DURBAN UNIVERSITY OF TECHNOLOGY

THE KNOWLEDGE, ATTITUDE AND PERCEPTIONS OF PEOPLE WITH T2DM AS RELATED TO SELF-MANAGEMENT PRACTICES IN THE UGU DISTRICT OF KWAZULU-NATAL

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FEBRUARY 2021

THE KNOWLEDGE, ATTITUDE AND PERCEPTIONS OF PEOPLE WITH T2DM AS RELATED TO SELF-MANAGEMENT PRACTICES IN THE UGU DISTRICT OF KWAZULU-NATAL

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Dissertation submitted in fulfilment of the requirements for the Degree of Masters of Health Sciences: Nursing in the Faculty of Health Sciences at the Durban University of Technology

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Date : February 2021

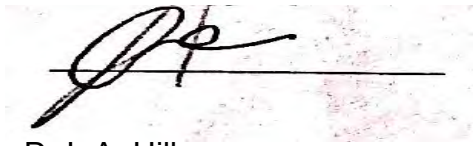
DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

Signature of student — Date: 06/09/2021

Approved for final submission

Dr A. Razak
PhD — Date: 06/09/2021



Dr L.A. Hillermann
PhD — Date: 06/09/2021

DEDICATION

I dedicate this dissertation to all diabetic individuals who are bravely embracing this lifelong disease. I wish to encourage and support them on this journey of maintaining good glucose levels, prevention of associated complications and their path to wellness and a productive life.

ACKNOWLEDGEMENTS

I would like to express my heartfelt gratitude and appreciation to the following people:

Firstly, to my supervisor Dr A. Razak, who provided me with knowledgeable guidance and support throughout this study. I kindly thank you and appreciate your time and confidence in me as a Masters student;

My co-supervisor, Dr L. Hillermann for her availability and support during the progress of this study;

Gillian Hendry the statistician, I thank you for all your professional assistance;

Carrin Martin the editor and Avenal Jane Finlayson the post graduate librarian, for their ongoing prompt and constant input and generous guidance relating to aspects of this study. I humbly thank you and salute you as vital partners in this study. Thank you again.

The Durban University of Technology: Mr George & Padmani Pillay for their love and kindness, Sheena, Sugrendran and Linda from the research office for their ongoing assistance and the awarding of a research grant.

The staff of Port Shepstone Campus and my special close friends Ellie Langtree, Thandi Malunga, NG Cele, Dr Shanaz Ghuman and Linda Subramoney who assisted, guided and motivated me throughout this study.

Lastly a special gratitude and with immense appreciation to my loving fiancée Bernhard Grdseloff who continuously supported and motivated me towards completion of this study. You are a wonderful person and I am so privileged knowing you.

ABSTRACT

Introduction and background

Type 2 Diabetes Mellitus (T2DM) has become a chronic non-communicable, metabolic disorder requiring the allocation of diverse resources to collectively manage the disease by both the patient and the partners of public health sectors. T2DM accounts for 90 - 95% of all non-communicable diseases and occurs mainly in older persons, being characterized by an uncontrolled and raised blood glucose levels, obesity and physical inactivity. This health crisis suggests the need for non-medical approaches, to understand the rising number of cases and why current public sector health interventions are not having the desired effect of reducing the cases of this health burden in South Africa (SA).

Aim

The study aimed to assess the knowledge, attitude and perceptions of people with T2DM as related to self-management practices in the Ugu District of KwaZulu-Natal (KZN) at four state hospitals and two community health centres.

Methodology

A descriptive, quantitative cross-sectional survey design was used, with the research settings including public hospitals and rural community healthcare centres within the Ugu District of Southern KwaZulu-Natal. The sample size consisted of 267 respondents. Data was analysed by the Statistical Package for Social Science (SPSS, Version 27) and was organised in graphs, frequency distribution tables and percentages.

Results

The results showed that 52.8% (n=141) had T2DM for more than 10 years, with 77.5% (n=207) having previously been hospitalized due to T2DM associated medical conditions. Over two thirds suffered from all the indicated medical conditions, with over three quarters being affected by high blood pressure (87.9%, $p<.0005$) and heart disease (75.3%, $p<.0005$).

The results of the knowledge, attitude and perceptions scores were of great concern, with a very small proportion (1.1%) scoring high (57.1%) about their knowledge related to T2DM. The ANOVA test showed that none of the demographic variables significantly affected the respondents' knowledge, attitudes and perceptions. There was significant disagreement among the respondents that they check the content of

the food that they buy and eat, with a mean 2.49, t-test of -13.364, p< 0005 and that they check their blood glucose levels at night and have a snack if necessary (mean of 2.48, t-test of -13.875, p<.0005).

Conclusion

T2DM individuals in the Ugu District of KwaZulu-Natal have very poor knowledge and lack insight into the disease condition, associated complications and appropriate self-management practices. The more knowledge, good attitude and perceptions that T2DM patients have, the more likely they are to participate in effective self-management procedures and take responsibility for their health and wellness.

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LIST OF ACRONYMS

CSM: Common sense Model

DoH: Department of Health KZN SA

DUT: Durban University of Technology

HIV: Human Immune Deficiency Virus

IREC: Institutional Research Ethics Committee

KZN: KwaZulu-Natal

SA: South Africa

SSA: sub-Saharan Africa

T2DM: Type 2 Diabetes Mellitus

TB: Tuberculosis

USA: United States of America

WHO: World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter outlines the contextual setting of the study, from international to local factors, and the explicit challenges that compels such an investigation. It features the study aim, objectives and research questions, as well as the study's significance, associated definitions, and the structure of the following chapters.

1.2 Background to the study

T2DM is a chronic condition, long-lasting in its effects and requires continuous self-management and seeking medical attention to prevent any associated complications (Vasuthevan and Mthembu 2016:96-99). This condition is also a non-communicable disease, where T2DM cannot be transmitted from one person to another, but is rather a non-infectious medical condition or disease threat (Vasuthevan and Mthembu 2016: 96-99). Nearly nine out of ten new diabetes cases in older age groups are T2DM, presenting with raised blood sugar levels, obesity and physical inactivity (Graffigna *et al.* 2016: 1). T2DM accounts for 90% to 95% of all non-communicable diseases, and occurs mainly in older persons, while Type 1 diabetes mellitus manifests in children, who usually outgrow the condition (Wan *et al.* 2017: 166).

T2DM is a metabolic disease involving the hormone insulin that causes high blood sugar levels over a prolonged period of time. The hormone insulin that the pancreas releases, stores and utilises glucose and fats from the meals that one eats (Wan *et al.* 2017: 166). Diabetes mellitus is diagnosed when the pancreas releases less or no insulin or when one's physiology presents with insulin resistance. If left untreated diabetes mellitus can cause many serious acute and long-term complications. As yet, there is no cure for diabetes mellitus. People with diabetes mellitus need to self-manage their disease condition to stay healthy and live productive lives (Wan *et al.* 2017: 166).

Prevention of disease is the initial step, with health information being the next, as people must be empowered, and have good attitude and perceptions around T2DM (Vasuthevan and Mthembu 2016: 96-99). Furthermore, these factors are

the best approach to prevent or successfully manage diseases, which are often linked to individuals' lifestyle (Vasuthevan and Mthembu 2016: 96-99). Thereafter, early diagnosis and appropriate treatments are essential for disease management, and treatment adherence, if successful outcomes are to be reached. The success of managing T2DM patients lies with the affected persons and their active engagement in their care continuum (Vasuthevan and Mthembu 2016: 96-99).

T2DM has become a widespread problem across South Africa (SA), in both urban and rural communities, where health facilities often have specific clinics to cater for this growing population (Wan *et al.* 2017: 166). Many people suffer from associated conditions, such as hypertension, cardiac disease, increased cholesterol levels, kidney failure, retinopathy, wounds and skin infections, and if not effectively managed, can result in amputations and premature death (Wan *et al.* 2017: 166). This condition is also of great concern in the Ugu District of KwaZulu-Natal (KZN), SA, where understanding the factors that affect T2DM ongoing presence will provide awareness into the function of the multidisciplinary health team, the affected individuals and their families. Furthermore, it will also indicate how to better manage the condition T2DM and prevent avoidable morbidity and premature mortality (Vasuthevan and Mthembu 2016: 96-99).

Regular clinic attendance and compliance with a treatment regime is of paramount importance, to ensure that the affected individuals with T2DM maintain good blood glucose levels (Vasuthevan and Mthembu 2016: 96-99). The appropriate care for people with T2DM needs to be available at all health services to ensure correct diagnosis, relieve symptoms, prevent acute and chronic complications, screen for retinopathy, kidney-related disease and manage cholesterol levels (Vasuthevan and Mthembu 2016: 96-99). Good blood glucose control also requires the availability of oral diabetic medication, insulin, syringes and drugs for the patients. Through effective disease management, patients can embrace and foresee a quality productive life and collectively a reduced economic burden on the individual, their family and community (Vasuthevan and Mthembu 2016: 96-99).

T2DM currently presents as a large and growing health threat, with high costs for the family and society at large (Graffigna *et al.* 2016: 1). In 2016 about 387 million

adults were diagnosed with diabetes globally (Graffigna *et al.* 2016: 1), an estimated 451 million (one in 11) in 2017, half of them undiagnosed (Van Den Berg, Mokhehle and Raubenheimer 2019:1), this number being expected to rise to 592 million by 2035. Therefore, active prevention approaches remain critical to address the diabetes condition as well as the associated complications of the disease.

The increasing number of T2DM cases presents a substantial challenge on the health care system, primarily due to life-long multi-organ problems, which can lead to increased ill health and early deaths in low-, middle- and high-income states (Arambepola *et al.* 2016: 2). In 2016, the United States of America (USA) reported having over 29 million people with T2DM (Wan *et al.* 2017: 166). This disease requires compliance from the affected individual to medical regimes and preventative practice through diet and exercise (Wan *et al.* 2017: 166). T2DM is connected with greater risks of blindness, kidney failure, heart disease, stroke and amputations, making a comprehensive framework for promoting diabetes awareness and its management mandatory in the health care sector (Wan *et al.* 2017: 166). Therefore, this situation requires intervention processes at numerous levels to provide optimal healthcare to affected persons (Kugbey, Asante and Adulal 2017:1).

The occurrence of lifelong non-communicable diseases is escalating in the sub-Saharan Africa (SSA), with its related health, financial and social challenges (Sinclair 2019:6). In the last 25 years the incidence of diabetes mellitus in those aged 20–79 years in SSA, has been rising, with changing percentages of 2.0% in Gambia, 6.3% in Congo, 9.3% in SA, and as elevated as 14.8% in Mauritius (Sinclair 2019:6). The frequency of diabetes mellitus is quickly growing in SA, with an associated increase in complications and surgical amputations (Pheiffer *et al.* 2018:1). In 2009, approximately 2 million (nine percent) of those aged 30 years and older, accounted for approximately two million cases of diabetes mellitus. Prompt and effective action is therefore vital to stop the diabetes mellitus endemic in SA (Pheiffer *et al.* 2018:1).

The acute and chronic conditions can be averted through timeous recognition and effective management (Sahadew and Singaram 2016: 389). Medical and nursing interventions urgently require evidence-based practices and diabetes clinical guidelines which could be in the form of health promotion programmes. The prevention of complications of T2DM is essential, as these complications are debilitating and expensive to treat (Vasuthevan and Mthembu 2016: 96-99). Quality data and relevant information required on the epidemiology, burden of disease and complications due to diabetes mellitus, is essential for planning health services for diabetes diverse management (Sahadew and Singaram 2016).

Against this backdrop, T2DM remains a great concern for health facilities across KZN, SA and globally which needs to manage the condition and associated complications, knowing that the problem is likely to get worse despite providing all the necessary medical care and follow up. This suggests the need for non-medical approaches to understand why the numbers of cases are increasing, and why the current health facility interventions are not having the desired effect of reducing this health burden and related complications. This is the case across KZN, including the Ugu District in the southern part of KZN, where many diabetic clinics provide services to a growing number of diabetic mellitus patients. Therefore, this makes it important to have a comprehensive picture of the factors that affect the presence of T2DM, including from the perspective of affected patients through the structured questionnaire of the sample size of 267.

1.3 Problem Statement

As a Professional Nurse working in the public health sector of Ugu District in rural southern KZN, the researcher noted an increase in co-morbidities, amputations, foot ulcerations, disabilities and increased mortality rate amongst T2DM patients at the referral hospital at which the researcher worked. In addition, frequent hospitalization was proving very challenging regarding the availability of beds for referred patients.

T2DM has become the fastest growing chronic non-communicable disease in Ugu District, requiring the allocation of diverse resources to manage the disease by both the patient and the public health sector.

The referral hospital records reflect that from 1 November 2016 to December 2016, 200 new patients were diagnosed with T2DM and 172 amputations related diabetes mellitus cases were reported. Due to the current ill effects, the increasing prevalence and incidence of the disease, the need for assessing affected individuals with T2DM self-management practices, has become essential for the public health sector. The problem in the population of Ugu District is that there seems to be little understanding and awareness of the prevalence, causes, pathophysiology, relevant self-management practices, socio-economic barriers, complications, mortality rates and disabilities relating to T2DM.

1.4 Aim and Objectives

The aim of the study was to assess the knowledge, attitude and perceptions of people with T2DM with respect to self-management practices, in the Ugu District of KZN at the four hospitals and the two community health centres.

The specific objectives were:

1. To assess the knowledge, attitude and perceptions of people with T2DM with respect to self-management practices.
2. To establish the self-management practices of people with T2DM.

1.5 Research Questions

The study had the following research questions:

1. What is the knowledge, attitudes and perceptions of people with Type 2 diabetes mellitus with respect to self-management practices?
2. What are people's self-management practices, related to T2DM?

1.6 Significance of the study

Understanding the factors that affect the ongoing presence of T2DM in the Ugu District, will identify the roles required by the multidisciplinary health team members, the affected individuals and family, regarding how to better manage the condition and prevent avoidable morbidity and premature mortality. It will also contribute to improving the existing support systems, and the implementation of practices that help affected individuals make better use of these systems.

By assessing the knowledge, attitude and perception levels of T2DM individuals regarding their disease management, the study will identify areas of information deficit. This will be the basis for implementing educational policies aimed at improving awareness of the disease in the Ugu District. By analysing data about the ability of T2DM individuals to self-manage their disease, areas where more support is required by the affected individuals will be identified. These findings can be used for planning and implementing more targeted services by the public health authorities in the Ugu District of KZN.

1.7 Research assumptions

The research assumptions obtained from previous studies include:

- Managing T2DM is the key to preventing long-term complications, such as retinopathy, nephropathy, peripheral neuropathy, constricted blood vessels, and cardiovascular system problems. Family members remain essential sources of various forms of support, including emotional support (Pamungkas, Chamroonsawasdi and Vatanasomboon 2017:2).
- The health care outcomes and influence of health education of T2DM is indirectly navigated by knowledge, attitude and practices (Pamungkas, Chamroonsawasdi and Vatanasomboon, 2017:2).
- The evidence-based practice suggests that good glucose control, blood pressure and cholesterol levels prevent complications and early deaths amongst those already diagnosed with diabetes (Arambepola *et al.* 2016: 2).
- Chronic conditions, such as T2DM, requires ongoing care and higher levels of co-operation and service integration beyond hospital boundaries (Graffigna *et al.* 2016: 1)
- Empirical research has shown that patient participation may contribute to reduced healthcare costs and improved organisational economic processes (Graffigna *et al.* 2016: 2).

1.8 Operational Definitions

The following definitions apply:

Attitude: refers to the psychological manner involving the feelings and emotions associated with patient responses to T2DM and their self-management practices.

Knowledge: refers to understanding T2DM and all the essential self-management practices necessary for keeping diabetes under control.

Perceptions: refers to the way in which T2DM patients interpret and view their illness**.**

Self-management practices: refers to the capability of T2DM affected individuals to adhere to their prescribed care and practices. This includes adhering to their medications, healthy eating, monitoring their blood glucose, undertaking physical activities, reducing risks and problem solving.

T2DM: The American Diabetes Associations 2018 states that "diabetes is a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both" (Walker, 2018:25). Diabetes comprises of affected people with insulin resistance and insulin deficiency. Furthermore 85 percentage of the individuals diagnosed with T2DM are overweight (Walker 2018:25).

1.9 Study outline

This study is presented in the following four chapters:

Chapter 2: **Literature Review**: This chapter presents relevant literature that relates to the study, which is T2DM globally, in Africa and SA, as well as the knowledge, attitudes and perceptions of people with this condition. Furthermore, this chapter reviews the complications associated with the condition, outlines appropriate self-management practices and details the Common-Sense Model of Illness and Self-Regulation, which informs the components that were investigated in the study.

Chapter 3: Methodology: This chapter outlines the research methodology used to guide the study and address the objectives. It includes a description of the research design, research setting, target population, sampling technique, sample size, data collection instrument, pilot study, data collection process and data analysis using descriptive inferential statistics to obtain the results. This chapter also concludes with a discussion of validity and reliability as well as the ethical issues taken into consideration to conduct the study.

Chapter 4: Presentation of results: This chapter presents the findings of the analysed data as obtained from the structured questionnaire in the Ugu District of KZN at the four hospitals and the two community health centres. The demographic results are followed by the results of those questions related to Objective 1 and Objective 2 of the 267 questionnaires that were distributed with a 100% response rate.

Chapter 5: **Discussion, conclusions and recommendations**: This chapter presents the discussions, conclusions, recommendations and limitations of the study.

1.10 Conclusion

In this chapter, the researcher introduced the study and provided the background to the research study. The aim and objectives were highlighted as well as the significance of the study. The problem statement was elaborated, operational concepts were defined and the study was outlined.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents related studies on the topic under discussion. It is divided into a number of sections: T2DM globally, T2DM in Africa and in South Africa (SA). The knowledge of people with T2DM is discussed, their attitude and perceptions, as well as the complications of the condition. This is followed by the self-management practices of people with T2DM, the theoretical framework of the study, known as the "Common Sense Model (CSM) of illness representation and self-regulation, and finally the conclusion. To explore the literature review in Chapter 2, it is essential to reflect on the objectives of this study, which are: to assess the knowledge, attitude and perceptions of people with T2DM as linked to self-management practices, and to establish what is understood as "the self-management practices of people" with this condition.

Lambrinou, Hansen and Beulens state that chronic illnesses, such as T2DM, need long term and extensive care collectively by the health team and the affected individual. The public health policies should be directed towards embracing the increased incidence of T2DM, now a complex chronic condition. These health policies require a holistic approach to ensure minimum complications and good quality life of the affected individuals (Lambrinou, Hansen and Beulens 2019:60). According to Alsairafi Type 1 diabetes mellitus accounts for 5-10% of all diabetes cases, and presents in children and young adults, whereas T2DM accounts for around 90% of all diabetes cases and affects grownups, presenting with obesity, hyperlipidaemia and hypertension (Alsairafi 2016: 24-25).

In order to address the increased incidence of T2DM, the empowerment of individuals and support families through knowledge and self-management education is essential (Lambrinou, Hansen and Beulens 2019:60).Therapeutic programmes like nutrition, foot care and monitoring of blood glucose levels throughout the disease course is advised for the affected individuals and families, hereby preventing costly associated complications (Lambrinou, Hansen and Beulens 2019:60).The key to combating this rising epidemic might lie in the active part of individuals and families in the self-management of the disease (Lambrinou, Hansen and Beulens 2019:60).

2.2 T2DM globally

Kpekura quotes, that the WHO (World Health Organization) states that in 2007, 190 million people suffered from diabetes world-wide and about 330 million are estimated to have diabetes by the year 2025 (Kpekura 2018: 3788-9). According to Standl *et al.* (2019:7), diabetes is on the increase worldwide, with an international incidence of 8.8% in 2017, with an anticipated further increase of 9.9% by 2045. Standl *et al.* projected that the amount of adults with diabetes in the world has increased from 108 million in 1980 to 422 million in 2014 (Standl *et al.* 2019: 8). Worldwide diabetes occurrence is approximately 5% for 35–39-year-olds, 10% for 45–49, 15% for 55–59 and close to 20% 65–69 years of age (Standl *et al.* 2019:7). Sinclair adds that on a worldwide measure, diabetes affects mainly middle-aged people amongst 40 and 59 years, 50% of cases are undiagnosed, which has severe financial and social implications as it particularly involves low and middle-income countries (Sinclair 2019: 6).

The incidence of chronic, non-communicable diseases like T2DM is fast becoming a global threat with 70-75% of patients with cardiac disease and uncontrolled blood glucose levels (Hentschel *et al.* 2017: 1). Bommer *et al.* (2018) reported that diabetes is a major international health risk that has speedily increased over the past 40 years, and the 15th most important cause of death, while according to Erzse *et al.* (2019:1), it is expected that by the year 2030, emerging countries will experience as much as 69% rise in the number of adults identified with diabetes. Even though WHO's objective is to reduce the occurrence of diabetes by one-third by 2030, the current prevalence of the disease is most challenging (Bommer *et al* 2018: 963). The current approximations by Bommer *et al.* suggests that worldwide, the number of people with diabetes between the ages of 20 and 79 years will rise from 415 million in 2015 (1 in 11 adults) to 642 million in 2040 (1 in 10 adults) (Bommer *et al.* 2018).

According to (Standl *et al.* 2019: 8), since 1980, the worldwide age-standardised diabetes occurrence increased from 4.3% in 1980 to 9.0% in 2014 in males, and from 5.0% to 7.9% in females. Apart from the growth and aging of the world population in general, the prevalence of obesity contributes to the rise in diabetes incidence. Furthermore, longevity due to the advancement and availability of cardiovascular risk management therapy of affected persons, contributes to the expanding diabetes

population (Standl *et al.* 2019: 8). Diabetes is one of the top 10 international causes of mortality (Adu *et al.* 2019: 2). Adu *et al.* considers it responsible for 1.6 million deaths in 2015, indicating a 60% increase in 15 years, from less than 1 million in 2000 and internationally have found that medication regime was found to be difficult to comply with, in both Type 1 and 2 diabetes mellitus patients (Adu *et al.* 2019: 2). Thus, T2DM has become one of the leading causes of mortality in industrialised countries, such as the USA, and developing countries, such as SA (Alsairafi 2016: 24-25).

Alsairafi (2016: 24-25) and Adu *et al.* (2019: 2) reported that the majority individuals with T2DM are at risk of serious health associated complications that endanger life and impose great economic burden on affected individuals and the health care system (Adu *et al.* 2019: 2). The growing prevalence of diabetes and the cost of more expensive antidiabetic treatments presents a high and growing burden for health insurance in France (Baudot *et al.* 2019: 657) and according to a study by (Hentschel *et al.* 2017: 1), the number of diabetics in India is estimated to be 69 million.

2.2.1 Risk factors of T2DM globally

Sahadew and Singaram consider metabolic syndrome, which is related to obesity, absence of physical activity and insulin resistance, a risk factor for developing T2DM with affected persons being five times more at risk of developing diabetes (Sahadew and Singaram 2016: 389). Metabolic syndrome is a group of cardiovascular risks, including diabetes, hyperglycaemia, hypertension, abdominal obesity and hyperlipidaemia. To stem the increasing menace of diabetes, Michael *et al.* (2018: 626), stresses the importance of effectively managing the existing cases of T2DM and preventing new ones by controlling the adaptable modifiable risk factors, such as physical inactivity and unhealthy diet, chronic stress and obesity (Michael, Gbadebo and Akinlade 2018: 62).

Michael *et al.* (2018:626), suggests that lifestyle modifications, such as aerobic workout, weight control and smoking cessation, are efficacious therapeutic approaches to preventing diabetic cardiomyopathy (Michael *et al.* 2018:626). According to Al-Sahouri *et al.* (2019:675) WHO statistics shows that in 2016, 21% of male Jordanians and 35.6% of females were considered obese with overweight and obesity defined as

abnormal or excessive fat accumulation that presents a health risk (Al-Sahouri, Merrel and Snelgrove 2019: 675-676). These authors therefore recommend a need for more public health campaigns to reduce the burden of obesity as a risk factor for developing T2DM (Al-Sahouri, Merrel and Snelgrove 2019: 675-676). Furthermore Al-Sahouri *et al*. (2019:675) states that lack of knowledge about healthy behaviours like nutritious diet and the extensive role of social activities with eating out, may present as risk factors for T2DM (Al-Sahouri, Merrel and Snelgrove 2019: 675-676).

2.3 T2DM in Africa

In the Middle East and North African regions, diabetes has become one of the most fast growing non-communicable diseases and affects roughly 35 million of adult population in the region, this number being projected to double to 68 million by 2030 (Alsairafi 2016: 24-25). Al-Sahouri, Merrel and Snelgrove (2019: 675-676), noted that T2DM is a significant health problem in the Middle East region, and it will become worse. In Africa, as in other parts of the world, T2DM characterizes over 90% of all non-communicable diseases, which will more than double by the year 2040 and cost an estimated 5.5 billion US dollars in health expenditure (Sinclair 2019: 6). Sinclair estimates the proportion of undiagnosed diabetes in African to be 69.2%, while 77% of deaths due to diabetes occurred in individuals younger than 60 years of age, emphasising the increase of the diabetes epidemic (Sinclair 2019: 6). Furthermore, because diabetes in Africa affects largely working-aged people between 40 and 60 years of age, it places an additional burden on economies due to increased work absenteeism and decreased output (Erzse *et al*. 2019:1).

According to Sahadew and Singaram (2019:90), Africa is anticipated to see the highest surge in the occurrence of diabetes, a projected 56% by the year 2045. While this increase has been related with urbanisation, many other predisposing risk issues exist within the African setting (Sahadew and Singaram 2019:90). These consist of the compounded effects of poverty, unexpected and unmanaged population growth, and the challenging problems of the Human Immune Deficiency Virus (HIV) and Tuberculosis (TB), resulting in numerous interactions between communicable and non-communicable diseases. The HIV-positive patient is twice as likely to develop diabetes, which in turn triples the risk of developing TB (Sahadew and Singaram 2019:90).

With 62% of Africa's diabetic population being undiagnosed, many people are not aware that they are at risk and often develop associated complications, such as cardiovascular disease, skin infections and kidney disease (Sahadew and Singaram 2019:90). The undiagnosed patients, being unaware of their condition, are unlikely to present timeously, which results in them having acute or long-term complications that require insulin therapy and assistance from health care providers to manage the threat (Bahendeka *et al*. 2019: 342).

