitus.

The concept support was selected defined according to different fields. The concept was analyzed based on the procedures recommended for concept analysis by (Walker & Avant, 2019). The uses, characteristics and defining attributes of the concept support were clearly identified. The researcher identified a model case that illustrate and explained a real-life example of the concept's application and included all of the concept's important features guided by (Walker & Avant, 2019). In this study the researcher discovered characteristics that help to strengthen the contrary case of patient support. The antecedents and consequences of support were also identified, followed by defining the empirical referents for support of patients living with diabetes mellitus. Concept analysis provided a basis for the development of support model for adult diabetes mellitus patients

in self-care management at the CHCs of Limpopo Province, South Africa. The developed model is discussed in Chapter 6 of the stud

CHAPTER 6

DEVELOPMENT OF A SUPPORT MODEL

PHASE THREE

6.1 Introduction

Chapter 5 discussed concept analysis following the steps in Walker and Avant (2019) to distinguish and clarify the definition of the identified concept. This chapter form phase three of the study, and focuses on the development of a model to support adult patients living with diabetes mellitus in self-care management. It is guided by six survey list as indicated in Dickoff et al. (1968) namely: contexts, agents, recipients, dynamics, procedures, and terminus. It further outlines the integration of concept analysis and forms the building blocks of the model. The development of a model was also guided by the objectives of the study as stated in Chapter 1. Orem's self-care deficit theory was also applied. The data that was collected on self-care management from patients living with diabetes mellitus, support from professional nurses and family members was analysed. The findings revealed that some patients do not receive support from professional nurses and family members. Some patients do not have adequate information on self-care management. Family members indicated that they are not advised on how to support a family member who is living with diabetes mellitus.

6.2 Components of the model

According to Chin and Kramer (2015), the model consists of six components namely: the purpose, concepts, definitions, relationships, structure, and assumption. The six questions are put forward for a detailed description of the model.

1. What is the purpose of the model?
2. What are the concepts of this model?
3. How are the concepts defined?
4. What is the nature of the relationship?
5. What is the structure of the model?
6. On what assumptions was the model built?

6.3 Purpose of the model

According to Chin and Kramer (2015), the general purpose of the model is imperative. It specifies the situation and setting in which the theory is applicable. The first question the researcher should ask is why this model was created. The purpose of this model is to support adult patients living with diabetes mellitus in self-care management. If this model is used efficiently, professional nurses and family members will be able to support adult patients diagnosed with DM effectively. Giving diabetic patients and their families appropriate information about DM and self-care management is the key to providing diabetic patients with effective support.

The objectives of developing a support model were to:

- Improve diabetic self-care management.
- Reduce the chances of DM emergencies.
- Prevent and reduce complications of DM.
- Achieve support of patients.

6.4 Definition of the concept ‘‘support’’

The concepts that were identified in Chapter 5 throughout the process of concept analysis were well-defined. For the patients to be supported, the family members and professional nurses should have knowledge and capability to support them. The concept of support was also defined in Chapter 5 of this study**.**

6.5 Relational statement

According to Chin and Kramer (2015), relationship statements explain, anticipate, or characterise how the theory's concepts interact with one another. Theories frequently contain some levels of relationship statements which, when combined, give a rather comprehensive description of how the theory's constituent parts interact. The relationship begins to take shape when concepts are discovered and joined, but when formulating relationship statements, it is particularly crucial to pay attention to the content, direction, strength, and quality of interaction between concepts. Figure 6.1 presents the relationship between antecedents, defining attributes, and consequences to provide an overview of statements relating to successful support for diabetic support.

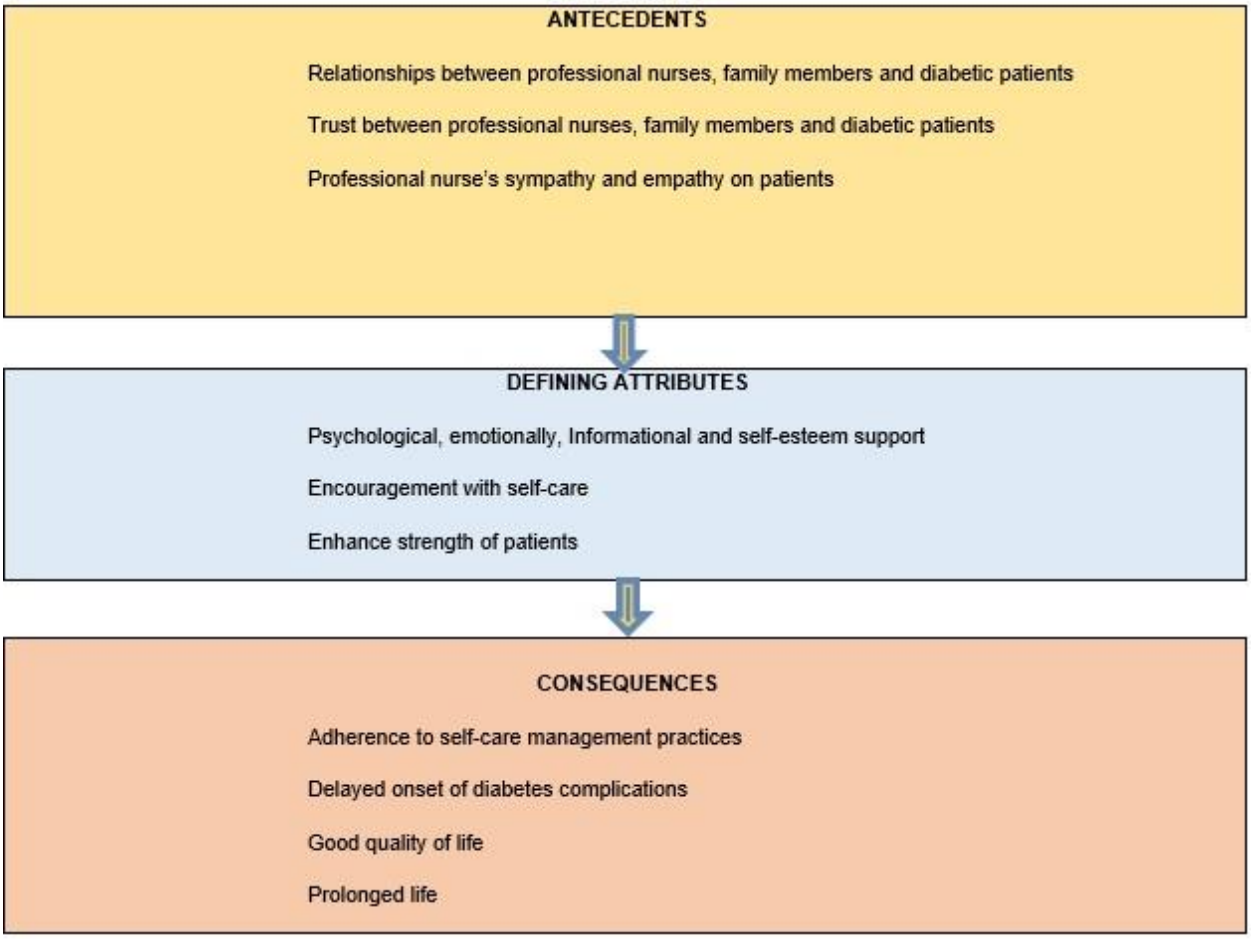


Figure 0.1: Relational statements

6.6 The structure of the support model.

According to Dickoff et al. (1968), the theoretical framework is used to incorporate the results of concept analysis and form a building block of the model. Theoretical framework that informed development of a model to support adult patients living with diabetes mellitus in self-care management was the six-survey list as described by Dickoff et al. (1968). Table 6.1 shows six survey list of the model and the description.

Table 0.1: The six survey lists of the model

Survey list	Description
Context	In what context is the activity performed?
Agent	Who or what performs the activity
Recipient	Who or what is the recipient of the activity?
Dynamics	What is the energy source for the activity?
Process	What is the guiding procedure, technique, or protocol of the activity?
Terminus	What is the endpoint of the activity?

6.6.1 Context

According to Dickoff et al. (1968), context is a setting, location, the physical structure of a unit or medical care, space, time, or structure that constitutes different elements of the situation in which the activity occurs. A context encompasses the elements external to person. A person and environment are considered as an integrated system related to self-care (George 2011). In this study, diabetic self-care support occurs in the CHCs in which the professional nurses (agents) provide diabetes mellitus nursing care to patients living with diabetes mellitus (recipients). In the community health care context, DM guidelines guide professional nurses to support patients. The internal contexts of support of patients are their homes. The patients visit the CHCs for follow up visits and to collect medication. At the CHCs, professional nurses render care to patients who are accompanied by family members. Figure 6.2 shows the diabetic self-care context.

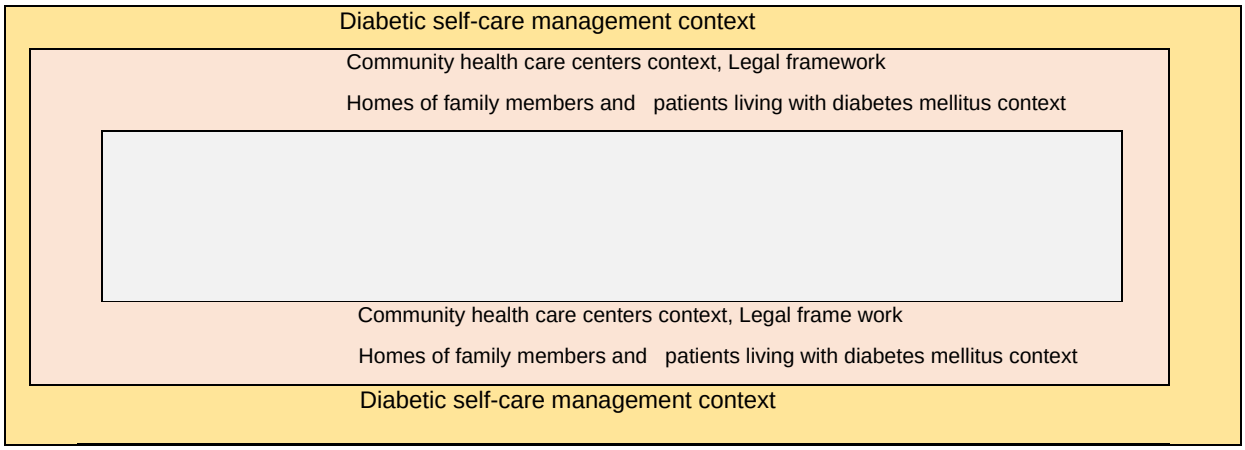


Figure 6.2: The diabetic self-care context

6.6.1.1 Community health centre context.

The community health centre is the context in which patients living with diabetes mellitus receive health services regarding diabetes, such as monitoring of blood glucose level, education about healthy diet, eyes care, feet care, and exercises. This context predominantly focuses on prevention, promotion, and curative aspects of improving the health of the community. In this context, family members are educated on how to support their members who are diagnosed with diabetes mellitus. The findings of the study revealed that though professional nurses educate patients about self-care management, some patients end up having insufficient information concerning diabetic self-care management. Therefore, it is crucial to comprehend the CHCs and a home context to effectively prevail against the dynamics that affect the support of patients living with diabetes mellitus in CHCs of Limpopo Province.

6.6.1.2 Legal framework context

The legal framework context is the context among patients living with diabetes mellitus and professiomal nurses who provide diabetic services at the community health centers context. The legal framework influence professional nurses to effectively support patients living with diabetes mellitus.

6.6.1.3 Patients living with diabetes mellitus home context

A home is the context in which patients living with diabetes mellitus receive support from family members concerning self-care management. The patients may need assistance with buying and preparing healthy diets, administration of diabetic medication, feet care, and exercises. During data analysis, it was identified that some family members could not support the patients, because they do not have sufficient information on how to support patients concerning feet and eye care and a healthy diet. Understanding the patients' home context guides the professional nurses in addressing the dynamics experienced by patients living with diabetes during self-care management.

6.6.2 Agents

According to Dickoff et al. (1968), an agent can be a person who performs an activity toward the realisation of a goal. Inside the contexts, the external agent for support in diabetic self-care management is the Department of Health. The DoH provides resources at the CHCs such as human and material. Human resources such as professional nurses and material resources such as blood glucose monitors. Internal agents are: professional nurses who provide diabetic health services to patients at the CHCs of Limpopo Province, South Africa.

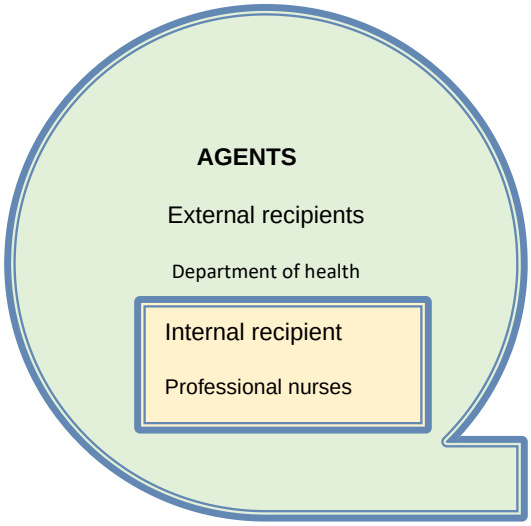


Figure 0.2: Agents

6.6.2.1 Department of Health

The Department of Health is the external agent that provides healthcare institutions with material and human resources. The findings revealed that there is a shortage of professional nurses and material resources such as glucose monitors. Therefore, professional nurses, patients, and family members have indicated that the DoH may supply blood glucose monitors to patients who cannot afford to buy.

6.6.2.2 Professional nurses

The role of professional nurses is to provide diabetic care and educate patients and family members on how to manage diabetes mellitus. This is supported by Fain (2017) who indicated that professional nurses support and educate patients, and family members about diabetes self-management and support to improve blood glucose control, self-care management and quality of life, and healthy coping of patients living with DM.

6.6.3 Recipients

A recipient is a person who benefits from the activity (Dickoff et al., 1968). Diabetic patients are the primary recipients to benefit from this model.

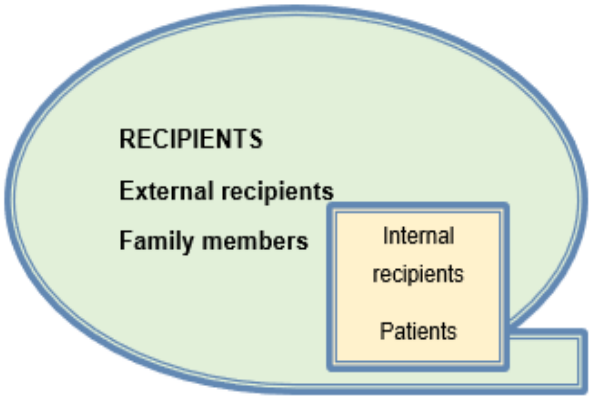


Figure 0.3: Recipients

6.6.3.1 Family members as recipients

Family members provide support to patients to manage their self-care living with diabetes mellitus, also need support and guidance from professional nurses.

6.6.3.2 Patients as recipients

Patients receive support from professional nurses and family members. The support provided to the patients by the family determines the life span and improve the state of health of patients living with diabetes mellitus.

6.6.4 Dynamics

Dickoff et al. (1968) explain dynamics as power sources for the activity, either psychological or physical or both for a person, thing, or part of the framework. Dynamics entails the activities or people working towards the realisation of a common goal, or outcome. In this study, the goal is to develop a model that will guide the support of adult patients living with diabetes mellitus at the CHCs of Limpopo Province. The dynamics that emanated from study findings were: lack of support of patients by family members and professional nurses, lack of blood glucose monitors, inadequate healthy diet, and insufficient information about diabetes mellitus and self-care management. Figure 6.5 shows the dynamics.

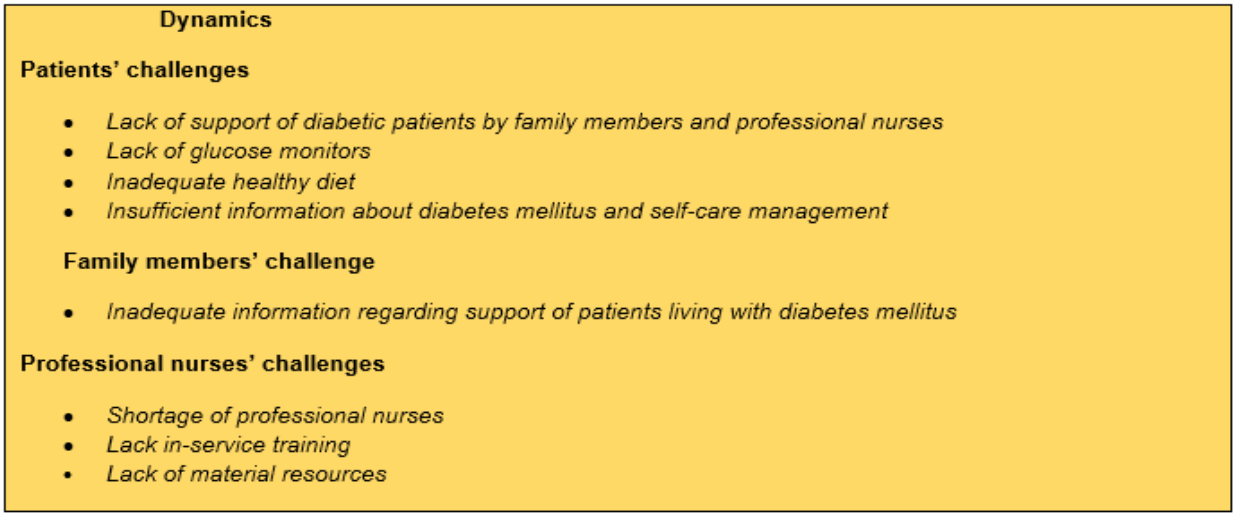


Figure 0.4: Dynamics

6.6.5 Procedure

Procedure refers to how the activity takes place; a guiding technique of the activity. The procedure outlines the steps, and the equipment to be used in a situation toward the accomplishment of the desired goal (Dickoff et al. 1968). The procedure for this model outlines the activities to be accomplished by the DoH, professional nurses and family members toward support of adult patients living with diabetes mellitus as indicated in Figure 6.6.

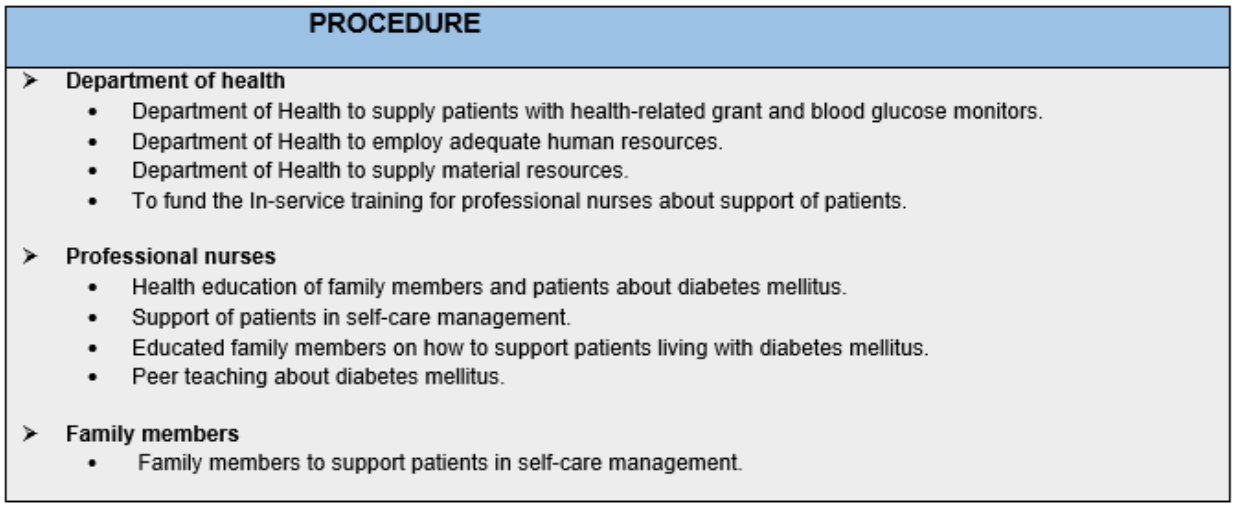


Figure 0.5: Procedure

6.6.6 Terminus/Goal

Terminus is the desired outcome an agent wishes to attain through the procedure; the results to be attained by the agent's action. It is to view activity from the perspective of the endpoint achievement of activity (Dickoff et al. 2008). Terminus is the support (all types of support) that should be provided to patients by professional nurses and family members, as outlined in Figure 6.7. The support is characterised by the following effects:

- Adherence to diabetic self-care practices.
- Delayed diabetes mellitus complications.
- Quality of life.
- Improved state of health.
- Long life span.

Figure 0.6: Terminus

Figure 6.8 outlines the schematic presentation of a model to support adult patients living with diabetes mellitus in self-care management in the Vhembe and Mopani Districts of Limpopo Province, South Africa. The model is interpreted from top to down approach.