The affected individuals may not be aware of the treatment options that are needed to improve their long-term outcomes, only presenting when the symptoms are well advanced with associated complications, such as limb amputations (Sahadew and Singaram 2016: 389). The burden of T2DM in sub-Saharan Africa (SSA) is therefore considerable, with national and international public health prevention and treatment measures being important (Sinclair 2019:6). Early diabetes screening, affordable medications, the availability of clinics that can diagnose and identify risk factors, are required for a minimal level of care, specifically in resource constrained settings in Africa (Sinclair 2019:6). Education systems in place are required to support the patients and the health care providers towards empowerment of T2DM. Focusing on prevention is central to reducing the healthcare costs that are incurred due to diabetes mellitus in SSA (Sinclair 2019:6).

2.3.1 Risk factors of T2DM in Africa

The burden of diabetes and other non-communicable diseases are projected to increase in Africa due to a myriad of factors, such as unwholesome nutritional lifestyles, ageing process and rapid urbanization (Kpekura 2018: 3788-9). The increase in the T2DM prevalence in SSA can be attributed to rapidly growing urban population and their associated socio-economic and demographic changes (Van Den Berg, Mokhehle and Raubenheimer 2019:98). The change in nutrition has been associated with an increase in obesity and various non-communicable diseases, including diabetes (Van Den Berg, Mokhehle and Raubenheimer 2019:98).

Africa has suffered the most from the combined consequences of diabetes, HIV and TB (Kpekura 2018: 3788-9). These co-infections and their treatment presents many challenges, such as drug compliance and drug interactions (Sahadew and Singaram 2016: 389). Diabetes patients are reported to be of greater general risk for infection, and are two to three times more likely to develop TB (Sahadew and Singaram 2016: 389). Glucose intolerance may affect people taking anti-retroviral drugs, with HIV- positive patients being more likely to develop diabetes. Adverse medication interactions complicate the efforts to manage both conditions in the affected patient (Sahadew and Singaram 2016: 389).

2.4 T2DM in SA

Sahadew and Singaram (2016: 389) noted that SA has over 2.5 million diagnosed diabetics, and an additional one million undiagnosed. An estimated additional 2.6 million have less than optimal glucose tolerance levels, an early metabolic abnormality that generally results in the development of diabetes (Sahadew and Singaram 2016: 389). As a public health and clinical problem, T2DM is associated with high morbidity and mortality rates in SA, and presents in patients who are still economically active (le Roux *et al.* 2019: 83). By 2019, there were at least 2.6 million people being regarded as having T2DM in SA, being regarded as a severe undercount, with screening surveys confirming many undiagnosed cases (le Roux *et al.* 2019: 83). The prevalence increased between 1980 and 2010, with women increasing from 7.7% to 11.8% and men from 4.8% to 9% (Erzse *et al.* 2019: 1).

A national burden of disease study in SA in 2000 (Erzse *et al.* 2019:1) noted that diabetes was associated with various other conditions, such as ischaemic heart disease (14%), stroke (10%), hypertensive disease (12%) and kidney disease 12%). SA is battling a quadruple burden of disease, namely maternal and child mortality, infectious and non-communicable diseases, injury-related disorders, and having considerable resource limitations to address the associated growing economic and health costs of diabetes (Erzse *et al.* 2019:1).

Non-communicable diseases like T2DM are often asymptomatic, and remain undiagnosed and untreated leading to associated complications (Erzse *et al.* 2019: 1). Erzse *et al.* estimated that up to 80.6% of people with T2DM (diagnosed and

undiagnosed cases) in SA have unmet care needs, with the 19.4% treatment coverage rate not being close to that recommended by the WHO of 80%. Addressing the non-communicable disease burden is a priority, as indicated by several South African Sustainable Development Goals (Erzse *et al.* 2019: 1).

Sahadew and Singaram report that clinical visits of diabetic patients in KwaZulu-Natal (KZN) increased by 30% in 2006 to 2016 and the number of patients not returning for scheduled treatment has reduced since recording began in 2012 (Sahadew and Singaram 2019:83). The incidence of diabetes in KZN has changed over time, with a strong correlation being found between patient screening and incidence, highlighting the need for early identification through screening, resulting in a new primary healthcare protocol and system. The KZN health data, highlights the importance of reviewing healthcare policies and providing more effective health care to patients (Sahadew and Singaram 2019:83). Sahadew and Singaram (2019:90) indicated an improvement in patients screening for diabetes in KZN, and a few patients defaulting on their treatment. This may be a result of the KZN Department of Health (KZN DoH) collecting diabetes screening data for research purposes (Sahadew and Singaram 2019:90).

According to Erzse *et al.* (2019:1), the associated complications from T2DM were the leading natural cause of death in women in SA in 2015, and the second largest cause of death for the entire population (Erzse *et al.* 2019: 1). As the emergence of T2DM has occurred alongside the country's HIV and TB co-epidemic, T2DM has exacerbated "the strain on an already fragile public healthcare system that services over 80% of the population (Erzse *et al.* 2019: 1). The authors recognize that there is limited capacity to effectively deliver healthcare to those with non-communicable diseases while simultaneously providing treatment to populations with HIV, TB and other communicable diseases (Erzse *et al.* 2019: 1).

2.4.1 Risk factors of T2DM in SA

Several risk factors, such as an ageing population, urbanisation, and the associated economic and nutrition transition as well as obesity contribute to the increased prevalence of diabetes (Pheiffer *et al.* 2018: 1-2). In 2000, an estimated 87% of SA's diabetes cases were attributed to excess body weight, the implications being of

concern, with 38% of men and 69% of women being regarded as overweight or obese in 2013. Pheiffer *et al.,* considers T2DM a major burden on the health care system, due to the health threats association with a number of microvascular and macrovascular complications, such as heart and kidney disease and blindness (Pheiffer *et al.* 2018: 1-2). In 2009, it was estimated that diabetes caused 8000 new cases of blindness and resulted in 2000 limb amputations (Pheiffer *et al.* 2018: 1-2). Low-income countries, such as SA, are not only affected by the challenge of resource constraints, but by an ageing population and urbanisation and the double burden of communicable diseases, specifically HIV and TB (Sahadew and Singaram 2016: 389).

2.5 Knowledge, attitudes and perceptions

The knowledge, attitude and perceptions of patients in relation to self-management practices of T2DM is essential to assess for behaviour change and promote compliance of treatment for T2DM (Vasuthevan and Mthembu 2016: 96-99). Knowledge alone does not change behaviour; it should be complimented by positive attitudes and perceptions towards the condition and the treatment plan (Vasuthevan and Mthembu 2016: 96-99). Patients should collectively embrace adequate knowledge, positive attitudes and perceptions to manage their disease in order to live healthy and productive lives. The key to successfully manage T2DM and the associated complications lies with the affected person and their dynamic participation in their care (Vasuthevan and Mthembu 2016: 96-99).

2.5.1 Knowledge of people with T2DM

Appropriate knowledge is essential to ensure effect preventive health behaviour, being a motivating factor for patients to ensure that they manage their illnesses correctly (Alsairafi 2016:53). Knowledge and self-management practices form the cornerstone of diabetes care amongst patients, with good levels of correct knowledge leading to good self-management practices and prevention of any associated complications (Alsairafi 2016:54).

Low levels of knowledge about T2DM, unhealthy attitudes and inappropriate practices contribute to the challenges associated with managing the condition. Knowledge about T2DM management has been reported globally to be inadequate, despite being an essential aspect of prevention and control (le Roux *et al.* 2019: 83). Fatema *et al.* (2017)

contend that it is essential to improve all stakeholders' understanding, compliance and management of the condition by providing appropriate health services and public health information (Fatema *et al.* 2017).

Diabetes teaching has been described in both Type 1 and T2DM patients attending diabetes education programmes in Sydney, Australia, and has shown that appropriate diabetes education is effective in controlling the condition (Muchiri, Gericke and Rheeder, 2016:30). Comprehending the fundamental principles of diabetes education and self-management practices could impact positively or negatively on the patients' self-care activities. According to Muchiri, Gericke and Rheeder (2016:30), the study showed that despite a reduced performance in knowledge section of the questionnaire, the information gained motivated the patients to engage on basic physiology and insulin management of T2DM. Poor (low) knowledge scores in patients may reflect inadequate empowerment by health workers who either do not have the necessary information or are not passing it on (Muchiri, Gericke and Rheeder 2016:30).

The study in Bangladesh by Fatema *et al*, (2017:9) found that education and counselling on all aspects of diabetes was required and that planning for group as well as individual education programs, delivers preventive and management methods for T2DM. The authors felt that there is room for clinical practice to be enhanced by providing satisfactory information, and increasing the accessibility of educational materials and appropriate direction towards diabetes self-management practices of individuals (Fatema *et al.* 2017).

Alsairafi (2016:53) reported that numerous studies have researched the information of patients with diabetes in the Middle East, with reduced levels having been recorded in most areas. One study reported reduced knowledge among patients about the effects of diabetes on the eye and kidney and about the signs of hypoglycaemia and its management (Alsairafi 2016:53). Furthermore Alsairafi (2016:53) reported that other studies in Oman revealed that a substantial amount of people had no information regarding preventive measures needed to manage with diabetes, a considerable number did not mention any signs of irregular glucose levels or did not know how to notice hypoglycaemia. In addition, 90% of patients had reduced information about

diabetes; 83.7% had poor knowledge about T2DM complications and 96.3% had poor awareness of how to control the disease. Since patients with T2DM are accountable for their self-control practices, it is vital that they understand the disease and how to manage it (Alsairafi 2016:53).

(Al-Sahouri, Merrel and Snelgrove 2019: 675-676) aimed to classify the degree of T2DM and the impact of knowledge, perceptions and socio-cultural factors on adherence to the diabetes management plan in Jordan. The conclusions were intended to inform policy and practice, and the development of an educational package for patients with T2DM (Al-Sahouri, Merrel and Snelgrove 2019: 675-676). The authors found that" people with diabetes displayed more adherence to medications than other self-management practices" (Al-Sahouri, Merrel and Snelgrove 2019: 675-676). According to them deficiency of information about healthy practices, high energy dense diet, the role of social activities that are linked with consuming a high-calorie dense food, sedentary lifestyle and physical inactivity are reported to be contributing factors to unstable blood glucose levels and associated T2DM complications (Al-Sahouri, Merrel and Snelgrove 2019: 675-676).

The cross-sectional study in Jordan with 223 patients found that poorly controlled T2DM was high amongst insulin users, which might be ascribed to inadequate knowledge, capabilities or skills relating to T2DM management (Al-Sahouri, Merrel and Snelgrove, 2019:684). The researchers found that low literacy rates, family income and self-care were the aspects that contributed to poor knowledge levels among the T2DM patients. These patients sought their information from family members or friends rather than health care professionals, which may have added to their poor knowledge levels (Al-Sahouri, Merrel and Snelgrove 2019:684). However, family members with diabetes may be regarded as a good source of information. It also appeared that good support and a positive relationship with health care professionals have a positive impact on the levels of information (Al-Sahouri, Merrel and Snelgrove 2019:684).

Bett (2019:3) conducted a survey in Kenya to determine if a planned diabetes education intervention for patients in an urban-rural hospital would increase their diabetic knowledge and self-efficacy, and henceforth stabilise their blood glucose levels. The

outcome was that organized diabetes education is a significant step for reducing blood glucose levels and controlling diabetic complications (Bett 2019:3). Diabetes education, according to the author, increases the patients' self-efficacy, which is essential in adjusting lifestyles, such as diet intake and exercise regime. The study emphasized the significance of structured diabetes education not only for the patients but for the management practitioners, caregivers and community at large (Bett 2019:3).

Lambrinou, Hansen and Beulens stated that reaching and support for self-management practices are essential when caring for people with a chronic disease, such as T2DM" (Lambrinou, Hansen and Beulens 2019:57). They emphasize that self-management education should be customised and meet individual's needs, taking into account their illness experience and individual characteristics, such as medical history, age, health beliefs and attitudes, diabetes knowledge, health literacy, physical limitations, family support, financial status and socio-cultural factors. (Lambrinou, Hansen and Beulens 2019:57).

According to Alsairafi (2016:54), hypertension and glaucoma as diabetic complications motivated T2DM patients to have consistent blood pressure checks and attend eye screenings, while information about foot ulcers stimulated them to have regular foot check-ups. However, only a small number of insulin-dependent patients were found to regularly monitor their blood glucose levels, as many lacked an understanding of the importance of this practice, did not know how, or did not have the desire to do so (Alsairafi 2016:54). The research showed that patients with added knowledge are inspired to control their disease, as they link their symptoms with readings of their blood glucose and hence monitoring their diabetes condition (Alsairafi 2016:54). Consequently Shiyanbola, Ward and Brown recognise that educating patients about the symptoms of diabetes, especially if they are borderline diabetics, is essential for them to realise that it is a chronic, long-term disease that necessitates treatment control and self-management practices (Shiyanbola, Ward and Brown 2018:17).

Kugbey, Asante and Adulal (2017:6) found that diabetes knowledge significantly and positively predicted overall self-care practices such as prescribed diet, blood sugar testing and foot- care practices, indicating that the added knowledge diabetic patients

have about their illness, the more likely they are to participate in appropriate self-care practices (Kugbey, Asante and Adulal 2017:6).

A study by (Kpekura 2018: 3788-9) was conducted to establish the knowledge and approaches of diabetic patients in influencing their self-management practices. Many people diagnosed with T2DM demonstrated fears and anxiety about their future health due to the misconceptions about the disease and its management practices (Kpekura 2018: 3788-9).

Kpekura (2018: 3788), indicates that this is heightened by the irrational explanation of causation of diseases that is found in many cultures in Africa, where they are thought to be caused by poison and evil spirits. One way to take care of some of these difficulties, notes Kpekura, is exposing patients and the general public to diabetes education (Kpekura 2018: 3788-9).

2.5.2 Attitudes of people with T2DM

Al-Sahouri, Merrel and Snelgrove looked at barriers to good glycaemic control levels and adherence to diabetes management plan in adults with T2DM in Jordan and concluded that patients' attitudes are essential to provide comprehensive diabetes care, as it may enable health care workers to be aware of what underpins their practices and behaviours (Al-Sahouri, Merrel and Snelgrove 2019:684). For this purpose, patients with T2DM need to have the chance to express their feelings and fears regarding their condition (Al-Sahouri, Merrel and Snelgrove 2019:684). In the qualitative research stress and family history were perceived as causes of developing diabetes and reasons for it being poorly controlled and fatalistic beliefs were shared when the patients were talking about the causes of diabetes, the reasons for increase in diabetes and their failure to control their blood glucose levels (Al-Sahouri, Merrel and Snelgrove 2019:684).

In a review of the (Knowledge, Attitude, Practice – Outcome) framework for diabetes, Rav-Marathe, Wan and Marathe points out that patients may have fluctuating attitudes towards their self-care management of diabetes (Rav-Marathe, Wan and Marathe 2016:5). For example, they may love to exercise, as it makes them feel good, but hate self-monitoring their blood sugar as they are opposed to piercing their skin. The Authors

consider the proneness to act in particular ways in relation to the object as the behavioural element associated with attitude. Therefore, some diabetic patients may follow through all the recommendations provided by their physicians, while others may not (Rav-Marathe, Wan and Marathe 2016:5).

Muchiri, Gericke and Rheeder (2016:30) reported that beliefs and attitudes are considered significant determinants of behaviour and its alteration in people with diabetes. According to their research approaches towards diabetes and its management are related with the degree of self-care, including compliance with meal plans and good glycaemic control (Muchiri, Gericke and Rheeder 2016:30). They found indication that patients with positive attitudes towards managing their diabetes are more likely to change their behaviour in order to keep their condition under control than those with negative attitudes (Muchiri, Gericke and Rheeder 2016:30). Moreover, there is evidence on the significance of positive attitudes to appropriate diabetes self-management practices, with studies having reported poor attitudes regarding patient autonomy and its psychosocial impact (Muchiri, Gericke and Rheeder 2016:30).

In order to ensure good glycaemic control and prevent complications amongst the T2DM patients Muchiri, Gericke and Rheeder recommend to address information and attitudes as these are important possible mediators of dietary and related behaviour change (Muchiri, Gericke and Rheeder 2016:30). In general, patients who described high levels of compliance to diabetes care had more positive attitudes toward the condition and its management (Muchiri, Gericke and Rheeder 2016:32).

For Al-Sahouri, Merrel and Snelgrove understanding patients' attitudes is essential to provide comprehensive diabetes care, as it may enable health care workers to be aware of what underpins their practices and behaviours (Al-Sahouri, Merrel and Snelgrove 2019:684). Fatema *et al*. states that an urgent need for coordinated educational campaigns with a prioritized focus on poorer, rural and less educated groups in order to prevent diabetes and its complications (Fatema *et al*. 2017:1).

2.5.3 Perceptions of people with T2DM

Based on a number of studies which examined how different racial groups with diabetes perceive their illness, including Mexican Americans, overweight African and European Americans (Standl *et al.* 2019: 9) concluded that illness perceptions are based on the knowledge obtained from their socio-cultural environment, such as friends and family, influential sources, such as health care providers, and individual personal experience of the illness, such as symptoms or anxiety associated with the disease. This is confirmed by research from across the globe (Standl *et al.* 2019: 9).

A study by Shiyanbola, Ward and Brown (2018:2) explored the illness narratives of African Americans with T2DM, focusing on symptom symbols, patient and family explanatory models, culturally-marked disorders, and their personal and interpersonal perceived significance of the condition. The authors examined how patients currently diagnosed with T2DM view their illness, as this is likely to be associated with their medication-taking behaviours and diabetes self-management practices. Shiyanbola, Ward and Brown (2018:2) conclude that illness perceptions predict diabetes self-care behaviour, including blood glucose monitoring, medication compliance and good glycaemic control. The specific focus group, according to Shiyanbola, Ward and Brown (2018:2), considered three elements as crucial to accept and use treatment: medications, faith in God, and positive thinking about survival. They suspect that improved diabetes self-management and medication adherence may depend on the meaning attached to diabetes, the available psychosocial support for managing T2DM and their associated experiences (Shiyanbola, Ward and Brown, 2018:1).

In Japan a cross sectional study by Hasimoto *et al*. (2019: 1) identified three important factors predicting the medication compliance of T2DM patients: Patient's perception, living an orderly life, and diabetes knowledge. The authors recognise that a poor adherence group may be able to change their adherence to diabetes treatment by developing the perception of living an orderly life (Hasimoto *et al*. 2019:1).

A research conducted in Ghana by Kugbey, Asante and Adulal (2017:1) showed a correlation between the T2DM patients' overall illness perception and their level of psychological distress, which again is strongly linked to their diabetes perception and

self-care practices, such as influencing their adherence to medication, diet and exercise. The authors state that illness perception domains predict self-management practices of individuals living with diabetes and that self-care practices of persons living with T2DM are significantly influenced by their illness perception and their level of diabetes knowledge. Kugbey, Asante and Adulal point out to health care practitioners that they should understand that the way in which patients interpret their illness is significant, in determining whether they will follow the recommended self-care practices or not. Ensuring good glucose control and preventing of T2DM associated complications require good levels of positive attitudes towards the importance of diabetes care, according to the study (Kugbey, Asante and Adulal 2017:1).

Shiyanbola, Ward and Brown (2018:2) states that understanding the perceptions of an illness that is shared by a group of people will be useful in developing culturally-appropriate interventions targeted to the needs of a particular community. By adapting the response to misconceptions about diabetes accordingly, healthcare professionals can provide tailored interventions that address negative beliefs about diabetes and thereby influence medication compliance (Shiyanbola, Ward and Brown 2018:2-3). Apart from this, enlightening the patients about T2DM could improve provider-patient communication by enhancing an understanding between the two parties, which may in turn reduce frustration and improve health care outcomes (Shiyanbola, Ward and Brown 2018: 2-3).

2.6 Complications of T2DM

Dealing with diabetes is a challenging task for the health care professionals and patients (Kpekura 2018: 3788-9). As diabetes is a chronic disease, most diabetic patients need to continue their treatment for the rest of their lives, recognises Kpekura in an article published in the International Journal of Community Medicine and Public Health. He adds that the emphasis is therefore usually on controlling the condition through a schedule of blood glucose and urine monitoring, medication and dietary modifications (Kpekura 2018: 3788-9).

This can only be achieved with competent appropriate self-care, which can be developed from a thorough understanding of the disease process and management

challenges by the patient and their family (Kpekura 2018: 3788-9). This highlights the need for diabetes education and counselling. Educating and supporting diabetic patients and their family members in managing their daily lives are important goals of diabetic patients' care. He estimates that approximately one third of people suffering from diabetes may not be aware of the onset of signs and symptoms, considering the insidious onset of the disease and its associated life-threatening complications (Kpekura 2018: 3788-9).

T2DM leads to complicated conditions including blindness and lower-limb amputations. The unmanaged individual living with T2DM can also have severe health complications, including cardiovascular disease, renal impairment and renal failure, impairment of eyesight, venous ulcers and amputations, all of which further impact on an already struggling healthcare system (Van Den Berg, Mokhehle and Raubenheimer 2019:98). Arambepola *et al.* (2016:2) elaborated that the available evidence suggests that better control of blood glucose, blood pressure and cholesterol levels would delay the onset of complications, and thereby prevent premature deaths among those already diagnosed with diabetes, with lifestyle modification focusing on healthy diet being an accepted component of management, alongside the promotion of physical activity (Arambepola *et al.* 2016: 2).

According to Mashitisho and Mashitisho T2DM poses a common public health problem associated with long-term complications which are not well controlled. The authors clarify that delay in insulin initiation is the common cause of prolonged exposure to hyperglycaemia, which results in diabetes-related complications. They call on clinicians to initiate insulin therapy early so as to reach individualised glycaemic targets early, thereby preventing T2DM- related complications (Mashitisho and Mashitisho 2016:15).

A significant increase in the number of heart failures, with all the related negative effects from disability to death, is, to a large extent, related to the rise of T2DM, as shown in the literature (Al-Sahouri, Merrel and Snelgrove 2019:679). Diabetic retinopathy is a common microvascular complication among patients with diabetes due to unstable blood glucose levels and a longer duration of diabetes (Al-Sahouri, Merrel and Snelgrove 2019:679). T2DM is also the main cause of partial vision loss and blindness

in people over 20 years old, and can result in various socio-psychological problems, such as job, family, driving, mood disorders and a poor quality of life (Standl *et al.* 2019:9). Adults with diabetes also have higher rates of stroke and death from heart disease (Kpekura 2018: 3788-9), and according to Afroz *et al.* 2018: 1-2. T2DM is linked to macrovascular complications such as cardiovascular, cerebrovascular and peripheral vascular diseases, as well as microvascular complications, such as retinopathy, nephropathy and neuropathy (Afroz *et al.* 2018: 1-2).

Van Netten, Woodburn and Bus describe diabetic foot ulceration as another common and debilitating complication of diabetes, which is preventable through active engagement in appropriate foot-related practices. Yet, the researchers regret, many individuals with diabetes do not adhere to recommendations for foot care. As a consequence, foot ulcers are the leading cause of hospitalization, amputation, reduced mobility, loss of social participation, and lower quality of life in people with T2DM (Van Netten, Woodburn and Bus 2019:2).

A qualitative study by Shirazian *et al*. stated that T2DM is the leading cause of chronic kidney disease in the USA, affecting 40 percentage of the 26 million people with the condition. The authors recognize that the treatment of blood pressure and blood glucose in patients with early chronic kidney disease and T2DM has been shown to slow the progression to end-stage renal disease and decreases mortality rates, adding that this treatment requires not only appropriate medical therapy delivered by health care providers, but also rigorous self-management practices by the patient (Shirazian *et al.* 2016:19).

2.7 Self-Management practices of people with T2DM

Self-management is the ability of patients to adopt and maintain certain health promoting behaviours. As Shirazian *et al.* elaborate*,* these behaviours can vary depending on the underlying chronic illness, but often include refraining from smoking and excessive alcohol intake, adhering to medications prescribed by health care providers, an appropriate diet and exercise regimens, self-monitoring and medical follow-up (Shirazian *et al.* 2016:19). Blonde *et al.* briefly describe self-management as

the process of actively engaging in self-care activities with the goals of improving behaviours and well-being (Blonde *et al.* 2017:172).
Engaging in self-care activities, according to Lambrinou, Hansen and Beulens (2019: 57), includes planning meals, physical activity, monitoring blood glucose, taking diabetes medicines and managing episodes of illness and low and high blood glucose. In summary, as Hasimoto *et al.,* put it, the self-management which involves adherence to medical instructions on diet and nutritional advice, physical activity, medication regimen, weight and stress management, is necessary for diabetes treatment and management of the condition (Hasimoto *et al.* 2019:1).

Lambrinou, Hansen and Beulens elaborate that the above self-management finds its expression in the national standards for diabetes self-management education and support, defining diabetes self-management education as a collaborative and ongoing process intended to facilitate the development of knowledge, skills and abilities that are required to successfully self-manage diabetes. Consequently, self-management education support, including problem-solving and shared decision-making skills development, is a continuous process in the care of T2DM patients (Lambrinou, Hansen and Beulens 2019:59).

As De Man *et al. (2019:20)* states, self-management practices are one of the key elements for adequate prevention and treatment of T2DM and other non-communicable diseases. Such practices improve the care processes and health outcomes, for instance, through good treatment compliance and adapting treatment to a person's situation. The authors specify: Self-management means that individuals play an active role in managing their condition, and implies that they engage in decision-making, and adopting and adapting strategies to improve their health status for that particular condition. It also suggests an engagement in supportive partnerships with other people, such as family, friends, health providers, community members and peers (De Man *et al.* 2019:20).

For this purpose, De Man *et al.* suggests that individuals need to adopt a pro-active mind-set, and acquire skills and knowledge relating to T2DM. Also, beyond the individuals' engagement, this requires the right conditions with regards to the health

system, the socio-cultural and physical environment, as well as their family and friends, who are also categorized as self-management support (De Man *et al.* 2019:20).

Poor self-care results in complications, consequently self-care practices among persons living with T2DM are essential according to Kugbey, Asante and Adulal (2017:1). This suggests that cognitive and emotional representation of diabetes and relevant knowledge are key determinants of patients' self-care practices, making it important that appropriate psychosocial interventions are developed to help patients adhere to recommended self-care practices (Kugbey, Asante and Adulal 2017:1).

2.7.1 General lifestyle as a self-management practice

Lambrinou, Hansen and Beulens sees lifestyle management as an important part of T2DM care including self-management education and support, as well as lifestyle modification. They define self-care as a human regulatory function, where people must act for themselves on the basis of deliberation to achieve a foreseen result, preceded by investigation, reflection and judgment to appraise the situation, and by deliberate choice about what should be done (Lambrinou, Hansen and Beulens 2019:57).

According to a review by Rav-Marathe, Wan and Marathe diabetes self-management programs have advocated the need to improve the knowledge, attitude and practice of self-care to patients diagnosed with diabetes to enable them to engage in behavioural change to avoid complications, with the goals of behavioural change being: ensure good control of blood sugar through adherence to medications and diet, self-monitor blood sugar, develop healthy eating, perform 150 minutes of physical exercise weekly, and follow up with medical appointments. Such diabetes self-management programs have been shown to improve knowledge, attitude, practice and health care outcomes (Rav-Marathe, Wan and Marathe 2016:1).

Van Den Berg, Mokhehle and Raubenheimer (2019) underlines that lifestyle interventions with proper diet and physical activity are effective in preventing and treating diabetes, and while many international diabetes organisations have guidelines in this regard, they can only achieve their goal if people know about and follow them, making it important to understand the importance to optimise diabetes care.

Pamungkas, Chamroonsawasdi and Vatanasomboon share similar views. For them managing diabetes is the cornerstone of preventing long-term complications and improving the quality of life among people with T2DM.

The American Diabetes Association, which has presented diabetes self-management education as a foundation for good diabetes care, as diabetes is complex to manage (Pamungkas, Chamroonsawasdi and Vatanasomboon 2017:2). This complexity manifests itself in those patients are given multiple tasks: attend medical appointments regularly, adhere to verifying medication regimens and engage in self-care practices, including at-home blood glucose monitoring, healthy dietary changes, and increased physical activity (Pamungkas, Chamroonsawasdi and Vatanasomboon 2017:2). As a prerequisite increased awareness is a major determinant for preventing diabetes and its complications, as well as related metabolic disorders (Fatema *et al*. 2017:1).

2.7.2 Nutrition as a self-management practice

Forouhi *et al*. (2018:2), considers it as recognised that dietary advice for both the prevention and management of T2DM should converge and not be treated as different entities, pointing out that however in those with T2DM, the degree of glycaemic control, and the type and dose of diabetes medication should be co-ordinated with dietary intake. They clarify that with some dietary interventions, such as very low calorie or low carbohydrate diets, people with diabetes would usually stop or reduce their diabetes medication and be monitored closely (Forouhi *et al.* 2018:2).

In India Hentschel *et al.* (2017:1*)* agree that diet is a major component of diabetes management, with many global solutions for healthier diets, but they warn that these generic solutions lack an understanding of lifestyles, cooking styles, dietary preferences, and eating practices. Other local aspects also come into play where research shows that Indians are used to an approach to medicine that differs from the West and have a different style of doctor-patient interaction (Hentschel *et al.* 2017:1).

Alkhatib *et al.* emphasize the importance of dietary counselling and education, which they consider an integral part in both screening and evaluating the dietary behaviour for people with T2DM. According to them dietary counselling can identify behaviours related to food and beverage consumption, likes, dislikes and food allergies, and assess

the magnitude of reliance on alternative medicine, whether in the form of consuming dietary supplementation or natural food products known locally to contribute to glycaemic control (Alkhatib *et al.* 2017:9). They add that dietary counselling and education also empower diabetic people with the tools and skills needed to better manage their condition, prevent the development of related co-morbidities and improve their quality of life (Alkhatib *et al.* 2017:9).

According to Forouhi *et al.* considerable evidence supports a common set of dietary approaches for preventing and managing diabetes, and while uncertainties remain as to whether weight management is a cornerstone of metabolic health, diet quality is important, whereas low carbohydrate diets as the preferred choice in T2DM are controversial, with some guidelines maintaining that no single ideal percentage distribution of calories from different macronutrients (carbohydrates, fat, or protein) exists. Furthermore, there are calls to review this, in light of emerging evidence on the potential benefits of low carbohydrate diets for weight management and glycaemic control (Forouhi *et al*. 2018:6).

Forouhi *et al.* claim that the quality of carbohydrates, such as refined versus whole grain sources, is important and should not be lost in the debate on quantity. According to them recognition is increasing that the focus of dietary advice should be on foods and healthy eating patterns rather than on nutrients, and evidence supports avoiding processed foods, refined grains and sugar sweetened drinks, and promoting the intake of fibre, vegetables and yoghurt. Forouhi *et al.* further call for dietary advice to be individually tailored and take into account personal, cultural and social factors. T2DM, they write, does not have to be a progressive condition but instead there is potential for remission with dietary intervention (Forouhi *et al.* 2018:6).

2.7.3 Treatment and compliance as self-management practices

Blonde *et al.* states that the regrettable circumstance that glycaemic control is suboptimal in a large proportion of people with T2DM who are consequently at an increased and avoidable risk of potentially severe complications. Data published by these researchers indicates that glycaemic control is suboptimal in a substantial proportion, typically 40%–60% of people with diabetes (Blonde *et al.* 2017:172).

Blonde *et al.* (2017:172) recognizes the diabetes cases across geographic regions and in both low- and higher-income countries. Therapeutic inertia appears to be an important contributor to poor glycaemic control in up to half of people with T2DM. In particular, prescribers are often willing to tolerate extended periods of mild hyperglycaemia as well as having low expectations for their patients. There are often delays of three years or longer in initiating or intensifying glucose-lowering therapy when needed. Many people with T2DM are failed by current management of health professionals, with half the people not achieving or maintaining appropriate target blood glucose levels, resulting in an increased and avoidable risk of serious complications (Blonde *et al.* 2017:172).

Some emergent beliefs that affected treatment compliance, as indicated in a study by Alkhatib *et al.* (2017:1), were about the disease (downplaying its seriousness), medicines (disbelief in their efficacy) and self-beliefs. According to this research the determinants of medication compliance among individuals were lack of knowledge, illness perceptions, treatment misconception and satisfaction, self-efficacy, beliefs about necessity/safety of medicines, beliefs about herbs, forgetfulness and beliefs about health care practitioners, while determinants of compliance to lifestyle modifications were poor health awareness, lack of social support and time (Alkhatib *et al.* 2017:1). Pamungkas, Chamroonsawasdi and Vatanasomboon (2017:6) reported that a higher level of support significantly influenced blood glucose monitoring at home. Regarding medication taking behaviour, it was found that regular medication adherence was performed under family support, and increased self-awareness on foot inspections correlated to foot ulcer prevention (Pamungkas, Chamroonsawasdi and Vatanasomboon 2017:6).

2.8 Common Sense Model of Illness representation and self-regulation.

2.8.1 Description of the model.

Harvey and Lawson describe the concept, used for this study to demonstrate what effect the understanding of the disease has on self-management, as follows: Leventhal's Self-Regulation Model of Health and Illness (SRM, also known as the Illness Representation Model, Common Sense Model or Personal Sense Model),

suggests that cognitive and emotional processes operate independently. Leventhal describes the illness cognition as patient's personal common-sense perceptions about their illness. The self-regulatory model (SMR) views the patient as an active problem-solver, where the behaviour reflects their attempts to move from their current status of ill-health to the desired goal of good health and wellness (Harvey and Lawson 2008: 7-8).

Patients therefore internalise and interpret information and cope with the presenting problems (Harvey and Lawson 2008: 7-8). This concept was considered appropriate as this research project aims to understand the elements affecting the self-management practices of people with T2DM in the Ugu District of KZN, SA. As Leventhal *et al.* states, "the Common-Sense Model (CSM) suggests that perceptions about illness threat have five core dimensions: cause; identity; perceived control; severity of illness consequences; and time line. Moss-Morris *et al* clarify that subsequent research has added further dimensions including illness coherence, a belief that the illness makes sense, to this core set of illness beliefs (Moss-Morris *et al.* 2002:1-16). Overall, the CSM predicts that illness perceptions (such as perceived control of diabetes or severity of illness consequences) will influence emotional outcomes such as illness-related distress (Hagger and Orbell 2003:141).

According to Leventhal, Phillips and Burns the CSM provides a helpful framework for clinicians, patients and families and it provides understanding of the interplay of factors that contributes to an individual's response to an illness or disorder. Therefore, the use of the CSM during case formulation could contribute to an increase in treatment compliance, recovery time and relapse prevention regarding treatment and management (Leventhal, Phillips and Burns (2016: 935).

Harvey and Lawson (2008: 7) proposes that there are three stages that regulate behaviour in this model:
Stage 1: Illness representation, where there is patient's understanding of the health threat, affecting their attitude and perceptions resulting in a management plan which is structured around five components (Harvey and Lawson 2008: 7-8);

a. identity, a label or name and perceptions of associated symptoms/conditions (for example cancer, heart disease, flu);
b. perceived time-line, or perceived and measured rates of onset, duration and decline;
c. consequences or experienced and anticipated physical, cognitive and social disruption;
d. causes (for example environmental toxins as causes of cancer; stress as a cause of heart attacks);
e. control (for example self- versus medical provider);

Stage 2: Coping or action plans by the patient. This stage focuses on their knowledge, attitude and perceptions as related to their self-management practices and their understanding of the health threat effects and directs how they self-manage. As they manage their health threat, they will be able to understand their health status in the evaluation stage, why they are improving or not improving. If they are not improving, it means that they need to reassess their knowledge and how that links to their attitudes and perceptions. Their knowledge, attitude and perceptions related to self-management practices, indicate their knowledge in stage 1, their understanding of their condition and the associated threat. The action plans by the patient is structured around five components (Harvey and Lawson 2008: 7-8);

a. avoidance/denial;
b. cognitive evaluation;
c. expressing emotions;
d. problem-focused coping;
e. seeking social support;

Stage 3: Evaluation, where coping and progress are assessed around the impact of coping styles, leading to modification of coping behaviours. There is a dynamic interaction between the three stages of illness representation, coping and evaluation, which is associated with parallel cognitive and emotional processing that may operate independently, although they generally interact (Harvey and Lawson 2008: 7-8).

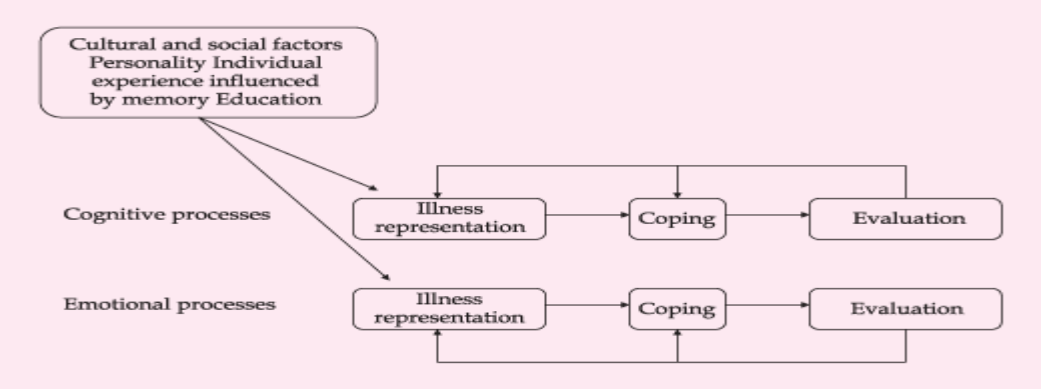

Figure 2.1 "Schematic representation of CSM of Illness representation and self-regulation" (Harvey and Lawson 2008: 7).

The assessment of T2DM using CSM of illness representation and self-regulation provides a basis for understanding and predicting self-care activities (Harvey and Lawson 2008: 5). This model advocates patients taking an active role in managing their own condition and identifies the issues that patients themselves think are important. The model recognises the importance of both cognitive and emotional responses to illness and the individuals' self-management and coping strategies of ongoing problems and future health threats, including associated complications of T2DM (Harvey and Lawson 2008: 5). According to the CSM relating to chronic disease, when patients understand the seriousness of their condition of T2DM and the effectiveness of their treatment, this will then translate into informed better self-management practices (Harvey and Lawson 2008: 5).

Furthermore, according to Leventhal, Phillips and Burns (2016:24), these treatment representations are: Medication that takes longer to act than expected can be perceived as ineffective, and those that have unwanted consequences (such as symptoms causing emotional distress) can be problematic for compliance towards a chronic condition such as T2DM. It is also clear that common-sense perceptions of the effectiveness for control can affect the choice of treatment, for example, surgery for an amputation of limb may be perceived as better than medication and dressings (Leventhal, Phillips and Burns, 2016:24).

According to Hagger and Orbell (2003:142), the CSM contends that individuals create mental representations of their illness based on the concrete and abstract sources of

information available to them in order to make sense of and manage the problems of the condition experienced. It is the interpretation of this information that forms the first step in the process of seeking help, engaging in a coping strategy or adopting an illness management regimen (Hagger and Orbell 2003 :142).

2.8.2 Analysis of CSM of Illness representation and self-regulation.

The knowledge, and resulting attitudes and perceptions about individual's health threat then informs their coping action plans, including those about self-care practices. This study will explore the components of the stages in their regulator behaviour so as to understand how they cognitively represent their health threat (stage 1). These components have implications for stage 3, their evaluation of whether or not what they are doing is effective, and if not, what are the implications for their reviewing their cognitive representation in stage 1.This presents as a cyclical model, where the patient needs to continually reflect on their self-care practices to see if they are doing the right self-management practices, is it working, and if not, why not, is it because their knowledge is not adequate, or are they not taking the advice seriously and modifying their behaviour (stage 3).

The model was used in this study as in stage 1, the diabetic patients are assumed to have some knowledge, which informs their cognitive representation, the attitudes and perceptions, of their health threat. This in turn affects their action plans (stage 2) related to self-care, although it cannot be assumed that correct knowledge will automatically translate into the right attitudes and perceptions, and therefore decisions and actions being taken, to effectively manage their condition. This study explores the link between their knowledge related to self-care practices and their resulting attitudes and perceptions to what they need to do to care for them. Stage 3, evaluation, is an important component, as it indicates their knowledge gaps, this being important to adjust their attitudes and perceptions if they are to correctly self-manage their health threat.

According to (Harvey and Lawson 2008: 5) Healthcare professionals ask patients with diabetes to carry out many self-care behaviours. These include dietary change, exercise, regular self-medication, insulin injection, self-monitoring of blood glucose, insulin dose adjustment, and regular attendance at clinic and for screening programmes (Harvey and Lawson 2008: 5). These behaviours are often not achieved, despite their value being understood by both the patient and professional. Much has been made of the importance of education in diabetes, with 'education, education, education' having become a mantra, with a lack of knowledge being regarded as the most easily remediable reason for failure to achieve good self-care (Harvey and Lawson 2008: 5).

According to Leventhal, Phillips and Burns, (2016:24-25), the patient's cognitive illness representation of the health threat is structured around five components:

Identity: beliefs concerning the condition, such as T2DM and associated complications, such as heart and renal diseases and skin disorders.

Cause: beliefs regarding possible causes of T2DM, such as stress, heredity, environmental and lifestyle factors as a cause of T2DM and associated complications.

Time line or course: beliefs regarding the duration of the illness: acute, cyclic (symptoms may subside, then recur) or chronic. It includes views on the variability and predictability of the condition, such as T2DM, which is important for compliance and a life-long commitment to prevent complications and premature death.

Consequences: beliefs regarding the perceived physical, psychological, social and financial consequences of T2DM on the individual, family and the community.

Control/cure: confidence in T2DM self-management practices, efficacy of diabetes mellitus treatment, whether the clinical advice from health team is helpful and whether attending clinic is worthwhile, are some of the patient's cognitive illness representations (Leventhal, Phillips and Burns 2016:24).

Kugbey, Asante and Adulal (2017:1) identified illness perception and as a significant factor that influences T2DM self-care practices, psychological distress and other health outcomes among persons living with T2DM. They assume that the association between illness perception and the health outcomes could be due to the fact that T2DM self-

management practices such as blood sugar monitoring and diet involves complex decision making that depends on the patients' representation of their illness in terms of whether it is controllable, comprehensible, curable, cyclical and severe or not (Kugbey, Asante and Adulal 2017:1).

2.8.3 The understanding and the use of the model in response to patient's needs.

The CSM suggests that individuals search to understand their illness or disease threat by developing an understanding of what the illness is, what T2DM means, T2DM causes, consequences, how long it will last, and whether T2DM can be cured or controlled (Browning *et al.* 2009: 3).This understanding (or illness representation) is not necessarily scientifically or medically validated, but formulated from personal experience (physical symptoms and emotions), social influences, and/or interaction with healthcare providers (Browning *et al.* 2009: 3). Individuals are thought to reduce their health risks or change their health behaviour in ways consistent with their own illness representation like for T2DM (Browning *et al*. 2009: 3).

Illness representation following a diagnosis such as T2DM, the individual analyzes, internalizes, and interprets the meaning of the illness T2DM (Browning et al 2009: 3). The individual becomes an active problem solver and simultaneously deals with two phenomena: the perceived reality of the illness and their emotional reaction. Internal and external stimuli such as previous experience with the illness and social and societal influences operate to influence the development of the illness representation (Browning *et al*. 2009: 3).

For example, a newly diagnosed T2DM individual interprets their increased weight gain, polyuria, polyphagia and polydipsia as symptoms of T2DM. Depending on past experiences with these symptoms and influences from healthcare providers, the media, family and/or friends, an illness representation is formed by the patient with respect to his or her continued blood glucose control and lifestyle behaviour, after this new diagnosis (Browning *et al*. 2009: 3). Aside from recognizing the signs and symptoms of the disease, other components of this illness representation are cause, consequence, control, and timeline. The patient's perception of T2DM will influence the interpretation of the cause of the disease, linking past or continued blood glucose levels and lifestyle

behaviour with the cause of the disease. The consequences of continuing or modifying the lifestyle behaviour will be internalized and made part of the T2DM illness representation (Browning *et al*. 2009: 3).

Perceived control of T2DM symptoms and disease and whether lifestyle modification or continuing with former lifestyle will have an effect upon the symptoms and the stage of the T2DM, become part of the illness representation. In addition, the individual's ability to change the overall timeline or prognosis of the diagnosis, with respect to lifestyle modification or continuing with former lifestyle, will be an important component of the illness representation (Browning *et al.* 2009: 3).

Illness representations are complex and dynamic. The internal and external stimuli of the individual change the illness representation over time and further guides actions of the individual in response to the health threat. Internal stimuli such as side effects of T2DM treatment and external stimuli such as public opinion on causes of T2DM and prognosis will shape the illness representation over the course of the disease. Emotions are also integral to illness representation and develop simultaneously with the cognitive component. Emotional experiences such as fear, anger, depression or anxiety can motivate the individual to develop an action plan (coping procedure), or can be so overwhelming, resulting in less or no action taken (with respect to the disease). After a patient has had the opportunity to consider the diagnosis, prognosis, and proposed medical treatment, the patient's illness representation may change. Receiving a T2DM with associated complication diagnosis, can evoke a range of emotions, contributing to the formation of the illness representation that influences the coping procedures (Browning *et al*. 2009: 4).

Coping procedure— the illness representation drives the individual's coping strategies (Browning *et al*. 2009: 4). A response to the illness representation is instituting behaviour, or coping procedure. The individual develops a response plan or procedure to cope with the illness representation and the selection of a coping procedure is guided by the illness representation concept. An individual diagnosed with T2DM may choose to cope with the new diagnosis by either modifying lifestyle behaviour or continuing with the current lifestyle (Browning et al. 2009: 4). The consequences of modifying lifestyle

behaviour may involve physical and psychological factors (both positive and negative) such as change of diet, movement and exercise, increased family support, and improved survival (Browning et al. 2009: 4). Although the consequences of T2DM, treatment and change in lifestyle behaviour may result in discomfort and side effects of treatment, the patient may continue to adopt some former lifestyle behaviour to avoid the additional stress of treatment and modified lifestyle behaviour during this already stressful time (Browning et al. 2009: 4).

Outcome appraisal— the individual will engage in ongoing outcome appraisal, or the analysis of the consequence or efficacy of the coping procedure (Browning et al. 2009: 4). The outcome appraisal is the repeated evaluation of the coping procedure (continued or changing lifestyle behaviour) and may be influenced by such variables as quality of life, clinical response to T2DM treatment (Browning et al. l 2009: 4). If an individual perceives that a coping procedure is ineffective, an alternative coping procedure may be selected. Thus, the model is fluid and dynamic, with continuous feedback between each component: a patient may use his or her own quality of life assessment as a proxy indicator for outcome appraisal when evaluating their illness representation of T2DM and coping procedures (Browning et al. 2009: 4).

Representation of self— the individual's cognitive and emotional processes that form illness representations do not occur in isolation; they are influenced by the representation of self (Browning *et al*. 2009: 4). A T2DM patient's representation of self is defined as their self-perception (Who am I? or How do I define myself?) and self-meaning or importance of self (What value do I place on myself? or Why do I matter?). After a disease threat or illness (like T2DM), the representation of self is redefined within the context of the illness and is influenced by the individual's social interactions (such as family, friends, society, and healthcare professionals) (Browning *et al.* 2009: 4). Thus, the individual looks at or interprets the illness through the eyes of the self. There are many sociodemographic and bio-behavioral characteristics that are specific to an individual and are known to be associated with T2DM and lifestyle behaviour (Browning *et al.* 2009: 4).

2.9 Conclusion

In this chapter, T2DM prevalence and risk factors globally, in Africa and SA were presented. Furthermore, knowledge, attitude, perceptions, complications and self-management practices of individuals with T2DM and CSM of illness representation and self-regulation were presented. This study aims to assess the knowledge, attitude and perceptions of individuals with T2DM as related to their self-management practices. The people's understanding of their condition, rationalising the way it would affect their lives depending on what course of action they take to manage it. The model was therefore used to inform the questions that were asked in this study so as to understand the progression from knowledge to attitudes and perceptions of their self-management practices. Chapter 3 details the methodology used in this study, including the questions that were asked based on the literature reviewed in this chapter.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology used to guide the study and address the objectives. It includes a description of the research design, research setting, target population, sampling technique and sample size, data collection instrument, pilot study, data collection process and data analysis. The chapter concludes with a discussion of validity and reliability as well as the ethical issues taken into consideration to conduct the study. The study focused on understanding the knowledge, attitude and perceptions of individuals with T2DM as related to their self-management practices.

The following objectives were set for the research in line with the aim of the study:

- To assess the knowledge, attitude and perceptions of people with T2DM as related to self-management practices;
- To establish the self-management practices of people with T2DM.

3.2 Research approach and design

This study employed a descriptive, cross-sectional quantitative design by using a structured questionnaire. The design specified the methods to be used to recruit respondents, collect and analyse data as well as interpret the results (Polit and Beck 2012: 12-13). The quantitative design was appropriate for the study, as a questionnaire was used to acquire information addressing the problem regarding the increase in T2DM among individuals in the Ugu District of KZN (KZN).

It was chosen to suit the purpose and financial constraints of the study (Polit and Beck 2012: 12). The questionnaire was designed to collect quantitative data, and required respondents to select from a number of options, the results for each option being summed up for descriptive and statistical analysis. The positivist paradigm (knowledge can be discovered through the use of the scientific method) was used in this study as it entailed a systematic orderly system and deductive reasoning to acquire information (Polit and Beck 2012: 12-13). This scientific methodology enabled responses from which objective conclusions were drawn that could be generalized to the population in the Ugu District of KZN regarding the knowledge, attitude, perceptions and self-management of T2DM.

3.3 Research setting

Research can take place in many environments, where information is collected (Polit and Beck 2012: 12-13). Researchers decide on a specific place to collect data, depending on the data required for the research. Many sites are sometimes used because they are bigger or the sample of the study participants have many differences (Polit and Beck 2012: 12-13).

This study was conducted at the diabetic clinics of four public hospitals and two community healthcare centres in the Ugu District of KZN, these being public sector facilities that serve largely a rural population. The records reflect that between November 2016 and December 2016, 200 new patients were diagnosed with T2DM and 172 limb amputations related to diabetes were reported, which indicates the extent of the problem in the Ugu District. The pilot study was conducted at a diabetic clinic in the Ugu District at one facility and the data was not included in the study.

3.4 Population and Sampling

3.4.1 Study population

The study population refers to the people at large in which a researcher shows attention to, and here the findings will be reported over the people in that area (Polit and Beck 2012: 744), these being all those who attended the diabetic clinics at the four hospitals and two community health centres. The study population consisted of approximately 580 patients with chronic T2DM attending the diabetic clinics at the four public hospitals and the two community health centres in the Ugu District of KZN.

As a largely rural district, many people live in scattered homesteads where they rely on various sources to sustain themselves, including growing their own food, social grants (pensions and children <18 years) and remittances sent home by relatives who are employed out of the area. They are financially poor, uneducated, poorly enlightened regarding health and diseases and have limited access to healthy food. The population comprised of T2DM attendees per facility monthly and these are the numbers for the six facilities:

A – Rural hospital 60 patients;
B – Rural hospital, 100 patients;
C - Rural community health centre, 80 patients;
D - Urban hospital, 120 patients;
E – Rural community healthcare centre, 120 patients and
F - Rural hospital, 100 patients
Total = 580 patients.

3.5 Sampling technique

Sampling is the process of identifying a part of the people to show all the people in that area (Polit and Beck 2012: 742). For this study, consecutive sampling was used to identify possible participants, which involved recruiting people as they presented themselves at the clinic who met the eligibility criteria over a specific time interval (Polit and Beck 2012: 278). For the purpose of this study, a chronic diabetic patient is one who has had the disease for the past one year and is being managed at one of the health facilities.

3.6 Sample size

As the total study population attending the six clinics was estimated to be 580, the sample size was calculated to be 232 patients, which was increased to 267 by the statistician in order to allow for incomplete questionnaires. The sample size was calculated on a confidence level of 95%, a margin error of 0.5, an alpha level of 0.5 and a response distribution of 50%. The larger the sample size, the greater the prospects of generalisation, hence 267 was the agreed sample size.

The following inclusion criteria were used to recruit participants:

- patients clinically diagnosed as chronic T2DM;
- patients who were 18 years and older, males and females;
- patients who had the disease for at least the past one year;
- patients who resided in the Ugu District of KZN and
- patients who gave written consent to participate in this study.

The following exclusion criteria were used:

- patients clinically diagnosed as Type I diabetes mellitus;
- patients younger than 18 years of age;
- patients who lived outside the Ugu District of KZN;
- patients who had been diagnosed for less than one year and
- patients who did not give written consent to participate in this study.

3.7 Data collection instrument

A self-administered questionnaire is where the respondents read the questions and give their answers in writing (Polit and Beck 2012: 742). A questionnaire developed by (Duprez *et al.* 2013: 433-435) was used in this study, and was modified after obtaining permission by the author (Annexure 7). The structure of the questionnaire was guided by the aim, objectives, research questions and the theory with respect to the three stages of the Leventhal's Common Sense- Model (CSM) to regulate self-management behaviour in order to address the health threat:

1. The cognitive representation of the health threat, illness representation stage (knowledge, attitudes and perceptions related to self-management);
2. The action plan or coping stage (how they manage their health threat, based on their knowledge, attitudes and perceptions), and
3. The evaluation stage, in which coping and progress are assessed, leading to the modification of the representation (knowledge, attitudes and perceptions) and coping behaviours (self-management practices).