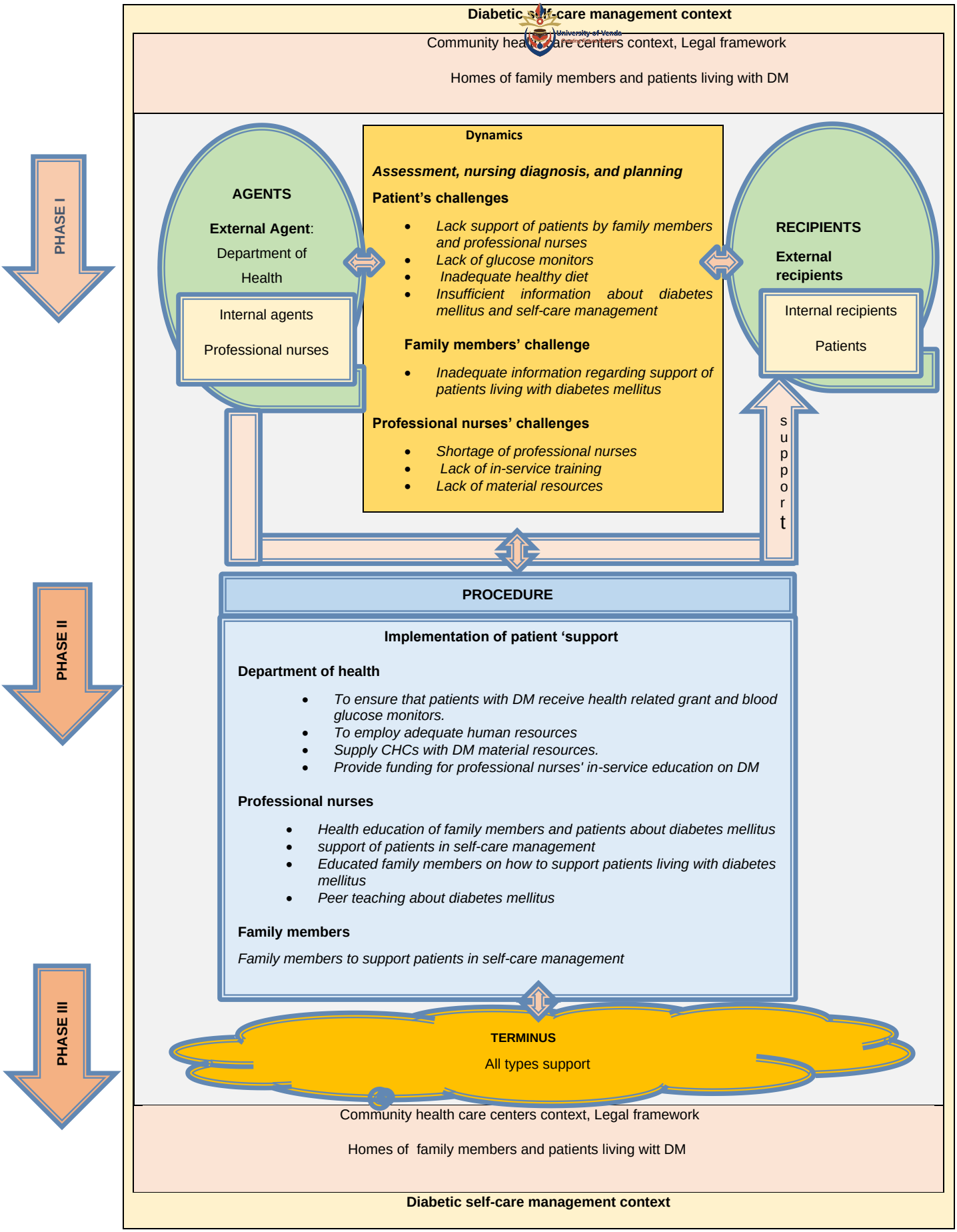


Figure 6.7 Schematic presentation of a model for support

6.7 Process of the model

To provide diabetic education and counselling that is required to meet the self-care needs of patients living with diabetes mellitus, the researcher employed a nursing process approach as outlined by Orem's theory of self-care deficit (George 2011). Kozier et al. (2011) defined the nursing process as a systemic, patient-centred, and scientific method of problem-solving for structuring nursing care to achieve the maximum level of change toward expected outcomes in providing nursing care. The nursing process consists of five steps that are followed when providing nursing care to a patient, this include: assessment, nursing diagnosis, planning, implementation, and evaluation.

The approach guides professional nurses to identify the gaps in self-care management of patients living with diabetes mellitus, and the support role to be played by the professional nurse in supporting the patients. Professional nurses educate patients at the initial visit and during follow-up visits to enhance the quality of life of patients and get them ready to manage diabetes mellitus on their own.

The support procedure to be followed by professional nurses at the CHCs in the province of Limpopo was developed using Orem's self-care theory. Orem's self-care theory was applied to guide the self-care agents (professional nurses), to support recipients (patients) with diabetic self-care management. At the community health centre, professional nurses organise and apply the phases of the nursing process to support patients.

According to George (2011), the self-care theory refers to self-care, therapeutic requirements, and requirements for self-care. Self-care denotes diabetic self-care management practices performed by DM patients to keep their blood glucose level within normal ranges and to maintain healthy life and well-being. When patients living with diabetes have the skills to take care of themselves, they can manage diabetes mellitus effectively. This skill is acquired by patients through learning from professional nurses and other health care professionals including other reliable sources such as the internet, and it is influenced by age, life experiences, culture, beliefs, and education, among other factors.

The following phases of the nursing process guided patients' support: Phase I (Assessment, nursing diagnosis, and planning), Phase II (Implementation of patient self-management support and Phase III (Evaluation of diabetic self-care management) (George 2011).

6.7.1 Phase I: Assessment, nursing diagnosis, and planning

In this phase, the professional nurses collect diabetic health history from the patients and the challenges that were experienced by the patients that ultimately made them to visit the community health centre. Professional nurses assess, make a nursing diagnosis, plan, implement, and evaluate the nursing interventions. They also assess the family members who assist the patients with self-care for information deficit related to support of a person living with DM. In this phase, the professional nurse should assess the challenges that can hinder effective support of patients living with DM. According to Orem, professional nurses act as facilitators and agents of change. Therefore, professional nurses as an agent of support in diabetic self-care management, collect data from the patients guided by Orem's self-care theory. The patient's data should entail the following:

Personal data: Personal data such as gender, age, marital status, nationality, education, and medical diagnosis of the patient should be documented (George 2011; Kimber et al. 2022). The patients' personal data guides professional nurses to plan and implement diabetic self-care management accordingly. The *therapeutic care demand*, and the actions that the patients need to perform to meet diabetic self-care requisites should be assessed. The following universal self-care requisites should be assessed:

- Universal requirements - entails patient physical examination data, daily life habits: diet, smoking, drinking, physical activity, stressor factor, resting, sexual activity and gynaecologic data; vaccination. The patient's ability to meet the universal requirements should be assessed by the professional nurse to identify diabetic self-care deficit.
- Growth and development requirements - family history, socioeconomic status, previous and current diseases, surgeries, and drug utilisation.
- Health deviations: current complaints, perceptions regarding treatment, and learning to live with diabetes mellitus. Health deviations are attended to after the collection of diabetic health history and physical examination.

Nursing diagnosis: Professional nurses identify patient's self-care deficits related to knowledge about diabetes mellitus, healthy diet, diabetic medication, self-blood glucose monitoring, feet care, eye care, and exercises.

Planning: The professional nurse together with the patients and family members design a supportive education, and plan for the therapeutic self-care demand of the patient to support the patients living with diabetes mellitus effectively.

6.7.2 Phase II: Implementation of patients' support

In this phase, the professional nurses develop a collaborative strategy, through the identification of procedures, to be implemented by the DoH, professional nurses, patients and family members to achieve effective support in diabetic self-care management. To achieve support for patients who are living with diabetes mellitus, the following activities ought to be executed.

- During the initial visit and follow-up care, professional nurses to educate patients living with DM and family members about DM, diabetes self-care management practices, as well as DM emergencies and diabetes-related complications.
- Professional nurses support patients in the following manner:
    - Guide the patients about diabetic self-care management practices to be followed, and the importance of adhering to self-care management practices following SEMDSA diabetic guidelines.
    - Provide psychological support to enable patients living with diabetes mellitus to cope with diabetes.
    - Do supportive education by providing and promoting an environment that supports patients to learn more about diabetes mellitus.
    - Teach family members about diabetes management and how to support a member with diabetes according to SEMDSA diabetes guidelines.
    - Continuous diabetic education of patients living with diabetes mellitus and family members about diabetic self-care practices.
    - Organise diabetes mellitus campaigns to empower family members about diabetes management and support.
    - Develop a checklist to monitor the adherence to diabetic self-care management practices of patients living with DM.

6.7.3 Phase III: Evaluation of patient' support

Phase III of the model's process is the terminus or endpoint stage of the model. It is based on the outcomes of Phase II implementation of activities.

In this final phase, the professional nurses evaluate the outcomes of the support model as follows:

- The patient's understanding the importance of adhering to diabetic self-care management according to SEMDSA diabetes guidelines.
- The patient's ability to execute diabetic self-care management to maintain normal blood glucose levels.
- Patients taking care of themselves, displaying self-care agency.
- Assess improvement in patients' self-care management.
- The professional nurses together with the patients evaluate the effectiveness of individualised diabetes management plans.
- Evaluate patients' support by family members.
- Evaluate patients' coping with diabetes mellitus.
- Evaluate implementation of all types of support provided to the patients (emotional, education/information, material and social support).

6.8 Guidelines for patient support

To achieve support, the following guidelines were considered to support patients living with diabetes mellitus in self-care management namely:

- Guidelines for the DoH.
- Guidelines for professional nurses.
- Guidelines for patients living with diabetes mellitus.
- Guidelines for family members.

6.8.1 Guidelines for the Department of Health

- The DoH to provide blood glucose monitors for patients living with diabetes mellitus.
- The DoH to employ sufficient professional nurses at primary healthcare institutions.
- The DoH to ensure that diabetes mellitus workshops and in-service training are conducted at least once a year and when there are new updates.
- DoH to fund the diabetes mellitus campaigns at the districts level and not focus on the national campaign only.
- Districts campaigns should be conducted twice a year, excluding the 14 November - World Diabetes Day.
- Campaigns to include education about how family members or care giver support a member living with DM in a home context.

6.8.2 Guidelines for professional nurses

- Professional nurses should follow the SEMDSA diabetic guidelines, and a guide on the Management of type 2 Diabetes in adults at the primary care level in South Africa when providing diabetic care in the primary health care setting.
- Professional nurses in primary health care to request the DoH to provide patients with glucose monitoring machines.
- Patients living with DM and their family members to be educated about DM physiology using language that they understand better, to ensure better understanding. The education should emphasise the importance of a healthy diet which includes healthy culture diet, eating frequency per day, types of drinks to be used, eye care, feet care, dental care, weight management, exercises.
- Individualised diabetic education that includes patients and family members are to be done by professional nurses during an initial visit, repeated during the second visit, and third visit.
- The professional nurse monitors the adherence to self-care management practices every sixth month and records of adherence should be kept in file of the patient or a pocketbook where the patient records their blood glucose levels.
- Constant follow-up is necessary through return and routine consultations so that compliance to self-care management practices is constantly checked and reinforced by the professional nurses at each follow-up visit. Considering incorporating lifestyle changes, which are critical to meet self-care demands, requires dedication and motivation from the patients.
- Patients with poor adherence to self-care management to be counselled and re-educated about self-care management practices and the importance thereof, making sure that patients understand. According to Clarke (2016), patients living with DM should be counselled to:
    - Accept that diabetes mellitus is a chronic and lifelong condition.
    - Accept that continuity of care is required to attain and maintain a quality life.
    - Comply with the treatment plan; never be without blood glucose monitoring equipment and pharmacological treatment.
    - Comply with health care follow-up visits as arranged.
    - Rather enjoy 5–6 smaller meals during the day than three heavy meals.
    - Review lifestyle and modify as required.

- As part of self-care, wearing a medic alert bracelet, carrying simple carbohydrates (glucose sweets) or sugar sachets for treatment of hypoglycaemia, involving family members and significant others, testing blood glucose levels regularly, controlling weight, reading food labels and becoming involved with local social and interest support groups (Clarke 2016).

6.8.3 Guidelines for patients

- Patients to learn about DM from health professionals and reliable information on the internet.
- Adherence to self-care management practices as advised by professional nurses is required from the patients.
- Patients to be actively involved in diabetic self-care management.
- Patients to seek clarity regarding DM and its management from professional nurses, doctors, dieticians and from the internet, where they do not understand.
- Patients to adopt healthy Tshivenda and Xitsonga traditional diets such as locusts, Mopani worms, termites, pumpkin, pumpkin porridge, a traditional stamp made of different kinds of beans and samp, and vegetables to be added to the diet.
- Patients living with DM to maintain blood glucose levels within the normal parameter.

6.8.4 Guidelines for family members

- Family members to be educated about DM; its management and on how to support a member who is living with DM.
- Family members to learn about DM from health professionals and reliable information on the internet.
- Family members are to be actively involved in supporting a member diagnosed with DM and encourage the member to adhere to diabetic self-care management practices.

6.9 Assumptions of the support model

Assumptions are declarations or opinions that are recognised and dominant of a model and are the basic fundamental premises from which and within which theoretic perception proceeds (Chin & Kramer 2015). Oxford English dictionary defines assumption as a belief or feeling that something is true or that something will happen, although there is no proof. The model to support adult patients living with DM was based on the following assumptions:

- The DoH, professional nurses, and family members, have an important role to ensure the effective self-care management support of patients living with DM.
- The DoH may provide blood glucose monitors to patients living with diabetes mellitus.
- The DoH may provide patients with social grant.
- Professional nurses' role as educators and a counsellor is vital to reinforce patients' adherence to self-care management practice.
- Patients may learn self-care management practices, become self-reliant and responsible for their care.
- Family members are pillars that play a substantial role in supporting patients living with diabetes mellitus in self-care management practices.

6.10 A paradigm for research

Theory developers can utilise the support model as a literature source. A support model can be chosen by researchers to serve as the foundation for a study.

6.11 A paradigm in nursing practice

The model may guide professional nurses to view patients living with diabetes as individuals who require support to meet specific healthcare demands because of a lack of knowledge, skills, motivation, or orientation concerning DM. Professional nurses may employ the support model when rendering diabetic services to a patient in order to meet the patient's self-care needs.

6.12 Nursing education

Nursing educators should follow these guidelines to instruct future nurses, other professionals, and student nurses on how to support patients with diabetes mellitus.

6.13 Summary

Based on the survey list created by Dickoff, James, and Widenbach (1968), the procedures required to establish a model to support patients living with DM were thoroughly detailed, and applied to the support of patients using the Orem self-care model. The model's assumptions, which were based on the study's findings, are consistent with Orem's self-care model. The evaluation of the model will be done according to the recommendations for critical theory reflection from (Chinn & Kramer 2015).

CHAPTER 7

MODEL VALIDATION

PHASE THREE

7.1 Introduction

Model validation forms phase three of this study. Validation of concept and confirmation are used to characterise authentication processes within the empiric patterns. While the term "confirmation" is reserved for the authentication of more qualitative and naturalistic kinds of empiric research findings, "validation" refers to methods for more quantitative, quantifiable forms of empiric research findings Chinn and Krammer (2015). Therefore, validation of the developed support model is imperative to confirm its authenticity in clinical practice.

Chapter 6 focused on the development of a support model, and a description of the components and structure of the support model. The structure of a support model for adult diabetic patients living with diabetes mellitus was described based on orem's self-care deficit theory (george 2011; Dickoff et al. 1968). this chapter discusses the validation of the support model. According to Chinn and Krammer (2015), deliberate model validation entails using research techniques to show how a model influences the nursing practice. The model's utility in fostering nurses' scientific competence and guaranteeing high-quality care is demonstrated through confirmation and validation. The purpose of model validation, the objectives of model validation, the outline of the model validation methodology, and the conclusions are also included in this chapter, along with the process and findings of model validation.

7.2 The purpose of model validation

The purpose of validation was to determine whether the structure of a support model is helpful authentic, and significant in supporting patients living with DM in managing it.

7.3 Model validation objectives

The objectives of validating a support model were to:

- Explore how professional nurses, operational managers, patients living with DM, family members, and diabetic educator experts perceive the authenticity, significance, and effectiveness of the support model.
- To validate if the developed model will achieve the purpose as outlined in Chapter 1.

- Demonstrate understanding of the constructed model through interpretation of the phases concerning empirical data.

7.4 Methodology for model validation outline

Validation employed a qualitative approach using semi-structured in-depth interviews of professional nurses who provide diabetic health services to diabetic patients, operational managers at the CHCs of Vhembe and Mopani Districts, patients living with diabetes mellitus, family members, and consultation with diabetic educator. According to Chinn and Krammer (2015), the choice of health care professionals to validate a model in health care practices is crucial and acknowledged as practice-based evidence in the health care literature. The validation process adopted a qualitative, exploratory design using a 'member check' (Brink et al. 2019). It included that a researcher returns to the study subjects, operational managers and experts to confirm whether what was described in the support model is effective in supporting patients in self-care management. The model was validated in the Vhembe district in one CHC which was included in the study.

7.4.1 Target population and sample

The population was professional nurses, patients living with diabetes mellitus, family members who participated in the main study, community health care centers operational managers and diabetic educators who did not form part of the main study. Participants were purposefully sampled. Professional nurses and operational managers were sampled based on the highest qualifications, diabetic educators were sampled based on their expert knowledge about DM, family members and patients were conveniently sampled, family members who accompanied patients for followup visits and patients living with diabetes mellitus who were found at the CHCs during validation were included in the validation of the model.

- Two professional nurses who participated in the main study one doctoral student and one master's student.
- Two CHCs operational managers Phd graduates, who did not participate in the main study with knowledge of model development and validation, were visited by the researcher to arrange for date, time and venue for model validation.
- Two diabetic educators/experts who did not participate in the main study were visited by the researcher to arrange for date, time and venue for model validation.
- Two adult patients living with diabetes mellitus.
- Two family members.

7.4.2 Model validation interview guide

A semi-structured interview guide served the purpose of examining professional nurses, patients, family members, operational managers, and diabetic experts' understanding of a model's value, authenticity, and applicability. The validation discussions were guided by a semi-structured interview guide that the researcher created (Table 7.1). The study's promoter evaluated the construct validity of the interview guide. Using an interview guide served the purpose of integrating the model analysis concerning the study's selection criteria; which were authenticity and usefulness, as defined by the meanings of the concept of "validation." (Chinn & Krammer 2015). The researcher planned a synthesis of the exploration in advance of data collection, which contained written components of the validation processes. These are discussed in the section below.

7.4.3 Data collection

Data collection included the following.

- The aim of validation.
- The methodological framework.
- The themes and the sub-themes.
- The interview guide (Table 7.1).
- The constructed model (Figure 6.7).

The model was validated by meeting with the purposefully selected validators to get their perspectives and judgments of how accurate the final model reflected the input and responses of those who participated in the main study. To reach a consensus about how effective the support model is in supporting adult patient living with DM in self-care management The interview guide's validation questions were designed to assist the validators compare how well the main study's coded major themes, themes, and sub-themes related to each of the three phases of the diabetic ‘‘support’’ model. The use of comparison guided the validators to establish how well the model does in addressing the identified challenges in diabetic self-care management and support. One of the CHCs in the district of Vhembe was used to validate the support model. The researcher revisited the validators to schedule the date, time and venue for interviews. Validators were provided with topic of study, a copy of coded themes that emerged during data analysis, a developed model structure and and the interview guide prior the process of validation. Written informed consent was obtained from the participants before data collection. Information regarding the study was provided to participants in both English and Tshivenda, along with study information

leaflets and a checklist for model validation. The languages that were used during the interview to validate the model were: English and Tshivenda. English was used for professional nurses, operational managers, and diabetic educators, Tshivenda was used for family members and patients living with DM. Table 7.1, a validation criterion checklist adapted from Chinn and Jacobs (1987), was used to validate whether the "support" model can be used in the practical CHCs.

Table 0.1: Checklist to validate the practical application of support model in the CHCs

1. Theory goal and goal relationship			
Criterion	*Yes*	*No*	*Suggestion*
Do the model's elements adequately represent the idea of "support"?			
Is the model helpful to professional nurses who care for adult patients living with diabetes mellitus?			
Is the model helpful to family members who care for adult patients living with diabetes mellitus?			
Is operational validity guaranteed such that the output of the "support model" is accurate enough for the intended purpose?			
2. Situational factors			
Criterion	*Yes*	*No*	*Suggestion*
Does the "support model" address the challenges and support of for adult patients living with diabetes mellitus?			
3. Theory variables and practice variables			
Criterion	*Yes*	*No*	*Suggestion*
Does the "support model" show how the three phases interact with one another?			
Does the "support model" content reflect the self-care practices for adult patients living with diabetes mellitus?			
4. Nursing actions			
Criterion	Yes	No	Suggestion
Does the "support model" content portray the challenges experienced and support provided to for adult patients living with diabetes mellitus?			
Does the "support model" explain the phenomenon and predictions of the outcomes?			
Does the "support model" approach offer suggestions for what needs to be done or provide an action plan?			
5. Research evidence			

Criterion	Yes	No	Suggestion
Ar the study's findings sufficient to justify the implementation of the "support model"?			

Adapted from Chinn and Jacobs (1987)

7.4.4 Data analysis

The analysis examined the criteria chosen for the study and determined whether the model satisfied the requirements for usefulness and authenticity. These criteria were selected because it could test the veracity of the developed model and to formally validate that the model is useful and of an acceptable standard.

7.4.5 Model validation findings

7.4.5.1 The authenticity of the model to support adult patients living with diabetes mellitus

The validators were given the created model diagram and requested to examine the entirety of the information in the synthesis of the study. This was done to evaluate the accuracy or veracity of the support model. The interview guide was given to the validators, who had to decide whether the sub-themes in table 4.3 were symbolising the following:

- The challenges experienced by professional nurses, family members and adult patients living with diabetes mellitus regarding diabetesin self-care management.
- The procedure to support adult patients living with diabetes mellitus.
- Applicable to the support adult patients living with diabetes mellitus.

To aid the understanding of the validators, the researcher explained how sub-themes emerged and how synthesis of the study findings was made. In the first stage, the validators were requested to describe the created model diagram, themes, and sub-themes and to bring inputs. They responded as follows:

The operational managers, professional nurses and diabetic experts indicated that:

> *‘‘The structure of the model is simple to comprehend as the three phases are portrayed by the arrows that also display the connection between them, implementation of the model will improve support of patients living with diabetes mellitus.”*
>
> *‘‘The procedure of the model to show that the DoH ensure funding of inservice training of professional nurses regarding DM’’*

"Peer teaching should be included in the procedure of the model, professional nurses to look for recent information about DM, and teach each other".

Patients living with diabetes mellitus said that:

"The model is well structured, and may assist in effective support of patients living with diabetes mellitus mellitus, only if professional nurses at the CHCs can use it".

The response from the 10 validators revealed an understanding of the structure of the model.

In the second stage, validators were asked to identify if the constructed model is a reflection of the content of the themes and the sub-themes. They all deliberated on the constructed model, and agreed on the following:

"The structure of the model demonstrates the connection of the challenges and actions that should be considered to address those challenges."

"The sub-themes represent precisely the challenges and the solutions."

The 10 validators also agreed that the dynamics of the constructed model reflected the challenges experienced by adult patients during self-care management. Before validation start the validator explained tho the validators that they are allowed to ask questions for clarity where they don't understand. In the third stage, the validators were requested to respond to the questions in the checklist.

Table 7.3 presents the summary of validators responses.

A. *Model and Goal Relationship*	***Responses of the Participants***
Do the aspects represented in the support model serve as an accurate reflection of the concept of support?	All validators agreed that the aspects represented in the model are an accurate reflection of the concept of'' support''.
Is the support model of value to the professional nurses caring for patients diagnosed with diabetes mellitus?	The agreement was reached by all validators that a support model will be of value in addressing the professional nurse's challenges.
Is the support model of value to the family members support for patients diagnosed with diabetic mellitus?	The agreement was reached by all validators that a support model will be of value in supporting the patients.

Is operational validity ensured so that the support model output has enough accuracy for its intended purpose?	A consensus was reached that the model will achieve the intended goal, which is effective support
B. *Situational Factors*	***Responses of the Participants***
Is the support model congruent with the situation where diabetic care is provided?	Validators agreed that the model is congruent to the nursing practice context where patients receive diabetic care services.
C. Model Variables and Practice Variables	***Responses of the Participants***
Does the support model display the interrelationship of the three phases?	All validators agreed that an interrelationship of the phases of the model is indicated by the linking arrows.
D. Nursing Actions	***Responses of the Participants***
Does the support model content show the challenges experienced and support received by patients?	All validators agreed that the model content provides adequate information on the challenges and support of patients.
Does the support model explain the phenomenon (support) and predictions of the consequence?	The agreement was reached by validators that the model explained that challenges were successfully addressed.
Does the support model provide direction for nursing actions needed?	The validators agreed that Phase II of the model provides direction for achieving support of patients by professional nurses.
C. Model Variables and Practice Variables	***Responses of the Participants***
Does the support model display the interrelationship of the three phases?	All validators agreed that an interrelationship of the phases of the model is indicated by the linking arrows.
Are practice variables included in the theoretical relationship statements?	Consensus by all validators has been reached that antecedent, defining attributes, and consequences of the model were included in the relationship statements.
E. Research Evidence	***Responses of the Participants***
Is the research evidence sufficient to justify the support model in practice?	All validators agreed that it is evident that the support model can be implemented in a community health centre and home context.

7.4.5.2 Usefulness of the support model

According to Webster (2020) usefulness is the quality of having utility, and more importantly, practical worth or applicability. Validators were required to keep referring to the model's diagram

to assess the theoretical objectives of the model to determine whether the support model was useful. All the validators demonstrated an understanding of the support model's structure and its usefulness in resolving the challenges faced by patients living with diabetes mellitus.

They all agreed that:

> The challenge that needs immediate attention is inadequate support of adult patients living with diabetes mellitus provided by the following stakeholders:

- *Professional* nurses

> *"Shortage of professional nurses, and insufficient knowledge about some self-care management practices resulting in ineffective support of patients living with diabetes mellitus. More professional nurses to be hired. Inservice training of professional nurses regarding diabetes mellitus"*

- *Family* members

> *''Family members lack information on how to support patients, resulting in ineffective support. Family members to be educated on how to support patients living with diabetes mellitus in the home environment''.*

- *Department* of Health

> *''The Department of Health should consider supplying unemployed patients with a social grant and glucose monitors for constant monitoring of blood glucose which may result in the effective management of diabetes mellitus''.*

> "The *model will be very useful if the procedures in the model are implemented as indicated in Phase II: Implementation of patient support in self- care management''*.

The operational managers and professional nurses further tested the usefulness of the model to support patients in self-care management by comparing it with the findings of the study in accordance to the following legal framework:

- The Constitution of the Republic of South Africa, Act No. 108 of 1996 (Chapter 2 Section 27) which explains the right to health care that includes treatment and rehabilitation,

counselling, health information, and responsibilities of the patients regarding their health including treatment or rehabilitation procedures, SEDMSA, 2017 diabetic guidelines.

- The Nursing Act, Act No. 33 of 2005. Chapter 2.
- The scope of practice of registered nurses Nursing Act, 1978 (Act 50 of 1978), SANC Rules and Regulations R2598, and Regulations R387 (acts and omissions).

Furthermore, the validators praised the incorporation of the legal framework and the researchers' explanation of the support model for adult patients living with diabetes mellitus in self-care management. The researcher, therefore, concluded that the support model is valuable in supporting adult patients living with DM. The model proved to be useful in supporting patients in self-care management and required no modifications.

7.4.5.3 Justification of original contribution of the study to the body of knowledge

This original study adds to the body of knowledge on how to support adult patients living with DM in self-care management. The following suggests that this study is possibly an original contribution to the body of knowledge.

This study employed a qualitative, exploratory, contextual, and descriptive design. The study population consisted of patients living with diabetes mellitus, professional nurses, and family members. A non-probability, purposive sampling was used to select the CHCs, professional nurses, and family members. A non-probability convenient sampling was used to select the patients living with diabetes mellitus. The sample size of participants was determined by data saturation. Semi-structured in-depth interview using an interview guide was used to collect data from the patients. Different central questions were used to collect data from professional nurses and family members. Data were analysed using Tesch's open-coding method (Creswell 2017).

This study also explored and described the self-care management practices that contribute to the support of adult patients in the management of diabetes mellitus. The support that is provided to adult patients living with diabetes mellitus by professional nurses and family members was explored and described. The researcher further explored and described the form of support that diabetic patients anticipate from professional nurses and family members. The results drawn from the analysis of the concept revealed that support is very imperative. The concept "support" was analysed using the eight steps of Walker and Avant (2019) to clarify and distinguish the definition of the main concepts. It is therefore necessary for the professional nurses to reinforce adherence to diabetic self-care management practices by patients living with diabetes mellitus and promote effective support of adult patients living with diabetes mellitus.

The researcher developed a model to support adult patients living with diabetes mellitus in self-care management at the CHCs of Limpopo Province, South Africa, guided by (Dickoff et al. 1968). Dickoff's methods were used by different authors who developed models and training programs such as A Model for Psychiatric Nurses to Facilitate the Mental Health of Couples Living with Borderline Personality Disorder by Mokoena et al. (2022). A Model to enhance support for newly qualified registered nurses in selected hospitals Limpopo Province, South Africa by Sadike (2022). Model of Critical Success Factors (CSFs) Influencing Food Inspection Management in UAE by Almahrooqi et al. (2022).

Additionally, a model to support adult patients living with DM in self-care management adopted Orem's theory of self-care deficit coupled with the nursing process (George 2011; Kozier et al. 2011). The following phases of the nursing process were adopted in the model to support patients in self-care management: Phase I (Interview and physical examination, nursing diagnosis), Phase II (Implementation), and Phase III (Evaluation) (George 2011). In Phase 1, the professional nurses assessed the needs of the patient and come up with the nursing diagnosis or the therapeutic care demand and plan the actions to meet patient's self-care requisites. In Phase II, the professional nurses, together with the patients and family members, executed the plan. Finally, in Phase III, the professional nurses evaluated the effectiveness of the nursing interventions.

In addition, support of adult patients living with DM may result in effective management of diabetes mellitus. The patients' blood glucose level will be controlled and kept within normal ranges; preventing, or reducing DM emergencies, the onset of diabetic complications. This will improve quality of life, resulting in long life span to individuals who are living with DM.

7.5 Summary

Chapter 7 described the model's validation, aim, objectives, methodology, validation findings, and conclusions. The proposed model was accepted by the validators who accepted it to be representing the support of adult patients living with diabetes mellitus in Vhembe and Mopani Districts of Limpopo Province, South Africa. In this respect, the study validators validated the support model accordingly.

During the interviews the validators were asked to describe the structure of the model concerning the themes and sub-themes of data analysed from the main study. The validator's responses revealed a profound understanding of the model as reliable and useful. Since the model proved to be reliable, relevant, and useful, the researcher concluded that the acceptance and implementation of the model for support of adult patients living with diabetes mellitus at the CHCs

of Limpopo Province should be considered to improve support of patients in self-care management and practices. Chapter 8 summarises the conclusions, summary of the dissertation chapters, and recommendations.

CHAPTER 8

SUMMARY, LIMITATIONS, RECOMMENDATIONS, AND CONCLUSIONS

8.1 Introduction

Chapter 7 focused on the validation of the support model to support adult patients living with diabetes mellitus in self-care management at the CHCs of Limpopo Province, South Africa. The findings of the study and relevant theoretical and empirical literature were taken into consideration while developing a support model for patients. The study population comprised professional nurses allocated at the CHCs, adult patients living with diabetes mellitus, and family members who live and supported patients with self-care management in the Vhembe and Mopani districts of Limpopo Province, South Africa. The findings of the study are specifically relevant to the participants who were involved in the study. The validation procedure provided in the final chapter of the study allowed for greater transferability to another similar context. This chapter presents the summary, limitations, recommendations for future research and conclusions.

8.2 Summary of the study

Table 0.1: Summary of the study chapters

Chapter	Clarification
1	**Overview of the study** This chapter introduced the study, discussed the background, theoretical framework, problem statement, rationale of the study, the significance of the study, study purpose and objectives, research question, definition of concepts, research methodology, structure of dissertation and summary. The purpose of the study was to develop a model to support adult patients living with diabetes mellitus, at the community health centres in Vhembe and Mopani districts of Limpopo province, South Africa. A qualitative approach using exploratory descriptive design was used to explore the support of adult patients living with diabetes mellitus. The objectives in this study were organised into five phases.

	Phase one: Organised according to population of study as follows: **1. Patients living with diabetes mellitus** To explore: • Self-care management practices of adult patients diagnosed with DM at the community health centres of Limpopo province, South Africa. • Challenges faced by adult patients diagnosed with DM in self-care management. • Support that is needed by adult patients diagnosed with DM in self-care management. **2. Professional nurses** To explore and describe the self-care management support that the professional nurses provide to adult patients living with diabetes mellitus. **3. Family members** To explore and describe the form of support provided by family members to adult patients living with diabetes mellitus. Phase two: To analyse the concept. Phase three: To develop a model to support adult patients living with diabetes mellitus in self-care management at the community health Centre of Limpopo province, South Africa. To validate a model to support adult patients living with diabetes mellitus in self-care management. The objectives of the study were met as the support of adult patients living with diabetes mellitus were explored by the researcher and described by professional nurses, family members and by patients themselves.
2	**Literature review** This chapter discussed the literature review according to the topic of study. The literature was discussed under the following headings: • Self-care management practices of adult patients diagnosed with DM. • Challenges faced by adult patients diagnosed with DM in self-care management. • Support that is needed by adult patients diagnosed with DM in self-care management.

	• The support is given to adult DM patients by professional nurses. • The support is given by family members to adult patients diagnosed with DM. • Legal framework
3	**Research Methodology** In this chapter, research methodology, design, study population, sampling and sample, inclusion criteria, data collection, data management, and analysis were clearly outlined. Ethical considerations and measures to ensure trustworthiness were discussed. The study was conducted in Vhembe and Mopani Districts' health centres. The study population comprised of professional nurses, family members, and patients living with diabetes mellitus. The sample size was determined by data saturation. The interview guide was used to collect data from patients, and central questions were used to collect data from professional nurses and family members. English language was used to collect data from professional nurses, Tshivenda and Xitsonga languages were used to collect data from family members and patients. The study was conducted in five phases namely: Exploration of the objectives, Concept analysis, Model development, Evaluation of the model, and Model validation.
4	**Data analysis, presentation, interpretation, and discussion of findings** Data analysis employed Tesch's eight steps open coding methods. The following major themes that reflected the support of patients in diabetic self-care management were discussed: • Self-care practices. • Challenges experienced by patients living with DM. • Support expressed by patients living with DM. The findings from collected data of all the participants revealed that adult patients receive ineffective support.
5	**Concept analysis** This chapter presented the analysis of the concept that emerged from the findings of the collected data following eight steps of (Walker and Avant 2019). • Selecting a concept: ○ The concept ''support'' was selected, defined and analysed. • Determining the purpose of the analysis:

	○ The purpose of concept analysis was to provide a definition, clarify the meaning of the concept "support", and to have a better understanding of how it is perceived. • Identifying the use and characteristics of the concept: ○ The use and characteristics of concept ''support'' was identified and reviewed on how it is used in the general field, military science, communication, medicine and management. • Determining the defining attributes: ○ The defining attributes of concept ''support'' was determined. In this study, "support" refers to providing assistance, encouragement, and strength to patients living with DM. These attributes were explained in details in Chapter 5 of this study. • Identifying the model case: ○ The researcher identified a model case that illustrated and explained a real-life example of the concept's application and included all the concept's important features. • Identifying borderline, related, contrary, invented, and illegitimate cases: ○ The researcher identified the contrary case by discovering the participants' characteristics that helped to strengthen the contrary case. • Identifying the antecedents and consequences: ○ The antecedents that were found to be important in developing a model to support adult patients living with diabetes mellitus in self-care management are relationship and trust, empathy, and sympathy. • Defining the empirical referents: ○ The standards and guidelines regarding the management of DM were identified as the empirical referents.
6	**Model development** This chapter discussed the development of a support model. A model to support of adult patients living with diabetes mellitus was conceptualised using six survey list as indicated by Dickoff et al. (1968). • Context: Community health centres and homes of the patients where support of adult patients living with diabetes mellitus occur. • Agents: External agent (DoH) and internal agents (professional nurses). These agents provide support to patients living with DM. • Recipients: Patients living with DM are the ones to receive support in self-care management. • Dynamics: Material and human resources, DM education and insufficient support are challenges that hinder effective support of patients in self-care management.

	• Procedure: The DoH supplies adequate human and material resources, diabetic education, and support. • Terminus: All types of support. This is the desired outcome an agent wishes to attain through procedure. This includes physical support, emotional support, educational support, material support and dietary support. • For support to be achieved, Guidelines for: DoH, professional nurses, family members and patients were formulated. • The process for model evaluation was outlined and discussed in chapter six of the study.
7	**Model validation** This chapter described the model's validation, aim, objectives, methodology, validation findings, and conclusions. • The model was validated to determine whether the structure of the support model is authentic, significant, and helpful in supporting diabetes patients in managing diabetes mellitus. The validation process adopted was a qualitative exploratory design (Brink et al., 2018). Validators comprised of: o Professional nurses who participated in the main study with knowledge of model development. o Operational managers with knowledge of model development and validation. o Diabetic educators. o Family members. o Adult patients living with diabetes mellitus. The checklist for data collection was formulated and data was collected from validators. Findings of validation demonstrated validators' awareness of the support model's structure and its usefulness in supporting patients living with DM. All validators agreed that the support model can be implemented in a community health centre and home contexts of patients living with DM. This chapter also discussed justification of original contribution of the study to the body of knowledge. This study adds to the body of knowledge on how to support adult patients living with DM in self-care management.
8	**Summary, limitations, and recommendations and conclusions**

	Chapter 8 provides the summary, limitation, recommendations, and conclusions of the study. A summary of all the chapters of the study was provided. The limitations of the study were clearly stated. The study was conducted at the community health centres in the two selected districts of Limpopo Province, namely the Vhembe and Mopani Districts. The recommendations were made to the DoH, Department of Social Development, CHCs managers, professional nurses, patients living with diabetes, family members, nursing research and nursing education.

8.3 Summary of the findings

The findings of this study covered all the objectives that the researcher had to achieve when exploring the support of adult patients living with diabetes mellitus. The findings from three groups of participants were presented using tables and similar findings were merged. Table 4.5 presented the merged findings from all three groups of participants. The findings of the study showed that there is insufficient support of adult patients living with diabetes mellitus by professional nurses and family members. The major themes, themes and subthemes were developed during data analysis, and discussed in Chapter 4. The major themes that emerged during data analysis were:

- Self-care practices.
- Challenges related to diabetic self-care management.
- Support of patients living with diabetes mellitus.

8.3.1 Self-care practices

During the interviews, the professional nurses explained how they support patients with self-care management at the CHCs. Family members revealed how they support patients living with diabetes mellitus at home. One theme (lifestyle interventions), and three subthemes (adherence and non-adherence to monitoring of blood glucose, dietary practices and medication, physical care and weight control), emerged under this major theme. The patients living with DM revealed how they practice self-care management at home. The findings revealed that patients could not adhere to self-monitoring of blood glucose because they did not have blood glucose monitors. Patients were unable to afford the suggested healthy diet; hence healthy eating recommendations were not followed. Due to their lack of education, majority of the patients were unaware of the importance of caring for their eyes and feet. In order to improve support for patients with diabetes mellitus, it is necessary to address the poor patient support in self-care management practices.

8.3.2 Challenges related to diabetic self-care management

Under this major theme, two themes (social challenges and physical changes) emerged. Four subthemes (lack of resources, insufficient information about self-care, poor self-esteem and sexual challenges) emerged under the theme social challenges. The findings demonstrated that a shortage of professional nurses at CHCs prevented the nurses from providing patients with educational support about diabetes mellitus and self-care management. The findings also showed that some patients living with DM and with sexual dysfunction did not receive adequate emotional support, which contributed to low self-esteem. Three subthemes (poor sensation, painful legs and poor eye sight) emerged under the theme, physical challenges. The physical challenges faced by patients living with diabetes mellitus were associated with hyperglycaemia. Supporting patients' compliance with self-care management practices may therefore result in the maintenance of blood glucose levels within normal ranges and decreasing the physical challenges. Addressing challenges related to diabetic self-care management may improve self-care and support of patients living with DM.

8.3.3 Support of patients living with diabetes mellitus

Two themes emerged from this major theme (source of support and types of needed support). The subthemes that emerged from the theme source of support were support from professional nurses, and family members. Patients with DM reported that although they receive support from their families and professional nurses, it is insufficient. The findings indicated that patients required medical, emotional, and educational support from professional nurses regarding DM and a healthy diet to be followed. Dietary and emotional support are two things that patients need from their families. The findings revealed that patients, family members, and professional nurses all wanted the government to provide blood glucose monitors for patients. Support for patients is likely to enhance DM management, delay or prevent diabetes mellitus complications from developing, and prolong the lives of those who have DM.

8.4 Limitations

The study was conducted at the CHCs in the two selected districts of Limpopo Province, namely the Vhembe District and Mopani District. As a result, the findings of this study cannot be generalised to all the districts in Limpopo Province and other provinces in South Africa. Data collection was postponed because of COVID-19 pandemic; the plan for data collection was not accomplished as originally scheduled due to restrictions and limitations which were enforced for the safety of the population of South Africa. The purpose of the study was to develop a model to support adult patients living with diabetes mellitus in self-care management and did not include all patients living with diabetes mellitus, family members, and professional nurses in the Vhembe and Mopani Districts of Limpopo Province.

8.5 Recommendations

Recommendations were formulated based on the findings to ensure that a model to support adult patients living with diabetes mellitus is operationalised. Recommendations of the support model are useful in nursing practice, the DoH, and for further research in nursing. The recommendations were based on the following: DoH, professional nurses, patients living with diabetes mellitus, family members, research, and nursing education.

8.5.1 Department of Health

Findings of the study shows that some adult patients living with diabetes mellitus do not adhere to self-care management practices such as self-blood glucose monitoring, healthy diet practices, and proper foot care due to poor socio-economic status and poor or lack of support from family members and professional nurses.

- The DoH ensures that the South African Department of social development assist unemployed patients with diabetes mellitus in receiving food parcels or grants in aid, with the assistance of social workers.
- The DoH to supply unemployed patients living with DM material resources such as blood glucose level monitors and test strips. Through tenders supplying blood glucose monitors and test bstrips.
- The DoH to employ adequate professional nurses to improve diabetic support.
- The DoH to fund in-service training for professional nurses. Training to include support of patients, monitoring of blood glucose, diabetic medication, weight control, physical care,

and a diabetic healthy diet for patients as they have indicated that sometimes they advise patients about healthy diet in the absence of dietician.

- The DoH to organise and execute additional campaigns that inform or educate the family members on how to support their members living with DM.

8.5.2 Community health centres managers

- The nursing managers at the CHCs level should organise intermittent in-service training for professional nurses who render DM health care services at CHCs. The in-service training should focus on support of adult patients living with DM. In-service training to include training professional nurses about continuous education of patients and family members regarding diabetic self-care management as stipulated in SEMDSA diabetic guidelines.
- Professional nurses who provide diabetes mellitus health care services should be empowered about the management of DM.
- The nursing managers in the CHCs level should arrange training of professional nurses to counsel patients with sexual dysfunction.
- Patients living with DM complain of symptoms related to diabetes mellitus such as fatigue, dizziness, and weakness that need urgent attention. Due to this, during education about self-care management, patients should be provided with the numbers to contact the professional nurses when they need assistance or advice. This will reduce the number of patients who are ultimately admitted to hospital with hyperglycaemia after they consumed sugar or sweets when they experience such symptoms. The operational managers at the CHCs should ensure that professional nurse advise the patients and family members appropriately.

8.5.3 Professional nurses

Patients living with DM revealed that professional nurses and family members are their sources of support in diabetic self-care management. Professional nurses support the patients through diabetic education. Findings revealed that patients' challenges include poor support by professional nurses which is evidenced by insufficient information regarding self-care management. Unacceptable and unsafe feet care practices were done by some patients.

- Professional nurses to initiate diabetic education during diagnosis of DM and when patients visit the community health centres for follow-up care.
- Support of patients in self-care management.

- Educate family members on how to support patients living with diabetes mellitus.
- Peer teaching about DM, for professional nurses to equip one another.

Sexual dysfunction is one of the challenges experienced by patients as a complication of diabetes mellitus. Therefore, patients should be educated about complications such as eretile dysfunction, and The public needs to be made aware of the importance of treating people with diabetes mellitus with respect and avoiding the false assumption that they lack functional male genitalia.

8.5.4 Patients living with diabetes mellitus.

Adult patients living with DM to adhere to self-care management practices such as eating healthy diet, monitoring of blood glucose levels, weight management, eye care and feet care. They should also honour follow-up visits as scheduled.

8.5.5 Family members

In this study, it appears that family members are underutilised for on-going support of patients living with diabetes mellitus and generally struggle with how to do it.

- A successful outcome in the management of DM can be facilitated by involving family members in the education and support process for diabetes self-care management.
- It is recommended that family members get involved as soon as DM is diagnosed.
- The family members to be educated on how to provide support to adult patients living with DM at home.
- Family members to support patients with diabetic self care practices such as administration of medications, buying, preparing and consuming healthy diet, exercises and feet care.

8.5.6 Nursing research

Multiple studies have been conducted on DM around the globe, including in South Africa. There was no research conducted in Limpopo Province to develop a model to support adult patients living with DM in self-care management. Further research may be conducted on:

- Implementing the model to support patient living with DM in other provinces in South Africa to assess whether the model yields similar results.
- The experiences of participants towards the implementation of the model should be assessed by future research.

- The future reseachers to evaluate the effectiveness of this support model

8.5.7 Nursing education

Universities and nursing colleges in South Africa, as institutions of higher education, are accredited by the South African Nursing Council and the Council of Higher Education to provide education and training for nurses. Therefore:

- Nurse educators should ensure that diabetic education that encompasses effective support of adult patients living with DM in self-care management practices is emphasised during education and training.
- During students' work-integrated learning, evidenced-based practical care of patients living with DM should be evaluated by the nurse educators.
- Nurse educators to evaluate students on support of patients living with DM, and on how to educate the family members to support patients in a home context.

8.6 Conclusion

The primary purpose of the study was to explore the support of adult patients living with diabetes mellitus, and to develop a model to support adult patients living with diabetes in self-care management. The researcher explored how family members and professional nurses supported adult patients living with DM in self-care management. It is possible that the study contributed to the body of knowledge, hence the support of adult patients living with diabetes will improve. The collected empirical data resulted in the development of the model to support adult patients living with DM in self-care management. The support model was developed using Orem's theory of self-care deficit. The process of developing a model was attained through the following:

- Exploring the self-care management of adult patients diagnosed with DM at the community health centres of Limpopo Province, South Africa.
- Exploring the challenges faced by adult patients diagnosed with DM in self-care management.
- Exploring the support that is needed by adult patients living with DM in self-care management.
- Exploring and describing the self-care management support that professional nurses give to adult patients living with DM.
- Exploring and describing the type of support given by family members to adult patients.

- Concept analysis and development of the support model to support adult patients living with DM in self-care management.