The questionnaire, letter of information and consent forms were translated from English to IsiZulu (Annexures 3 and 5) to allow for understanding and completion by IsiZulu speaking patients, and translated back into English, to ensure reliability and validity of the instrument. The participants were therefore able to decide which language version they preferred to complete the questionnaire. The questionnaire (Annexures 2 and 3) was divided into three sections:

A: Demographic data (11 questions): gender, age, ethnicity, highest educational qualification, marital status, employment status, receipt of social grant, duration of suffering, associated illnesses and medical conditions, hospitalisation and clinic attendance.

B1: Knowledge, attitude and perceptions (14 questions): to establish the respondent's knowledge, attitude and perceptions of nutrition, treatment, regime, treatment and compliance, and general lifestyle as related to T2DM. The respondents indicated their knowledge level of T2DM as correct, incorrect or I do not know. The statistician changed the response options to true, false and I don't know, in order to prevent any confusion with the data analysis. The, I don't know option, was scored as incorrect for the 14 items addressing objective one (knowledge, attitude and perceptions as related to self-management practices).

B2: Self-management practices (57 questions) - divided into 5 sub-sections:

B2.1 Nutrition (7 questions): these questions explored their diet when socialising, amount of fat and sugar in their food, night time snacks and checking of blood glucose levels. The respondents were required to rate their responses from strongly disagree, disagree, neutral, agree and strongly agree to a set of statements on nutrition. Strongly disagree, disagree and neutral were combined as disagree, while agree and strongly agree were combined as agree. A one-sample t-test was applied to test if there was significant agreement or disagreement to each item. The mean agreement score was tested against the neutral score of '3'.

The six nutrition items were grouped into two groups. Items 1 and 2 were dropped because it did not correlate well enough with the other items on food content, resulting in two measures for nutrition; food content and snacking. The first group measured the food content, and the second group measured snacking at night, using Cronbach's alpha. The factors can be interpreted as food content and night snacks. These factors were tested for reliability using Cronbach's alpha. Alpha>.7 is considered to indicate a reliable measure. In order to test if there is significant agreement or disagreement to each item, a one-sample t-test was applied. The mean agreement score was tested against the neutral score of '3'.

B2.2 Treatment (10 questions): these explored how they self-managed their treatment by reading drugs leaflets, measuring blood glucose before meals and during illness, inspecting their feet, checking body weight, wearing appropriate

shoes, podiatrist and dietician consultations. The respondents were required to rate their responses from strongly disagree, disagree, neutral, agree and strongly agree to a set of statements on treatment. A 5-point Likert agreement scale was used where 1 being strong disagreement and 5 being strong agreement. Strongly disagree, disagree and neutral were grouped together as disagree whilst agree and strongly agree were combined. In order to test if there was significant agreement or disagreement to each item, a one-sample t-test was applied. The t-test value was equal to 3.

B2.3 Regime (12 questions): these explored tobacco smoking, physical activity participation, carrying of glucose, injecting of insulin, carrying of glucometer, sharing condition with new people, wearing of medical bracelet, checking blood glucose levels and injecting of insulin in the presence of others. The respondents were required to rate their responses from never, seldom, now and then, often and always to a set of statements on regime. A 5-point Likert agreement scale was used where 1 represented never and 5 represented always. Never, seldom and now and then were grouped together as seldom, while often and always were combined as always. This data was ordinal and categorical therefore the t-test is not applicable. In order to test if there is significant frequency to each item, application of a chi-square goodness-of-fit test was used.

B2.4 Treatment and compliance (13 questions): these explored their interpretation of blood glucose levels, coding of glucometer, administration of insulin injections, adjusting of insulin doses, recognition of high blood sugar, recognition of low blood sugar, questioning the doctor or nurse about their diabetic treatment, recording blood glucose levels in a diary, measuring their blood glucose levels, doctor and nurse consultations. The respondents were asked to choose the one option that best applies to them from ‘definitely not’, ‘probably not’, ‘might be’, ‘probably’, definitely and ‘not applicable’ a set of statements regarding treatment and compliance. A 5-point Likert agreement scale was used where 1 represented definitely not, 2 probably not, 3 might be, 4 definitely and 5 represented not applicable. Definitely not, probably not, might be and probably are grouped together as definitely not, and the other option as definitely. Those for whom it

was not applicable were excluded from this analysis. A chi-square goodness-of-fit test was used to test if a significant number selected any of the response options more than others.

B2.5 General lifestyle (15 questions): these explored the choice of healthy food, time frames between meals and snacks, dietary requirements, menu selection while eating out, seeking assistance from family and friends, notification of condition to colleagues, clinic and doctor appointments, weight control, ensuring exercise activities, maintenance of normal glucose levels while exercising, feet inspection, consumption of healthy diabetic diet food at home. The respondents were asked to choose the one option from a 5-point Likert agreement scale that best applies to them from: 1 definitely not, 2 probably not, 3 might be, 4 probably and 5 definitely to a set of statements regarding their general lifestyle. Definitely not, probably not, might be and probably were grouped together as definitely not, and the other option is definitely. Those who responded 'not applicable' were excluded from this analysis. A chi-square goodness-of-fit test was used to test if a significant number selected any of the response options more than others.

3.8 Pilot study

The pilot study was to identify mistakes, to check the reliability and validity of the questionnaire and understand the applicability of the questions, and if need be, change the questions to suit the sample population in order to meet the study objectives (Polit and Beck 2012: 745).

The modified instrument was pre-tested on five chronic T2DM patients who met the inclusion criteria at a local diabetic clinic at a health facility in the Ugu District of KZN.The modified questionnaire was piloted with the respondents' data, which was not included in the sample group of the data collection. The five patients completed the questionnaires and there was 100 percent response rate for the pilot study conducted at the diabetic clinic. No changes were made to the questionnaire at this stage, as the pilot study population indicated an understanding of the questions and experienced no difficulty completing the questionnaire. On assessment after the pilot study, the questionnaire was found to be effective in capturing the information required for this study.

3.9 Data collection process

Data collection refers to the systematic collecting of data required for the purpose of the research (Polit and Beck 2012: 197). Data collection commenced after ethical clearance had been obtained from the Durban University of Technology (DUT) Institutional Research Ethics Committee (IREC) (Annexure 8). Furthermore, written consents were obtained from the author for use of the questionnaire (Annexure 7); DoH KZN Health Research (Annexure 9); Ugu District Manager (Annexure 10); Chief Executive Officers at the six public health institutions (Annexures 11,12,13,14,15 and 16 consecutively) and Operational Manager at the public health institution for pilot study (Annexure 17).

Data was collected over four months until the required number for the sample size (267) was reached. Recruitment was done with the aid of English and IsiZulu advertisement (Annexure 6, 7) placed at the various institutions, which were read out to the patients who were waiting to be consulted by the nurses and medical practitioners. Patients were also approached as they arrived in the waiting area. They were presented with an overview of this study and asked if they were keen to participate in the research study. The patients were given the information letter and consent form to sign prior to being allowed to participate in this study (Annexure 4 and 5). They were informed that the data would be treated as confidential, that they would not be penalised for not participating, nor would they lose their place in the queue while completing the questionnaire.

A quiet area with seating was used at the facilities for completing the questionnaire by the patients, which were handed out by the researcher and research assistant after obtaining consent from the patients, who were available to assist while it was completed. The questionnaire was completed within 30 minutes by the patients with the help of the research assistant when required, as the patients were IsiZulu speaking. Those patients with chronic T2DM associated complications, who encountered difficulty in completing the questionnaire, were helped by the IsiZulu speaking research assistant. The questionnaire (Annexures 2 and 3) and consent (Annexures 4 and 5) were translated into isiZulu for isiZulu speaking patients.

Data was collected in a consistent manner, with all the questionnaires being taken to the facility by the researcher, who remained on the premises during the day to assist with data collection. There were two boxes for collection of questionnaires, one for the informed consent and one for the questionnaire, so that the participants could not be identified by the informed consent attached to the questionnaire. The researcher and research assistant collected the questionnaires from the participants and deposited the respective forms into the appropriate boxes, which were kept in the area allocated for the completion of questionnaires.

These boxes were locked with an opening for insertion of the questionnaires and consent forms. At the end of each day, the two boxes were taken by the researcher for safe keeping until data collection was completed at the four hospitals and two community health centres. Two hundred and sixty-seven questionnaires were handed out to the patients and the response rate was one hundred percent. The questionnaires will be kept for five years, which is the institution's policy, and thereafter shredded. The electronic data captured will be deleted from technological devices after five years.

3.10 Data analysis and interpretation

Descriptive and statistical analyses were used to analyse data.

A: Demographic data (11 questions): was descriptively analysed and summed with numbers and percentages to provide a context to the study respondents.

B1: Knowledge attitude and perceptions (14 questions): to establish their knowledge, attitude and perceptions about appropriate nutrition, treatment and compliance, regime and general lifestyle. They were required to select one option: correct, incorrect, I don't know, to establish their level of knowledge, attitude and perceptions of T2DM. The data was initially descriptively analysed to sum the numbers, after which it was statistically analysed to obtain results. An independent samples t-test was applied to establish if there was a significantly different score between the two genders. ANOVA testing (analysis of variance) was applied across the demographic variables of age, race, educational levels, marital status, types of

employment and suffering time against the knowledge, attitude and perception score.

B2: Self-management (57 questions) - divided into 5 sub-sections:

1. **Nutrition (7 questions):** factor analysis was applied to these items to establish if they were grouped together into a few meaningful factors under the construct of nutrition. Factor analysis extraction with Promax rotation was applied to the six items. Bartlett's test (p<.05) indicated that correlations between items were not too low. The first group measured the food content and the second snacking at night using Cronbach's alpha. The factors can be interpreted as food content and night snacks, and were tested for reliability using Cronbach's alpha, with an Alpha>.7 being considered to indicate a reliable measure.

2. **Treatment (10 questions):** a 5-point Likert agreement scale was used, with 1 being strong disagreement and 5 being strong agreement. Strongly disagree, disagree and neutral were combined as disagree, while agree and strongly agree were combined as agree. In order to test if there was significant agreement or disagreement to each item, a one-sample t-test was applied. A t-value could not be computed for these statements as the standard deviation was zero and all participants gave the same answers. Furthermore, these variables will not have a p-value as the variance is zero.

3. **Regime (12 questions):** a 5-point Likert agreement scale was used, where 1 represented never and 5 always. Never, seldom and now and then were grouped together as seldom, while often and always were combined as always. This data is ordinal and categorical, with the t-test therefore not being applicable. In order to test if there was significant frequency to each item, a chi-square goodness-of-fit test was used.

4. **Treatment and compliance (13 questions):** a 5-point Likert agreement scale was used, where 1 represents definitely not, 4 represents definitely and 5 represents not applicable. Definitely not, probably not, might be and probably were grouped together as definitely not, while the other statement is definitely. Those

for whom it was not applicable were excluded from this analysis. A chi-square goodness-of-fit test was used to test if a significant number selected any of the response options more than others.

5. **General lifestyle (15 questions):** a 5-point Likert agreement scale was used where 1 represented definitely not, 4 represents definitely and 5 represented not applicable. Definitely not, probably not, might be and probably were grouped together as definitely not, while the other statement was definitely. Those who responded not applicable were excluded from this analysis. A chi-square goodness-of-fit test was used to test if a significant number selected any of the response options more than others.

A statistician was consulted for assistance with the statistical analysis, with the data collected being analysed using SPSS statistical analysis software version 27.0. The results of all the questions were analysed using descriptive statistics, and included means, frequencies and standard deviations where applicable, to enable the findings, conclusions and recommendations of the study. All the responses to the questions were analysed descriptively to present as totals and percentages, and in some cases mean and standard deviations. The demographic data provided an indication of who was included, with age and gender being important to establish the generalisability of the results in this community.

Regarding the 14 knowledge, attitude and perception questions, these were categorised into the sections included in Section B2, that being nutrition, regime, treatment and compliance, and general lifestyle. This was analysed descriptively to establish their level of knowledge, this being important to assist the health professionals to address any gaps regarding the management and treatment of T2DM. The five components of Section B2 were analysed separately to establish how they managed their conditions, and then statistically analysed with the demographic data of age, gender, ethnicity, highest educational qualification, marital status, and employment status, receipt of social grant, duration of suffering, associated illnesses, hospitalisation and clinic attendance, to establish any correlation between these variables.

Inferential techniques included a number of tests that were interpreted using the *p*-values. Chi-square goodness-of-fit-test is a univariate test that was used on categorical variables to test whether any of the response options were selected significantly more/less often that the others. Under the null hypothesis, it was assumed that all responses were equally selected. Chi-square goodness-of-fit test was used to test for significant number of samples (N=267) for regime, treatment and compliance and general lifestyle under section B2 of self-management practices. The ANOVA tests were used for several independent samples that compared two or more groups of cases into one variable. ANOVA testing (analysis of variance) was applied across the demographic variables of age, race, educational levels, marital status, types of employment and suffering time against the knowledge, attitude and perception scores. Furthermore, ANOVA testing was done for nutritional statement of food content and night snacks across age, race, educational level, marital status and employment.

Binomial tests establish whether a significant proportion of respondents selected one of a possible two responses, and can be extended when data with more than two response options is split into two distinct groups, being used to test knowledge, attitude and perceptions statement across male and female gender. Testing was also done for nutritional statement of food content and night snacks across male and female gender. One sample t-test establishes whether a mean score is significantly different from a scalar value. A one-sample t-test was applied to establish if there was significant agreement or disagreement to each item of the nutrition statement. The mean agreement score was tested against the neutral score of '3'. In order to test if there was significant agreement or disagreement to each item of the treatment statement, a one-sample t-test was applied, with the t-test value being equal to 3.

Independent samples t-test is a test that compares two independent groups of cases. An independent samples t-test was applied to the knowledge, attitude and perception statement to establish if there was a significantly different score between the two genders, with the results showing this not to be the case. For testing across gender, an independent sample t-test was done as there were only two categories in gender for nutritional statement of food content and night snacks. For all the statistical tests a *p* value of <.0005 was regarded as significant.

3.10 Validity

Validity concerns the soundness of the study's evidence, which is whether the findings are unbiased and well grounded (Polit and Beck 2012: 745). Content validity concerns the degree to which an instrument has an appropriate sample of items for the construct being measured (Polit and Beck 2012: 745). Content validity index was important as the questionnaire was modified by the researcher. Measuring the validity of the tool was important to establish the degree to which the tool covered the content it was supposed to measure. The modified instrument was constructed on a sound and extensive literature review. The instrument was examined, by the experts in the fields of research at the Department Research Committee at Durban University of Technology, Faculty Research Committee and finally at the Institutional Research Ethical committee, for overall suitability and appropriateness for the study.

310.1 Face Validity

Face validity is whether the instrument looks like it is measuring the target construct. Here it appears to measure what it is supposed to measure (Polit and Beck 2012: 745). Many experts reviewed the instrument at the various committees at Durban University of Technology. The face validity was good with no major remarks given by the experts. Content and face validity preceded the actual collection of data for the study.

3.10.2 Criterion- related validity

An instrument is said to have criterion-related validity if the scores on the instrument in question, correlates highly with scores on an external criterion (Polit and Beck 2012: 745).

3.11 Reliability

Reliability refers to the degree of consistency or dependability with which an instrument measures an attribute (Polit and Beck 2012: 741). The pilot study was conducted to assess for reliability. The modified instrument was pre-tested on five chronic T2DM patients at a local diabetic clinic at one health facility. This data was not used in the final analysis and only collected to establish any challenges and to make changes to the questionnaire. No changes were made after the pilot study was conducted, with the

questionnaire being regarded as representing the concepts being examined, the knowledge, attitude and perceptions of people with T2DM as related to self-management practices.

The questionnaire was translated from English to IsiZulu and back to English to ensure that the questions were the same in both language and that the responses obtained could be relied upon as being credible. The psychometrical evaluation of a set of instruments to evaluate the effectiveness of diabetes patient education (Duprez *et al.* 2013: 433-435), was used as a modified tool for data collection. Diabetes knowledge has been identified as one of the key determinants of adherence to diabetes self-management practices (Kugbey, Asante and Adulal 2017: 2), with T2DM requiring a long-term approach to care and a good synergy between hospitals and primary care resources (Graffigna *et al.* 2016: 7).

Cronbach's alpha coefficient was the test used to establish internal consistency and reliability of the study. Factor analysis was applied to the seven nutrition questions to establish if they were grouped together into a few meaningful factors under the construct of nutrition. Factor analysis extraction with Promax rotation was applied to the six items. Bartlett's test ($p<.05$) indicated that correlations between items were not too low. The first group measured the food content and the second snacking at night using Cronbach's alpha. The factors can be interpreted as food content and night snacks, and were tested for reliability using Cronbach's alpha, with an Alpha>.7 being considered to indicate a reliable measure.

3.12 Ethical considerations

When conducting a research study, it is important for the researcher to uphold the rights of others and to be aware of the study impacting negatively on the sample population. This consideration may include a number of moral principles generally accepted in research committees in all disciplines (Polit and Beck 2012: 742). The study was conducted once the ethical clearance was obtained from the Durban University of Technology (DUT) Institutional Research Ethics Committee (IREC) (Annexure 9). Once the proposal was approved by the IREC, permission to conduct the research was obtained from the KZN Department of Health (DOH), Ugu District Manager, Chief

Executive Officers and Deputy Nurse Managers at the four public hospitals and two community health centres (Annexures 10. 11.12 .13.14.15.16 and 17) respectively.

3.12.1 Confidentiality and anonymity

The autonomy of prospective respondents was respected, as they were required to volunteer their participation in this study by signing an informed consent document prior to commencing with the completion of the questionnaire (Polit and Beck 2012: 742). Autonomy and self-determination were the respondent's ability to voluntarily decide whether or not to participate in a study (Polit and Beck 2012: 742). The questionnaire was identified using numbers not respondents' names so as not to link respondents' identity with the information. Care has been taken to ensure the privacy of respondent's information (Polit and Beck 2012: 742). The following measures were adopted to ensure confidentiality regarding respondents' information: immediately following completion of the questionnaires, the researcher removed the documents from the respective clinics to ensure that completed questionnaires were not viewed by others and the respondents' names on the questionnaires were coded with numbers to ensure the confidentiality.

3.12.2 Permission and informed consent

The information letter outlined the aim and objectives of this study, and process of data collection, and the respondents were required to sign an informed consent prior to participating in this study (Annexure 4 and 5). They were informed that they have the right to withdraw at any point of time for which there would be no penalty. The information letter (Annexures 4 and 5) given to patients prior to completing the questionnaire, gave accurate information about the research and the purpose of this study. The provision of the researcher's details and contact numbers gave the patients credible information to empower them with a personal choice as to whether they would like to participate in this study or not.

3.12.3 Respect for human dignity and protection from harm

The principles of beneficence and justice were upheld during this study. Beneficence is a fundamental ethical principle that seeks to maximise benefits for study respondents and prevent harm (Polit and Beck 2012: 720). Justice was the respondents right to fair

selection, treatment and privacy with the researcher selecting participants for reasons directly related to the study problem and not because they are readily available (Polit and Beck 2012: 720).

3.13 Conclusion

This descriptive, cross-sectional survey entailed the use of a modified questionnaire that was administered to 267 participants who attended diabetic clinics in the Ugu District of KZN to manage their T2DM condition. The method of data collection from the different hospitals and community health centres and the ethical principles incorporated into the research was explained. Methods of data analysis to obtain the results from the captured quantitative data were included in this Chapter 3. Chapter 4 will indicate the findings and statistical analysis of data collected from 267 respondents suffering from chronic T2DM.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter presents the findings of the data as obtained from the structured questionnaire in the Ugu District of KZN at four hospitals and two community health centres. The objectives of this study were firstly to assess the knowledge, attitude and perceptions of people with T2DM as related to their self-management practices, and secondly, to examine their self-management practices. The data was firstly analysed using descriptive statistics, followed by inferential techniques to obtain the results. The demographic results are followed by those of Objective 1 and Objective 2 of the 267 questionnaires, a 100% response rate with few incomplete questions. Table 4.1 presents the study objectives and the associated method used to obtain the results.

4.2 Description of statistical analysis

Data was analysed by the Statistical Package for Social Science (SPSS, Version 27) and was presented in graphs, frequency distribution tables and percentages. A critical part of any research project is the accurate representation of analysed data, and presentation and discussion of the results in a systematic and logical manner. The following tests were used to analyse the data:

- Descriptive statistics including means and standard deviations, where applicable. Frequencies are represented in tables or graphs;
- Chi-square goodness-of-fit-test: A univariate test, used on a categorical variable to test whether any of the response options are selected significantly more/less often that the others. Under the null hypothesis, it is assumed that all responses are equally selected;
- ANOVA. A test for several independent samples that compares two or more groups of cases in one variable;
- Binomial test: Tests whether a significant proportion of respondents select one of a possible two responses. This can be extended when data with more than 2 response options is split into two distinct groups;
- One sample t-test: Tests whether a mean score is significantly different from a scalar value and
- Independent samples t-test: A test that compares two independent groups of cases.

The *P*-value and Confidence interval were as follows:

There is significant disagreement that they check the content of the food they eat and buy, M=2.49, t (266) = -13.364, p<.0005. There is significant disagreement that they check their blood glucose levels at night and have a snack, if necessary, M=2.49, t (266) = -13.872, p<.0005.

Data analysis contains demographic characteristics, medical conditions and assessment of the knowledge, attitude and perceptions of people with T2DM as related to their self-management practices. Furthermore, data analysis contains ANOVA testing of knowledge, attitude and perception score across the demographic variables; the self-management practices of people with T2DM; response to nutrition statements, response to treatment statements N= (267); factors food content and night snacks from nutrition statement.

Factor analysis was applied to these nutrition statements to see if the statements together could combine into a few meaningful factors under the construct of nutrition. For this analysis, items 1 and 2 are regarded as a single item, as their responses are identical; when at a party/social gathering "I watch what I eat and drink". Factor analysis extraction with Promax rotation was applied to the six items. Treatment statements N= (267); treatment and compliance, chi-square goodness-of-fit test (N=267); Regime statements, chi-square goodness-of-fit test: for significant number of samples (N=267) and general lifestyle, chi-square goodness-of-fit test: for significant number of the samples N= (267) were also analysed

Table 4.1 Study Objectives and methods

Objectives		Method
1	To assess the knowledge, attitude and perceptions of people with T2DM as related to self-management practices.	Structured questionnaire, Descriptive and statistical analysis
2	To establish the self-management practices of people with T2DM.	

4.3 Demographic characteristics

Section A of the questionnaire contained questions about the 267 respondents' demographic details, with Table 4.2 showing that the majority (53.2%) were male, aged 51 to 60 years (47.6%), Black African (70.0%) and had obtained a high school education (70%). Approximately half (53.6%) were married, the majority (n=107, 40.1%)

were employed by others and 30.7% (n=82) received social grants. The *p-value* column was omitted as they were all the same value of *p*<.0005.

Table 4.2 Demographic Characteristics

Variable	Characteristics	No (%)	Variable	Characteristics	No (%)
Gender	Male	142 (53.2)	Receipt of social grant	Yes	82 (30.7)
	Female	125 (46.8)		No	185 (69.3)
Age	41-50	58 (21.7)	Marital status	Married	143 (53.6)
	51-60	127 (47.6)		Single	88 (33)
	61-70	65 (24.3)		Widowed	24 (9)
	>70	17 (6.4)		Divorced	12 (4.5)
Ethnicity	Black	187 (70)	Employment status	Employed by others	107 (40.1)
	Coloured	17 (6.4)		Self-employed	33 (12.4)
	White	39 (14.6)		Unemployed	47 (17.6)
	Indian	24 (9)		Retired	78 (29.2)
Highest education	Primary school	70 (26.2)		Other	2 (0.7)
	High school	187 (70)			
	Post matric	10 (3.7)			

The results for the period of time the respondents suffered from T2DM showed that 52.8% (n=141) had the disease for more than 10 years, with 77.5% (n=207) having previously been hospitalized due to medical conditions (Table 4.3). The respondents indicated that they visited the clinic monthly to have their assessments done, collect medication and receive ongoing health education from the health team, with 100% (n=267) attendance. Over two thirds of the respondents suffered from all the indicated medical conditions, with over three quarters being affected by high blood pressure (87.9%, *p*<.0005); heart disease (75.3%, *p*<.0005) (Table 4.3).

Table 4.3 Medical conditions

Variable	Characteristics	No.	%	*p-value*
Duration of type 2 diabetes	1-<5 years	67	25.1	<.0005
	5-10 years	59	22.1	<.0005
	>10 years	141	52.8	<.0005
Hospitalised at any stage of their condition.	Group 1: Yes	207	78	<.0005
	Group 2: No	60	22	<.0005
Clinic attendance	Yes	267	100	Nil
Variable	Characteristics	Present No. (%)	Absent No. (%)	*p-value*
Incidence of medical conditions	High blood pressure	234 (87.9)	33 (12.4)	<.0005
	Heart disease	201 (75.3)	66 (24.7)	<.0005
	High cholesterol	181 (67.8)	86 (32.2)	<.0005
	Kidney failure	185 (69.3)	82 (30.7)	<.0005
	Blindness	178 (66.7)	89 (33.3)	<.0005
	Skin infections	182 (68.2)	85 (31.8)	<.0005

4.4 Objective 1: To assess the knowledge, attitude and perceptions of people with Type 2 diabetes as related to self-management practices

Section B1 of the questionnaire contained statements related to knowledge, attitude and perceptions of Type 2 diabetes with respect to nutrition, treatment, regime, treatment and compliance, and general lifestyle, being required to select one options from correct, incorrect or I do not know. The statistician changed the response options to 'true', 'false' and 'I don't know', in order to prevent any confusion with the analysis. The 'I don't know' option was scored as incorrect for the 14 items (Table 4.4).

Table 4.4 Knowledge, attitude and perception statements about diabetes in relation to self-management practices.