The study participants were professional nurses, adult patients living with diabetes mellitus at the CHCs, and family members from Vhembe and Mopani Districts of Limpopo Province, South Africa. A qualitative explorative descriptive strategy was used. The support model was developed using evidence that was obtained from data analysis. Validators of the developed model were professional nurses, operational managers, family members, adult patients living with diabetes mellitus and diabetic educators to ensure that the model is relevant to the diabetic care context. Data was collected in the Vhembe and Mopani Districts of Limpopo Province, South Africa. Central questions that were followed by probing were used to collect data from professional nurses and family members. Semi-structured interviews, were used to collect the data from diabetic patients using an interview guide with a set of predetermined open-ended questions.

REFERENCES

Acquah, C., Dzuvor, C.K., Tosh, S. and Agyei, D., 2022. Anti-diabetic effects of bioactive peptides: recent advances and clinical implications. *Critical reviews in food science and nutrition*, *62*(8), pp.2158-2171.

Adu, M.D., Malabu, U.H., Malau-Aduli, A.E. and Malau-Aduli, B.S., 2019. Enablers and barriers to effective diabetes self-management: A multi-national investigation. *PloS one*, *14*(6), p. e0217771.

Affusim, C.C. and Francis, E., 2018. The influence of family/social support on adherence to diabetic therapy. *Int J Advs Sci Res Engineer*, *4*, pp.71-80.

Aikaeli, F., Njim, T., Gissing, S., Moyo, F., Alam, U., Mfinanga, S.G., Okebe, J., Ramaiya, K., Webb, E.L., Jaffar, S. and Garrib, A., 2022. Prevalence of microvascular and macrovascular complications of diabetes in newly diagnosed type 2 diabetes in low-and-middle-income countries: A systematic review and meta-analysis. *PLOS Global Public Health*, *2*(6), p. e0000599.

Akhtar, K., Ali, A. and Bhatti, R., 2018. Knowledge and Practice of Foot Care among Diabetic Patients at a Public Tertiary Care Hospital Lahore. *National journal of health sciences*, *3*(4), pp.139-144.

AlHaidar, A.M., AlShehri, N.A. and AlHussaini, M.A., 2020. Family support and its association with glycemic control in adolescents with type 1 diabetes mellitus in Riyadh, Saudi Arabia. *Journal of diabetes research,* 2020.

Alligood, M., R. and Tomey, A. M., 2010. *Nursing theories and their works*. 7th edn. Elsevier, United States of America.

Almahrooqi, F.K.A., Arif, S. and Zainudin, M.Z., 2022. Model of Critical Success Factors (CSFs) Influencing Food Inspection Management in UAE. *International journal of sustainable construction engineering and technology,* 13(4), pp.71-89.

Alotaibi, A., Gholizadeh, L., Al-Ganmi, A. H. A. and Perry, L., 2018. Factors influencing nurses' knowledge acquisition of diabetes care and its management: A qualitative study. *Journal of clinical nursing,* 27(23-24), 4340-4352.

AL-Shahrani, A.M., 2018. Impact of health education program on diabetic control among diabetic patient managed at diabetic and endocrine center in Bisha, Saudi Arabia. *Biomed. Res*, *29*(11), pp.2391-2394.

Alshammari, M., Windle, R., Bowskill, D. and Adams, G., 2021. The role of nurses in diabetes care: a qualitative study. *Open journal of nursing*, *11*(8), pp.682-695.

Amed, Z. and Yeasmeen F., 2016. *Active family participation in diabetes self-care: a commentary. diabetes management* 6(5), 104–107.

American association of diabetes educators, 2020. An effective model of diabetes care and education: revising the AADE7 Self-care behaviors®. *The diabetes educator*, 46(2), pp.139-160.

American diabetes association. Lifestyle management. Sec. 4. In Standards of medical care in diabetes. *Diabetes care* 2017; 40(1): S33–S43.

Amin, M.E.K., Nørgaard, L.S., Cavaco, A.M., Witry, M.J., Hillman, L., Cernasev, A. and Desselle, S.P., 2020. Establishing trustworthiness and authenticity in qualitative pharmacy research. *Research in social and administrative pharmacy*, *16*(10), pp.1472-1482.

Asan, O., Crotty, B.H. and Choudhury, A., 2021. Patient–professional communication. *In the patient factor* (pp. 107-128). CRC Press.

Aschalew, A.Y., Yitayal, M., Minyihun, A. and Bisetegn, T.A., 2019. Self-care practice and associated factors among patients with diabetes mellitus on follow up at University of Gondar Referral Hospital, Gondar, Northwest Ethiopia. *BMC research notes*, *12*, pp.1-6.

Aschner, P., 2017. New IDF clinical practice recommendations for managing type 2 diabetes in primary care. *Diabetes research and clinical practice*, *132*, pp.169-170.

Asgharzadeh, M., Pourasghary, S., Pourasghary, B., Nourazarian, M. and Kafil, H.S., 2016. Effective factors in controlling diabetes progression among patients in the northwest of Iran. *Journal of natural science, biology, and medicine*, *7*(1), p.68.

Aslan, G.Y., 2021. Examining the relation between family support and compliance to treatment in individuals with diabetes. *International journal of caring sciences*, *14*(3), pp.1833-1839.

Atinga, R.A., Yarney, L. and Gavu, N.M., 2018. Factors influencing long-term medication non-adherence among diabetes and hypertensive patients in Ghana: a qualitative investigation. *PloS one*, *13*(3), p. e0193995.

Awasthy, R., 2019. Nature of qualitative research. In *Methodological issues in management research: Advances, challenges, and the way ahead*. Emerald publishing limited.

Awe, E.O., 2022. Design Issues in Scientific Research. *Available at SSRN 4189858*.

Baig, A.A., Benite, A., Quinn, M.T. and Burnet, D.L., 2015. Family interventions to improve diabetes outcomes for adults. *New York academy of sciences*, 1353, (1) 89-112.

Baporikar, N., 2020. Sustainability of social enterprises*. In senior entrepreneurship and aging in modern business* (pp. 148-169). IGI Global.

Barbagallo, F., Mongioì, L.M., Cannarella, R., La Vignera, S., Condorelli, R.A. and Calogero, A.E., 2020. Sexual dysfunction in diabetic women: an update on current knowledge*. Diabetology*, 1(1), pp.11-21.

Beede, E., Baylor, E., Hersch, F., Iurchenko, A., Wilcox, L., Ruamviboonsuk, P. and Vardoulakis, L.M., 2020, April. A human-centered evaluation of a deep learning system deployed in clinics for the detection of diabetic retinopathy. In *proceedings of the 2020 CHI conference on human factors in computing systems* (pp. 1-12).

Bell, K., 2014. “support.” In white-collar worker definition, open education sociology dictionary. (Online) Available from: (https://sociologydictionary.org/support/). (Accessed 4 February 2023).

Bennich, B.B., Røder, M.E., Overgaard, D., Egerod, I., Munch, L., Knop, F.K., Vilsbøll, T. and Konradsen, H., 2017. Supportive and non-supportive interactions in families with a type 2 diabetes patient: an integrative review. *Diabetology & metabolic syndrome*, 9(1), pp.1-9.

Bernam, A., Snyder, S.J., Kozier, B. and Erb, G., 2008. *Fundamental of nursing. Concepts process and practice,* Alexander. United States of America.

Bhagavathula, A. S., Gebreyohannes, E. A., Abegaz, T. M. and Abebe, T. B., 2018. Perceived obstacles faced by diabetes patients attending the university of Gondar Hospital, Northwest Ethiopia. *Frontiers in public health*, *6*, 81.

Bihu, R., 2020. Using unstructured interviews in educational and social science research: The process, opportunity and difficulty. *GSJ, 8*(10).

Birkinshaw, A., Nel, R. and Walsh, C., 2018. Adherence of patients with type 2 diabetes mellitus with the SEMDSA lifestyle guidelines. *Journal of endocrinology*, *metabolism and diabetes of South Africa,* 23(2), pp.39-45.

Bisnar, J., 2017. Self-care management among older adults with diabetes mellitus: A systematic literature review.

Bonger, Z., Shiferaw, S. and Tariku, E. Z., 2018. Adherence to diabetic self-care practices and its associated factors among patients with type 2 diabetes in Addis Ababa, Ethiopia. *Patient preference and adherence*, *12*, 963.

Bongongo, T., Ndimande, J.V. and Tumbo, J., 2019. An assessment of erectile dysfunction among male diabetics attending Temba Community Health Centre, Pretoria. *South African family practice*, *61*(6), pp.229-233.

Brink, H., Vander Walt, C. and Van Rensburg G., 2018. *Fundmentals of research methodology for healthcare professionals*. 4th ed. Juta and company Ltd.

Bus, S.A., Lavery, L.A., Monteiro-Soares, M., Rasmussen, A., Raspovic, A., Sacco, I.C., van Netten, J.J. and International working group on the diabetic foot, 2020. Guidelines on the prevention of foot ulcers in persons with diabetes (IWGDF 2019 update). *Diabetes/metabolism research and reviews*, *36*, p. e3269.

Byers, D., Garth, K., Manley, D. and Chlebowy, D., 2016. Facilitators and barriers to Type 2 diabetes self-management among rural African American adults. *Journal of health disparities research and practice*, 9(1), p.9.

Camacho-Otero, J., Boks, C. and Pettersen, I.N., 2019. User acceptance and adoption of circular offerings in the fashion sector: Insights from user-generated online reviews. Journal of Cleaner Production, 231, pp.928-939.

Candela, A.G., 2019. Exploring the function of member checking. *The qualitative report*, 24(3), pp.619-628.

CARE, I., 2018. Standards of medical care in diabetes, *Abridged for primary care providers*.

Careau, V., Halsey, L.G., Pontzer, H., Ainslie, P.N., Andersen, L.F., Anderson, L.J., Arab, L., Baddou, I., Bedu-Addo, K., Blaak, E.E. and Blanc, S. 2021. Energy compensation and adiposity in humans. *Current biology*, *31*(20), pp.4659-4666.

Chali, S.W, Salih, M.H and Abate, A.T., 2018. Self-care practice and associated factors among diabetes mellitus patients on follow up in Benishangul Gumuz regional state public hospitals, Western Ethiopia. *Biomed central,* 833, (11). 1-8.

Chan, J., DeMelo, M., Gingras, J. and Gucciardi, E., 2015. Challenges of diabetes self-management in adults affected by food insecurity in a large urban center of Ontario, Canada. *International journal of endocrinology*.

Chatterjee, A., Prinz, A., Gerdes, M. and Martinez, S., 2021. An automatic ontology-based approach to support logical representation of observable and measurable data for healthy lifestyle management: Proof-of-concept study. *Journal of medical internet research*, 23(4), p. e24656.

Children's Act (Act No. 38 of 2005).

Chinaza, G.A. Chinelo, K.E. and Igwe, S.V., 2020. Diabetes and nutrition and diets for its prevention and treatment: A systematic review and dietetic perspective. *Health science research*, 6(1)5-10.

Chinn, P. L., and Kramer, M. K., 2015. *Knowledge development in nursing*: Theory and process (9th ed.). St. Louis, Missouri: Elsevier Mosby.

Chinn, P.L. and Jacobs, MK., 1987. *Theory and Nursing*. A systematic approach. 2nd edition. St Louis: Mosby Company.

Clarke, M., 2016.Vlok's *Community Health.* Revised 6th edition. Lansdowne, Juta, Cape town, South Africa.

Cohen, L., Leibu, O., Tanis, T., Ardalan, F. and Galynker, I., 2016. Disturbed self-concept mediates the relationship between childhood maltreatment and adult personality pathology. *Comprehensive psychiatry*, *68*, 186-192.

Consitt, L.A., Dudley, C. and Saxena, G., 2019. Impact of endurance and resistance training on skeletal muscle glucose metabolism in older adults. *Nutrients*, *11*(11), p.2636

Creswell, J.W. and Creswell, J.D., 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Creswell, J.W. and Poth, C.N., 2016. *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Cristian, B.A. and Remus, P.A., 2018. Alpha lipoic aAcid iInfluence in the attenuation of oxidative stress and of clinical manifestations of neuropathy in diabetes mellitus patients. *Internal medicine*, *15*(4), pp.15-26.

Cunningham, A.T., Crittendon, D.R., White, N., Mills, G.D., Diaz, V. and LaNoue, M.D., 2018. The effect of diabetes self-management education on HbA1c and quality of life in African-Americans: a systematic review and meta-analysis. *BMC health services research*, 18(1), pp.1-13.

Dambha-Miller, H., Griffin, S.J., Kinmonth, A.L. and Burt, J., 2020. Provision of services in primary care for type 2 diabetes: a qualitative study with patients, GPs, and nurses in the east of England. *British journal of general practice*, 70(698), pp. e668-e675.

De la Fuente Coria, M., Cruz-Cobo, C. and Santi-Cano, M. J., 2020. Effectiveness of a primary care nurse-delivered educational intervention for patients with type 2 diabetes mellitus in promoting metabolic control and compliance with long-term therapeutic targets: Randomised controlled trial. *International journal of nursing studies*, 101, 103417.

de Roo, G., 2021. Knowing in Uncertainty: On epistemic conditions differentiated for situations in varying degrees of uncertainty, the distinction between hierarchical and flat ontology, and the necessary merger with the axiological domain of values. *disP-The planning review*, 57(2), pp.90-111.

de Vos, A.S., Strydom, H., Fouche, C.B. and Delport, C.S.L., 2018. *Research at Grassroots: For social sciences and human services profession*, 4th ed., Pretoria: Van Schaik.

Department of Health., 2006. South African good clinical practice guidelines. 2nd Ed. (Online) Available from :http://www.nhrec.org.za/?page_id=14. Accessed 20. January 2022.

Dickinson.J.K., 2018.The experience of diabetes-related language in diabetes care. Spectrum. Diabetic journals. Organization. 31(1), 58-68.

Dickoff, J, James, P and Wiedenbach, E., 1968.*Theory in a practice discipline. Practice oriented theory,* 17(5), 415 – 453.

Didarloo, A., Shojaeizadeh, D. and Alizadeh, M., 2016. Impact of educational intervention based on interactive approaches on beliefs, behavior, hemoglobin A1c, and quality of life in diabetic women. *International journal of preventive medicine*, *7*.

Diriba, D.C., Bekuma, T.T. and Bobo, F.T., 2020. Predictors of self-management practices among diabetic patients attending hospitals in western Oromia, Ethiopia. *PloS one*, *15*(5), p. e0232524.

Dube, L., Van den Broucke, S., Dhoore, W., Kalweit, K. and Housiaux, M., 2015. An audit of diabetes self-management education programs in South Africa. Journal of public health research, 4(3).

Evert, A. B., Dennison, M., Gardner, C. D., Garvey, W. T., Lau, K. H. K., MacLeod, J. and Yancy Jr, W. S., 2019. Nutrition therapy for adults with diabetes or prediabetes: a consensus report. *Diabetes care*, 42(5), 731-754.

Fain, J. A., 2017. National standards for diabetes self-management education and support (DSMES): revised and updated. *The diabetes educator*, *43*(5), 439-439.

Formosa, C., and Muscat, R., 2016. Improving diabetes knowledge and self-care practices. *Journal of the American podiatric medical association.*106, (5), 352-356.

Garcia, D., Cloninger, K.M. and Cloninger, C.R., 2023. Coherence of character and temperament drives personality change toward well-being in person-centered therapy. *Current opinion in psychiatry*, 36(1), pp.60-66.

Gemeda, S.T. and Woldemariam, Z.B., 2022. Assessment of self-care practice amongst patients with type II diabetes attending Adama Hospital Medical College, Ethiopia. *BMC endocrine disorders,* 22(1), pp.1-10.

George, J. B., 2011. *Nursing theories, the base for professional nursing practice*. 6th edition. United States of America: Pearson education.

Goodman, P., Robert, R.C. and Johnson, J.E., 2020, November. Rigor in PhD dissertation research. In *Nursing forum* (Vol. 55, No. 4, pp. 611-620).

Gordon, C., 2019. Blood glucose monitoring in diabetes: rationale and procedure. *British journal of nursing,* 28(7), pp.434-439.

Gregory, P.A. and Austin, Z., 2021. How do patients develop trust in community pharmacists? *Research in social and administrative pharmacy*, 17(5), pp.911-920.

Grove, S. K and Gray, J.R., 2019*. Understanding nursing research, building evidence – based practice*. St Louis, Missouri: Elsevier.

Grove, S.K, Gray, J.R. and Burns, N., 2017. *The practice of nursing research appraisal, synthesis and generation of evidence*, 8th edition. Philadelphia: Elsevier.

Halali, F., Lapveteläinen, A., Aittola, K., Männikkö, R., Tilles-Tirkkonen, T., Järvelä-Reijonen, E., Absetz, P., Kolehmainen, M., Schwab, U., Lindström, J. and Lakka, T.A., 2022. Associations between weight loss history and factors related to type 2 diabetes risk in the stop diabetes study. *International journal of obesity*, *46*(5), pp.935-942.

Health Organization. 2019. *Human resources for medical devices, the role of biomedical engineers*. World Health Organization.

Hirpha, N., Tatiparthi, R. and Mulugeta, T., 2020. Diabetic foot self-care practices among adult diabetic patients: a descriptive cross-sectional study. *Diabetes, metabolic syndrome and obesity: targets and therapy,* 13, p.4779.

Hornby, A. S., 2018. *Oxford Advanced Learner's Dictionary* of current english (9th Edition).

Jentoft, N. and Olsen, T.S., 2019. Against the flow in data collection: How data triangulation combined with a 'slow'interview technique enriches data. *Qualitative social work*, 18(2), pp.179-193.

Jin, Y., Chen, Z., Li, J., Zhang, W. and Feng, S., 2022. Effects of the original gymnastics for pregnant women program on glycaemic control and delivery outcomes in women with gestational diabetes mellitus: A randomised controlled trial. *International journal of nursing studies*, p.104271.

Jiraporncharoen, W., Pinyopornpanish, K., Junjom, K., Dejkriengkraikul, N., Wisetborisut, A., Papachristou, I., Hashmi, A. and Angkurawaranon, C., 2020. Exploring perceptions, attitudes and beliefs of Thai patients with type 2 diabetes mellitus as they relate to medication adherence at an out-patient primary care clinic in Chiang Mai, Thailand. *BMC family practic*, 21(1), pp.1-9.

Johnston, L. and Terp, D.M., 2019. Support is a complicated concept: A social work practice reflection on support and anxiety. *Clinical social work journal*, *47*(3), pp.236-248.

Kalra, S., Jena, B., N. and Yeravdekar, R., 2018. Emotional and psychological needs people with diabetes. Indian journal of endocrinology and metabolism, 22, 696-704.

Kankam, P.K., 2019. The use of paradigms in information research. *Library and information science research*, 41(2), pp.85-92.

Karthik R.C, Radhakrishnan A, Vikram A, Arumugam B and Jagadeesh S., 2020. Self-care practices among type II diabetics in rural area of Kancheepuram district, Tamil Nadu. *Journal of family medicine in primary health care*, 9, (2912)8.

Kato, A., Fujimaki, Y., Fujimori, S., Isogawa, A., Onishi, Y., Suzuki, R., Ueki, K., Yamauchi, T., Kadowaki, T. and Hashimoto, H., 2020. How self-stigma affects patient activation in persons with type 2 diabetes: a cross-sectional study. *BMJ open,* 10(5), p. e034757.

Katsaridis, S., Grammatikopoulou, M.G., Gkiouras, K., Tzimos, C., Papageorgiou, S.T., Markaki, A.G., Exiara, T., Goulis, D.G. and Papamitsou, T., 2020. Low reported adherence to the 2019 American diabetes association nutrition recommendations among patients with type 2 diabetes

mellitus, indicating the need for improved nutrition education and diet care. *Nutrients*, 12(11), p.3516.

Kaushik, V. and Walsh, C.A., 2019. Pragmatism as a research paradigm and its implications for social work research. *Social sciences*, 8(9), p.255.

Khan, T. A., Chiavaroli, L., Zurbau, A., and Sievenpiper, J. L., 2019. A lack of consideration of a dose-response relationship can lead to erroneous conclusions regarding 100% fruit juice and the risk of cardio metabolic disease. *European journal of clinical nutrition*, 73(12), 1556-1560.

Kimber, J. M., Ertl, M. M., Egli, M. R., and Brenner, R. E., 2022. Psychotherapies for clients with physical health conditions: A scoping review of demographic reporting. Psychotherapy.

Kokoszka, A., Pacura, A., Kostecka, B., Lloyd, C.E. and Sartorius, N., 2022. Body self-esteem is related to subjective well-being, severity of depressive symptoms, BMI, glycated hemoglobin levels, and diabetes-related distress in type 2 diabetes. Plos one, 17(2), p. e0263766.

Kolb, L., 2021. An effective model of diabetes care and education: the ADCES7 Self-Care Behaviors. *The science of diabetes self-management and care*, *47*(1), pp.30-53.

Kovacova, A. and Shotliff, K., 2022. Eye problems in people with diabetes: more than just diabetic retinopathy. *Practical diabetes*, *39*(1), 34-39a.

Kozier, B., Erb, G., Berman, A. and Snyder, S. J., 2011. Fundamentals of nursing concepts process and practice. 9th edition. United States of America: Berman and Snyder. Prentice hall.

Kristianingrum, N.D. Wiarsih, W. and Nursasi, A.Y., 2018. Perceived family support among older persons in diabetes mellitus self-management. *Biomed central geriatrics*, 18(304)1-5.

Kubica, A., Gruchała, M., Jaguszewski, M., Jankowski, P., Świeczkowski, D., Merks, P. and Uchmanowicz, I., 2017. Treatment adherence a pivotal issue in the long-term treatment of patients with cardiovascular diseases. An expert standpoint. *Medical research journal*, 2(4), pp.123-127.

Kumar, S., Kumari, S. and Sinha, A.K., 2022. Neovascular Glaucoma: An update on etiopathogenesis, diagnostics and management. *Open journal of ophthalmology*, *12*(3), pp.242-258.

Lea, D. and Bradbery, J. eds. 2020. *Oxford Advanced Learner's Dictionary*. Oxford University Press.

Letta, S., Aga, F., Yadeta, T. A., Geda, B. and Dessie, Y., 2021. Barriers to diabetes patients' self-care practices in Eastern Ethiopia: A qualitative study from the health care provider's perspective. *Diabetes, metabolic syndrome and obesity: Targets and therapy*, 14, 4335.

Lewis, S.L., Bucher, L., Heitkemper, M.M., Harding, M.M., Kwong, J. and Roberts, D., 2016. *Medical-surgical Nursing-E-Book: Assessment and management of clinical problems, single volume*. Elsevier health sciences.

Lewis, S.L., Dirksen, S.R., Heitkemper, M.M., P.G. and Bucher, L., Camera, I.M., 2014. *Medical surgical nursing. Assessment and management of clinical problems*. U.S.A: Elsevier.

Lewis, S.M., Bucher, L., Heitkemper, M.M., Harding, M., Kwong, J. and Roberts, D., 2017. Elsevier; St.

Ligita, T., Harvey, N., Wicking, K., Francis, K. and Nurjannah, I., 2020. Diabetes self-management: what role does the family play? *Health education*, *121*(1), pp.75-92.

Limpopo provincial government department of health vote7 annual performance plan. 2016/2017.

Lin, Y.Y., Yen, W.J., Hou, W.L., Liao, W.C. and Lin, M.L., 2022, March. Mental health nurses' tacit knowledge of strategies for improving medication adherence for schizophrenia: A qualitative study. In *healthcare* (Vol. 10, No. 3, p. 492). MDPI.

Luthfa, I. and Ardian, I., 2019. Effects of Family Empowerment on Increasing fFamily sSupport in pPatients with Type-2 diabetes mMellitus. *Nurse media journal of nursing*, 9(1), 58-68.

Magaldi, D. and Berler, M., 2020. Semi-structured interviews. *Encyclopedia of personality and individual differences*, pp.4825-4830.

Maiya, A.G., Gundmi, S., Matpady, P., Jadhav, R., Lingadakai, R., Hande, M., Kamath, V.G., Shivashankar, K.N., Chinmayee, P., Hazari, A. and Shastri, N., 2018. Prevalence of foot complications in people with type 2 diabetes mellitus: a community-based survey in rural Udupi. *The international journal of lower extremity wounds*, 17(3), pp.169-175.

Majumder, S. and Biswas, D., 2022. COVID-19: impact on quality of work life in real estate. sector. *Quality and quantity*, 56(2), pp.413-427.

Maree, J., 2012. *A conceptual examination of the sequences of emotional labour, emotional dissonance and emotional exhaustion: the argument for the role of contextual and provider characteristics.* England: M.E Sharp.

Mathew, T.K. and Tadi, P., 2021. Blood glucose monitoring. In *StatPearls [Internet]*. StatPearls Publishing.

Mayberry, L.S. and Osborn, C.Y., 2012. Family support, medication adherence, and glycemic control among adults with type 2 diabetes. *Diabetes care*, 35(6), pp.1239-1245.

McIntosh, C., 2013. Cambridge Advanced Learner's Dictionary. *Cambridge University Press,* 4th edition*, ISBN, 3125401534, 9783125401532.*

Meetoo, D., Wong, L. and Fatani, T., 2018. 'Knowing where I am': self-monitoring of blood glucose in diabetes. *British journal of nursing*, 27(10), pp.537-541.

Menon, D., Chandrasekhar, M., Kosztin, D. and Steinhoff, D.C., 2020. Impact of mobile technology-based physics curriculum on preservice elementary teachers' technology self-efficacy. Science education, 104(2), pp.252-289.

Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/ Concept, strengthen, support., Accessed 4 Feb. 2023.

Miikkola, M., Lantta, T., Suhonen, R. and Stolt, M., 2019. Challenges of foot self-care in older people: a qualitative focus-group study. *Journal of foot and ankle research*, 12(1), pp.1-10.

Mikhael, E.M., Hassali, M.A., Hussain, S.A. and Shawky, N., 2018. Self-management knowledge and practice of type 2 diabetes mellitus patients in Baghdad, Iraq: a qualitative study. *Diabetes, metabolic syndrome and obesity: targets and therapy*, pp.1-17.

Miller, T.A. and DiMatteo, M.R., 2013. Importance of family/social support and impact on adherence to diabetic therapy. *Diabetes, metabolic syndrome and obesity: targets and therapy*, pp.421-426.

Milota, M.M., van Thiel, G.J. and Van Delden, J.J., 2019. Narrative medicine as a medical education tool: a systematic review. *Medical teacher*, 41(7), pp.802-810.

Mohammed, A.S., Adem, F., Tadiwos, Y., Woldekidan, N.A. and Degu, A., 2020. Level of adherence to the dietary recommendation and glycemic control among patients with type 2 diabetes mellitus in eastern ethiopia: a cross-sectional study. *Diabetes, metabolic syndrome and obesity: targets and therapy*, *13*, p.2605.

Mohebi, S. Parham, M. Sharifirag, G. Gharlipour, Z. Mohammadbeigi, A. and Rajati, F., 2018. Relationship between perceived social support and self-care behaviour in type 2 diabetics: A cross-sectional Study. *Journal of education and health promotion*, (7).

Mokoena, A.G., Temane, A., Poggenpoel, M., Myburgh, C.P. and Ntshingila, N., 2022. A Model disorder. *Gender and behaviour*, 20(3), pp.20288-20304.

Moreno-Poyato, A.R., Rodríguez-Nogueira, Ó. and MiRTCIME. CAT working group, 2021. The association between empathy and the nurse–patient therapeutic relationship in mental health units: a cross-sectional study. *Journal of psychiatric and mental health nursing*, *28*(3), pp.335-343.

Mosby 's dictionary of medicine, nursing and health profession, 2013. Missouri: Elsevier.

Mostafavi, A., 2022. Architecture, biometrics, and virtual environments triangulation: a research review. *Architectural science review*, *65*(6), pp.504-521.

Motsharine, S., 2018. *Knowledge of diabetes chronic complications amongst diabetic patients in the Vhembe District of the Limpopo Province SA*. Masters dissertation. University of Venda.

Moudatsou, M., Stavropoulou, A., Philalithis, A. and Koukouli, S., 2020, January. The role of empathy in health and social care professionals. In *Healthcare* (Vol. 8, No. 1, p. 26). MDPI.

Mphasha, M.H., Mothiba, T.M. and Skaal, L., 2022. Assessment of diabetes dietary knowledge and its impact on intake of patients in Senwabarwana, Limpopo, South Africa. *Journal of endocrinology, metabolism and diabetes in South Africa*, *26*(3), pp.89-95.

Mphasha, M.H., Skaal, L., Mothiba, T.M., Ngoatle, C. and Hlahla, L.S., 2022. Primary health care–family partnership for better diabetes outcomes of patients: a systematic review. *Journal of endocrinology, metabolism and diabetes of South Africa*, pp.1-6.

Mphasha, P., Mothiba, T. and Skaal, L., 2022. A Qualitative study on perspective of patients regarding family support in the management of diabetes in Limpopo Province.

Muchiri, J.W., Gericke, G.J. and Rheeder, P., 2019. Stakeholders' perceptions of dietary and related self-management challenges and education programme preferences for type 2 diabetes adults. *Journal of endocrinology, metabolism and diabetes of South Africa*, 24(1), pp.1-9.

Muenzer, C., 2021. Begriff (Concept). Goethe-Lexicon of philosophical concepts, 1(1), pp.20-44.

Munkanda, W., 2022. The nurse educator's perspective on nursing ethics education.

Murchison, A.P., Hark, L., Pizzi, L.T., Dai, Y., Mayro, E.L., Storey, P.P., Leiby, B.E. and Haller, J.A., 2017. Non-adherence to eye care in people with diabetes. *BMJ Open diabetes research and care*, *5*(1), p. e000333.

Mutyambizi, C., Pavlova, M., Hongoro, C. and Groot, W., 2020. Inequalities and factors associated with adherence to diabetes self-care practices amongst patients at two public hospitals in Gauteng, South Africa. *BMC endocrine disorders*, 20(1), pp.1-10.

Mwila, K.F., Bwembya, P.A. and Jacobs, C., 2019. Experiences and challenges of adults living with type 2 diabetes mellitus presenting at the university teaching hospital in Lusaka, Zambia. *BMJ Open diabetes research and care*, *7*(1), p. e000497.

Nachimuthu, S., Vijayalakshmi, R., Sudha, M. and Viswanathan, V., 2020. Coping with diabetes during the COVID–19 lockdowns in India: Results of an online pilot survey. *Diabetes and metabolic syndrome: clinical research and reviews,* 14(4), 579-582.

Nagel, D.A., Keeping-Burke, L. and Shamputa, I.C., 2021. Concept analysis and proposed definition of community health center. *Journal of primary care and community health*, 12, p.21501327211046436.

Nandyal, S., Strawhun, D., Stephen, H., Banks, A. and Skinner, D., 2021. Building trust in American hospital-community development projects: a scoping review. *Journal of community hospital internal medicine perspectives,* 11(4), pp.439-445.

National standards for diabetes self-management education and support, 2017. (Online). From: https://doi.org/10.2337/dci17-0025,1-12. Accessed 10. September 2019.

Nazar CMJ, Bojerenu MM, Safdar M. and Marwat J., 2016. Effectiveness of diabetes education and awareness of diabetes mellitus in combating diabetes in the United Kingdom; a literature review. *journal of nephropharmacology*, 5(2):110-115.

Ng, L.C. and Gupta, M., 2020. Transdermal drug delivery systems in diabetes management: A review. *Asian journal of pharmaceutical sciences*, 15(1), pp.13-25.

Nikitara M, Constatious, C., S. Andreou, E. and Diomidous M., 2019. The role of nurses and the facilitators and barriers in diabetes care: A mixed method systemic literature review. *Behavioural science*, 14, 9(6), 61.

Nikoviotis, R. and Ringas, D., 2021, November. Self-care diabetes: a diabetes self-management application based on the seven self-management areas (AADE7) of the American association of diabetes educators. In *25th pan-hellenic conference on informatics* (pp. 477-482).

O'Brien, C., van Rooyen, D. and Ricks, E., 2020. Self-management of persons living with diabetes mellitus type 2: Experiences of diabetes nurse educators. *Health SA Gesondheid*, *25*.

Olczuk, D. and Priefer, R., 2018. A history of continuous glucose monitors (CGMs) in self-monitoring of diabetes mellitus. Diabetes & metabolic syndrome: *Clinical research & reviews*, 12(2), 181-187.

Olokundun, M., Dishon, G.J., Ibidunni, A.S. and Ogbari, M., 2020. Empathy and university students' business startups: the moderating role of experiential learning. *Universal journal of educational research*, 8(12), pp.6415-6428.

Omar Omar, S.M., Musa, I.R., Idrees, M.B., Abdelbagi, O. and Adam, I., 2022. Prevalence and associated factors of erectile dysfunction in men with type 2 diabetes mellitus in eastern Sudan. *BMC endocrine disorders*, *22*(1), pp.1-8.

Opoku-Addai, K., Korsah, K.A. and Mensah, G.P., 2022. Nutritional self-care practices and skills of patients with diabetes mellitus: A study at a tertiary hospital in Ghana. *Plos one*, *17*(3), p. e0265608.

Ormerod, R.J., 2021. Pragmatism in professional practice. *Systems research and behavioral science*, *38*(6), pp.797-816.

Oxford Dictionaries online. Confidence. 2022. (Online). Available from: http://www.oxforddictioneries.com/definition/english/confidence. 10. Accessed 21 October 2022.

Pamarta, K.K.P., 2022. The Accuracy and the Acceptability of Ten Popular Indonesian Songs Translation from Indonesian into English. Kata Kita: Journal *of language*, *literature, and teaching*, 10(3), pp.450-454.

Pamungkas, R.A., Chamroonsawasdi, K. and Vatanasomboon, P., 2017. A systematic review: family support integrated with diabetes self-management among uncontrolled type II diabetes mellitus patients. *Behavioral sciences*, *7*(3), p.62.

Pamungkas, R.A., Chamroonsawasdi, K., Vatanasomboon, P. and Charupoonphol, P., 2020. Barriers to Effective Diabetes Mellitus Self-Management (DMSM) Practice for Glycemic Uncontrolled Type 2 Diabetes Mellitus (T2DM): A Socio-Cultural Context of Indonesian Communities in West Sulawesi. *European journal of investigation in health, psychology and education,* 10(1), pp.250-261.

Pathak, A., Poulter, N. R., Kavanagh, M., Kreutz, R. and Burnier, M., 2021. Improving the management of hypertension by tackling awareness, adherence, and clinical inertia: a symposium report. *American journal of cardiovascular rugs*, 1-11.

Pesantes, M.A., Del Valle, A., Diez-Canseco, F., Bernabé-Ortiz, A., Portocarrero, J., Trujillo, A., Cornejo, P., Manrique, K. and Miranda, J.J., 2018. Family support and diabetes: Patient's experiences from a public hospital in Peru. *Qualitative health research*, *28*(12), pp.1871-1882.

Polit, D.F. and Beck, C.T., 2017. *Nursing research: Generating and assessing evidence for nursing practice.* 10th Edition, Wolters Kluwer Health, Philadelphia.

Pourkazemi, A., Ghanbari, A., Khojamli, M., Balo, H., Hemmati, H., Jafaryparvar, Z. and Motamed, B., 2020. Diabetic foot care: knowledge and practice. *BMC endocrine disorders*, *20*, pp.1-8.

Powers, M. A. Bardsley, J., Cypress, M., Duker, P., Funne, M.M., Fischl, A.H., Maryniuk, M.D., Siminerio, L. and Eva Vivian, E., 2015. Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American diabetes association, the American association of diabetes educators, and the academy of nutrition and dietetics. *Clinical diabetes journals organization*, 34 (2)70-80.

Powers, M.A., Bardsley, J.K., Cypress, M., Funnell, M.M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E.D., Maryniuk, M.D. and Norton, A., 2020. Diabetes self-management education and support in adults with type 2 diabetes: a consensus report of the American Diabetes association, the association of diabetes care and education specialists, the academy of nutrition and dietetics, the American academy of family physicians, the American academy of PAs, the American association of nurse practitioners, and the American pharmacists' association. *Diabetes care*, *43*(7), pp.1636-1649.

Profile Limpopo Province. 2016/2017

Qasim, M., Rashid, M. U., Islam, H., Amjad, D. and Ehsan, S. B., 2021. Knowledge, attitude, and practice of diabetic patients regarding foot care: Experience from a single tertiary care outpatient clinic. *The Foot*, *49*, 101843.

Radwan, H., Hasan, H.A., Ismat, H., Hakim, H., Khalid, H., Al-Fityani, L., Mohammed, R. and Ayman, A., 2019. Body mass index perception, body image dissatisfaction and their relations with weight-related behaviours among university students. *International journal of environmental research and public health*, *16*(9), p.1541.

Rafii, F., Alinejad-Naeini, M. and Peyrovi, H., 2020. Maternal role attainment in mothers with term neonate: A hybrid concept analysis. *Iranian Journal of nursing and midwifery research*, *25*(4), p.304.

Rahmanian, E., Salari, N., Mohammadi, M. and Jalali, R., 2019. Evaluation of sexual dysfunction and female sexual dysfunction indicators in women with type 2 diabetes: a systematic review and meta-analysis. *Diabetology & metabolic syndrome*, 11(1), pp.1-17.

Rocco, T.S., Plakhotnik, M.S. and Silberman, D., 2022. Differentiating between conceptual and theory articles: Focus, goals, and approaches. *Human resource development review*, *21*(1), pp.113-140.

Rosli, N.A., Sofian, H.N.H.M., Saiful, F.H.M. and Zolkefli, Y., 2022. nurses 'perceptions of the responsibility of patients with diabetes mellitus: a vignette study. *The Malaysian journal of nursing (MJN)*, *13*(3), pp.19-25.

Sadike, T.S., 2022. *A Model to enhance support for newly-qualified registered nurses in selected hospitals Limpopo Province, South Africa* (Doctoral dissertation).

Sánchez, R.O., Letiecq, B.L. and Ginsberg, M.R., 2019. An integrated model of family strengths and resilience: Theorising at the intersection of indigenous and western paradigms. *Journal of family theory and review*, 11(4), pp.561-575.

Santos, Z.R., Cheung, C.M., Coelho, P.S. and Rita, P., 2022. Consumer engagement in social media brand communities: A literature review. *International journal of information management*, 63, p.102457.

Sari, Y., Upoyo, A. S., Isworo, A., Taufik, A., Sumeru, A., Anandari, D. and Sutrisna, E., 2020. Foot self-care behavior and its predictors in diabetic patients in Indonesia. *BMC research notes*, 13(1), 1-6.

Sari, Y., Yusuf, S., Haryanto, H., Sumeru, A. and Saryono, S., 2022. The barriers and facilitators of foot care practices in diabetic patients in Indonesia: a qualitative study. *Nursing open*, 9(6), pp.2867-2877.

Savolainen, R., 2020. Elaborating the sensory and cognitive-affective aspects of information experience. *Journal of librarianship and information science*, *52*(3), pp.671-684.

Schaper, N.C., van Netten, J.J., Apelqvist, J., Bus, S.A., Hinchliffe, R.J., Lipsky, B.A. and IWGDF Editorial board, 2020. Practical guidelines on the prevention and management of diabetic foot disease (IWGDF 2019 update). *Diabetes/metabolism research and reviews*, *36*, p. e3266.

Scharp, K.M. and Sanders, M.L., 2019. What is a theme? Teaching thematic analysis in qualitative communication research methods. *Communication teacher*, *33*(2), pp.117-121.

Sechabe, E.V., Mothiba, T.M. and Bastiaens, H., 2019. What are the experiences and needs of primary care nurses in caring for patients with type 2 diabetes in a rural village in South Africa? An exploratory study. *Global journal of health science*, *11*(7), pp.1-90.

Segen's Medical Dictionary. 2011. Support. (n.d.) (Online). Available from: https://medical-dictionary.thefreedictionary.com/support. (Accessed 26 February 2023).

Senyo, P.K., Liu, K. and Effah, J., 2019. Digital business ecosystem: Literature review and a framework for future research. *International journal of information management*, *47*, pp.52-64.

Senyo, P.K., Liu, K. and Effah, J., 2019. Digital business ecosystem: Literature review and a framework for future research. *International journal of information management*, *47*, pp.52-64.

Shahabuddin, S., 2020. *A survey study on relation of diabetes with people's lifestyle in small cities of Bangladesh* (Doctoral dissertation, Brac University).

Shilubane, H., Netshikweta, L. and Ralineba, T., 2016. Beliefs and practices of diabetic patients in Vhembe District of Limpopo Province. *African journal of primary health care & family medicine*, 8(2), pp.1-6.

Shufutinsky, A., 2020. Employing use of self for transparency, rigor, trustworthiness, and credibility in qualitative organizational research methods. *OD practitioner*, *52*(1), pp.50-58.

Siedlecki, S.L., 2020. Understanding descriptive research designs and methods. *Clinical nurse specialist*, *34*(1), pp.8-12.

Simane-Netshisaulu, K.G., 2018. *Transition support programme for newly graduated midwives in Limpopo Province, South Africa* (Doctoral dissertation).

Smyth, T., 2021. Understanding the principles of insulin use in type 1 and type 2 diabetes management. *Nurs stand*, 36(1), pp.61-66.

Solan, Y.M., Kheir, H.M., Mahfouz, M.S., Al-Faify, A.A., Hakami, D.T., Al Faifi, M.A., Hakami, A.W., Hakami, A.H. and Sharif, H.H., 2017. Diabetic foot care: knowledge and practice. *Journal of endocrinology and metabolism*, *6*(6), pp.172-177.

South Africa, (1995) Regulation relating to the scope of practice of persons who are registered or enrolled under the Act. R2598, in terms of the Nursing Act, 1978 (Act No. 50 of 1978, as amended). Pretoria: Government printers.

South Africa, (1995) Rules setting out the acts or omissions in respect of which the Council may take disciplinary steps. R387, in terms of the Nursing Act, 1978 (Act No. 50 of 1978, as amended). Pretoria: Government printers.

South Africa, (1996) The Constitution of Republic of South Africa, Act No. 108 of 1996. South Africa: Government printers.

South Africa, (2005) *The Nursing Act, Act No. 33 of 2005*. Pretoria: Government printer.

Starke, G., De Clercq, E. and Elger, B.S., 2021. Towards a pragmatist dealing with algorithmic bias in medical machine learning. *Medicine, health care and philosophy,* 24(3), pp.341-349.

Stephani, V., Opoku, D. and Beran, D., 2018. Self-management of diabetes in Sub-Saharan Africa: a systematic review. BMC public health, 18(1), p.1148.

Stevenson, A. and Waite, M., 2011. Concise Oxford English dictionary.12th edition. Oxford: Oxford uUniversity pPress.

Stevenson, A. ed., 2010. Oxford dictionary of English. Oxford University Press, USA.

Stiffler, D., Cullen, D. and Luna, G., 2014. Diabetes barriers and self-care management: the patient perspective. *Clinical nursing research*, 23(6), pp.601-626.

Stormshak, E.A., Seeley, J.R., Caruthers, A.S., Cardenas, L., Moore, K.J., Tyler, M.S., Fleming, C.M., Gau, J. and Danaher, B., 2019. Evaluating the efficacy of the family check-up online: A school-based, eHealth model for the prevention of problem behavior during the middle school years. *Development and psychopathology*, *31*(5), pp.1873-1886.

Swedberg, R. 2020. Exploratory research. The production of knowledge: Enhancing progress in social science, pp.17-41.

Tamiru, S., Dugassa, M., Amsalu, B., Bidira, K., Bacha, L. & Tsegaye, D. 2023. Effects of nurse-lLed diabetes sSelf-mManagement education on self-care knowledge and self-cCare behavior among adult patients with type 2 diabetes mellitus attending diabetes follow up clinic: A quasi-experimental study design. *International journal of Africa nursing sciences*, *18*, p.100548.

Tewahido, D and Berhane, Y., 2017. Self-cCare practices among diabetes patients in Addis Ababa: A qualitative study. *PLoS ONE* 12(1): e0169062.

Thaba, D., 2018. Self-care activities among patients with diabetes attending a tertiary care hospital in Biratnagar, Nepal. *Journal of nobel medical college*, 7(1), 11-17.

The Society for Endocrinology, Metabolism and Diabetes of South Africa Type 2 Diabetes Guidelines Expert Committee. *The 2017 SEMDSA Guideline for the Management of Type 2 Diabetes Guideline Committee. JEMDSA 2017*, 21(1), (Supplement 1): S1-S196

Thomas nelson, 2013.*The holy bible, new king James version*. Holman bible publisher. Galatians 6:2, Pp1449.

Vibha, S.P., Kulkarni, M.M., Kirthinath Ballala, A.B., Kamath, A. and Maiya, G.A., 2018. Community based study to assess the prevalence of diabetic foot syndrome and associated risk factors among people with diabetes mellitus. *BMC endocrine disorders*, 18(1), pp.1-9.

Viet Hung, N., Chamroonsawasdi, K., Vatanasomboom, P. and Chottanapund, S., 2020. Effectiveness of a family support coaching program on diabetes mellitus self-management to improve health outcomes among Thai patients with uncontrolled type 2 diabetes: a quasi-experimental study. *Journal of public health and development*.18 (3): 64-83.

Viswanathan, V., Krishnan, D., Kalra, S., Chawla, R., Tiwaskar, M., Saboo, B., Baruah, M., Chowdhury, S., Makkar, B.M. and Jaggi, S., 2019. Insights on medical nutrition therapy for type 2 diabetes mellitus: An Indian perspective. *Advances in therapy*, *36*, pp.520-547.

Walker L.O. and Avant K. C., 2019. Strategies for theory construction in nursing (6th ed.). Pearson.

Walsh, K., Grech, C. and Hill, K., 2019. Health advice and education given to overweight patients by primary care doctors and nurses: A scoping literature review. *Preventive medicine reports*, *14*, p.100812.