Glycaemic control	Correct No. (%)	Incorrect/ **I don't know** No. (%)
Nutrition		
1. Drinking a diet coke is effective to prevent hypoglycaemia.	153 (57.3)	114(42.7)
2. Diabetic patients should only pay attention to reducing sugar intake.	51 (19.1)	216 (80.9)
TOTAL	204	330
Regime		
1. Quitting smoking is important for people with diabetes.	101 (37.8)	166 (62.2)
2. There is a test that your doctor can use to measure your average blood sugar control during the previous 3 months.	29 (10.9)	238 (89.1)
TOTAL	130	404
Treatment and compliance		
1. Injecting insulin or taking tablets without having breakfast in the morning can lower your blood sugar.	61 (22.8)	206 (77.2)
2. A high blood sugar level can result from too little insulin.	115 (43.1)	152(56.9)
3. You don't need to inject insulin if you feel sick and feverish and cannot eat.	39 (14.6)	228 (85.4)
4. The insulin is best kept in the refrigerator.	23 (8.6)	244 (91.4)
5. Blood pressure of a diabetic patient should be regularly monitored.	89 (33.3)	178 (66.7)
6. Total cholesterol of a diabetic patient should be regularly monitored.	111 (41.6)	156 (58.4)
7. You should avoid using exactly the same spot to inject your insulin.	69 (25.8)	198 (74.2)
TOTAL	507	1362
General lifestyle		
1. A low blood sugar level may result from too little physical activity.	108 (40.4)	159(59.6)
2. A low blood sugar level can be prevented by lying down and resting.	46 (17.2)	221 (82.8)
3. Stress can increase your blood sugar.	51 (19.1)	216 (80.9)
TOTAL	205	596

The results of the sample percentage and the knowledge, attitude and perception score in Figure 4.1 indicates that 3.7% obtained a knowledge score of 7.1%, 23.6% scored 28.6% on the knowledge section and 1.1% scored 57.1% on knowledge. A very small proportion of the sample scored high on the knowledge level.

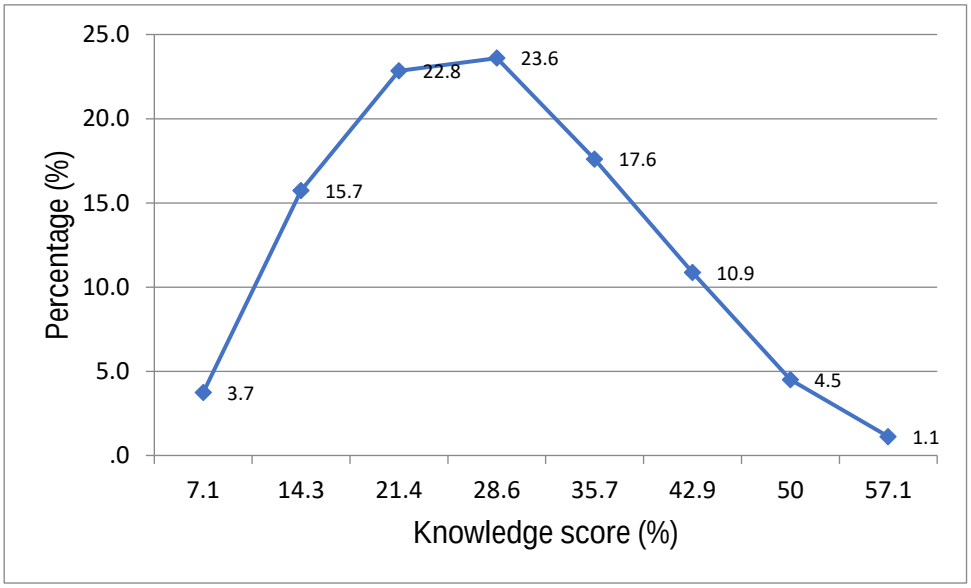

Figure 4.1 Percentage of sample with knowledge, attitude and perception score.

An analysis was done to establish if this knowledge, attitude and perception scores differed significantly across various demographic characteristics. An independent samples t-test was applied to establish if there was a significantly different score between the two genders, with the results showing that there was no difference between the two genders. Table 4.5 depicts the gender, knowledge, attitudes and perception scores.

Table 4.5 Gender and knowledge, attitude and perception scores

	Gender	No	Mean	Std. Deviation	St. Error Mean
Knowledge percentage	Male	142	27.77	11.76	.987
	female	125	28.23	10.23	.915

ANOVA testing (analysis of variance) was applied across the demographic variables of age, race, educational levels, marital status, types of employment and suffering time against the knowledge, attitude and perception score. The results showed that none of the demographic variables significantly affected the respondents' level of knowledge, attitude and perception (Table 4.6).

Table 4.6 ANOVA testing of knowledge, attitude and perception score across the demographic variables

Variable	Characteristics	No.	Mean	Std. Deviation	St. Error
Age	41-50	58	27.588	12.0851	1.587
	51-60	127	28.630	10.9720	.9736
	61-70	65	27.808	10.6584	1.322
	>70	17	25.206	9.8273	2.384
Race	Black	187	27.924	11.3282	.8284
	Coloured	17	26.471	11.2511	2.729
	White	39	28.213	11.3627	1.819
	Indian	24	29.171	8.4136	1.717
Educational levels	Primary school	70	27.347	11.0134	1.316
	Some/all high school	187	28.079	10.9462	.8005
	Post matric Diploma/ Certificate	10	30.710	13.9207	4.402
Marital status	Married	143	28.122	11.1028	.9285
	Single	88	28.006	10.9006	1.162
	Widowed	24	27.988	11.9080	2.430
	Divorced	12	26.200	11.1170	3.209
Types of employment	Employed by others	107	28.172	10.7033	1.034
	Self-employed	33	27.921	12.3048	2.142
	Unemployed	47	29.034	12.1377	1.770
	Retired	78	26.835	10.2533	1.161
	Other	2	39.300	15.1321	10.700
Duration of type 2 diabetes	1-<5 years	67	27.721	11.7737	1.438
	5-10 years	59	28.932	10.5651	1.375
	>10 years	141	27.715	11.0542	.9229

4.5 Objective 2: To examine the self-management practices of people with T2DM.

Section B2 of the questionnaire contained statements related to nutrition (7 questions); treatment (10 questions); regime (12 questions); treatment and compliance (16 questions) and general lifestyle (13 questions). The self-management practices of the T2DM patients were indicated on a Likert scale for the five sections of nutrition, treatment, regime, treatment and compliance and general lifestyle.

4.5.1 Nutrition

The respondents were required to rate their responses from strongly disagree, disagree. neutral, agree and strongly agree to a set of statements on nutrition (Table 4. 7). A 5-point Likert agreement scale was used, with 1 being strong disagreement and 5 strong

agreement. Strongly disagree, disagree and neutral were combined as 'disagree', while agree and strongly agree were combined as 'agree'. A one-sample t-test was applied to test if there was significant agreement or disagreement to each item. The mean agreement score was tested against the neutral score of '3'. The response to 'I eat several snacks in the evening to avoid hypoglycaemia at night' was answered by 264 of the 267 respondents, with the significance level being 0.53. The results showed that there was significant disagreement for all the nutrition statements, indicating that the respondents are non-compliant or are disempowered with good nutrition practice for diabetes.

Table 4.7: Response to nutrition statements

Statement	Disagree No. (%)	Neutral No. (%)	Agree No. (%)	Mean (SD)	t statistic	df	*p*-value
1. When at a party/ social gathering, I watch what I eat. (n=267)	82 (30.7)	126 (47.2)	59 (22.1)	2.91 (0.72)	-1.95	266	0.053
2. When at a party/social gathering, I watch what I drink. (n=267)	82 (30.7)	126 (47.2)	59 (22.1)	2.91 (0.72)	-1.95	266	0 .053
3. I watch the fat in my food. (n=267)	171 (64)	47 (17.6)	49 (18.4)	2.54 (0.79)	-9.50	266	<.0005
4. I check the amount of sugar in the products I want to buy when I go to the supermarket. (n=267)	172 (64.4)	Nil	95 (35.6)	2.71 (0.96)	-4.91	266	<.0005
5. I check the amount of fat in the products I want to buy when I go to the supermarket. (n=267)	238 (89.1)	Nil	29 (10.9)	2.22 (0.62)	-20.52	266	<.0005
6. I eat several snacks in the evening to avoid hypoglycaemia at night. (n=264)	146 (54.7)	71 (26.6)	47 (17.6)	2.63 (0.59)	-7.91	263	<.0005
7. I check my blood glucose level before going to sleep and if necessary, I eat a snack to avoid hypoglycaemia at night. (n=267)	186 (69.7)	66 (24.7)	15 (5.6)	2.36 (0.59)	-17.85	266	<.0005

Bartlett's test – $p<.0005$ – indicates that correlations between items are not too low. The six nutrition items were grouped into two groups. Items 1 and 2 were dropped as they did not correlate well enough with the other items on food content, resulting in two measures for nutrition; food content and snacking. The first group measured the food content and the second snacking at night using Cronbach's alpha. These factors are tested for reliability using Cronbach's alpha. Alpha>.7 is considered to indicate a reliable measure. These responses are presented in Tables 4.8 and 4.9.

Table 4.8: Factors food content and night snacks from nutrition statement

Factor/Construct	Label	Items included	**Cronbach's alpha**
F1 – food content	Content	3, 4 and 5	0.672
F2 – night snacks	Snack	6 and 7	0.710

Table 4.9: Agreement/disagreement: Food content and night snacks from nutrition statement

	N	Mean	Std. Deviation	t-statistic	df
Content	267	2.4906	.62278	-13.364	266
Snack	267	2.4888	.60221	-13.872	266

In order to test if there is significant agreement or disagreement with each item, a one-sample t-test was applied. The mean agreement score was tested against the neutral score of '3'. There is significant disagreement that they check the content of the food they buy and eat =2.49, t (266) = -13.364, p<.0005. There is significant disagreement that they check their blood glucose levels at night and have a snack if necessary=2.49, t (266) = -13.872, p<.0005. Testing was done for significant differences across demographics. For testing across gender, an independent sample t-test was done as there are only two categories, while for the other variables, the ANOVA test was used as there are more than two categories. There were no significant differences across the genders (Table 4.10)

Table 4.10: Testing across gender from nutrition statement

	Gender	N	Mean	Std. Deviation	Std. Error
Content	Male	142	2.4906	.61334	.05147
	Female	125	2.4907	.63581	.05687
Snack	Male	142	2.5106	.63712	.05347
	Female	125	2.4640	.56145	.05022

There were no significant differences across age groups (Table 4.11)

Table 4.11: Testing across age from nutrition statement

Age		N	Mean	Std. Deviation	Std. Error
Content	41-50	58	2.4943	.64961	.08530
	51-60	127	2.5276	.60777	.05393
	61-70	65	2.3692	.60703	.07529
	>70	17	2.6667	.67700	.16420
	Total	267	2.4906	.62278	.03811
Snack	41-50	58	2.5345	.59870	.07861
	51-60	127	2.5276	.60523	.05371
	61-70	65	2.3538	.56405	.06996
	>70	17	2.5588	.70450	.17087
	Total	267	2.4888	.60221	.03685

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There was a significant difference in checking the food content across different race groups (Table 4.12), Welch (3, 47.136) = 3.354, *p*=.027. Blacks agreed significantly more than Whites that they check the content of their food before they buy and eat. Welch test was used as the conditions for ANOVA were not satisfied.

Table 4.12: Testing across race from nutrition statement

Race		N	Mean	Std. Deviation	Std. Error
Content	Black	187	2.5437	.65379	.04781
	Coloured	17	2.5490	.72592	.17606
	White	39	2.2991	.41035	.06571
	Indian	24	2.3472	.52456	.10707
	Total	267	2.4906	.62278	.03811
Snack	Black	187	2.4786	.62611	.04579
	Coloured	17	2.6176	.48507	.11765
	White	39	2.5769	.61279	.09812
	Indian	24	2.3333	.43406	.08860
	Total	267	2.4888	.60221	.03685

There was a significant difference in checking the food content across education levels, Welch (2, 35.351) = 12.243, *p*<.0005. Those with primary or secondary schooling only agree significantly more than those with post matric qualifications, that they check the content of their food before they buy and eat (Table 4.13).

Table 4.13 Testing across educational levels from nutrition statement

Education levels		N	Mean	Std. deviation	Std. Error
Content	At most primary school	70	2.5000	.63385	.07576
	Some/all high school	187	2.5080	.62821	.04594
	Post matric diploma/certificate	10	2.1000	.22498	.07115
	Total	267	2.4906	.62278	.03811
Snack	At most primary school	70	2.4929	.59887	.07158
	Some/all high school	187	2.4893	.61338	.04485
	Post matric diploma/certificate	10	2.4500	.43780	.13844
	Total	267	2.4888	.60221	.03685

There was a significant difference in checking the food content across education levels, Welch (2, 35.351) = 12.243, *p*<.0005 (Table 4.14).

Table 4.14 Robust Tests of Equality of Means, content and snack from nutrition statement

		Statistic	df1	df2	Sig.
Content	Welch	12.243	2	35.351	.000
Snack	Welch	.039	2	25.503	.962

The married, single and widow agree more than the divorced that they check the content of the food before they buy and eat. The married, single and widow agree more than the divorced that they check their blood glucose levels at night and have a snack if necessary (Table 4.15).

Table 4.15: Testing across marital status from nutrition statement

Marital status		N	Mean	Std. deviation	Std. error
Content	Married	143	2.5315	.62076	.05191
	Single	88	2.3939	.59916	.06387
	Widowed	24	2.7917	.71433	.14581
	Divorced	12	2.1111	.21711	.06268
	Total	267	2.4906	.62278	.03811
Snack	Married	143	2.5699	.62687	.05242
	Single	88	2.3807	.58228	.06207
	Widowed	24	2.5833	.54507	.11126
	Divorced	12	2.1250	.22613	.06528
	Total	267	2.4888	.60221	.03685

There was a significant difference in checking the content of the food before they buy and eat, checking their blood glucose levels at night and having a snack, if necessary, across marital status, Welch (11.318), $p<.0005$ (Table 4.16).

Table 4.16 Robust Tests of Equality of Means, content and snack from nutrition statement

		statistic	df1	df2	Sig.
Content	Welch	11.318	3	52.475	.000
Snack	Welch	10.079	3	52.017	.000

There were no significant differences across the types of employment (Table 4.17)

Table 4.17 Testing across types of employment from nutrition statement

Content	Employed by others	107	2.5670	.60780	.05876
	Self-employed	33	2.4444	.68550	.11933
	Unemployed	47	2.4326	.59350	.08657
	Retired	78	2.4060	.59978	.06791
	Total	265	2.4805	.61386	.03771
Snack	Employed by others	107	2.5888	.59800	.05781
	Self-employed	33	2.4848	.63103	.10985
	Unemployed	47	2.4043	.57708	.08418
	Retired	78	2.3718	.56658	.06415
	Total	265	2.4792	.59396	.03649

4.5.2 Treatment

The respondents were required to rate their responses from strongly disagree, disagree, neutral, agree and strongly agree to a set of statements on nutrition (Table 4.18). A 5-point Likert agreement scale was used where 1 being strong disagreement and 5 being strong agreement. Strongly disagree, disagree and neutral went together as disagree whilst agree and strongly agree were combined. In order to test if there is significant agreement or disagreement to each item, a one-sample t-test was applied. The t-test value is equal to 3, with the results being presented in Table 4.18.

Table 4.18: Treatment N= (267)

Statement	Responses			Mean (SD)	T stats	df	p-value
	Disagree N (%)	Neutral N (%)	Agree N (%)				
I read the patient information leaflet carefully for each drug I take.	257 (96.3)	9 (3.4)	1 (.4)	2.04 (.217)	-72.137	266.	<.0005
I measure my blood glucose level before each meal.	256 (95.9)	Nil	11 (4.1)	2.08 (.398)	-37.650	266.	<.0005
I check my blood glucose level more frequently when I am ill N= (263).	253 (94.8)	Nil	10 (3.7)	2.08 (.383)	-39.099	262.	<.0005
I inspect my feet.	18 (6.7)	Nil	249 (93.3)	3.87 (.502)	28.138	266.	<.0005
I check my body weight.	255 (95.5)	6 (2.2)	6 (2.2)	2.07 (.329)	-46.322	266.	<.0005
I wear appropriate shoes for a diabetic	247	6	11	2.14	-26.845	265	<.0005

patient N= (266).	(92.5)	(2.2)	(4.1)	(.525)		.	
I get a podiatrist to care for my feet nails.	267 (100)	Nil	Nil	2.00 (.000)	nil	nil	<.0005
I visit the dietician at least once a year N= (264).	Nil	Nil	264 (98.9)	1.00 (.000)	nil	nil	<.0005
I visit the podiatrist at least once a year.	267 (100)	Nil	Nil	1.00 (.000)	nil	nil	<.0005
I visit the ophthalmologist at least once a year.	78 (29.2)	Nil	189 (70.8)	3.42 (.911)	7.455	266	<.0005

A t-value could not be computed for these statements as the standard deviation was zero and they all answered the same. Furthermore, these variables will not have a *p*-value as the variance is zero. There is significant agreement regarding: inspection of their feet; annual visitation to the dietician and annual visitation to the ophthalmologist. There is significant disagreement regarding: reading of patient information leaflet for the drugs the respondents are taking; measurement of their blood glucose levels prior to their meals; checking of their blood glucose levels frequently during their illness periods; measuring their body weight; wearing off appropriate shoes for a diabetic person and annual visits to the podiatrist.

4.5.3 Regime

The respondents were required to rate their responses from never, seldom, now and then, often and always to a set of statements on regime (Table 4.18). A 5-point Likert agreement scale was used where 1 represents never and 5 represents always. Never, seldom and now and then were grouped together as seldom, whilst often and always were combined as always. This data is ordinal and categorical therefore the t-test is not applicable. In order to test if there is significant frequency to each item, application of a chi-square goodness-of-fit test was used (Table 4.19).

Table 4.19: Regime, chi-square goodness-of-fit test: for significant number of samples (N=267)

Statement	Responses		Chi-Square	df	Asym p. Sig.
	Seldom N (%)	Always N (%)			
I avoid smoking tobacco.	96 (36)	171 (64.1)	155.828[a]	4	.000
I reduce sports/physical activity to avoid hypoglycaemia when my blood glucose level is already low.	35 (13.1)	232 (86.9)	178.944[b]	2	.000
I participate in physical activity/sports.	86	181	33.801[c]	1	.000

	(32.2)	(67.8)			
I carry glucose with me.	140 (52.4)	127 (47.6)	70.584[b]	2	.000
When I undertake extreme/great physical exertion, I inject less insulin than I usually do N= (266).	60 (22.6)	206 (77.4)	80.135[d]	1	.000
I carry a snack with me if I participate in physical activity.	236 (88.4)	31 (11.6)	157.397[c]	1	.000
I carry an insulin pen with me.	236 (88.4)	31 (11.6)	157.397[c]	1	.000
I carry a glucose meter with me.	256 (95.9)	11 (4.1)	232.337[b]	2	.000
When I meet new people, I inform them about my disease.	64 (24)	203 (76)	221.753[b]	2	.000
I wear a medical bracelet to allow others to recognise me as a diabetic patient.	257 (96.2)	10 (3.7)	228.498[c]	1	.000
I inject insulin in the presence of others N= (264).	259 (98)	5 (1.9)	375.205[e]	2	.000
I measure my glucose levels in the presence of others N= (266).	266 (100)	Nil	162.647[d]	1	.000

A significant majority of the sample of always: 76% inform new people of their disease when they meet them; 77.4% inject less insulin than they usually do when undertaking extreme/great physical exertion; 67.8% participate in physical activity/sports; 86.9% reduce sports/physical activity to avoid hypoglycaemia when their blood glucose level is already low and 64.1% avoid smoking tobacco. The full (100%) sample seldom: measure their blood glucose levels in the presence of others; inject insulin in the presence of others; wear a medical bracelet to allow others to recognise them as a diabetic patient; carry a glucose meter with them; carry an insulin pen with them and carry a snack with them if when participating in physical activity. Factor analysis was unsuccessful.

4.5.4 Treatment and compliance

The respondents were asked to choose the one option that best applies to them from definitely not, probably not, might be, probably, definitely and not applicable a set of statements regarding treatment and compliance. A 5-point Likert agreement scale was used where 1 represents definitely not, 4 represents definitely and 5 represents not applicable. Definitely not, probably not, might be and probably were grouped together as definitely not, whilst the other statement is definitely. Those for whom it was not applicable were excluded from this analysis. A chi-square goodness-of-fit test was used,

to test if a significant number selected any of the response options more than others. The results are presented in Table 4.20.

A significant majority (79.3%) of the respondents is definitely able to take their diabetic tablets as prescribed when away from home and ill. Furthermore, a significant majority (100%) of the respondents is definitely not able to: decide when it is necessary to consult a nurse or a doctor; measure their blood glucose levels themselves; record their blood glucose levels in a daily diary; (82.3%) question their diabetes nurse or doctor about the treatment of their diabetes; properly correct a low or high blood glucose level and to recognise a high or low blood sugar level early enough to allow correction. A significant majority of the respondents believe that it is not applicable for them to; adjust their insulin dose in special situations, for example, when doing sports, when attending parties; adjust their insulin dose to the measured blood glucose when they are ill; administer to themselves their daily required number of insulin injections; code their glucose meter and correctly interpret their blood sugar level. Factor analysis was unsuccessful.

Table 4.20: Treatment and compliance, chi-square goodness-of-fit test (N=267)

Statement	Responses		Chi-Square	df	Asymp. Sig.
	Definitely not. N (%)	Definitely N (%)			
To correctly interpret my blood sugar level N= (266).	63 (23.7)	nil	8.397[a]	1	.004
To code my glucose meter.	67 (25.1)	Nil	25.090[b]	1	.000
To administer to myself the daily required number of insulin injections.	68 (25.5)	Nil	31.118[c]	1	.000
To adjust my insulin dose in special situations e.g., when doing sport; when attending parties etc.	71 (26.6)	Nil	33.817[d]	1	.000
To adjust my insulin dose to the measured blood glucose when I am ill.	75 (28.1)	Nil	49.613[e]	1	.000
To take my diabetic tablets as prescribed when away from home and ill N= (266).	55 (20.7)	211 (79.3)	91.489[f]	1	.000
To recognise a high blood sugar level early enough to allow correction.	267 (100)	Nil	79.708[g]	2	.000
To recognise a low blood sugar level early enough to allow correction.	267 (100)	Nil	79.708[g]	2	.000
To properly correct a high blood glucose level.	267 (100)	Nil	251.663[g]	2	.000

To properly correct a low blood glucose level.	267 (100)	Nil	251.663[g]	2	.000
To question my doctor about the treatment of my diabetes (N=266).	218 (82)	48 (18)	235.857[h]	2	.000
To question my diabetes nurse about the treatment of my diabetes.	220 (82.3)	47 (17.6)	241.169[g]	2	.000
To record my blood glucose levels in a daily diary N= (265).	265 (100)	Nil	63.155[i]	2	.000
To measure my blood glucose levels myself N= (266).	266 (100)	Nil	64.744[h]	2	.000
To decide when it is necessary to consult a doctor.	267 (100)	Nil	72.067[g]	2	.000
To decide when it is necessary to consult a nurse.	267 (100)	Nil	69.371[g]	2	.000

4.5.5 General lifestyle

The respondents were asked to choose the one option that best applies to them; from definitely not, probably not, might be, probably and definitely to a set of statements regarding their general lifestyle. A 5-point Likert agreement scale was used where 1 represents definitely not, 4 represents definitely and 5 represents not applicable. Definitely not, probably not, might be and probably are grouped together as definitely not, whilst the other statement is definitely. Those who responded not applicable were excluded from this analysis. A chi-square goodness-of-fit test was used, to test if a significant number selected any of the response options more than others. The results are summarised in Table 4.21.

Table 4.21: General lifestyle, chi-square goodness-of-fit test: for significant number of the samples N= (267).

Statement	Responses		Chi-Square	df	Asymp. Sig.
	Definitely not N (%)	Definitely N (%)			
To choose healthy food suitable for diabetic patients in a restaurant.	267 (100)	Nil	171.775	2	.000
To take into account recommended time frames in between meals and snacks.	241 (90.3)	26 (9.7)	54.423	3	.000
To keep to my dietary requirements.	267 (100)	Nil	56.719	2	.000
To make a good menu selection when I go out to eat N= (266).	266 (100)	Nil	146.211	3	.000
To ask for help from my family and friends to manage my diabetes.	267 (100)	Nil	64.281	3	.000
To notify my colleagues and others about my diabetes if	267 (100)	Nil	166.674	2	.000

required.					
To keep my appointments with the clinic.	266 (99.6)	Nil	63.534	1	.000
To keep my appointments with my general practitioner N= (266).	266 (100)	Nil	63.534	1	.000
To control my weight myself N= (266).	266 (100)	Nil	62.038	2	.000
To ensure sufficient exercise, by walking or cycling.	107 (40.1)	160 (60)	10.521	1	.000
To keep my blood glucose within normal ranges when being active or stressed.	259 (97)	8 (3)	171.787	3	.000
To inspect my feet daily.	267 (100)	Nil	66.899	2	.000
To eat healthy food suitable for diabetic patients when I eat at home.	249 (93.2)	18 (6.7)	86.225	2	.000

A significant majority (60%) of the respondents were definitely able to ensure sufficient exercise by walking or cycling. Furthermore, a significant majority (93.2%) were definitely not able to: eat healthy food suitable for diabetic patients when they eat at home; (100%) inspect their feet daily; (97%) keep their blood glucose within normal ranges when being active or stressed; (100%) control their weight themselves; (100%) notify their colleagues and others about their diabetes if required; (100%) ask for help from family and friends to manage their diabetes; (100%) make a good menu selection when they go out to eat; (90.3) take into account recommended time frames in between meals and snacks; (100%) choose healthy food suitable for diabetic patients in a restaurant; (100%) to keep their dietary requirements and keep their appointments with their general practitioner or clinic.

4.6 Conclusion

The results of the sample percentage and the knowledge, attitude and perception score was very poor. A very small proportion of the sample scored high on the knowledge level. The results showed that none of the demographic variables significantly affected the respondents' level of knowledge, attitude and perception. The results showed that there is significant disagreement to all the nutrition statements. There is significant agreement regarding the treatment, regime, treatment and compliance and general lifestyle statements. Chapter 5 will utilise these findings, elaborate on the results and make recommendations.

CHAPTER 5: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discussed the results and indicated how these findings relate to studies reported elsewhere. The study aimed to assess the knowledge, attitude and perceptions that affect the self-management practices of people with T2DM at selected public sector health facilities in the Ugu District of KZN.

In this chapter the conclusions, recommendations, limitations and areas for further research are presented. CSM of illness representation and self-regulation was used to guide this study. As attitudes and perceptions are navigated by accurate knowledge of the disease, ensuring that people have the correct information is essential, if they are going to make the appropriate lifestyle and behaviour changes to manage their health threat (Lambrinou, Hansen and Beulens 2019:55).

The process of how people perceive their health threat (illness representation), and what needs to happen for them to make changes (coping), is clarified in CSM. The CSM contends that three stages of cognitive and emotional processes occur, that is illness representation (identity, cause, timeline, consequences and control), coping (avoidance/denial, cognitive evaluation, expressing emotions, problem focused coping and seeking social support) and evaluation (the individual assesses coping and progress leading to lifestyle modification and behaviour changes).