Webb, D., 2018. 2017 SEMDSA diabetes management guidelines. *South African journal of diabetes and vascular disease*, *15*(1), pp.37-40.

Wen, L., Wang, Y., Lin, Z., Wang, F.H., Ding, X.X., Li, D., Feng, K., Liang, Y.B., Zhang, D.X., Dou, Y. and Zhai, G., 2020. The prevalence and causes of visual impairment in type 2 diabetes mellitus in Northeast China. *Journal of ophthalmology*, *2020*.

Werfalli, M.M., Kalula, S.Z., Manning, K. and Levitt, N.S., 2020. Does social support effect knowledge and diabetes self-management practices in older persons with Type 2 diabetes attending primary care clinics in Cape Town, South Africa? *PloS one*, 15(3), p. e0230173.

Whittemore, R., Vilar-Compte, M., De La Cerda, S., Marron, D., Conover, R., Delvy, R., Lozano-Marrufo, A. and Pérez-Escamilla, R., 2019. Challenges to diabetes self-management for adults

with type 2 diabetes in low-resource settings in Mexico City: a qualitative descriptive study. *International journal for equity in health*, 18(1), 133, 1-10.

Whyte, J., 2019. The morals of the market: Human rights and the rise of neoliberalism. Verso Books.

Williams, G., 2019. Applied qualitative research design. Scientific e-Resources.

World Health Organization, 2019. Decommissioning medical devices.

Wright, G., Adeniyi, O.V., Yogeswaran, P. and Longo-Mbenza, B., 2015. Diabetic patients' perspectives on the challenges of glycaemic control. *African journal of primary health care and family medicine*, *7*(1), pp.1-8.

Wulandari, I., Kusnanto, K., Wibisono, S. and Haryani, A., 2021. Family support in caring for diabetes mellitus patient: Patient's perspective. *Open access maced J Med Sci*. 2021 Apr 09; 9 (T4): 199-205.

Yin, T., Yin, D.L., Xiao, F., Xin, Q.Q., Li, R.L., Zheng, X.G., Yang, H.M., Wang, L.H., Ding, X.Y. and Chen, B.W., 2019. Socioeconomic status moderates the association between patient satisfaction with community health service and self-management behaviours in patients with type 2 diabetes: a cross-sectional survey in China. *Medicine,* 98(22).

Young, L., O'Connor, J. and Alfrey, L., 2020. Physical literacy: A concept analysis. *Sport, education and society*, *25*(8), pp.946-959.

Yuan, C., Jian, Z., Gao, X., Jin, X., Wang, M., Xiang, L., Li, H. and Wang, K., 2022. Type 2 diabetes mellitus increases risk of erectile dysfunction independent of obesity and dyslipidemia: A mendelian randomization study. *Andrology*, *10*(3), pp.518-524.

Yusra, A. and Waluyo, A., 2022. Family support toward adherence and glycemic control of tType 2 diabetes patient: A systematic review. *Problems of endocrine pathology*, 79(1), pp.100-111.

Zhao, X., He, Q., Zeng, Y. and Cheng, L., 2021. Effectiveness of combined exercise in people with type 2 diabetes and concurrent overweight/obesity: A systematic review and meta-analysis. *BMJ open*, *11*(10), e046252.

Zhou, Y., Li, X., Sun, Q., Wei, J., Liu, H., Wang, K. and Luo, J., 2022. Adherence to Annual Fundus Exams among Chinese Population with Diagnosed Diabetes. *Journal of clinical medicine*, *11*(22), p.6859.

Zhu, X., Lee, M., Chew, E. A., Goh, L. J., Dong, L. and Bartlam, B., 2021. “When nothing happens, nobody is afraid!” beliefs and perceptions around self-care and health-seeking behaviours: Voices of patients living with diabetic lower extremity amputation in primary care. *International wound journal*, *18*(6), 850-861.

LIST OF ANNEXURES

Annexure A: university of venda ethics committee (uvrec) clearance certificate

ETHICS APPROVAL CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms S Motsharine

STUDENT NO:
11640996

PROJECT TITLE: **A model to support adult diabetes mellitus patients in self- care management at the community health centres of Limpopo province, South Africa.**

PROJECT NO: SHS/20/PDC/39/2110

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr ND Ndou	University of Venda	Promoter
Prof DU Ramathuba	University of Venda	Co - Promoter
Dr KG Nelshisaulu	University of Venda	Co - Promoter
Ms. S Motsharine	University of Venda	Investigator – Student

Type: Doctoral Research
Risk: Minimal risk to humans, animals or environment
Approval Period: October 2020 – October 2023

The Human and Clinical Trails Research Ethics Committee (HCTREC) hereby approves your project as indicated above.

General Conditions:
While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principal investigator) must report in the prescribed format to the REC:
  - Annually (or as otherwise requested) on the progress of the project, and upon completion of the project
  - Within 48hrs in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
  - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be effected necessary during the course of the project, the project leader must apply for approval of these changes at the REC. Would there be deviation from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
  - Request access to any information or data at any time during the course or after completion of the project
  - To visit facilities/sites; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process
  - withdraw or postpone approval if:
  - Any unethical principles or practices of the project are revealed or suspected
  - It becomes apparent that any relevant information was withheld from the REC or that information has been false or misrepresented
  - The required amendments/reporting of adverse events was not done timely and accurately.
  - New institutional rules, national legislation or international conventions deem it necessary

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE
Date Considered: September 2020

Name of the HCTREC Chairperson of the Committee: Prof MS Mapulle

Signature: MSMapulle

UNIVERSITY OF VENDA
OFFICE OF THE DIRECTOR
RESEARCH AND INNOVATION
2020 -10- 23
Private Bag X5050
Thohoyandou 0950

Annexure B: Request for permission to Department of Health

Post net suite 37

P/bag X5020

Thohoyandou

0959

ENQ: Motsharine S

CEL: 072 431 47 46

The Head of Department

Department of Health

Limpopo Province

Private Bag X 9302

Polokwane

0700

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

This letter serves as an application to conduct research entitled: “A model to support of adult diabetes mellitus patients at the community health centres of Limpopo Province, SA”. I am currently registered for Doctor of Philosophy (Health Sciences) at the University of Venda.

The study will be conducted in Vhembe and Mopani Districts of Limpopo Province.

The following ethical standards will be observed throughout the research process to preserve the name and dignity of the participants:

- Informed consent will be signed voluntarily or under no pressure.
- Voluntary participation and freedom to withdraw without penalty.
- Data collected will only be accessed by my supervisor and independent coder.
- Raw data will be kept under lock and key to ensure confidentiality.
- Names of the participants will not be mentioned during discussion.

- The research summary will be made available for the Head of Department of Health.

Granting the researcher permission to conduct the research study will be of benefit to the selected health care services and the community at large.

Thank you

Motsharine S.

Signature of the researcher …… Date ……

Contact no: 072 431 4746

Promoter:

Co-promoter:

Annexure C : permission to conduct the study from Limpopo Province Department of Health

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref : LP_2020_10_041
Enquires : Ms PF Mahlokwane
Tel : 015 293 6028
Email : Kumula.Hlomane@dhsd.limpopo.gov.za

Selina Motsharine

PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

A MODEL TO SUPPORT ADULT DIABETES MELLITUS PATIENTS IN SELF- CARE MANAGEMENT AT THE COMMUNITY HEALTH CENTRES OF LIMPOPO PROVINCE, SOUTH AFRICA.

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
   a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
   b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
   c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
   d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
   e. The approval is only valid for a 1-year period.
   f. If the proposal has been amended, a new approval should be sought from the Department of Health
   g. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated

Director Research
Dr. Ramalivhana NJ

Date

Private Bag X9302 Polokwane
Fidel Castro Ruz House, 18 College Street, Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.
Website: http/www.limpopo.gov.za

The heartland of Southern Africa – Development is about people!

Annexure D : Request to Vhembe District office to conduct the study

Post net suite 37

P/bag X5020

Thohoyandou

0959

The Head of Department

Department of Health

Limpopo Province

Vhembe District

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

The above matters refer:

I Motsharine Selina, a doctoral degree student at the University of Venda, under the Department of Advanced Nursing Science., hereby request for permission to conduct a research study at the community health centres in Vhembe District of the Limpopo Province.

Research topic: A model to support of adult diabetes mellitus patients at the community health centres of Limpopo Province, South Africa. The purpose of study is to: develop a model to support adult DM patients in self-care management at the community health centre of Limpopo Province, SA. The following ethical standards will be observed throughout the research process to preserve the name and dignity of the participants:

- Informed consent will be signed voluntarily or under no pressure.
- Voluntary participation and freedom to withdraw without penalty.
- Data collected will only be accessed by my supervisor and independent coder.
- Raw data will be kept under lock and key to ensure confidentiality.
- Names of the participants will not be mentioned during discussion.
- The research summary will be made available for the Head of Department of Health.

Granting the researcher permission to conduct the research study will be of benefit the Limpopo Province community at large.

Thank you

Motsharine S.

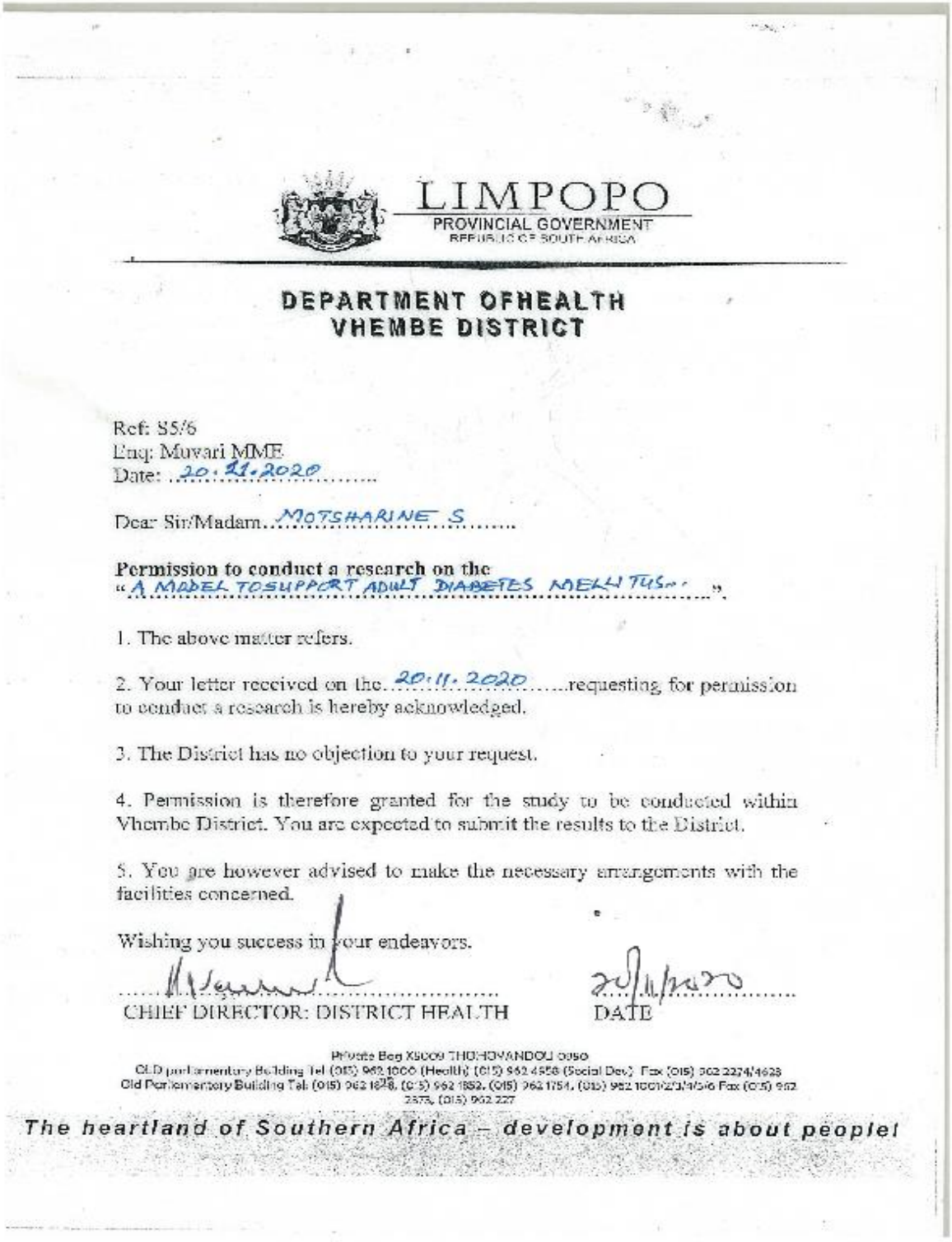
Signature of the researcher……Date……

Contact no: 072 431 4746

Promoter:

Co-promoter:

Annexure E : Permission to conduct the study from Vhembe District



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OFHEALTH
VHEMBE DISTRICT

Ref: S5/6
Enq: Muvari MME
Date: 20.11.2020

Dear Sir/Madam MOTSHARINE S

Permission to conduct a research on the
"A MODEL TOSUPPORT ADULT DIABETES MELLITUS".

1. The above matter refers.

2. Your letter received on the 20.11.2020 requesting for permission to conduct a research is hereby acknowledged.

3. The District has no objection to your request.

4. Permission is therefore granted for the study to be conducted within Vhembe District. You are expected to submit the results to the District.

5. You are however advised to make the necessary arrangements with the facilities concerned.

Wishing you success in your endeavors.

CHIEF DIRECTOR: DISTRICT HEALTH — DATE 20/11/2020

Private Bag X5009 THOHOYANDOU 0950
OLD parliamentary Building Tel (015) 962 1000 (Health) (015) 962 4558 (Social Dev) Fax (015) 962 2274/4628
Old Parliamentary Building Tel: (015) 962 1828, (015) 962 1852, (015) 962 1754, (015) 962 1001/2/3/4/5/6 Fax (015) 962 2573, (015) 962 227

The heartland of Southern Africa – development is about people!

Annexure F : Request to Mopani District office to conduct the study

Post net suite 37

P/bag X5020

Thohoyandou

0959

The Head of Department

Department of Health

Limpopo Province

Mopani District

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

The above matters refer:

I Motsharine Selina, a doctoral degree student at the University of Venda, under the Department of Advanced Nursing Science., hereby request for permission to conduct a research study at the community health centres in Mopani district of the Limpopo Province.

Research topic: A model to support of adult diabetes mellitus patients at the community health centres of Limpopo Province, South Africa. The purpose of study is to: develop a model to support adult DM patients in self-care management at the community health centre of Limpopo Province, SA. The following ethical standards will be observed throughout the research process to preserve the name and dignity of the participants:

- Informed consent will be signed voluntarily or under no pressure.
- Voluntary participation and freedom to withdraw without penalty.
- Data collected will only be accessed by my supervisor and independent coder.
- Raw data will be kept under lock and key to ensure confidentiality.
- Names of the participants will not be mentioned during discussion.
- The research summary will be made available for the Head of Department of Health.

Granting the researcher permission to conduct the research study will be of benefit the Limpopo Province community at large.

Thank you

Motsharine S.

Signature of the researcher …… Date ……

Contact no: 072 431 4746

Promoter:

Co-promoter:

Annexure G : Permission to conduct the study from Mopani District

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
MOPANI DISTRICT

Enquiries : S Chuma
Tel Direct : 015 811 6633

To : **Ms. Motshari S**
P/Bag x5020
Thohoyandou
0950

Dear Madam

PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL HEALTH FACILITIES OF MOPANI DISTRICT: YOURSELF

1. Your letter received on the **23 November 2020** has reference.
2. Note that your request for the purpose of conduct a research on "**A model to support adult diabetes mellitus patients in self care management at the community health centres of Limpopo Province, South Africa**" has been approved.
3. Note paragraph 2 of the approval letter from the provincial office for your attention and compliance.
4. Also note that further arrangements should be made with the responsible managers of the respective health care centers for access and assistance.
5. You are further expected to abide by all prescripts governing public service during the course of your research.
6. Thanking you.

Mahwedzeko
.....
DIRECTOR: CORPORATE SERVICES

2020/11/23
.....
DATE

Annexure H: Interview guide for patients living with diabetes mellitus

- Kindly explain to me how you take care of yourself as a person living with diabetes mellitus.
- May you kindly share with me the challenges that you face concerning self-care management and support, related to diabetes mellitus.
- May please explain to me the type of support that you need in self-care management.

Interview guide for patients living with diabetes mellitus: Tshivenda translation

- Ndi kho u humbela uri vha ntalutshedze uri vha di thogomela hani sa mulwandze wa swigiri
- Ndi kho u humbela uri vha ntalutshedze dzi khaedu dzine vha vha nadzo kha u di thogomela, zwi tshi kwama vhulwadze ha swigiri
- Ndi kho u humbela uri vha ntalutshedze uri vha toda u tikedziwa hani sa mulwandze wa swigiri.

Interview guide for patients living with diabetes mellitus: Xitsonga translation

- Ni kombela mi ni hlamusela leswaku mi tihlayisa njhani tani hi muvabyi wa vuvabyi bya chukele.
- Ni kombele mini hlamusela ku tikeriwa loku mi nga va na kona loko mi kha mi tihlayisa ka vuvabyi bya chukele.
- Ni kombela leswaku mini hlamusela leswaku ni mi seketela njhani tani hi muvabyi wa chukele.

Central question for professional nurses

As a professional nurse who is providing diabetic health care services in this community health center, kindly share with me the type of support you provide to adult patients living with diabetes mellitus.

Central question for family members

May you kindly share with me the type of support you provide to your family member who is living with diabetes mellitus.

Central question for family members Tshivenda translation

Ndi kho u humbela uri vha ntalutshedze uri vha tikedzisa hani murado wa muta wavho a ne a kho tshila na vhulwadze ha swigiri.

Central question for family members Xitsonga translation

Ni kombela mi ni hlamusela muxaka wa nsekelo lowu mi wu nyikaka va ndyangu wa nwina loyi

a hanyaka na vuvabyi chukele

Annexure I : Letter of information

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

ANNEXURE A

Title of the Research Study: A Model to support of adult's diabetes mellitus patients at the Community health centres of Limpopo Province, SA**.**

Principal Investigator/s/ researcher: Motsharine Selina

Co-Investigator/s/supervisor/s : Dr. Ndou N.D

: Prof Ramathuba D.U

: DR Netshisaulu K.G

Brief Introduction and Purpose of the Study:

Diabetes mellitus is a chronic multisystem disease that is more prevalent across the world and is placing increasing demands on healthcare systems. South Africa is amongst the developing countries in which prevalence of diabetes mellitus is growing fast in both urban and rural population. The prevalence of diabetes mellitus is growing fast in both urban and rural population. It is predicted that number of people living with diabetes mellitus in Africa will increase to 140% by the year 2040. The extreme increase is expected to be in the Africa region. Supporting diabetic mellitus patients with self-care management education is imperative because it assist diabetic mellitus individuals to gain the required knowledge and skills needed to attain optimal health.

The researcher is a nurse educator in general nursing science at the Limpopo College of Nursing in the Vhembe District of Limpopo Province South Africa. During student's clinical accompaniment in two of the hospitals of Vhembe District, the researcher observed that about 20 patients with diabetes mellitus were admitted in medical wards with hyperglycaemia, about 10 with diabetic keto acidosis (DKA) and about 12 with uncontrolled blood glucose levels every month (DHIS, 2019). This observation made the researcher to ask herself the following question? What can be the cause of hyperglycaemia in patients living with diabetes mellitus? Is there a problem regarding

adherence to the suggested life modification and diabetic medication? Are patients living with diabetes mellitus getting support in self-care management. The purpose of the study is to develop a model to support adults DM patients in self-care management at the community health Centre of Limpopo Province, SA.

Outline of the Procedures:

The study will employ a qualitative approach with explorative, descriptive design. Sampling of community health centre and all study participants will employ a non-probability purposive sampling. A pre-test will be conducted. The semi-structured interview guide and unstructured interview will be used. The interview will last about 30–45 minutes per participant. About 60 participants will be interviewed, sample size will be determined by data saturation. Data will be collected from four Community health centres in Vhembe and four Community health centres in Mopani District. All participants will sign an informed consent before data collection. Tech's method will be used for data analysis. Ethical considerations will be adhered to; research will be presented in the department and School Higher Degree Committees for quality assurance. Furthermore, the researcher will apply for ethical clearance from the University of Venda's Research Ethics Committee. Permission to conduct the study will be sought from the Limpopo Department of Health. Access to Vhembe and Mopani Districts Community health centres will be sought from the Department of Health Districts. The results of the study will be available at the University of Venda library, nurses' updates, and journals and will be presented at the nurse's conferences.

Risks or Discomforts to the Participant:

There are no discomfort or risk that are anticipated during data collection.

Benefits:

The study findings will be presented to the management and the study participants in Vhembe and Mopani Districts. The copies of the study will be submitted to the libraries for students' accessibility. The University of Venda will also be provided with the study copies in the form of bound copies and discs. The study will be presented at national and international conferences. The study will also be available on the internet for global accessibility. The published research findings can be used by other researchers in other settings.

Reason/s why the Participant May Be Withdrawn from the Study:

The participants will be informed that participation in the study is entirely voluntary. There will be no any penalties incurred if participants choose to withdraw at any stage.

Remuneration : Participants will not receive any monetary or other types of remuneration during or after the study.

Costs of the Study : Participants will not be liable to cover any cost regarding the study.

Confidentiality :

The names of the participants and identity document will not be required to ensure confidentiality. The researcher will also ensure to the participants that the information shared will not be used against them and will be kept safe. Furthermore, one on one interview will be conducted and privacy will be maintained. Research reports and articles in scientific journals will not include any information that may identify the participants.

Research-related Injury : No injuries anticipated during data collection and on the entire study.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher on (cell no: 072 4314 746), and my supervisor Dr. Ndou N.D (cell no: 060 6135 281) or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za.

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population.

Annexure J : Letter of information : Tshivenda translation

University ya Venda

Vhurifhi ha u divhadza mafhungo nga ha thoduluso ya ngudo ine ya do itwa

Thoho ya thoduluso: Modele wa u tikedaza vhalwadze vha hulwane vha lwalaho vhulwadze ha swigiri khadzi dzi senthara dza mutakalo dzi re mivhunduni ya dzingu la Limpopo shangoni la, Afurika Tshipembe.