The cognitive (knowledge and attitude) and emotional (feelings and perceptions) processes, regulate appropriate self-management practices such as nutrition, treatment and regime, treatment and compliance and general lifestyle of patients suffering from various chronic conditions, for example, T2DM. The three main factors for effective diabetes management are education, self-care procedures and necessary behaviour changes to manage the health threat (Lambrinou, Hansen and Beulens 2019:55).

In order to discuss the results reported in Chapter 4, it is worthwhile to reflect on the objectives of the study which were:

Objectives		Method
1	To assess the knowledge, attitude and perceptions of people with T2DM as related to self-management practices.	structured questionnaire
2	To establish the self-management practices of people with T2DM.	

The discussion focuses on the following aspects that were indicated as being important from the analysis:

1. Demographic characteristics;
   a. Testing for significant differences across demographics;
   b. Gender and knowledge, attitude and perceptions scores across demographic characteristics and
   c. ANOVA testing of knowledge, attitude and perceptions score across the demographic variables.
2. Objective 1. Knowledge, attitude and perceptions of people with T2DM in relation to self-management practices;
3. Objective 2. Self-management practices of people with T2DM;
   a. Nutrition in relation to self-management practices;
   b. Agreement/disagreement: Food content and night snacks;
   c. Treatment and regime in relation to self-management practices;
   d. Treatment and compliance in relation to self-management practices and
   e. General lifestyle in relation to self-management practices.

5.2 Demographic characteristics

Altogether 267 individuals, the majority (53.2%) were male, aged 51 to 60 years (47.6%), Black African (70.0%) and had obtained a high school education (70%), completed the questionnaires. Approximately half (53.6%) were married, the majority (n=107, 40.1%) were employed by others and 30.7% (n=82) received social grants. These demographics are representative of the bigger population with half being male, mainly Black African and married. Furthermore, these results can be generalised to the whole population of the Ugu district of KZN.

In the current study, the respondents suffering from T2DM showed that 52.8% (n=141) had the disease for more than 10 years, with 77.5% (n=207) having previously been

hospitalized due to medical conditions. Over two thirds of the respondents suffered from all the indicated medical conditions, with over three quarters being affected by high blood pressure (87.9%, $p<.0005$) and heart disease (75.3%, $p<.0005$).

This is an evident lack of knowledge of risk factors and poor appropriate self-management practices among the population in this study. Ignorance of risk factors for T2DM may impede preventative efforts for associated medical complications. A knowledge-based perception for potential complications of the disease appears to be an important factor in various preventative health behaviours. These findings are consistent with the results from the study done by Jia, Hill and Sowers, (2018:625), where the prevalence of cardiac disease increased in diabetic (39%) compared with nondiabetic (23%) patients (Jia, Hill and Sowers, 2018:625). Adults with T2DM are mainly diagnosed with associated complications of weight gain, raised cholesterol levels and high blood pressure (Alsairafi 2016: 24-25). Conversely findings from another study disclosed that increased mortality rates are due to cardiovascular and non-cardiovascular causes such as kidney disease and chest infections (Standl *et al.* 2019:11).

The results from the present study disclosed that the respondents visited the clinic monthly to have their assessments done, collected medication and received ongoing health education from the health team, with 100% (n=267) attendance. The 100% clinic attendance depicts commitment and responsibility from the diabetic patients. Here the individual appears to be taking ownership towards their own health and wellness as reflected in Leventhal's CSM. These findings are supported by Kpekura (2018:3794), who concluded a positive correlation between adherence to medication and level of knowledge on drug adherence. Furthermore, organised systems for timeous advanced screening for diabetes, generic treatment for diabetics, and the use of primary health care system will enable individuals in Africa to access diabetes care (Sinclair 2019:6).

a. Testing for significant differences across demographics

In this study there were no significant differences across the genders, nor were there any significant differences across the age groups. There was a significant difference in checking the food content across the different race groups, Welch (3, 47.136) = 3.354,

p=.027. Black Africans agreed significantly more than Whites that they check the content of their food before they buy and eat.
These findings do not correspond with the results from the study done by Pamungkas *et al*. (2020:257) in Indonesia where females enjoyed sweets and drinks more than males, whereas males defaulted with medication compliance and effective sugar monitoring than females.

The findings from the present study revealed a significant difference in checking the food content across education levels, Welch (2, 35.351) = 12.243, *p*<.0005. Those with primary or secondary schooling only agree significantly more than those with post matric qualifications that they check the content of their food before they buy and eat. The married, single and widow agree more than the divorced that they check the content of their food before they buy and eat, that they check their blood glucose levels at night and have a snack if necessary. There were no significant differences across the types of employment.

b. Gender and knowledge, attitude and perception scores across demographic characteristics.

This study discovered that there was no difference between the two genders regarding knowledge, attitude and perception score. However, in a study by Fatema *et al.,* (2017:7) men revealed increased levels of information, while women revealed better attitudes and practice than men (Fatema *et al.* 2017:7).

c. Knowledge, attitude and perception score across demographic variables.

This study showed that none of the demographic variables significantly affected the respondents' level of knowledge, attitude and perception. In a similar study conducted by Kpekura (2018:3792) found that there were no differences among age groups of the respondents in their knowledge (*p*=0.568) and attitude (*p*=0.501) towards diabetes patients. However, females *(p*=0.025) were more knowledgeable in diabetic condition than males whereas their attitude towards the condition was similar (*p*=0.79). Again, their marital status did not influence their knowledge and attitude about diabetic condition. The respondents were largely knowledgeable (*p*=0.0001) and had positive attitude *(p*=0.0001) towards the disease. Educational levels, occupation, religion,

duration of contracting T2DM and total income of the participants did not influence their knowledge and attitude towards the disease (*p>0*.05) (Kpekura 2018:3792).

5.3 Objective 1: Knowledge, attitude and perceptions of people with T2DM in relation to self-management practices.

For Objective 1, Leventhal's CSM contends that having the correct knowledge will result in appropriate attitudes and perceptions being held by the individual about a health condition, which in turn will result into appropriate self-management practices being followed to manage the condition, prevent associated complications and death.

According to Wan *et al.* (2017: 166), T2DM patients should have the knowledge to understand the condition, progression and necessary self-management practices. Furthermore, according to Al-Sahouri, Merrel and Snelgrove (2019: 10), knowledge alone is not enough to change self-management practices, and knowledge should be complemented by appropriate behaviours and positive attitudes toward diabetes and the treatment plan. Knowledge accrues from both education and experience and possessed by diabetics, refers to the comprehension of the disease, its progression, and the self-management practices necessary for keeping diabetes under control (Rav-Marathe, Wan and Marathe 2016:4). Furthermore, knowledge of diabetes can prevent the development of chronic comorbidities of T2DM, which impact significantly on the quality of life of the diabetic patients (Fatema *et al.* 2017:2).

The findings of the present study disclosed that the sample percentage and the knowledge, attitude and perception score indicated that 3.7% obtained a knowledge score of 7.1%, 23.6% scored 28.6% on the knowledge section and 1.1% scored 57.1% on knowledge, attitude and perceptions. A very small proportion of the sample scored high on the knowledge level. This indicates a significant ignorance of the knowledge of T2DM among the population of the Ugu District and the negative impact on KZN health departments and the community. Lack of knowledge is not only a barrier to early detection of the disease, but also the cause of poor self-management by diabetics. Self-management practices are the key elements in T2DM management.

This is consistent with the findings by Fatema *et al.* (2017:6), where knowledge, attitude and practice survey among the general population of rural Bangladesh found that decreased level of information was associated with less attention of predisposing factors of T2DM. In addition, a study by Kpekura (2018:3793), showed elevated numbers of respondents with poor information, bad attitude and decreased practices with regard to diabetes. A statistically significant correlation was found between knowledge and attitude scores, indicating that better knowledge about diabetes could be associated with a more positive attitude towards diabetes (Kpekura 2018:3795). On the other hand, a study by (Muchiri, Gericke and Rheeder 2016:30) revealed that poor (low) knowledge scores in patients may reflect inadequate empowerment by health workers who either do not have the necessary information or are not health educating appropriately on T2DM.

a. Nutrition

The significant findings in this study on nutrition show that 27.3% correctly answered the question whether drinking a diet coke is effective to prevent hypoglycaemia and 19.1% scored correctly whether T2DM patients should only pay attention to reducing sugar intake. A low percentage of the population scored correctly highlighting the lack of knowledge regarding nutrition and T2DM. Similarly results from a study conducted by Lambrinou, Hansen and Beulens, (2019:57), reported that diabetic persons empowered with dietary knowledge experiences good glucose control and positive decisions towards behaviour and practice.

Moreover, another study conducted by Alkhatib *et al.,* (2017:2) revealed that the Mediterranean diet is therapeutic for T2DM due to the polyphenol content of fruit and olive oil. Good nutrition allows diabetic people to prevent complications and live a quality life. (Alkhatib *et al.* 2017:9). In addition, Alsairafi (2016:53) and Muchiri, Gericke and Rheeder (2016:30) in their studies revealed that enlightened T2DM individuals have a shared responsibility regarding the disease threat and lifestyle change to ensure control and prevent complications.

b. Treatment and Regime

Regarding knowledge on a test that your doctor can use to measure your average blood sugar control during the previous three months, very few (10.9 %) answered correctly. Conversely, Bett (2019:3) found that structured diabetes education is an important step for reducing blood glucose levels and controlling diabetic complications. Few respondents (37.8%) in the current study understand that quitting smoking is important for people with diabetes. This indicates a significant ignorance on the risk factors for T2DM among the population of the Ugu district. In a study Pamungkas, Chamroonsawasdi and Vatanasomboon (2017:2), stated that patients are given many tasks: attend medical appointments regularly, adhere to verifying medication regimens and engage in self-care practices, including at-home blood glucose monitoring, healthy dietary changes, and increased physical activity.

c. Treatment and Compliance

Regarding knowledge on injecting insulin or taking tablets without having breakfast in the morning can lower your blood sugar, 77.2% answered incorrectly, insulin is best kept in the refrigerator, 8.6% answered correctly and you should avoid using exactly the same spot to inject your insulin 25.8% answered correctly. This implies lack of critical knowledge of T2DM on treatment and compliance. However (Al-Sahouri, Merrel and Snelgrove 2019: 675-676) in a study revealed that diabetic people only displayed good taking of treatment as opposed to other factors such as foot care and nutrition.

Regarding knowledge on injecting insulin if you feel sick, feverish and cannot eat, 14.6% answered correctly in this study. However, in a study by Sahadew and Singaram (2016: 389), it was stated that patients with diabetes have been found to be prone to neutropenia and high risk for TB. Erzse *et al.* (2019:1) reported that 14 percent of cases of cardiac disease, ten percent of cerebrovascular accident, 12 percent of high blood pressure and 12 percent of renal disease were associated complications of diabetes.

According to Alsairafi (2016:54), high blood pressure lead T2DM patients to regularly check their readings, have eye tests and foot checks. Furthermore, a minimum number of patients on insulin tested their blood sugar levels for the others lacked insight or did not have the will power to do so (Alsairafi 2016:54). Knowledgeable individuals strive to

control their health threat for they understand their importance of regular blood glucose checks. (Alsairafi 2016:54).

d. General lifestyle

Concerning knowledge that a low blood sugar level may result from too little physical activity, 40.4% answered correctly; a low blood sugar level can be prevented by lying down and resting. 17.25 answered correctly; a high blood sugar level can result from too little insulin 43.1% answered correctly. This indicates a significant lack of knowledge about management of blood sugar levels. These findings are consistent with the results from the study by (Al-Sahouri, Merrel and Snelgrove 2019: 675-676), who discovered that unhealthy lifestyle behaviour such as high carbohydrate diet and physical inactivity are predisposing elements to hyperglycaemia and complications. In this study 19.1% of the respondents answered correctly that stress can increase your blood sugar levels. On the other hand, Al-Sahouri, Merrel and Snelgrove (2019:684) revealed that stress and family history were perceived as causes of developing diabetes.

5.4 Objective 2: Self-management practices of people with T2DM.

For Objective 2, Leventhal's CSM contends that the three stages of the model (illness representation, the action plan or coping stage and the evaluation stage), regulates self-management behaviour. The structure of the questionnaire was guided by the aim, objectives, research questions and the CSM. Nutrition had (seven questions), food content and snacks, treatment (ten questions) and regime (12 questions), treatment and compliance (13 questions) and general lifestyle behaviour (15 questions).

Education and support for self-care practices are essential for people with long term disease such as T2DM.It is vital to motivate people to attain good self-care procedures and lifestyle modification (Lambrinou, Hansen and Beulens 2019:55). The active role of individuals and families in preventing and managing T2DM could be the way forward in addressing the epidemic in SA (Lambrinou, Hansen and Beulens 2019:60). The patients who self-managed well showed good attitudes towards the health threat (Muchiri, Gericke and Rheeder 2016:32).

a. Nutrition in relation to self-management practices

Regarding knowledge of the respondents watching what they eat and drink at the social gathering, 22.1% agree, watching the fat in the food 35, 6% agree, checking the amounts of sugar in the products that are purchased 35.6% agree, checking the amount of fat in the products,10.9% agree, eating several snacks in the evening to avoid hypoglycaemia at night 17.6% agree and checking blood glucose level before going to sleep and if necessary, eating a snack to avoid hypoglycaemia at night, 5.6% agree. This study revealed that there was significant disagreement for all the nutrition statements, indicating that the respondents are lacking appropriate knowledge or non-compliant with good nutrition practice for diabetes in order to maintain good glucose blood levels.

This is consistent with the findings of Al-Sahouri, Merrel and Snelgrove, (2019:680), who disclosed that most of the patients in Jordan with diabetes did not follow a healthy, balanced diet as recommended by the dietitian and being reluctant to follow the diet was associated with poorly controlled diabetes. In addition, Van Den Berg, Mokhehle and Raubenheimer (2019:98) stated that traditional high-fibre, low-fat diets that are associated with the diverse intake of wild and self-cultivated fruit and vegetables, and physically active lifestyles, have been replaced by diets high in ultra-processed, low-fibre, high-fat, sugar-laden foods, the inadequate intakes of fruit and vegetables, little overall dietary diversity and increasingly sedentary lifestyles, continue to be risk factors for T2DM.

b. Agreement/disagreement: Food content and night snacks

The findings of the study revealed that there was significant disagreement regarding the checking of food content of the food that they buy and night snacks that they eat. There was also significant disagreement that they check their blood glucose levels at night and have a snack if necessary=2.49, t (266) = -13.872, p<.0005. This disagreement is reflective of the respondent's lack of knowledge or non-compliance towards good nutrition practice in diabetes.

Similarly, a study by Pamungkas, Chamroonsawasdi and Vatanasomboon, 2017:2) stated that factors linked with uncontrolled glycaemia in T2DM patients include

unhealthy eating habits, physical inactivity, nonadherence to medication, and lack of regular blood glucose monitoring. Furthermore Lambrinou, Hansen and Beulens, 2019:55) stated that insulin is regarded as the initial therapy needed to manage T2DM when the disease is diagnosed in a patient with clinical features of catabolism, such as weight loss in patients, ketonuria or ketoacidosis, random glucose of more than 16.7 mmol; women with gestational T2DM.

c. Treatment and regime in relation to self-management practice

The result from the present study revealed that there was significant agreement among the respondents regarding the inspection of their feet (93.3%). This is consistent with the findings of Van Netten, Woodburn and Bus (2019:5) that revealed the key of personalized medicine regarding diabetic foot disease was to deliver the right treatment to the right patient at the right time. This still covers the cornerstones of ulcer prevention (education and self-management; adequate footwear; treatment of risk factors), with varying treatment strategies within each cornerstone needing to be available for different patients. In addition, Pamungkas, Chamroonsawasdi and Vatanasomboon (2017:6) found that regular medication adherence was performed under family support, and increased self-awareness on foot inspections correlated to foot ulcer prevention.

The findings in this study revealed the significant agreement regarding the annual visit to the dietician, (98.9. %) and the ophthalmologist, (70.8%). This is evident of being knowledgeable about the associated complications of T2DM and taking responsibility for good glucose control and specialist consultations. Similar findings by Standl *et al.,* (2019:9) stated that T2DM is also the main cause of partial vision loss and blindness in people over 20 years old, and can result in various socio-psychological problems, such as job, family, driving, mood disorders and a poor quality of life.

In this study it was found that there was significant disagreement regarding the reading of patient information leaflet was (96.3%) and measuring their blood glucose levels before meals was (95.9%). This is consistent with the findings by Mashitisho and Mashitisho, (2016:15) where it was found that it is important for clinicians to initiate insulin therapy early so as to reach individualised glycaemic targets early, thereby preventing T2DM related complications. In addition, Lambrinou, Hansen and Beulens

(2019:60), also found that diabetes education will ensure that the patient has access to information on methods to safely monitor and control blood glucose levels and prevent associated costly complications.

The findings of this study revealed that the disagreement regarding the measuring of the respondent's body weight was (95.5%) and annual visits to the podiatrist were (100%). Similarly, it was found in a study by Pheiffer *et al.* (2018: 1) that in 2000, it was estimated that 87% of diabetes cases in SA were attributed to excess body weight, which is concerning, as in 2013, 38% of men and 69% of women were considered overweight or obese. Owing to its association with several microvascular and macrovascular complications, such as heart and kidney disease and blindness, T2DM places a significant burden on the health system (Pheiffer *et al.* 2018: 1-2). In addition, Kugbey, Asante and Adulal (2017:6) in a study found that diabetes knowledge to be predictive of self-care practices and management, such as prescribed diet, blood sugar testing and foot- care practices.

In this study it was found that a significant majority (76%) of the sample always informs new people of their disease when they meet them; 67.8% participate in physical activity/sports; 86,9% reduce sports/physical activity to avoid hypoglycaemia when their blood glucose level is already low and 64.1% avoid smoking tobacco. These findings are encouraging towards managing T2DM in the Ugu District and patients together with health care providers must be encouraged to continue managing this devastating health threat.

Conversely Pamungkas *et al.* (2020:257), in a study found that although patients had experienced living with diabetes mellitus, some participated less in the diabetes self-management programs at the community health centre. This was caused by a lack of motivation to adhere to the diabetes practices, with management issues, such as exercise, being the hardest part of the regime for T2DM patients. Furthermore, one study reported poor knowledge among patients about the effects of diabetes on the eye and kidney, and about the symptoms of hypoglycaemia and its treatment (Alsairafi 2016:53).

In this study it was found that the majority (100%) of the sample seldom measure their blood glucose levels in the presence of others; inject insulin in the presence of others (98%); wear a medical bracelet to allow others to recognise them as a diabetic patient 96.2%; carry a glucose meter with them 95.9%; carry an insulin pen with them 88.4% and carry a snack with them if when participating in physical activity 88.4%.This depicts the lack of knowledge and poor attitude and perceptions towards their health threat T2DM.

A similar study by Mashitisho and Mashitisho (2016:15), found that insulin is also considered in patients on maximum oral hypoglycaemic agents with unmet individualised glycaemic target. In addition, undiagnosed patients are likely to present late with acute or long-term complications that require insulin therapy and assistance from health care providers to manage (Bahendeka *et al.* 2019: 342) and Shiyanbola, Ward and Brown (2018:1) found that participants perceived those medications, faith in God, and positive thinking about survival helped control the condition. Improved diabetes self-management and medication adherence may depend on the meaning attached to diabetes, the available psychosocial support for managing T2DM and their associated experiences.

d. Treatment and compliance in relation to self-management practices

In this study it was found that 79.3% of the respondents were definitely able to take their diabetic tablets as prescribed when they were away from home or ill. This finding is positive towards managing the health threat in the Ugu District. Conversely a study by Shiyanbola, Ward and Brown (2018:2) found that medication nonadherence (not taking medicines as prescribed by a healthcare provider) is a complex behaviour that is prevalent among patients with T2DM. To help patients improve adherence behaviour, health care providers need to be aware of how different cultural contexts influence patients' knowledge and beliefs about diabetes. Studies have shown that illness perceptions influence whether patients take their medicines or not and hence should be taken into account in designing adherence interventions (Shiyanbola, Ward and Brown 2018:2).

The findings of the current study disclosed that all the respondents were unable to decide when it was necessary to consult a nurse or a doctor (100%); measure their blood glucose levels themselves (100%); record their blood glucose levels in a daily diary (100%); question their diabetes nurse or doctor about the treatment of their diabetes (82.3%); properly correct a low or high blood glucose level 100% and to recognise a high or low blood sugar level (100%) early enough to avoid complications. These findings are disturbing in the management of this already explosive disease that has resulted in many deaths locally and nationally.

Similar studies by Shiyanbola, Ward and Brown (2018:2), have found that healthcare providers can provide tailored interventions that address negative beliefs about diabetes and thereby influence medication compliance and Standl *et al.* (2019:12) found that due to the associated cardiovascular complications, appropriate diabetes therapy, including the use of glucose-lowering drugs; need to be widely available as well as risk factor reduction measures, with the overall aim of reducing morbidity and mortality.

e. General lifestyle in relation to self-management practices

In this study it was found that a significant majority (60%) of the respondents is definitely able to; ensure sufficient exercise by walking or cycling, (100%) inspect their feet daily; 97%) keep their blood glucose within normal ranges when being active or stressed; (100%) control their weight themselves. These findings are positive towards managing the health threat T2DM. Similarly, Bett (2019:3) found that diabetes education increases the patients' self-efficacy, which is essential in adjusting lifestyles, such as diet intake and exercise regime. The study highlighted the importance of structured diabetes education not only for the patients but the management practitioners, caregivers and community at large and Rav-Marathe, Wan and Marathe (2016:1) found that the goals of behavioural change are to: ensure good control of blood sugar through adherence to medications and diet, self-monitor blood sugar, develop healthy eating, perform 150 minutes of physical exercise weekly, and follow up with medical appointments. Such diabetes self-management programs have been shown to improve knowledge, attitude, and practice and health care outcomes

Furthermore in this study , a significant majority (93.2%) is definitely not able to; eat healthy food suitable for diabetic patients when they eat at home; (100%) notify their colleagues and others about their diabetes if required; (100%) ask for help from family and friends to manage their diabetes; (100%) make a good menu selection when they go out to eat; (90.3) take into account recommended time frames in between meals and snacks; (100%) choose healthy food suitable for diabetic patients in a restaurant and (100%) to keep their dietary requirements and keep their appointments with their general practitioner or clinic. These findings are negative towards the management of T2DM in the Ugu District.

Similar studies by Hasimoto *et al.* (2019:1) found that the self-management of T2DM, which involves adherence to medical instructions on diet and nutritional advice, physical activity, medication regimen, weight and stress management, is necessary for its treatment; Jia, Hill and Sowers (2018:626) found that Lifestyle changes, such as aerobic exercise, weight control and smoking cessation, are efficacious therapeutic approaches to preventing diabetic cardiomyopathy. In addition, sustained glycaemic control reduces the prevalence of diabetic cardiomyopathy and reduces cardiovascular disease; Pamungkas, Chamroonsawasdi and Vatanasomboon (2017:2) found that as people with T2DM are nested within their families and larger social environment, these factors can also influence a patient's diabetes care and Pamungkas, Chamroonsawasdi and Vatanasomboon (2017:2) found that family members are key sources of both instrumental and emotional support. Instrumental support includes helping patients' complete specific tasks, such as making an appointment with health care providers or helping with insulin injections, while emotional support can include providing comfort and encouragement when patients face distress or frustration over the long course of their diabetes care.

5.5 Recommendations.

Based on the study findings, the following recommendations are made.

The Department of KZN Health should:

- Ensure a supply of pamphlets to health facilities as a method of information dissemination using the local language, as most patients indicated a lack of written instructions on diet and exercise in IsiZulu;

- Organize awareness programs on T2DM risk, diabetes prevention and diabetes prevalence among the public of the Ugu District of KZN to reduce the burden of the disease and healthcare costs on individuals and their families.

Health care providers should:

- Be empowered to address the issues of poor glycaemic control among T2DM patients, chronic care needs and the barriers that influence their adherence to diabetes management plans;
- Receive ongoing training in updated diabetes care to improve patient self-management practices in cost-effective ways;
- Educate and counsel patients in diabetes management during every visit, which may have an impact in improving the perception about the disease, appropriate diet, and lifestyle changes and thereby on glycaemic control to prevent the associated complications of T2DM.
- Pay particular attention to affected persons with T2DM, living in rural areas regarding health education on self-management practices and regular follow up clinic visits, to prevent associated complications, limb amputations and death.
- Prevent T2DM and associated complications. There is an urgent need for co-ordinated educational campaigns collectively by the health sectors, with a prioritized focus on poorer, rural and less educated communities.

5.6 Future research

Separate studies may obtain more information in areas such as:

- Establish the main information sources for T2DM individuals regarding their disease, and how best to use these channels to improve their knowledge and enlighten them on the best self-management practices;
- Explore how community-based initiatives can strengthen self-management practices to prevent the associated complications;
- Explore areas of uncertainty about dietary advice, including the role of nuts, fruits, legumes, fish, plant oils, low fat versus high fat dairy, and diet quantity and quality;
- Investigate barriers for the implementation of guidelines on diabetes self-management practices both in urban and rural areas, as well as in the private and public healthcare settings;

- Investigate behavioural approaches to managing T2DM by understanding the patients' illness perception;
- Compare the intervention and health outcomes of diabetes self-management education with and without family involvement in the programs;
- Conduct a qualitative design into understanding the key motivations to engage in diabetes self-management practices in terms of barriers and enablers.

5.7 Limitations of the study

The limitations that may have affected the results of this study include the questionnaire, which focused more on knowledge questions and less on attitudes and perceptions. The questions on self-care management practices (nutrition, treatment, regime, treatment and compliance and general lifestyle) had to be aligned to knowledge, attitudes and perceptions of the patients in the Ugu District of KZN with T2DM. The findings of this study should be interpreted cautiously in the light of these limitations; however, they provide the foundation for future empirical studies among persons living with T2DM in relation to their self-management practices to prevent complications, disabilities and death.

5.8 Conclusion

This descriptive, cross-sectional survey entailed the use of a modified questionnaire that was administered to 267 participants, who attended diabetic clinics in the Ugu District of KZN to manage their T2DM condition. The study aimed to assess the knowledge, attitude and perceptions of people with T2DM as related to self-management practices, in the Ugu District of KZN at four hospitals and two community health centres.

The objectives of this study were:

1. To assess the knowledge, attitude and perceptions of people with T2DM as related to self-management practices.
2. To establish the self-management practices of people with T2DM.