Mutodulusi: Motsharine Selina

Vhalavhelesi vha ngudo ya thoduluso ndi Dokotela Vho : Ndou N.D

: Phurofesa Ramathuba D.U

: Dokotela Netshisaulu K.G

Marangaphanda mapfufhi na ndivho ya thoduluso:

Vhulwadze ha swigiri ndi vhulwadze vhusa fholi vhu kwamaho zwi phida zwa muvhili zwo fhambanaho, vhulwadze u vhu ho anda shango lothe, vhu dovha hafhu ha to da u ri hu vhe na dzhenelela hunzhi ha mihasho ya mutakalo. Shango la Afurika Tshipembe li ngomu ha mashango a kho u aluwaho, line kha lo vhulwadze ha swigiri vhu khou aluwa nga luvhilo luhulu dzi doroboni na mahayani. Ho bvumbiwa uri tshivhalo tsha vhathu vhane vha kho u tshila na vhulwadze ha swigiri kha shango la Afurika Tshipembe I do aluwa uya kha 140 ya dzi phesenthe nga nwaha wa 2040. U a luwa hu hulwane ha vhulwadze u vhu zwi kho u vhonalesa kha dzhango la Afurika. U tikedza vhalwadze vha lwalaho vhulwadze ha swigiri nga u vha funza u di thogomela ndi zwa ndeme, ngauri zwi thusa vhalwadze kha u wana ndivho na ma maitele a vha konisaho u ri vhavhe na mutakalo wa vhudi. Mutodulusi kha ngudo iyi ndi mugudisi wa manese kha kholedzhi ire kha dzingu la li Limpopo kha tshitiriki tsha Vhembe kha la Afurika Tshipembe. Tshifhinga tsha musi mutodulusi o fheletshedza matshudeni kha zwinwe zwa zwibadela zwi re kha tshitiriki tsha Vhembe. Mutodulusi o vhona uri vhalwadze vha linganaho 12 uya kha 20 vha kho valelwa tshibadela kha dzi wadi dza medical vha na swigiri ire ntha, vha new vha no lingana 5 vha kho valelwa nga swigiri i re ntha lu sa langei. He zwo zwothe zwo i ta uri mutodulusi a vhe na dzangalelo la u todulusa nga ha thikhedzo i ne vhalwadze vha lwalaho vhulwadze ha swigiri vha i nekedzwa zwi tshi kwama u di thogomela.

Ndi vho ya ngudo ya thoduluso iyi ndi u bveledza modele u ne wa do tikedza vha lwadze vha lwalaho vhulwadze ha swigiri kha u di thogomela kha dzi senthara dza mutakalo dzi re mi vhunduni ya dzingu la Limpopo kha shango la Afurika Tshipembe.

Maitele a thoduluso:

Ngudo ya thoduluso heyi i do shumisa thoduluso dza vhudzivha na dza u talutshedza mafhungo. U nangwa ha mivhundu na vhathu vhane vha do dzhenelela kha thoduluso vha do khethwa nga ndila i ne a si vhathu vhothe vhane vha do khethwa, hu do khethwa vhathu ho sedzwa ndivho ya thoduluso. Hu do vha na tsedzuluso thangeli ine ya do itwa. Dzi mbudiziso dzo to nwalwaho fhasi dzi do vhudziswa, na mbudziso nthihi i tendelaho uri muthu a ambe nga u funa. Nyambedzano I do dzhia tshifhinga tshi linganaho mithethe ya 30-45. Tshivhalo tsha vhathu vhane vha do vhudziswa mbudziso tshi do langwa ngauri hu si tshena mafhungo maswa a ne a kho ambiwa nga vha vho dzhenelaho ngudo ya thoduluso. Thoduluso dzi do itwa kha dzi senthara nna dza mutakalo dza tshitiriki tsha Vhembe na nna dza tshitiriki tsha Mopani. Vhathu vhothe vha ne vha do dzhenelela kha thoduluso vha do saina fomo ya thendelano. Komiti ya thoduluso ya yunivesithi ya thoduluso ya Venda na Komiti ya thoduluso ya muhasho wa mutakalo wa dzingu la Limpopo vha do dovha vha vha vhone vhane vha do themendela u i itwa ha ngudo ya thoduluso iyi. Thendelo ya u i ta thoduluso kha dzi senthara dza mutakalo i do themendelwa nga muhasho wa mutakalo kha tshitiriki tsha Vhembe na kha tshitiriki tsha Mopani. Mvelelo dza thoduluso dzi do wanala library ya Yunivesithi ya Venda, kha bugu dza mafhungo maswa a vha ongi kana manese na kha dzi khonifarentse dza manese

Khombo dza u dzhenelela kha thoduluso:

A hu na khombo i kho lavhelelwaho musi thoduluso dzi kati na u itwa.

Mbuyelo:

Ma wanwa a thoduluso a do taniwa kha vha languli na kha vhathu vho dzhenelaho kha thoduluso vha re kha tshitiriki tsha Vhembe and tsha Mopani. Dzi bugu dza ma wanwa a thoduluso dzi do i swa laiburari uri matshudeni vha kone u dzi swikelela. Mvelelo dza thoduluso dzi do ambiwa kha khonifarentse dza mashango haya, na mashango a nnda. Mvelelo dza thoduluso dzi do wanala kha inthanethe uri dzi swikelwele nga shango lothe. Mvelelo dza thoduluso dzi nga shumiswa nga vha nwe vhatodulusi kha dzi nzulele dzi nwe vho.

Mbuno dza uri ndi ngani vho dzhenelaho kha thoduluso vha tshi nga di bvisa kha ngudo ya thoduluso:

Vhathu vhane vha do dzhenelela kha thoduluso vha do divhadziwa uri vha shela mulenzhe kha ngudo dza thoduluso nga u funa havho vha sa kombetshedzwi. A hu nga vhi na u vha iswa kana u sa farwa zwi si zwa vhudi ha vhathu vhane vha nga nanga u di bvisa tshifhinga tshinwe na tshinwe vha tshi funa.

Mbadelo: Vhathu vho dzhenelaho kha thoduluso a vhanga wani mbadelo ya tshelede musi thoduluso dzi kati kana dzo no fhela.

Ndozwo ya ngudo thoduluso: Vho dzhenelaho kha thoduluso a vha nga fhiwi mulandu wa u badela ndozwo yo vhaho hone hu tshi itwa thoduluso.

Tshiphiri:

Dzina na basa ya vhathu vho dzhenelaho kha thoduluso a dzi nga todei u i tela tshiphiri tsha thoduluso. Mutodulusi u do zwiita mafhungo uri mafhungo o a mbiwaho kha thoduluso ha nga shumisiwi u lwa na vho, mafhungo o the ado vhewa o tsireledzwa. Musi wa u vhudzisana mbudziso dza ngudo ya thoduluso iyi, zwi do itwa tshiphirini. Muvhigo wa thoduluso u do divhadziwa hu sina mafhungo ane ado talusa u dzhenelela havho kha thoduluso i dzi.

U huvhala zwi tshi kwama thoduluso i dzi: A huna u huvhala hu ne ha kho lavhelelwa musi hu tshi kho kuvhanganwa mafhungo na kha ngudo yothe ya thoduluso.

Vhathu vhane vha nga vha kwama arali vhana thaidzo kana mbudziso:

Kha vha kwame mutodulusi kha nomboro dzi tevhelaho:(cell no: 072 4314 746), Mulavhelesi wanga vho Dokotela Ndou N.D (cell no: 060 6135 281) kana munwaleli wa komiti ya vhudifari kha zwa thoduluso Yunivesithi ya Venda 015 962 9058. Dzi mbilaelo dzi nga vhigiwa kha mulangi wa zwa thoduluso na tshanduko, Phurofesa Vho: GE Ekosse kha 015 962 8313 kana Georges Ivo.Ekosse@univen.ac.za.

Annexure K : Letter of information : Xitsonga translation

University ya Venda
Papila ra vuxokoxoko

Nhlokomhaka ya ndzavisiso: Maendlelo mantswa yaku seketela vavabyi lavakulu va vuvabyi bya chukele hi tlhelo ra ku tihlayisa e ka tiklililiki ta purovhinsini ya Limpopo e Afrika Dzonga.

Mulavisisi nkulu: Motsharine Selina

Valanguteri : Dokotela Ndou N.D

: Purofesa Ramathuba D.U

: Dokotela Netshisaulu K.G

Masungulo hi ku komisa na xikongomelo xa dyondo

Vuvabyi bya chukele ivuvabyi byo ka byi nga tshunguleki lebyi katsaka swirho swo hambana hambana emirhini lebyi kumekaka ngopfu emisaveni hinkwayo and byi veka ntshikelelo e ka ku ngeteleleka ka swilaveko swa swarihanyo. Tiko ra Afrika Dzonga ri le xikarhi ka matiko lama ya ha humelelaka laha vuvabyi bya chulkele byi vonakaka byi kha byi andza eka vanhu emadorobeni na le matiko – xikaya. Ku bvumbhiwe leswaku nhlayo ya vanhu lava hanyaka na vuvabyi bya chukele e Afrika byi ta ndlandlamuka ku fika ka 140% hi lembe ra 2040. Ku ndlandlamuka loku ka xihatla ku languteriwe tha tindhawu ta Afrika.

Nseketelo eka vavabyi va vuvabyi bya chukele hi maelana na dyondo yaku tihlayisa swi na nkoka swinene ku pfuna munhu wa vuvabyi bya chukele ku vuyeriwa hi vutivi na viswikoti lebyi nga fanele ku kuma rihanyu ra xiyimo xa le henhla. Mulavisisi imuongori la nga twasela tidyondo ta ku dyondisa loyi a dyondisaka e kholichini ya vuongori ya Limpopo eka xifundha xa Vhembe, purovinsi ya Limpopo etikweni ra Afrika Dzonga. Hi nkarhi wa ku landelela swichudeni swa vunese eswibedhlele swa Vhembe, mulavisisi u xiyisisile a kuma leswaku vavabyi vo ringana 12-20 va vuvabyi bya chukele lava ava pfaleriwe exibedlele ka wadi ya lava vabya Kunene va kumemeke va ri chukele ra le henhla swinene, chukele ro ka ri nga lawuleki nhweti na nhweti (DHIS, 2019). Vuxiyaxiyi lebyi byi endle leswaku mulavisisi a tivutisa swivutiso lexi landelaka: I ncini lexi vangaka leswaku chukele ri va henhla eka vavabyi va vuvabyi bya chukele? Ku nga va ku ri na nkingha ku landelela swibumabumelo swa ku ncinca mahanyelo hi tlhelo ra ku tihlayisa. Xikongomelo xa dyondo I ku tumbuluxa maendlelo mantswa yaku seketela vavabyi lavakulu va

vuvabyi bya chukele hi tlhelo ra ku tihlayisa e ka tiklililiki ta purovhinsini ya Limpopo e Afrika Dzonga.

Maendlelo

Dyondo yi ta tirhisa “qualitative method, with explorative, descriptive design”. Ku langhiwa ka klililiniki na vamgheneleli ku ti tirhisiwa leswi vuriwaka “non-probality purposive sampling”. Ku sunguriwa hi ku endliwa nkambelo- ntivo. Ku ta van a papila leri nga ta landeleriawa loko ku kha vutisiwa swi vutiso. Ku vutisa swivutiso swi ta teka 30-45 wa timinete hi mungheneleli. Vangheneleli vo ringana 60 va ta vutisa swivutiso, lava vanga ta tirhisiwa va heta ku laviwa loko ku nga nga ha kumeki hungu rintshwa ro hambana nan a lama ku kumeka eku sunguleni. Mahungu ya ta hlengeletiwa a ka tiklililiniki ta mune ta xifundha xa Mopani. Vangheneleli va ta siyina papilla ra ku pfumelelana ku nga si hlengeletiwa mahungu. Mendlelo ya Tech’s ya ta ladeleriwa ku hlahluva mahungu lama ya nga hlengeletiwa. Matikhomele ya kahle ya vanhu ya ta landeleriwa swinene. Dyondo leyi yi ta andlariwa eka komiti yay a xikolo xa degiri ya le henhla ku tiyisisa ntikelo wa dyondo. Ku ya emahlweni, mulavisisi u ta endla xikombele e ka committee leyi tirhanaka na vulavisisi bya dyondo leyi langutaka ku ri vangheneleli va hlayisiwa njhani, ku pfumeleriwa ku teka mahungu. Mpfumelelo wo ya emahlweni na dyondo ya vulavisisi wu ta kumeke eka ndawulo ya rihanyu ya limpopo. Mpfumelelo wo teka mahungu etiklililiniki wu ta kumeka e ka xundha xexo. Mbuyelo wa dyondo ya vulavisisi byi ta kumeka elibrari ya university ya Venda na le ka maphepha hungu lama haxaka timhaka ta vuongori.

Tinghozi kumbe ku ka u nga khomeki kahle.

A ku nga vi na ku ka u nga khomeki kahle kumbe nghozi leyi nga languteriwa hi nkarhi wa hlengeleta mahungu

Ku vuyeriwa

Mbuyelo wa dyondo ya vulavisisi byi ta tivisiwa vakulukumba na vangheneleli va le swifundha swa Vhembe na Mopani. Lowu nga hlengeletiwa wu ta kumeka hi ku olova ka swichudeni e liyiburari. University ya Venda na yona yi ta kuma mbuyelo hi xivumbeko xa buku na disc. Dyondo ya vulavisisi yi ta tivisiwa e ka ti khoferense ta tiko hinkwaro hi ku angarhela na le ka matiko ya le handle. Dyondo leyi ya vulavisisi yi ta hangalasiwa na le ka internent misava hinkwayo jikelele. Endhaku ka ku hangalasiwa dyondo ya vulavisisi yi nga tirhisiwa na hi valavisisi vanwana e ka tindhawu tinwana.

Hikwalaho ka yini mungheneleli a nga susiwa ku va xiphemu xa dyondo ya vulavisisi

Vangheneleli va ta tivisiwa leswaku vunghenelí eka dyondo ya vulavisisi a byi bohi, a ku ve hi ku rhandza. A ku nga vi na ndziho loko munghenelí a kunguhata ku tshika nkarhi wunwana na wunwana.

Ku hakeriwa

A ku nga vi na ku hakeriwa ko karhi hambi mali kumbe yini hi nkarhi wa dyondo ya vulavisisi kumbe endhaku ka dyondo ya vulavisisi

Nxavo wa dyondo ya vulavisisi

Vanghenelí a va languteriwangi ku hakele hi nkarhi wa dyondo ya vulavisisi

Xihundla xa ku va xiphemu xa dyondo ya vulavisisi

Mavito ya vanghenelí na vutitivisisi a swi nge laveki ku tiyisisa xihundla xa ku va xiphemu xa dyondo ya vulavisisi. Mulavisisi u ta tiyisisa e ka vanghenelí leswaku mahungu lawa vanga ma humesa a ya nge tirhisiwi ku va lwisa kambe ya ta hlayisiwa exihundleni. Nakambe ku vutisiwa swivutiso ha unwe unwe swi endliwa exihundleni na kona swi ta tshama swi ri xihundla. A ku nga vi na nchumu na unwe lowu nga ta kombisa ku tiveka ka vangeneleli eku hangalasiweni ka mbuyelo wa dyondo ya vulavisisi

Nghozi leyi nga humelea; laka hikwalaho ka dyondo ya vulavisisi

A ku a nghozi leyi nga languteriwa hi nkarhi wa ku hlengeleta mahungu ya dyondoya vulavisisi ku konda yi fika emakumu.

Munhu loyi mi nga nwi khumbhaka hi tlhelo ra swivilelo kumbe swivutiso:

Mi komberiwa ku khumbha mulavisisi eka nomboro leyi landelaka ya rinqingho (cell no: 072 4314 746), na nkulukumba wa mina Dr. Ndou N.D (cell no: 060 6135 281) kumbe matsalani wa komiti ya vulavisisi ya University eka 015 962 9058. Swivilelo swi nga kongomisiwa eka Directara: vulavisisi na vusunguri, Profesa GE Ekosse eka 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za.

Annexure L : Informed consent

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, (*name of researcher*), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number.
- I have also received, read and understood the above written information (*Participant Letter of Information*) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	Date	Time	Signature
I, ……	**……**	**……**	**……..**

(*Motsharine Selina*) herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

Full Name of Researcher		
……	Date**……**	Signature**……**
Full Name of Witness (If applicable)		
……	Date **……**	Signature**……..**
Full Name of Legal Guardian (If applicable)		
……	Date**……**	Signature**……**

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counselling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References: Department of Health: 2004. Ethics in Health Research: Principles, Structures and Processes http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/

Annexure M : Informed consent / Venda translation

Tshitatamende tsha thendelano ya u dzhenelela kha ngudo ya thoduluso:

- Ndi kho u tenda uri ndo divhadziwa nga ha thoduluso, (*nga vho Motsharine Selina*), nga ha mvumbo, vhudifari, mbuyelo na khombo ya thoduluso - nomboro ya vhudifari kha thoduluso: SHS/20/PDC/39/2110

Ndo dovha hafhu nda tanganedza, u vhala na u pfesesa mafhungo o nwalwaho ntha (vhurifhi ha u divhadza mafhungo nga ha thoduluso ya ngudo ine ya do itwa) maelana na ngudo ya thoduluso.

- ndi a zwi divha uri mvelelo dza thoduluso, zwi tshi kwama mbeu yanga, mi nwaha, ma duvha a u begwa madzina na vhulwadze hanga a zwi nga divha dziwi kha muvhigo wa thoduluso iyi.

  Hu tshi itelwa thodea ya thoduluso iyi, ndi kho tenda uri mafhungo ane a do kuvhanganwa a nga longelwa kha computer nga mutodulusi.
- Ndi nga di bvisa kha u dzhenela kha thoduluso i dzi nga u tshifhinga tshinwe na tshinwe hu si na u hatuliwa
- Ndo vha na tshikhala tshi linganaho tsha u vhudzisa dzi mbudziso (nga u kona hanga) ndi bula uri ndo di i misela u dzhenela kha thoduluso iyi.
- Ndi a tenda uri ma wanwa maswa a ndeme a ne a do wanala kha iyi tsedzuluso a elanaho na u dzhenela hanga hu do itwa uri ndi a wane.

Madzina a mudzheneli nga vhudalo Datumu Tshifhinga Tsaino

Nne**, ……** **……** **……** **……**

(*Motsharine Selina*) Ndi kho khwathisedza uri a vha vho bulwaho ntha, vho talutshedzwa nga ha mvumbo, vhudifari na nga khombo dza thoduluso iyi.

Madzina a mutodulusi nga vhudalo

…….. Datumu**……** Tsaino**……**

Dzina la muthogomeli (Arali zwo tea)

…… Datumu **……** Tsaino**……**

Madzina a Thanzi nga vhudalo (Arali zwo tea)

…… Datumu**……** Tsaino **……**

Annexure N : Informed consent / Xitsonga translation

Papila ra ku pfumelelana ku nghenelela ka xikolo xa vulavisisi:

- Na tiyisisa leswaku ni tivisiwile hi mulavisisi (Motsharine Selina), muxaka, matikhomele, ku vuyeriwa na nghozi yo vangiwa hi dyondo ya vulavisisi: SHS/20/PDC/39/2110

Ni amukerile, ni hlayile ni tlhela ni twisisa mahungu lama ya nga tsariwa laha henhla (papilanyana ra mahungu) mayelena na dyondo.

- Ni swi lemuka leswaku mbyuyelo wa dyondo ya vulavisisi, ku katsa mahungu ya vuxokoxoko by vumunhu mayelana na rimbewu, vukhale, siku ra ku bebeuriwa, swirhangi swa mavito na muxaka wa vuvabyi a swi nge humeseriwi erivaleni eku heteleleni ka dyondo ya vulavisisi.
- Hi ku langutisisa swilaveko swa dyondo ya vulavisisi, na pfumela leswaku hungu hinkwaro leri nga ta kumisiswa eka dyondo ya vulavisisi byi ta langutisisiwa hi muchini hi Mulavisisi.
- Ni ve nkarhi wo ringana ku vutisisa swivutiso na kona (na tinyiketa ku nga ri hi ku bohiwa) ku boha leswaku niti lunghiserile ku nghenelela eka dyondo ya vulavisisi.
- Na swi twisisa leswaku leswi nga ta kumeka eka xikolo xa vulavisisi leswi fambelanaka na mina ni ta nyikiwa swona.

Mavito hi ku hetiseka munghenelelì Siku Nkarhi Nsayino

Mina…… …… …… ……

(Motsharine Selina) na tiyisisa leswaku munghenelelì eka dyondo ya vulavisisi lang laha henhla ni nwu tivisisle hi muxaka, matikhomele na nghozi ya dyondo ya vulavisisi.

Mavito hi xitalo ya mulavisisi Siku Nsayino

…… …….. ……

Mavito hi xitalo ya mbhoni (loko yi ri kona). Siku Nsayino

…….. …….. …….

Mavito hi xitalo ya muhlayisi hi tlhelo ra nawu (loko yi ri kona). Siku Nsayino

…….. …… ……..

Annexure O : Proof of editing and proof-reading certificate

EDIT IT!
EDITING DONE RIGHT

2023/03/08

To whom it may concern.

This is to certify that I have edited this dissertation for the following candidate:

Name: Motsharine Selina

Student number: 11640996

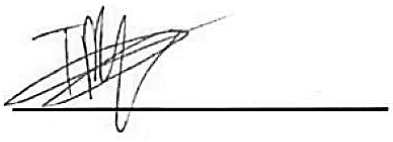
Title: A model to support adult diabetes mellitus patients at the community health centres of Limpopo Province, South Africa.

I used the accepted language in South Africa, which is UK English (not US). While editing, attention to detail was paid and I looked for most of the standard things: grammar, sentence structure, punctuation, capitalisation, spelling, word choice, organisation, and paragraphing. Additionally, I have checked it for relevant aspects of consistency in terms of style, format, redundancy, and most importantly, clarity. This is a very well-written document that meets all the requirements on the editors' checklist and can be published publicly.

Editor: Praise Magidi

Qualification: BA Languages Degree

Obtained from: University of Pretoria (in 2012)



Praise Magidi

Annexure P : Face to face interview transcripts

for professional nurses

Interview Key

R: Researcher

P: Participant

R: Good morning.

P: Morning

R: How are you?

P: Fine, thanks and how are you?

R: I am doing well. I am Selina Motsharine, a PhD student at the University of Venda. As I told you before, I am conducting a study on support of adult patients living with diabetes mellitus, in self- care management at the community health centres in Vhembe and Mopani districts. For how long have you been providing diabetic health care services in this institution?

P: It is 18 years now.

R: How old are you?

P: I am 54 years old.

R: Ok. Let's continue to adhere to Covid-19 standards. I have explained the purpose of the study to you. Let me remind you that you're not obligated to continue with the study if you no longer want to do so. Kindly read the consent form and sign it before we begin the interview. If there is something that you do not understand, please ask so that I may explain to you before you sign.

P: Mm…. ok.

R: Before we begin, I'd like us to speak louder so that we can hear each other, as the distance we have kept in accordance with the Covid-19 protocol may compel us to raise our voices. As we begin, the voice recorder is already turned on, as I previously stated it will be utilised to capture the interview. I promise you that your names or identities will not be mentioned throughout the interview; instead, I will refer to you by numbers. Let me remind you that there will be no monetary compensation for your participation in this study.

Kindly share with me the type of support that you as a professional nurse provide to an adult patients living with diabetes mellitus.

P: Ok, most of the time I advice them about diet.

R: Ok. Tell me the information you include when you advice patients about diet?