Knowledge about T2DM in our population was found to be inadequate and low, 3.7% obtained a knowledge score of 7.1%, 23.6% scored 28.6% on the knowledge section and 1.1% scored 57.1% on knowledge. A very small proportion of the sample scored high on the knowledge level, aimed to determine the knowledge, attitude and perceptions of T2DM as related to self-management practices (nutrition, treatment and regime, treatment and compliance and general lifestyle practices). This is probably due

to inadequate information, non-availability of educational material and lack of appropriate guidance.

Poor knowledge about risk factors for T2DM can lead to poor control of the disease and added potential complications, amputations and death. Thus, there is a need for large awareness programs to be arranged for the general public and also for appropriate media to be identified and used, even in rural areas, to spread the message which could change future public attitudes and behaviour towards this health threat (T2DM). Recommendations have been made in this regard to KZN Health and the authorities of the Ugu District.

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ANNEXURE 1: English Patient questionnaire

Questionnaire No	

Section A: Demographic Data

Please complete the following by placing an X against the option that applies to you.

Select one option unless otherwise instructed

1. Gender

Male		Female	

2. Age

Up to 40 years	41-50 years	51-60 years	61- 70 years	Over 70 years

3. Ethnicity

Black	Coloured	White	Indian	Other

4. Highest Educational qualification

Primary school or less	Some/all High school	Post matric diploma/ certificate	University degree

5. Marital status

Married	Single	Widowed	Divorced

6. Employment status

Employed by others	Self-employed	Unemployed	Retired	Other

7. Do you receive a social grant?

Yes		No	

8. How long have you suffered from type II diabetes?

Less than 1 year	1- <5 years	5-10 years	More 10 years

9. Do you suffer from any of the illnesses listed below? Tick ALL that apply

9.1 High blood pressure. Happens when the blood pressure is high and causes problems in the body.	
9.2 heart disease. Damage and disease of the heart causing problems with the heart and breathing.	
9.3 High cholesterol levels in the blood. High cholesterol levels cause heart disease.	
9.4 Kidney failure. The kidneys become diseased and fail to remove waste products and balance fluids in the body.	
9.5 Blindness and vision loss. Damage to the structures of the eyes caused by poor blood flow.	
9.6 Wounds and skin infections. A break in the skin causing tissue damage and slow healing.	

10. Have you ever been hospitalised due to any of the above illnesses?

Yes		No	

11. Do you visit the clinic every month to have your assessments done, collect medication and receive ongoing health education from the health team?

Yes		No	

Section B: 1. Knowledge, attitude and perception of type II diabetes. Indicate whether the following statements about diabetes are correct or incorrect

Glycaemic control	Correct	Incorrect	Do not know
1.1 Drinking a diet coke is effective to prevent hypoglycaemia.			
1.2 A low blood sugar level may result from too little physical activity.			
1.3 A low blood sugar level can be prevented by lying down and resting.			
1.4 Injecting insulin or taking tablets without having breakfast in the morning can lower your blood sugar.			
1.5 A high blood sugar level can result from too little insulin.			
1.6 Stress can increase your blood sugar.			
1.7 You don't need to inject insulin if you feel sick and feverish and cannot eat.			
1.8 Diabetic patients should only pay attention to reducing sugar intake.			
1.9 The insulin is best kept in the refrigerator.			
1.10 Blood pressure of a diabetic patient should be regularly monitored.			
1.11 Total cholesterol of a diabetic patient should be regularly monitored.			
1.12 You should avoid using exactly the same spot to inject your insulin.			
1.13 Quitting smoking is important for people with diabetes.			
1.14 There is a test which your doctor can use to measure your average blood sugar control during the previous 3 months.			

2.Self-management of type II diabetes

2.1 Nutrition

Indicate your agreement with the following statements:

2.2 Treatment

Indicate your agreement with the following statements:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
2.2.1 I read the patient information leaflet carefully for each drug I take.					
2.2.2 I measure my blood glucose level before each meal.					
2.2.3 I check my blood glucose level more frequently when I am ill.					
2.2.4 I inspect my feet.					
2.2.5 I check my body weight.					
2.2.6 I wear appropriate shoes for a diabetic patient					
2.2.7 I get a podiatrist to care for my feet nails.					
2.2.8 I visit the dietician at least once a year.					
2.2.9 I visit the podiatrist at least once a year.					
2.2.10 I visit the ophthalmologist at least once a year.					

2.3 Regime

Indicate the frequency with which you do the following:

	Never	Seldom	Now & then	Often	Always
2.3.1 I avoid smoking tobacco					
2.3.2 I reduce sports/physical activity to avoid hypoglycaemia when my blood glucose level is already low.					
2.3.3 I participate in physical activity/sports					
2.3.4 I carry glucose with me.					
2.3.5 When I undertake extreme/great physical exertion, I inject less insulin than I usually do.					
2.3.6 I carry a snack with me if I participate in physical activity					
2.3.7 I carry an insulin pen with me.					
2.3.8 I carry a glucose meter with me.					
2.3.9 When I meet new people, I inform them about my					
2.3.10 I wear a medical bracelet to allow others to recognise me as a diabetic patient.					
2.3.11 I inject insulin in the presence of others.					
2.3.12 I measure my glucose levels in the presence of others.					

2.4 Treatment and Compliance

For each question, tick the **ONE** option that best applies to you.

I am able....	Definitely not	Probably not	Might be	Probably	Definitely	Not applicable
2.4.1 To correctly interpret my blood sugar level.						
2.4.2 To code my glucose meter.						
2.4.3 To administer to myself the daily required number of insulin injections.						
2.4.4 To adjust my insulin dose in special situations e.g., when doing sport; when attending parties etc						
2.4.5 To adjust my insulin dose to the measured blood glucose when I am ill.						
2.4.6 To take my diabetic tablets as prescribed when away from home and ill.						
2.4.7 To recognise a high blood sugar level early enough to allow correction.						
2.4.8 To recognise a low blood sugar level early enough to allow correction.						
2.4.9 To properly correct a high blood glucose level.						
2.4.10 To properly correct a low blood glucose level.						
2.4.11 To question my doctor about the treatment of my diabetes.						
2.4.12. To question my diabetes nurse about my diabetes treatment						
2.4.13 To record my blood glucose levels in a daily diary.						
2.4.14 To measure my blood glucose levels myself.						
2.4.15 To decide when it is necessary to consult a doctor.						
2.4.16 To decide when it is necessary to consult a nurse.						

2.5 General lifestyle

For each question, tick the **ONE** option that best applies to you.

I am able....	Definitely not	Probably not	Might be	Probably	Definitely	Not applicable
2.5.1 To choose healthy food suitable for diabetic patients in a restaurant.						
2.5.2 To take into account recommended time frames in between meals/snacks.						
2.5.3 To keep to my dietary requirements.						
2.5.4 To make a good menu selection when I go out to eat						
2.5.5 To ask for help from my family and friends to manage my diabetes.						
2.5.6 To notify my colleagues and others about my diabetes if required.						
2.5.7 To keep my appointments with the clinic.						
2.5.8 To keep my appointments with my general practitioner.						
2.5.9 To control my weight myself.						
2.5.10 To ensure sufficient exercise, by walking or cycling.						
2.5.11 To keep my blood glucose within normal ranges when being active or stressed.						
2.5.12. To inspect my feet daily.						
2.5.13 To eat healthy food suitable for diabetic patients when I eat at home						

Thank you for your participation

ANNEXURE 2: Isizulu patient questionnaire

Isigaba A: Isigaba A Imininingwane yakho

Ngicela uphendule lemibuzo ngokubeka uphawu X maqondana nempendulo. Uyacelwa ukuba ukhethe impendulo eyodwa ngaphandle uma utsheliwe

1. Ubulili

Owesilisa		Owesifazane	

2. Ubudala

Kuya ku 40 weminyaka	41 kuya ku 50 weminyaka	51 kuya ku 60 weminyaka	61 kuya ku 70 weminyaka	Ngaphezu kuka 70 weminyaka

3. Ubuzwe

Black	Coloured	White	Indian	Okunye

4. Ibanga lemfundo

Amabanga aphansi	Ngafika e High School	Nginesitifiketi emva kuka Matekuletseni	Ngine degree yasenyuvesi

5. Isimo somshado

Ngishadile	Angishadile	Ngingumfelokazi/ umfelwa	Ngehlukanisile	Ukuhlalisana kwabantu abangashadile

6. Izinga lokuqashwa

Ngiqashiwe	Ngiyazisebenza	Angisebenzi	Ngidla umhlalaphansi	Okunye

7. Uyasithola isibonelelo sikahulumeni?

Yebo		Cha	

8. Isikhathi esingakanani uphila nesifo sikashukela?

Ngaphansi konyaka owodwa	Unyaka kuya kwengaphansi kwengu 5	Iminyaka engu 5 kuya kwengu 10	Ngaphezu kweminyaka engu 10

9. Kukhona isifo esikuphathayo kulezi ezingezansi? Khetha konke okuvumelana nawe.

9.1 I high high. Yenzeka uma umfutho wegazi uphezulu bese yenza izinkinga emzimbeni.	
9.2 Isifo senhliziyo. Isifo senhliziyo sibanga izinkinga zenhliziyo nokuphefumula.	

9.3. Izinga lamafutha eliphezulu. Izinga lamafutha eliphezulu libanga isifo senhliziyo.	
9.4 Izinso ezingasebenzi. Izinso ziyehluleka ukukhipha ukungcola emzimbeni.	
9.5 Ukungaboni. Ukonakala kwamehlo okudalwa ukungahambi kahle kwegazi.	
9.6 Izilonda nezinkinga zesikhumba. Ukonakala kwesikhumba okungasheshi ukuphola.	

10. Usuke walala esibhedlela ngenxa yezifo ezihambelana nesifo sikashukela?

Yebo		Cha	

11. Uyazigcina kahle izinsuku zokuya emtholampilo nyangazonke?

Yebo		Cha	

Isigaba B

1 Ulwazi ngesifo sikashukela

Ukunakekelwa kwezinga likashukela	Yiqiniso	Yiphutha	Angazi
1.1 Ukuphuza i diet coke kuyasiza ukuvimbela ukwehla ngokweqile kukashukela egazini			
1.2 Ushukela owehle ngokweqile ungabangelwa ukungawunyakazisi umzimba.			
1.3 Ushukela owehle ngokweqile ungavinjelwa ngokuphumula noma ucambalale			
1.4 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.5 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.6 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.7 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.8 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.9 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.10 Ukujova noma ukuphuza amaphilisi ungadlile kungawehlisa ngokweqile ushukela			
1.11 Izinga lamafutha lomuntu onoshukela kumele liqashelwe.			
1.12 Kumele ugweme ukujova i insulin endaweni eyodwa			
1.13 Ukuyeka ugwayi kubalulekile kubantu abanoshukela			
1.14 Udokotela angakwazi ukuhlola isimo sikashukela sezinyanga ezintathu ezedlule			

2 Imibuzo yokuzinakekela kwabantu abanoshukela

2.1 Ukudla

Khetha impendulo eyodwa ngokubeka uhlamvu X

	Angivumelani nhlobo	Angivumi	Ngiphakathi nendawo	Ngiyavuma	Ngiyavuma kakhulu
2.1.1 Uma ngiya ephathini ngiyaqaphela ukuthi ngidlani.					
2.1.2 Uma ngiya ephathini ngiyaqaphela ukuthi ngidlani.					
2.1.3 Ngiyasiqaphela isilinganiso samafutha ekudleni kwami.					
2.1.4 Ngiyasiqaphela isilinganiso samafutha ekudleni kwami.					
2.1.5 Ngiyasiqaphela isilinganiso samafutha ekudleni kwami.					
2.1.6 Ngidla ama snacks amaningi kusihlwa ukuvimbela ukwehla kakhulu kukashukela					
2.1.7 Ngihlola ushukela egazini ngaphambi kokulala, futhi uma kungenzeka ngiyadla ukuvimbela ukwehla kakhulu kukashukela ebusuku.					

2.2 Ukwelashwa

Khetha impendulo eyodwa ngokubeka uhlamvu X

	Angivumelani nhlobo	Angivumi	Ngiphakathi nendawo	Ngiyavuma	Ngiyavuma kakhulu
2.2.1 Ngiyalifunda ipheshana eliphuma emaphilisini ami.					
2.2.2 Ngihlola ushukela njalo					
2.2.3 Ngihlola ushukela njalo					
2.2.4 Ngihlola ushukela njalo ngaphambi kokudla					
2.2.5 Ngiyasihlola isisindo sami.					
2.2.6 Ngigqoka izicathulo ezilungele abantu abanoshukela.					
2.2.7 Ngicela udokotela wezinyawo ukuba anakekele izinzipho zami					
2.2.8 Ngigqoka umeluleki wezokudla okungenani kanye					
2.2.9 Ngivakashela kudokotela wezinyawo okungenani kanye					
2.2.10 Ngivakashela kudokotela wamehlo okungenani kanye ngonyaka.					

2.3 Uhlelo

Khetha ukuthi lokhu okulandelayo ukwenza kangaki ngokubeka uphawu uX

	Akwenzeki	Kancane	Kuyenzeka kodwa akuvamile	Kuvamile	Njalo
2.3.1 Ngigwema ukubhema ugwayi					
2.3.2 . Ngehlisa izinga lokudlala/ lokuzivocavoca uma ushukela wami wehlile ukuze ungehli ngokweqile					
2.3.3 Ngizibandakanya kwezemidlalo					
2.3.4 Ngihlala ngiphethe i glucose					
2.3.5 Uma ngizivocavoca ngokuzikhandla, ngijova i insulin encane kunokujwayelekile ukuvimbela ukwehla kakhulu kukashukela					
2.3.6 Ngihlala ngiphethe okokudla uma ngiyodlala.					
2.3.7 Ngihlala ngiphethe ipeni lami le insulin.					
2.3.8 Ngihlala ngiphethe umshini wami wokuhlola ushukela.					
2.3.9 Uma ngihlangana nabantu ngiyabazisa ngesifo sami.					
2.3.10 Ngihlala ngiphethe uphawu ukuze abanye babone ukuthi nginoshukela					
2.3.11 Ngiyazijova nge insulin noma kukhona abanye abantu.					
2.3.12 Ngihlola izinga likashukela wami noma kukhona abanye abantu.					

2.4 Ukwelashwa

Khetha okuvumelana nawe ngokubeka uX.

Ngiyakhona uku….	Nakancane	Mhlawumbe	Kungenzeka	Kuyenzeka	Ngokuqinisekile	Akwenzeki
2.4.1 Ukufunda izinga likashukela wami						
2.4.2 Ukuhlela kahle umshini kashukela						
2.4.3 Ukuzijova ngendlela efanele						
2.4.4 Ukukala izinga elifanele le insulin ezimweni ezithize njengase-mdlalweni nasephathini						
2.4.5 Ukukala izinga elifanele le insulin uma ngigula						
2.4.6 Ukuphuza kahle amaphilisi ami uma ngingekho ekhaya						
2.4.7 Ukuzizwa ngokushesha uma ngikhushukelwa ushukela ngokweqile ukuze ngisizakale						
2.4.8 Ukuzizwa ngokushesha uma ngehlelwa ushukela ngokweqile ukuze ngisizakale						
2.4.9 Ukwehlisa ushukela okhuphuke ngokweqile						
2.4.10 Ukwenyusa ushukela owehle ngokweqile						
2.4.11 Ukubuza udokotela ngemithi yami kashukela						
2.4.12. Ukubuza umhlengikazi ngemithi yami kashukela						
2.4.13 Ukugcina izinga likashukela wami lansukuzonke ku diary						
2.4.14 Ukuhlola izinga likashukela wami						
2.4.15 Ukunquma isikhathi esifanele sokubonana nodokotela						
2.4.16 Ukunquma isikhathi esifanele sokubonana nomhlengikazi						

2.5 Ukuziphatha okujwayelekile

Khetha okuvumelana nawe ngokubeka uX

Ngiyakhona uku…	Nakancane	Mhlawumbe	Kungenzeka	Kuyenzeka	Ngokuqinisekile	Akwenzeki
2.5.1 Ukukhetha ukudla okunempilo e restaurant						
2.5.2 Ukuqaphela izikhathi zokudla						
2.5.3 Ukudla ngendlela efanele						
2.5.4 Ukukhetha i menu ekahle uma ngizikhiphile						
2.5.5 Ukucela usizo emndenini nezihlobo ukubhekana noshukela wami						
2.5.6 Ukwazisa engisebenza nabo nabanye ngesifo sami sikashukela						
2.5.7 Ukugcina izinsuku zami zasemtholampilo						
2.5.8 Ukugcina izinsuku zokubonana nodokotela wami						
2.5.9 Ukwehlisa isisindo somzimba wami						
2.5.10 Ukuzivocavoca ngokwanele ngokuhamba noma ukugibela ibhayisikile						
2.5.11 Ukugcina ushukela wami usezingeni elikahle uma ngizivocavoca noma ngingaphathekile kahle.						
2.5.12. Ukuhlola izinyawo zami nsukuzonke						

Ngiyabonga ngokubamba iqhaza

ANNEXURE 3: English letter of information and consent form

LETTER OF INFORMATION

Dear Participant.
Thank you for agreeing to be a part of this study by sharing your valuable contributions.

Title: Knowledge, attitude and perceptions of people with type 2 diabetes as related to self-management practices in the Ugu District of KZN Province.

Principal Investigator/s/researcher: Veslutchmei Nagura. Bcur Nursing Degree

Co-Investigator/s/supervisor/s: Dr A Razak (PhD – Honorary Research Fellow)
Miss L. Snell: Masters in Nursing

Brief Introduction and Purpose of the Study:
There is currently an alarming increase in the rate of T2DM and its complications in the country. T2DM is becoming a major medical and public health concern globally. Furthermore, T2DM is an important risk factor for high blood pressure, heart disease, raised cholesterol level, kidney disease, eye disease, delayed wound healing and skin infections. The aim of this study is to assess the knowledge, attitude and perceptions of people with type 2 diabetes as related to self-management in the Ugu District of KZN.

Title of the Research Study:
Knowledge, attitude and perceptions of people with T2DM as related to self-management practices in the Ugu district of KZN.

Outline of the Procedures:
This study involves a survey which is open to a consecutive sample of patients at the four (4) hospitals diabetic clinic and two (2) community health centres in the Ugu District of KZN. Your role in the study is to fill out questionnaires. I will bring the questionnaires to your diabetic clinic at your hospital to conduct this study with you. My research assistant and I will hand out the questionnaires to you and answer questions that you may have. The questionnaires will be available in English and isiZulu for these are the primary spoken languages of the research population. Questionnaire and consent translated into isiZulu for isiZulu speaking patients. In the case of participants who are not familiar with English, arrangements will be made for interpreters' assistance at the institutions for completion of questionnaires. The data collection tools will be identified using numbers not participants names so as not to link participants' identity and information.

Risks or Discomforts to the Participant:

There should be no risks or discomforts to you as a participant.
Benefits: Your participation in this study is voluntary. There is no payment for anyone involved in this study. A peer reviewed publication for the researcher and the awarding of a Master's degree. Knowledge gained from the study will add to the current body of knowledge pertaining to knowledge, attitude and perceptions of people with T2DM as related to self-management practices in the Ugu district of KZN.

Reason/s why the Participant May Be Withdrawn from the Study: You have the right to withdraw at any time if you care to. There will be no adverse consequences should you choose to withdraw for any reason.

Remuneration: There is no payment for anyone involved in this survey.

Costs of the Study: You will not incur any costs for participating in the survey.

Confidentiality: Code numbers will be used to ensure confidentiality so that data will not be linked to your name. Data will be kept in a secure place and no one except the research team will have access to original questionnaires. The documents will be shredded after five (5) years.

Research-related Injury: There is no risk of research-related injury. You as the participant are only required to complete questionnaires on demographic information, knowledge and self-management of type II diabetes mellitus.

Persons to Contact in the Event of Any Problems or queries:
Please contact the researcher Veslutchmei Nagura (0828591860), my supervisor Dr Ayesha Razak (0837867282) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support, Prof S Moyo on 031 373 2577 or moyos@dut.ac.za

CONSENT FORM

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher Veslutchmei Nagura, 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 computerized 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 / Right Thumbprint**

I, Veslutchmei 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**

ANNEXURE 4: IsiZulu letter of information and consent form

LETTER OF INFORMATION

Title of the Research Study: Isihloko socwaningo
Ukuhlola ulwazi lokuzinakekela kubantu abaphila nesifo sikashukela esifundeni sasOgwini KZN.

Principal Investigator/s/researcher:
Veslutchmei Nagura. Bcur Nursing Degree

Co-Investigator/s/supervisor/s: Dr A. Razak: PhD Nursing; Dr LA Hillerman: PhD in Nursing

Brief Introduction and Purpose of the Study: Incazelo kanye nenhloso yocwaningo
Kunokwenyuka ngokwethusayo kwesifo sikashukela nezifo ezihambelana naso. Ngokusho komnyango wezempilo Isifo sikashukela sesiphenduke inkinga yezempilo emhlabeni woke jikelele. Ngaphezu kwalokho isifo sikashukela sandisa amathuba okuphathwa yisifo senhliziyo; sezinso; izilonda ezingapholi nezinkinga zesikhumba. Inhloso yalolucwaningo ukuhlola ulwazi nokuzinakekela kwabantu abaphila nesifo sikashukela emaklinikhi kashukela asezibhedlela ezine esifundeni sasOgwini KZN

Uhlelo locwaningo:
Kulolucwaningo kuzoba nenhlolovo evulelekile ezokwenziwa ezigulini ezizothathwa emaklinikhi esifo sikashukela ezibhedlela ezine nemitholampilo emikhulu emibili esifundeni sasOgwini KZN. Kulindeleke ukuba uphendule imibuzo ebhalwe phansi. Ngizokulethela imibuzo eklinikhi lakho likashukela ukuze ngikusize. Mina nomsizi wami siyokusiza ukuphendula yonke imibuzo ongaba nayo. Imibuzo iyatholakala ngolimi lwesiNgisi nesiZulu njengezilimi ezikhulunywa kakhulu umphakathi okwenziwa kuwo ucwaningo. Imibuzo nemvume yocwaningo kuhunyushelwe esZulwini kulabo abakhuluma isZulu. Kulabo abangasikhulumi isiNgisi, imizamo yokuthola umuntu ozotolika ingenziwa ukuze babasize ukugcwalisa ifomu lemibuzo. Amaphepha emibuzo ayobhalwa izinamba kungafakwa amagama ukuze kuvikeleke amagama nolwazi oluphathelene nalabo abaphendulile.

Risks or Discomforts to the Participant: Ubungozi nokungaphatheki kahle: Akukho bungozi noma ukungaphatheki kahle okulindekile

Benefits: Izinzuzo Ukubamba iqhaza kwakho akuphoqiwe. Akukho nkokhelo etholwa ngokubamba iqhaza kulolucwaningo. UMcwaningi uyothola ukuba kushicilelwe ucwaningo kanye neziqu ze Masters.
Ulwazi olutholwe kulolucwaningo luzokwandisa ulwazi ngesifo sikashukela

Reason/s why the Participant May Be Withdrawn from the Study: Izizathu ezingenza ukuba ukhishwe kulolucwaningo

Unelungelo lokuphuma kucwaningo noma nini uma uthanda. Angeke kube namiphumela emibi kuwe uma wenze njalo. Kungaba ngezizathu zokugula noma ukwephula imigomo yocwaningo.

Remuneration: Inkokhelo: Akukho nkokhelo etholwa ngokubamba iqhaza kulolucwaningo.

Costs of the Study: Izindleko zocwaningo: Akukho zindleko oyobhekana nazo ngobamba iqhaza kulolucwaningo

Confidentiality: Ukugcinwa kwemininingwane eyimfihlo: Kuzosetshenziswa izinombolo ukuze kuvikelwe igama lakho. Imininingwane yocwaningo iyogcinwa endaweni ephephile futhi akukho muntu ngaphandle kwabacwaningi oyofinyelela kuyo. Amaphepha ayodatshulwa ngendlela ephephile ngemva kwesikhathi esifanele.

Research-related Injury: Ukulimala okuhambisana nocwaningo
Akukho bungozi bokulimala okuhambisana nocwaningo. Wena kulindeleke ukuba uphendule imibuzo ebhalwe phansi ephathelene nolwazi lokuzinakekela kwabantu abanesifo sikashukela.

Persons to Contact in the Event of Any Problems or Queries: Umuntu ongathintana naye uma kunenkinga noma imibuzo:
Please contact the researcher Veslutchmei Nagura (0828591860), my supervisor Dr Ayesha Razak (0837867282) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support, Prof S Moyo on 031 373 2577 or moyos@dut.ac.z

Ungathintana nomcwaningi uVeslutcmei Nagura (0828591860) umeluleki wami uDr Ayesha Razak kumbe obhekelele ezocwaningo esikhungweni semfundo ku 0837867282. Izikhalo zingabhekiswa kuMqondisi wezocwaningo uProf S Moyo ku 031 373 2577 General: Okunye

CONSENT/ INCWADI YEMVUME

Statement of Agreement to Participate in the Research Study: Imvume yokubamba iqhaza kucwaningo

- Ngiyavuma ukuthi uVeslutcmei Nagura ungichazele ngocwaningo, izinzuzo nobungozi bocwaningo
- Ngiyifundile ngayiqonda kahle incwadi echaza ngocwaningo
- Ngiyazi ukuthi imiphumela yocwaningo kuhlanganisa nemininingwane yami yobulili, igama lami, ubudala nesifo sami kuzophathwa ngendlela eyimfihlo.
- Ngiyavuma ukuthi ulwazi olutholakele lungafakwa ku computer ngumcwaningi.
- Nginelungelo lokuphuma ocwaningweni noma ngasiphi isikhathi .
- Ngithole ithuba elanele lokubuza imibuzo futhi ngiyavuma ukubamba iqhaza ocwaningweni
- Ngiyazi ukuthi nginelungelo lokwazi ngemiphumela yocwaningo

_____	_____	_____	_____
Full Name of Participant	**Date**	**Time**	**Signature / Right Thumbprint**

I, Veslutchmei 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**

ANNEXURE 5: English recruiting pamphlet

Topic: Knowledge, attitude and perceptions of people with T2DM as related to self-management practices in the Ugu District of KZN Province.

Study Objectives: T2DM is becoming a major medical and public health concern worldwide. With the increase in the number of people living with T2DM, it is important that knowledge, attitude, perceptions and self-management practices be explored to form interventions for early diagnosis and prompt treatment. With the right treatment plan, diabetes mellitus can be managed and lead a long, healthy and active life.

1. To explore the knowledge, attitudes and perceptions of people with T2DM as related to self-management practices.
2. To examine the self-management practices of people with T2DM

Inclusion criteria.

- Patients who are clinically diagnosed as chronic T2DM and who have had the disease for the past one (1) year.
- Patients residing in the Ugu district in KZN.