P: Patients living with diabetes mellitus are adviced to boil or roast food such as meat instead of frying, to use salt sparingly,adding sugar in food is discouraged, we encourage patients to drink plenty of water and buy 100% juice instead of using fizzy drinks, fruits and vegetables are recomemmded for daily consumption. We educate them to eat small frequent meals with snacks in between.

R: Ok. What do you mean by educating them to eat small frequent meals and snacks in between?

P: I mean we educate them to eat small meals 4 to 5 times a day, taking an apple or two slices of bread in between the meals.

R: I understand, you can continue.

P:Yes, and I also teach them to take medication as prescribed by the doctor,and to control their weight.

R: Ok.

P: Patients living with diabetes mellitus are also adviced to take medication the right time and to adhere to diabetic diet as prescribed by the doctor or dietician.

R: Ok

P: We also teach them to avoid wearing tight feeting shoes and always put on their shoes to avoid prick injuries that may result in a wound that is difficult to heal.

R: Hmm..ok.

P: We also adviced them to do follow-up visits regularly as indicated, so that we can be able monitor their blood glucose level regularly.

R: Ok. What else do you do for the patients living with diabetes when they come for follow-up visit?

P:Ehh… most of the time is measuring of blood glucose levels, but if the blood glucose is elevated, patients are adviced come back for follow-up visits earlier, that is within a week.

R: Ok. Do patients living with diabetes mellitus visit the health center as expected?

P:Yes they do.

R: How else do you support the patients who are living with diabetes mellitus?

P: We also advice patients who can afford to buy blood glucose monitoring machine, to buy so that they can measure their blood glucose level at home.

R: Ok, Do patients living with diabetes mellitus purchase equipment to monitor their blood glucose levels as adviced?

P: Yes, those who afford , are able to purchase.

R: Is there something that you will like to add regarding the support you provide to patients living with diabetes mellitus?

P: Yes. Patients are dviced to be in possesion of some sweets when travelling to low blood glucose level.

R: Mmm… How do you give patients health advices?

P: We give the health advices as individuals. making sure that all patients who come for visit get health advice regarding self-care.

R: What information do you include when you give health advice to the patients living with diabetes mellitus?

P: We advice them to take medication as prescribed by the doctor.

R: You mentioned that you advice them about medication. What do you mean by that?

P: For example we may teach the patients to take medication two or three times a day as per doctors prescription.

R: OK

P: But we do have patients living with diabetes mellitus who donot follow doctors prescription,either they take more or less medication, for example we come across patients who take one tablet instead of taking three tablets per day. We ussually identify that when the patient blood glucose is not well managed. The blood glucose may be constatly high or very low.

R: Ok, therefore you support them by teaching them to take medication as per doctors prescription?

P: Yes

R: How do you help the patients living with diabetes mellitus when coming to excersises?

P: We teach them to first check their blood glucose level before excercising, when the

blood glucose is about 3 milli mol per litre, we advice the patient not to do excerices, to prevent blood glucose to drop futher.

R: How possible is it for you teach familiy members of a patients diagnosed with diabetes mellitus on how to support their family members in management of diabetes mellitus?

P: It is possible. Family members are very eager and interested to be educated about diabetes mellitus. More specially because they know that diabetes mellitus is inherited, it makes them to be really interested to know more about diabetes mellitus.

R: Mm…ok, I understand. Though you have indicated that you support patients diagnosed with diabetic mellitus by giving them diabetic education together with their family members, we still find patients diagnosed with diabetic mellitus admitted at the hospitals with diabetic emergencies su as keto acidosis and hypoglycemia, and complications such as blindness, diabetic foot, amputations of the lower legs, and kidney complications. As a person who is providing diabetic services,I would like to know if there is another way that you think may be used to support patients diagnosed with diabetes mellitus.

P: I think patients should be educated about diabetes more oftenly, and to be reminded about the importance of adherence to self care management practices. We are faced with some challenges of patients who do not cooperate with us here at the community health center. We have challenges of patients who donot want to come for follow-up visits. Some patients have a problem of denial. They do not accept the fact that they are diagnosed with diabetes mellitus, those are the patients who end up having diabetic complications such as blindness. Some patients do not want to visit the local health centres,they only come to seek health care service when they experience diabetic complications.We ussually refer those patients to the hospital,but without much help that can save them from such complications. Some of the patients that I come across, they prefer visiting private general practitioners/doctors.

R: Mm…….

P: I indicated that some patients do not come the health care centre for follow-up visits. Instead of coming to the health centre they visit to their general practioners/private doctors. Most of the patients come to our facilitity already complaining of blindness. Most of them deny that they have diabetic mellitus. They say high blood glucose level will not do them any harm. We ussually write transfer letter to hospital for patients' whose blood glucose levels is not well controlled, especially those with blood glucose readings high.

Those patients will stay at home and never go to the hospital.

R: Ok, What do you think should be done to assist patients who do not come for follow-up visit?

P: We could help by doing home visit,but we are unable to do home visits because of shortage of staff. We send the home based care staff members to visit patients. The challenge we experince is that, patients do not want home based carers to assist them because they know each other, they are local residence. The patients will say they do not want their conditions to be known by home base carers or community health workers as they reside with them in the same village.This delay patients diagnosed with diabetes mellitus to get diabetic health care services. But we do not get weary nor discouraged, we keep on sending the commuinty health workers to offer support to those patients and to remind them to come for follow-up visit. We compile a list for patients who are due for follow-up visits at our community health center. The list helps us when we phone them to persue them to come to the health centre for follow up visits, some respond positively, but some do not respond.

R: What do you think should be done to support diabetic patients effectively?

P: I think diabetic campaigns should be conducted more oftenly, may be three times in a year. The community should be educated about diabetes mellitus and its management. There should be frequent inservice training organised for professional nures and other nursing categories, because we also do not have sufficient information regarding diabetes mellitus.

R: Who should organise the campains and inservice training?

P: The managers in the department of health should organise that for us.

R: Thank you so much for the information you shared. If there is something that need follow-up I will phone you to make arrangements for the meeting.

P: Thank you.

Face to face interview transcripts for patients

Interview key

R: Researcher

P: Participant

R: Good morning.

P: Good morning.

R: How are you?

P: Fine, thanks and how are you?

R: I am doing well. I am Selina Motsharine, a PhD student at University of Venda. As I indicated to you before, I am conducting a study about support of adult diabetes mellitus patients in self-care management at the community health centres of Vhembe and Mopani districts of Limpopo Province. Before we proceed, I would like to remind you that we're meant to follow Covid-19 standards throughout the interview. You're not obligated to continue with the interview if you are no longer interested. I'll ask you to read through the consent form and sign it before we begin the interview. If there is something you do not understand, please ask so that I explain to you before you sign.

P: Ok.

R: How old are you?

P: I am 57 years old.

R: For how long have been living with diabetes mellitus?

P: Ooh… I do not know very well, but I was diagnosed, while working in town around 2004, 2005.

R: All right. Before we begin, I'd like us to speak louder so that we can hear each other, as the distance we have kept in accordance with the Covid-19 protocol may compel us to raise our voices. As we begin, the voice recorder is already turned on, as I have stated that it will utilised to capture the interview. I again promise you that your names or identities will not be mentioned throughout the interview; instead, I will refer to you by numbers. I would like to remind you again

that there will be no monetary compensation for your participation in this study. Do you still want to continue with the interview?

P: Yes.

R: Kindly explain to me how you take care of yourself as a person who is living with diabetes mellitus.

P: Ok. I was diagnosed with diabetes mellitus at Helen Joseph hospital in Gauteng Province. I was told to take care of myself in the following manner: not eat food with salt, to drink tea without this normal sugar, but to add this small pill (canderel) in my tea instead of a normal sugar. But I add a teaspoon of brown sugar in my tea. Now the nurses just told me that I should limit eating porridge, because I eat a large amount of it.

R: Hmm... I am listening, you can continue.

P: Sometimes my blood glucose level gets elevated. That is the challenge that I faced around 2018, and I was unable to see with my eyes, so I went to Baragwanath hospital where I had an operation of the right eye. Currently this left eye is not having good vision. I will probably have to go back to Baragwanath hospital to be operated again.

R: Ok.

P: Those are some of the challenges I come across. Sometimes my legs have a burning sensation, and I visited Zion Christian Church to consult the priest. The priest prepared a hot sand, and I put my feet on it to heal the burning sensation on my feet. At times my feet would feel better after putting them on hot sand. Though churches are closed, I go to the Zion Christian Church to meet the priest so that he can help me to heal this burning sensation.

R: Mm….

P: That is one of the challenges I face because of diabetes mellitus.

R: Alright, I appreciate that you have explained your challenge. Explain to me the dietary practices that you observe.

P: Professional nurses advised me not to eat big portions of porridge, I should only eat small amount at a time, but I am unable to do that, I eat large amount of food.

R: Ok, what is hindering you to take small amount of food as advised?

P: I cannot eat small portions, especially if I am too hungry, I eat more than the recommended portion, when I am hungry, I eat too much food to satisfy my hunger.

R: Okay.

P: I know I should eat small amount of porridge. Professional nurses said I should not eat big portions of porridge. I should eat small portion of porridge that is equivalent to my fist, but I am unable to do that. I eat more than the recommended portion, especially when I am hungry I eat lot. When I eat pap with (guxe) "vegetable" I eat until my stomach gets full.

R: How many times do you eat a day?

P: I eat three times, sometimes two times a day. Eating six times a day is a problem as I was advised by the professional nurses. I do not have enough money to buy fruits and other healthy food. I wish our government can provide us with healthy food parcels. It is not easy to afford a healthy diet.

R: How do you prepare your food?

P: My wife prepare food for me, such as porridge and vegetables or chicken some times. Sometimes when my wife cooks, she adds too much salt, when I tell her that she added too much salt said she says the salt is not too much.

R: How does she cook chicken for you?

P: She add salt, oil, onion and tomatoes in the chicken and boil.

R: Do you remove the skin of the chicken before you eat.

P: No. I eat the chicken without removing skin because I did not know that the skin of the chicken should be removed before eating.

R: Which beverage do you consume?

P: I drink tab, but now I cannot drink more than two cups of it. I only drink one cup of coke zero that is added with little water. I drink any type of juice (smiling), nurses said I can drink 100% juice.

R: Where you advised on what you should drink, or eat?

P: No, I was not advised during the time I was diagnosed with diabetes. The time I was diagnosed with diabetes mellitus I found a booklet that explained everything about diabetic diet, but the professional nurses who works here at the community health centre sometimes they give us advice regarding healthy diet.

R: Don't you get any health advice regarding diabetes mellitus here at the health centre?

P: Not always, it has been a while, today it is the first time in this year to find you talking to me about diabetes mellitus.

R: How do you care for your feet?

P: I bath my feet and put on the boots. I put them inside the hot sand to relieve burning sensation as instructed by the priest at Zion Christian Church (ZCC). I once burn my feet by the hot sand, I consulted a doctor in Giyani who prescribed an ointment to apply on my feet, and then my feet got cured.

R: Tell me about the advice that professional nurses gave you regarding feet care?

P: There is no advice that I was given regarding feet care.

R: What kind of exercises do you do at home?

P: I sometimes go for walks inside the yard. Because outside the yard I step on little stones and my feet start to pain, therefore I only walk around inside my yard. The doctor advised me to jog but I cannot jog.

R: Who assists you with medicine administration at home?

P: There is no one to remind me to take medication, even now I did not come on the expected date. I am late by almost a week, I was supposed to come back last week, but skipped a week, I was supposed to come back on the 7th, but I forgot. I sometimes forget to take medication.

R: Who else do you stay with at home except your wife?

P: I stay with my wife and grandchildren.

R: Explain to me how your wife assists you.

P: She helps me sometimes, but because she is not suffering from diabetes mellitus, at times when she cooks, she adds too much salt, when I tell her that she added too much said she says the salt is not too much. She sometimes follows some of the things that I tell her to do because she cannot even read. I also tell her that nurses said a diabetic patient is not supposed to be angered, so that she stops fighting with me.

R: Who educated your wife on how to assist you at home?

P: She was not educated.

R: Do you have a glucometer to check blood glucose levels at home?

P: I do not have a glucometer at home. One professional nurse once told me that I should buy it at clicks. I do not have enough money to buy it.

R: Alright

P**: Even if I buy it, I need someone who will show me how it works.**

R: Yes. Can you tell us about the challenges that you are faced with as a person living with diabetes mellitus?

P: They are many challenges. Sometimes at home we argue a lot, and when we had an argument, my feet start hurting, so I do not know if my blood sugar is elevated or not. The nurses told me that I should not be angry all the time. I want peace at home, I would like nurses to talk to my wife, maybe it will help us to stop exchanging hurtful words that stresses me.

R: Ok, I understand you. Tell me about the challenges regarding the support you get from the nurses at the health centre?

P: There is one that I came across today here at clinic. I got here in the morning. I went to get my file but when I got there, they told me they cannot find it, so I went into the cubicle for consultation, then the nurse started shouting at me and told me to go back get my file, even though I told her they cannot find my file.

R: Alright, then what happened after that?

P: Another nurse told me to get in the consultation room to receive the service, because they cannot find my file.

R: What do you think can be done to support you in diabetic self-care?

P: What can be done by professional nurses is to make sure that I have peace at home, so that we do not exchange hurtful words. To educate my wife about how to support me, and how to prepare food for me. The department of health should provide us with blood glucose monitoring machines because I cannot afford to buy. I also like to monitor my blood glucose at the comfort of my home, but I cannot. I must visit the community health centre to get my blood glucose monitored.

R: Did you say you would like your family members to be educated how to support of you?

P: Yes, because they do not know how to take care of me, including what I should eat and what I shouldn't.

R: Ok.

P: My wife needs to be taught how to take care of a person with this kind of a disease, how to cook for me, to remind me about my medication and follow up dates at the clinic, because I forget.

R: Can we please have her numbers so we can communicate with her?

P: Yes.

R: Thank you for your time, and the information you shared with us, it will help us to develop the model to support individuals living with diabetes mellitus.

P: Thank you too

Face to face interview transcripts for family members

Interview key

R: Researcher

P: Participant

R: Good morning

P: Morning

R: How are you?

P: Fine, thanks and how are you?

R: I am fine. I am Selina Motsharine, a PhD student at University of Venda. As I told you before I'm conducting a study on support of adult patients living with diabetes in self- care management at the community health centres of Mopani and Vhembe Districts of Limpopo Province.

P: Ok.

R: Let me remind you that we're meant to follow all the Covid-19 standards throughout the interview. You're not obligated to continue with the interview if you are no longer interested. I'll ask you to read through the consent form and sign it before we begin the interview. If there is anything you do not understand, please ask so that I may explain to you before you endorse your signature.

P: Ok

R: All right. Before we begin, I'd like us to speak louder so that we can hear each other, as the distance we have kept in accordance with the Covid-19 protocol may compel us to raise our voices. As we begin, the voice recorder is already turned on, as I previously stated that it will utilised to capture the interview. Let me assure you that your names or identities will not be mentioned throughout the interview; instead, I will refer to you by numbers, and there will be no monetary compensation for your participation in this study. Do you still want to continue with the interview?

P: Yes.

R: How old are you?

P: I am 42 years old.

R: Ok. Kindly share with me the support that you provide to your family member who is living with diabetes mellitus.

P: There are many changes that have occurred to him, he is no longer eating the way he used to. For example, for now he is supposed to eat two slices of bread at about 11h00, snacks every three hours.

R: How do you prepare and measure amount of food he eats.

P: I boil or roast most of the food we eat. I do not put too much salt in his food, I was advised to put little salt by nurses. I give him two slices of bread and soft porridge in the morning at 10h00. He does not drink tea. He drinks too much of water. Sometimes he feels weak and tired. I measure his blood glucose levels and blood pressure at home, to check if they are high or low.

R: Hmmm…

P: I make sure that I watch him very closely, so that I can be able to help him immediately he experiences some problems. During the night I always check on him if he is well. Sometimes he wakes up and eat during the night, therefore I wake up to prepare food for him. It is not easy, but I am trying my best to assist him.

R: Ok, you told me how you support him about diet. How do you support him regarding to medication?

P: In the morning, at 7h00 before he eats, I give him medication. He takes his treatment in the morning and evening at 19h00 before he eats.

R: Ok, how do you help him with the exercises?

P: Ok, we do have bicycle for exercises. He uses a bicycle to exercise for an hour at about 11h00 every morning.

R: How else do you support him?

P: No, the other thing is, a person who is diagnosed with diabetic mellitus need to be protected from other people. People like neighbours and other family members are not supposed to know about the diagnosis because he may feel bad when people knows that he is suffering from diabetes mellitus. When people around you know that you have diabetes mellitus, they perceive you somehow. My family may think that I am suffering because I have to take care of him. I try not to show anger towards him to avoid stressing him. I cannot even go out to look for a job because there will not a person to take care of

him. I once found a job, but I when I am at work, I would always get calls to summon me to come home to help him, because he mostly falls due to low blood sugar. I also accompany him to the health centre for follow-up visits, so that I should know what we should do or change as far as his care is concerned.

R: How do you support him about taking care of his eyes and feet?

P: There is nothing I do because he does not complain of feet or eyes problems.

R: Were you advised on how to take care of his eyes and feet even though he does not problems?

P: No. May you please advise me.

R: No problem, I will advise you after the interview. What other support do you think is necessary for people living with diabetes mellitus?

P: Hey…it is difficult. A person like my husband needs counselling because he is denying accepting that he is having diabetes mellitus. Imagine for 7 years he has been on denial. I think he need someone who can explain to him what diabetes mellitus is so that he can understand and accept to live with it. His blood glucose is always high, and I assume is because he is always stressed about having diabetes mellitus. Again, as a person who is taking care of a family member with diabetes mellitus, and I am not working, it become difficult to afford to buy a blood glucose machine more often because every year one should buy a new machine. These machines expire to work after a year. Another thing is blood glucose test strips get finished very quickly especially because my husband test blood glucose 3 times a day. The strips are too expensive, they cost about R250, and they are only 50 strips in a container, they get finished before the end of the month. I think the government should assist by providing us with machines and test trips. Another thing is I think there should be support groups for people who are diabetic, so that they can meet as groups and share their challenges, maybe it will assist them to cope better. Family members who take care of diabetic people at home need counselling or a psychologist to talk to them because we also get stressed when we see our loved one's suffering, and sometimes collapsing. We get confused and stranded not knowing what do. It is stressful. As I am talking now, I am not well, two days back I went to the clinic, my blood pressure was found to be 185/101, I know is because I am stressed. Sometimes I am awake up during midnight by my husband's jerking body, when I look at him, he will be shivering. I would wake up and just pump him with sugar and sweet until he become normal. Currently I am not working, I even quitted my job so that I can take care of him, because there is no one

to assist him. I also suggest that the government should provide food parcels for all the people living with chronic conditions, food such as vegetables and fruits will be of great help.

R: You indicated that family members who take care of patients living with diabetes mellitus need counselling or a psychologist to talk to them because they also get stressed. Who do you think should arrange the counsellor or a psychologist to counsel the family members?

P: The managers at the health centre can arrange that for us.

R: Where and when do you think the counselling should occur?

P: At any venue that we can be able to access is fine, or at the health centre because health centre is the centre for many of us. When coming to the time to do the counselling, I think it can be done at any time of the day, if the counsellor is available and ready to provide the service.

R: You also said support groups for diabetic patients should be established. I would like to know who you think should establish the group. Where and how it will operate?

P: Hey…. The nurses can help us to do that. Nurses should benchmark with nurses from other clinics and health centres to get information on how they have established their own groups, because as I say other clinics and health centre do have such groups. They should formulate our own here at the health centre. The nurses should again find out from the other nurses how the groups operate.

R: I understand what you explained. Thank you so much for the information you shared with me. I believe this information will assist in developing the model to support diabetic patients in the Vhembe and Mopani district. I may contact you again in relation to this study in case when a need arises.

P: Thank you too. You are welcome to contact me if need arise.

Annexure Q: Tshivenda translated model validation checklist

Table 7.1: Mutevhe wa u khwathisedza kushimisele kwa modele wa u tikedza vha lwadze vha swigiri kha dzi senthara dza mutakalo

1. Tshipikwa tsha modele na vhu konani ha tshipikwa			
Ndeme	*Ee*	*Hai*	*Muhumbulo munwe*
Zwi tenwa zwa modele zwi sumbedza muhumbulo wa u tikedza nga ndila ya vhudi?			
Modele u do thusa vha ongi kha u thogomela vhalwadze vha kho tshilaho na vhulwadze ha swigiri?			
Modele u do thusa vha mutani kha u thogomela vhalwadze vha kho tshilaho na vhulwadze ha swigiri?			
Modele uya themendelwa kha u do kona u shumisea wa bveledza ndivho ya u tikedza vha lwadze vha swigiri?			
2. Dzi nyimele			
Ndeme	*Ee*	*Hai*	*Muhumbulo munwe*
Modele wa u tikedza u a tandulula dzi khaedu na u tikedza vhalwadze vha kho tshilaho na vhulwadze ha swigiri?			
3. Zwitenwa zwa modele na ku shumisele kwa zwitenwa			
Ndeme	*Ee*	*Hai*	*Muhumbulo munwe*
Modele u a sumbedza uri zwi pida zwi raru zwawo zwi tumana hani?			
Modele u tikedza u sumbedza mafhungo a u di thogomela ha vhalwadze vha kho tshilaho na vhulwadze ha swigiri?			
4. Mushumo wa vha ongi			
Ndeme	*Ee*	*Hai*	*Muhumbulo munwe*
Modele wa u tikedza u sumbedza khaedu dza vhalwadze na thikhedzo ine ya tea u newa vha vhalwadze vha kho tshilaho na vhulwadze ha swigiri?			
Modele wa u tikedza u a talutshedza zwi kho iteaho na u bvumba mvelelo dza u u shumisa?			
Does the “support model” approach offer suggestions for what needs to be done or provide an action plan? Modele wa u tikedza wo nekedza pulane ya zwine zwa tea u itwa kha u tikedza vhalwadze vha kho tshilaho na vhulwadze ha swigiri?			
5. Research evidence			
Ndeme	*Ee*	*Hai*	*Muhumbulo munwe*

Ma wanwa a thoduluso a a tanziela nga vhudalo u khwathisedza u ri modele wa u tikedza vhalwadze vha swigiri u shumisiwe kha u tikedza vhalwadze vha swigiri?			

Adapted from Chinn and Jacobs (1987)

Annexure R : Independent coding certificate

Qualitative data analysis

DOCTORAL THESIS

OF

Selina Motsharine

THIS IS TO CERTIFY THAT:

Professor Azwihangwisi Helen Mavhandu-Mudzusi has independently

co-coded

the

transcripts from individual face-to-face interviews collected as part

of

a study titled

A model to support adult diabetes mellitus patients in self-care management at the community health centres of Limpopo Province, South Africa

I declare that the candidate and I have reached a consensus on the major themes reflected by the data. I further declare that adequate data saturation was achieved, as evidenced by repeating themes.

Signature: AHMudzusi 20 April 2021

Annexure S : Turnit in report