Exclusion criteria.

- Patients clinically diagnosed as type I diabetes mellitus.
- Patients outside of the Ugu district in KZN.
- Newly diagnosed T2DM patients.

Outline of the procedure.

This study involves a questionnaire survey for consecutive patients at the four hospitals diabetic clinic and two community health centres in the Ugu District, KZN. Your role in the study is to fill out questionnaires. I will bring the questionnaires to your diabetic clinic at your hospital to conduct this study with you. My research assistant and I will hand out the questionnaires to you and answer questions that you may have. The questionnaires will be available in English and isiZulu. The questionnaire and consent is translated into isiZulu for isiZulu speaking patients. In the case of participants who are not familiar with English, arrangements will be made for interpreters' assistance at the institutions for completion of questionnaires. The data collection tools will be identified using numbers not participants names so as not to link participants' identity and information.

Contact person: Researcher: Veslutchmei Shireen Nagura
Phone: 082 859 1860 /039 3155322
Email: shireennagura@gmail.com

ANNEXURE 6: Isimemo sabathanda ukuzibandakanya nocwaningo eklinic yesifo sikashukela

Isihloko: Ulwazi, indlela yokwamukela, nezinkolelo zabantu abaphila nesifo sikashukela wohlobo lwe type 2 kuhambisana nendlela yokuzinakekela kwabo.
Imigomo yocwaningo Uhlobo lwe-2 lwe-diabetes mellitus luba nokukhathazeka okukhulu kwezempilo nokwelapha emhlabeni jikelele. Njengoba ukwanda kwenani labantu abaphila nohlobo lwe-2 lwesifo sikashukela, kubalulekile ukuthi ulwazi, isimo sengqondo, imibono kanye nokuziphathisa ukuzihlola kuhlolwe ukwakha ukungenelela ekutholeni ukuxilongwa kanye nokwelapha okusheshayo. Ngesimiso sokunakekela esifanele, isifo sikashukela singasetshenziswa sikwazi ukuvumela umuntu ukuba aphile impilo ende, enempilo futhi esebenzayo.

- Ukuhlola ulwazi, indlela yokwamukela, nezinkolelo zabantu abaphila nesifo sikashukela kuhambisana ngendlela nokuzinakela kwabo.
- Ukuhlola ukuzinakekela kwabantu abaphila nesifo sikashukela

Abangaba yingxenye yocwaningo

- Iziguli eseziphile nesifo sikashukela wohlobo lwe type 2 isikhathi esingangonyaka nangaphezulu.
- Iziguli ezihlala esifundeni soGu.

Abangeke babe yingxenye yocwaningo

- Iziguli eziphila nesifo sikashukela wohlobo lwe type 1.
- Iziguli ezingahlali esifundeni soGu.
- Iziguli ezisanda kuphathwa yesifo sikashukela wohlobo lwe type 2.

Uhlelo locwaningo

Kulolucwaningo kuzoba nenhlolovo evulelekile ezokwenziwa ezigulini ezizothathwa emaklinikhi esifo sikashukela ezibhedlela ezine nemitholampilo emikhulu emibili esifundeni sasOgwini KZN. Kulindeleke ukuba uphendule imibuzo ebhalwe phansi. Ngizokulethela imibuzo eklinikhi lakho likashukela ukuze ngikusize. Mina nomsizi wami siyokusiza ukuphendula yonke imibuzo ongaba nayo. Imibuzo iyatholakala ngolimi lwesiNgisi nesiZulu njengezilimi ezikhulunywa kakhulu umphakathi okwenziwa kuwo ucwaningo. Imibuzo nemvume yocwaningo kuhunyushelwe esZulwini kulabo abakhuluma isZulu. Kulabo abangasikhulumi isiNgisi, imizamo yokuthola umuntu ozotolika ingenziwa ukuze babasize ukugcwalisa ifomu lemibuzo. Amaphepha emibuzo ayobhalwa izinamba kungafakwa amagama ukuze kuvikeleke amagama nolwazi oluphathelene nalabo abaphendulile.

Umuntu ongaxhumana naye

Umcwaningi: Veslutchmei Shireen Nagura
082 859 1860. / 039 3155322. Email: shireennagura@gmail.com

ANNEXURE 7: Permission letter from author for use of questionnaire

shireen nagura <shireennagura@gmail.com>

Re:Requesting permission for use of questionaire

4 messages

shireen nagura <shireennagura@gmail.com> Sat, Apr 23, 2016 at 9:50 PM
To: Veerle.Duprez@ugent.be

Mrs V. Nagura
P O Box 558
Port Shepstone
4240
KZN
South Africa

Email:shireennagura@gmail.com

Veerle Duprez

Madam

Re:Requesting use of questionaire

I Mrs V. Nagura am presently studying masters in Nursing Education at Durban University of Technology KZN , South Africa.

My topic is on Diabetes Type II.I plan to modify and use the questionaire from your article,The development and psychometrical evaluation of a set of instruments to evaluate the effectiveness of diabetes patient education.

I kindly request permission to modify and use the questionaire from the above article.

Thanking you kindly.

Yours faithfully
V.Nagura

Veerle Duprez <Veerle.Duprez@ugent.be> Mon, Apr 25, 2016 at 12:23 PM
To: shireen nagura <shireennagura@gmail.com>

Dear Mrs. Nagura,

We kindly give you permission to use and modify the questionnaire from our article 'The development and psychometrical evaluation of a set of instruments to evaluate the effectiveness of diabetes patient education, Duprez et al. 2013' when you cite our article correctly.

Pleas pay attention that it was the Dutch version that was validated and not the English one.

Kind regards,
Veerle

Veerle Duprez
Department of Public Health
University Centre for Nursing & Midwifery
UZ – 5K3 (entrance 42), De Pintelaan 185
B – 9000 Ghent, Belgium
Tel: +32 (0) 9 332 05 88
Mail: Veerle.Duprez@UGent.be
URL: http://www.UCVVGent.be
URL: http://www.publichealth.UGent.be
URL: Profile and publications
Please consider the environment before printing this email

Van: shireen nagura [mailto:shireennagura@gmail.com]
Verzonden: zaterdag 23 april 2016 21:51
Aan: Veerle Duprez
Onderwerp: Re:Requesting permission for use of questionaire

[Quoted text hidden]

Veerle Duprez <Veerle.Duprez@ugent.be>
To: shireen nagura <shireennagura@gmail.com> Fri, May 13, 2016 at 8

Hello Shireen,

You can perfectly use the English version as it is carefully translated and re-translated for publication purposes.

Kind regards,

Veerle

University Centre for
Nursing and Midwifery

Veerle Duprez
Department of Public Health
University Centre for Nursing & Midwifery

UZ – 5K3 (entrance 42), De Pintelaan 185
B – 9000 Ghent, Belgium
Tel: +32 (0) 9 332 05 88
Mail: Veerle.Duprez@UGent.be
URL: http://www.UCVVGent.be
URL: http://www.publichealth.UGent.be
URL: Profile and publications

Please consider the environment before printing this email

Van: shireen nagura [mailto:shireennagura@gmail.com]
Verzonden: vrijdag 6 mei 2016 11:53
Aan: Veerle Duprez
Onderwerp: Re: Re:Requesting permission for use of questionaire

[Quoted text hidden]

ANNEXURE 8: Permission letter from DUT IREC

DUT
DURBAN UNIVERSITY OF TECHNOLOGY

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2375
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

11 April 2019

Ms V S Nagura
P O Box 558
Port Shepstone
4240

Dear Ms Nagura

Knowledge, attitude and perceptions of people with type 2 diabetes as related to self-management practices in the Ugu district of KwaZulu-Natal.

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely,

Professor J K Adam
Chairperson: IREC

11

Scanned with CamScanner

ANNEXURE9: Permission letter from DoH KZN Health Research

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Physical Address: 330 Langalibalele Street, Pietermaritburg
Postal Address: Private Bag X9051
Tel: 033 395 2805/ 3189/ 3123 Fax: 033 394 3782
Email:
www.kznhealth.gov.za

DIRECTORATE:
Health Research & Knowledge Management

HRKM Ref: 332/18
NHRD Ref: KZ_201808_029

Dear Mr VE Matahela
University of South Africa

Approval of research

1. The research proposal titled **'Guidelines for the facilitation of self-leadership in nurse educators'** was reviewed by the KwaZulu-Natal Department of Health.

   The proposal is hereby **approved** for research to be undertaken at the following Colleges of Nursing: Addington, Benedictine, Charles James Memorial, Edendale, Grey's, King Edward VIII, Madadeni, Ngwelezane, Port Shepstone, Prince Mshiyeni Memorial and RK Khan.

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge
Chairperson, Health Research Committee
Date: 03/09/18

ANNEXURE 10: Permission letter from the Ugu District

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Physical Address: 41 Bisset Street, Nelson Mandela Drive
Postal Address: P/Bag X 735 Port Shepstone 4240
Tel: 0396883000 Fax: 0396826296 Email: ntokozo.mkhize@kznhealth.gov.za
www.kznhealth.gov.za

DIRECTORATE:
UGU HEALTH DISTRICT OFFICE

Enquiries: Mrs NC Mkhize
Date: 28 February 2019

To:
Mrs Veslutchmei Nagura

Permission to Conduct Research in Ugu District

Dear Mrs Nagura

I have the pleasure in informing you that permission has been granted to you by Ugu District Office to conduct research on "Knowledge, attitudes and perceptions of people with type 2 diabetes as related to self-management practices in the Ugu district of KwaZulu-Natal."

Please note the following:

a) Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health.

b) Please endure that this office is informed before you commence with your research

c) The District office/ facility will not provide any resources for this research.

e) You will be expected to provide feedback on your findings to the District office /facility

Thank You

.....
Mrs NC Mkhize
Ugu District Director

Fighting Disease, Fighting Poverty, Giving Hope

ANNEXURE 11: Permission letter from Port Shepstone Hospital

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

PORT SHEPSTONE REGIONAL HOSPITAL
Private Bag X5706, PORT SHEPSTONE, 4240
11 Bazley Street, PORT SHEPSTONE 4240
Tel: 039-6886208 Fax: 039-6821514

KWAZULU-NATAL DEPARTMENT OF HEALTH
PORT SHEPSTONE REGIONAL
HOSPITAL

Reference: HRKM140/15
Enquiries: Dr P.B Dlamini
Date: 07/03/2019

Chairperson: Research Committee
KZN Department of Health
Private Bag 9051
PIETERMARITZBURG
3200

RE: PERMISSION FOR RESEARCH STUDY – KNOWLEDGE, ATTITUDE AND PERCEPTIONS OF PEOPLE WITH TYPE 2 DIABETES AS RELATED TO SELF- MANAGEMENT PRACTICES IN THE UGU DISTRICT OF KWAZULU NATAL -TO BE CONDUCTED BY MRS VS NAGURA (HOD COLLEGE OF NURSING)

OBJECT

To grant permission to HOD Mrs. VS Nagura to conduct the above mentioned research at Port Shepstone Regional Hospital.

SUPPORTING DOCUMENTS

Appended hereto is documentation received.

OFFER OF SUPPORT

This office wishes to inform that the proposed research to be conducted by Mrs. VS Nagura is wholly supported. There are no financial implications.

RECOMMEDATION

In view of the above request I recommend the necessary authority be granted by the Research Committee for Mrs. VS Nagura to continue with the research.

Submitted for your attention and further action.

Yours sincerely

DR P.B DLAMINI
ACTING-CHIEF EXECUTIVE OFFICER
PORT SHEPSTONE REGIONAL HOSPITAL

Fighting Disease, Fighting Poverty, Giving Hope

ANNEXURE 12: Permission letter from St Andrews Hospital

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Directorate: CEO's office

Physical Address:14 Moodie street ,Harding, 4680
Postal Address: St Andrews hospital P/B x1010 4680
Tel no. 039 433 2419
Email:mandisa.vane@kznhealth.gov.zakznhealth.gov.za

St Andrews hospital

ENQUIRIES: MM VANE
DATE: 4/3/2019

To:

Veslutchmei Nagura

PERMISSION TO CONDUCT A STUDY AT ST ANDREWS HOSPITAL

Dear Mrs Nagura

Your application to conduct a research or study on "knowledge, attitudes and perceptions of people with type 2 diabetes as related to self-management practices in the Ugu district of KwaZulu-Natal" is hereby approved.

You are requested to adhere to the policies, procedure, protocols and guidelines of the Department of Health. Please note that you are required to inform this office before you start your study and you are also required to give us feedback on your findings.

This hospital will not provide any resources for your research.

Thank you

Miss MM VANE
ST ANDREWS HOSPITAL CEO

ANNEXURE 13: Permission letter from Murchison Hospital

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

N2 Main Kokstad/ Harding Rd. Murchison District Hospital
P.O. Box x 701 Port Shepstone 4240
687 7311 Fax: 039 687 7497 Email: edward.manyokole@kznhealth.gov.za
www.kznhealth.gov.za

DIRECTORATE:
Chief Executive Officer

Enquiries: Mr RE Manyokole
Reference: 30/5/1
Date: 11/03/2019

Mrs Veslutchmei Nagura

RE: PERMISSION TO CONDUCT RESEARCH AT MURCHISON HOSPITAL

I have ~~please~~ pleasure in informing you that permission has been granted to you by the Chief Executive Officer of the facility on "Knowledge, attitudes and perceptions of people with type 2 diabetes as related to self-management practices in the UGu district of KwaZulu-Natal".

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health.
2. Please ensure that the facility is informed before you commence your research.
3. The facility will not provide any resources for this research.
4. You will be expected to provide feedback on your findings to the facility.

Thank you,

Mr RE Manyokole
Chief Executive Officer
Murchison District Hospital

ANNEXURE 14: Permission letter from GJ Crookes Hospital

ATT: Mrs Nagura Port Shepstone
Nursing campus

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Physical Address: 1 Hospital Road, Scottburgh, 4180
Postal Address: Private Bag X5501
Tel: 039 978 7000, Fax: 039 978 1295 Email: Sibongile.nyawo@kznhealth.gov.za
www.kznhealth.gov.za

GJ CROOKES HOSPITAL

Reference:GJC/HR 9/2/3
Enquiries: Ms PT Mkhize
Telephone: 039-978 7019

Date: 24 January 2019

Mrs S Nagura
Port Shepstone Nursing Campus

Permission to conduct research: Knowledge, Attitude and Perceptions of people within type 2 Diabetes as related to Self- Management Practices in the Ugu District of KwaZulu- Natal.

I have pleasure in informing you that permission has been granted to you by GJ Crookes Hospital to conduct research on the above mentioned topic.

Please note the following:

1. Please ensure that you adhere to all policies, procedures, protocols and guidelines of the Department of Health with regards to the research.
2. The research will commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department of Health.
3. Please ensure that this office is informed before you commence your research
4. GJ Crookes Hospital will not provide any resources for the research
5. You will be expected to provide feedback on your findings to GJ Crookes Hospital and the KZN Department of Health.

Thanking You

PJ Mkhize

Ms PT Mkhize
Deputy Manager Nursing

Dr B. Shange

Dr B Shange
Clinical Manager / Acting CEO

ANNEXURE 15: Permission letter from Gamalakhe CHC

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:
Gamalakhe CHC-Nursing Management

Physical Address: Off Ray Nkonyeni Road, Rev Sithole Streets, Gamalakhe 4249
Postal Address: Private Bag X709, Gamalakhe, 4249
Tel: 039 318 1113 Fax: 039 3181033 Email: Thoko.ntuli@kznhealth.gov.za
www.kznhealth.gov.za

Enquiries: Mrs TMM Ntuli

Date: 13 March 2019

To: Mrs V Nagura

RE: Permission to conduct Research on " Knowledge, attitudes and perceptions of people with type 2 Diabetes as related to self –management practices in the Ugu District of Kwazulu Natal

Dear Madam

This is to confirm that Gamalakhe CHC is granting you permission to be a site for your research on the above mentioned topic.

Yours faithfully.

Mrs TMM Ntuli

Acting CEO Gamalakhe CHC

1

ANNEXURE 16: Permission letter from Turton CHC

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:

ENQUIRIES: Mrs P.P Fica
DATE : 14/03/2019

Dear Madam

RE: AUTHORITY TO CONDUCT RESEARCH PROPOSAL

Authority has been granted for you to conduct a research proposal at Turton CHC.

Regards

Mrs PPFica
Acting CEO
Turton CHC

Fighting Disease, Fighting Poverty, Giving Hope

ANNEXURE 17: Permission letter from Shelly Beach Clinic to conduct pilot study

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

SHELLY BEACH CLINIC
UMDONI ROAD
Shelly Beach
P.O. Box 942, Shelly Beach, 4265
Tel: 039 3151504, Fax: 039 3155951

To : Sister Shireen Nagura

From: Operational Manager – D Marshall

Date : 3 December 2018

RE: PERMISSION TO USE SHELLY BEACH CLINIC AS A PILOT STUDY FOR RESEARCH

TITLE KNOWLEDGE, ATTITUDE AND PERCEPTIONS OF PEOPLE WITH TYPE 2 DIABETES AS RELATED TO SELF MANAGEMENT PRACTICES IN THE UGU DISTRICT OF KWAZULU NATAL

I am pleased to inform you that permission has been granted for you to use Shelly Beach Clinic as a pilot study to conduct research as per title of this letter.

Please note the following

- Please ensure that you adhere to all policies, procedures, protocols and guidelines of the Department of Health with regards to research.
- The Department of Health will not provide any resources for this research.
- You will be expected to provide feedback on your findings to the Operational Manager of Shelly Beach Clinic.

Thanking you

Yours faithfully

D. Marshall

D Marshall
OM – Shelly Beach Clinic

ANNEXURE 18: Permission letter to DoH KZN Health Research

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Health Research and Knowledge Management sub-component
10-103 Natalia Building,330 Langalibalele Street
Private Bag x9051
Pietermaritzburg
3200

Dear Madam/Sir

Request for Permission to Conduct research study.
My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

There is currently an alarming increase in the rate of Type 2 diabetes and its complications among patients in the country. Type 2 diabetes is becoming a major medical and public health concern globally. With the increase in the number of people living with Type 2 diabetes, it is critical that knowledge and self-management be explored, to form interventions for early diagnosis and prompt treatment. With the right treatment plan, diabetes mellitus can be managed allowing one to lead a long, healthy and active life (Rutebemberwa *et al.* 2013: 1).

There is an increase in co-morbidities, amputations, foot ulcerations, disabilities and mortality rate among Type 2 diabetic patients at Port Shepstone Regional Hospital, in the Ugu District of KZN (KZN). In addition, frequent hospitalization has proved very challenging regarding availability of beds for patients. Type 2 diabetes is the fast-growing chronic non-communicable disease in the Ugu district of KZN. Port Shepstone Regional Hospital records reflect that as from November 2016 to February 2018, adult inpatient morbidity 213 patients, adult inpatient mortality 22, outpatient morbidity 2803, a hundred new patients were diagnosed with Type 2 diabetes and 217 cases related to amputations were reported.
Due to the current ill effects and prevalence of the disease, the need for assessing the knowledge, attitude and perceptions of people with Type 2 diabetes as related to

self-management practices is a priority. This is essential in order to place emphasis on the importance of tight early glycaemic control through health education programmes and prevent further complications and death.
The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications, which are debilitating and expensive to treat.
This study will use a quantitative cross-sectional descriptive survey design and be conducted at the diabetic clinics of four public hospitals and two community healthcare centres in the Ugu District of KZN. Two hospitals and two community health centres are situated in rural areas. Three hospitals and two community health centres refer their patients to Port Shepstone Regional hospital. The target population for this study will be all patients with chronic type 2 diabetes attending the diabetic clinics at the four public hospitals and the two community health centres. For the purpose for this study chronic diabetic patient is one who has had the disease for the past one year.
Recruitment will be done with the aid of an advertisement placed at the various institutions while the patients are awaiting nursing and medical consultation. A quiet area with seating arrangements will be identified at the institutions for completion of the questionnaires. The researcher and research assistant will be present to advise and guide the participants in completion of the questionnaires. I hereby kindly request your written permission to conduct the pilot study at Shelly Beach Clinic, in order to test the usefulness of the questionnaires and to detect flaws.

I have provided a copy of my proposal and the data collection tool, consent form and patient information letter. A provisional ethical approval from the Institutional Research Ethics Committee (IREC) of Durban University of Technology is attached. Participation in the study is voluntary and rights of patients regarding confidentiality will be respected and maintained. If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.
Yours sincerely
Veslutchmei Nagura: student no 21644761

ANNEXURE 19: Permission letter to Ugu District Manager

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Ugu District Manager
Port Shepstone hospital

Dear Madam/Sir

Request for Permission to Conduct research study.

My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

There is currently an alarming increase in the rate of Type 2 diabetes and its complications among patients in the country. Type 2 diabetes is becoming a major medical and public health concern globally. With the increase in the number of people living with Type 2 diabetes, it is critical that knowledge and self-management be explored, to form interventions for early diagnosis and prompt treatment. With the right treatment plan, diabetes mellitus can be managed allowing one to lead a long, healthy and active life (Rutebemberwa *et al.* 2013: 1).

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Due to the current ill effects and prevalence of the disease, the need for assessing knowledge, attitude and perceptions of people with Type 2 diabetes as related to self-management practices is a priority. This is essential in order to place emphasis on the importance of tight early glycaemic control through health education programmes and prevent further complications and death.

The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.

This study will employ a quantitative cross-sectional descriptive survey design. This study will be conducted at the diabetic clinics of the four (4) public hospitals and two (2) community healthcare centres in the Ugu District of KZN. Two (2) hospitals and the two (2) community health centres are situated in rural areas of the Ugu District. Three (3) hospitals and two (2) community health centres refer their patients to Port Shepstone Regional hospital. The target population for this study will be all patients with chronic type 2 diabetes attending the diabetic clinics at the four (4) public hospitals and the two (2) community health centres in the Ugu District of KZN. For the purpose for this study chronic diabetic patient is one who has had the disease for the past one (1) year.

Recruitment will be done with the aid of an advertisement placed at the various institutions while the patients are awaiting nursing and medical consultation. A quiet area with seating arrangements will be identified at the institutions for completion of the questionnaires. The researcher and research assistant will be present to advise and guide the participants in completion of the questionnaires.

I hereby kindly request your written permission to conduct the pilot study at Shelly Beach Clinic, in order to test the usefulness of the questionnaires and to detect flaws.

I have provided you with a copy of my proposal which includes copies of the data collection tool, consent form and patient information letter. A provisional ethical approval from the Institutional Research Ethics Committee (IREC) of Durban University of Technology is attached. Participation in the study is voluntary and rights of patients regarding confidentiality will be respected and maintained.

If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 20: Permission letter to Operational Manager: Shelly Beach Clinic to conduct pilot study

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Mrs Marshall
Operational Manager
Shelly Beach Clinic

Dear Madam

Request for Permission to Conduct Pilot study.
My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

There is currently an alarming increase in the rate of Type 2 diabetes and its complications among patients in the country. Type 2 diabetes is becoming a major medical and public health concern globally. With the increase in the number of people living with Type 2 diabetes, it is critical that knowledge and self-management be explored, to form interventions for early diagnosis and prompt treatment. With the right treatment plan, diabetes mellitus can be managed allowing one to lead a long, healthy and active life (Rutebemberwa *et al.* 2013: 1).
There is an increase in co-morbidities, amputations, foot ulcerations, disabilities and mortality rate among Type 2 diabetic patients at Port Shepstone Regional Hospital, in the Ugu District of KZN (KZN). In addition, frequent hospitalization has proved very challenging regarding availability of beds for patients. Type 2 diabetes is the fast-growing chronic non-communicable disease in the Ugu district of KZN. Port Shepstone Regional Hospital records reflect that as from November 2016 to February 2018, adult inpatient morbidity 213 patients, adult inpatient mortality 22, outpatient morbidity 2803, a hundred new patients were diagnosed with Type 2 diabetes and 217 cases related to amputations were reported.
Due to the current ill effects and prevalence of the disease, the need for assessing knowledge, attitude and perceptions of people with Type 2 diabetes as related to self-management practices is a priority. This is essential in order to place emphasis

on the importance of tight early glycaemic control through health education programmes and prevent further complications and death.
The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.
This study will employ a quantitative cross-sectional descriptive survey design. This study will be conducted at the diabetic clinics of the four (4) public hospitals and two (2) community healthcare centres in the Ugu District of KZN. Two (2) hospitals and the two (2) community health centres are situated in rural areas of the Ugu District. Three (3) hospitals and two (2) community health centres refer their patients to Port Shepstone Regional hospital. The target population for this study will be all patients with chronic type 2 diabetes attending the diabetic clinics at the four (4) public hospitals and the two (2) community health centres in the Ugu District of KZN. For the purpose for this study chronic diabetic patient is one who has had the disease for the past one (1) year.
Recruitment will be done with the aid of an advertisement placed at the various institutions while the patients are awaiting nursing and medical consultation. A quiet area with seating arrangements will be identified at the institutions for completion of the questionnaires. The researcher and research assistant will be present to advise and guide the participants in completion of the questionnaires. I hereby kindly request your written permission to conduct the pilot study at Shelly Beach Clinic, in order to test the usefulness of the questionnaires and to detect flaws.

I have provided a copy of my proposal and copies of the data collection tool, consent form and patient information letter. A provisional ethical approval from the Institutional Research Ethics Committee (IREC) of Durban University of Technology is attached. Participation in the study is voluntary and rights of patients regarding confidentiality will be respected and maintained. If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.
Yours sincerely
Veslutchmei Nagura: student no 21644761

ANNEXURE 21: Permission letter to Chief Executive Officer: Port Shepstone Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Chief Executive Officer
Port Shepstone Hospital

Dear Madam

Request for Permission to Conduct research study.

My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

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The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.

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I hereby kindly request your written permission to conduct the pilot study at Shelly Beach Clinic, in order to test the usefulness of the questionnaires and to detect flaws.

I have provided you with a copy of my proposal which includes copies of the data collection tool, consent form and patient information letter. A provisional ethical approval from the Institutional Research Ethics Committee (IREC) of Durban University of Technology is attached. Participation in the study is voluntary and rights of patients regarding confidentiality will be respected and maintained.

If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 22: Permission letter to Chief Executive Officer: Murchison Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Chief Executive Officer
Murchison Hospital

Dear Madam

Request for Permission to Conduct research study.
My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

There is currently an alarming increase in the rate of Type 2 diabetes and its complications among patients in the country. Type 2 diabetes is becoming a major medical and public health concern globally. With the increase in the number of people living with Type 2 diabetes, it is critical that knowledge and self-management be explored, to form interventions for early diagnosis and prompt treatment. With the right treatment plan, diabetes mellitus can be managed allowing one to lead a long, healthy and active life (Rutebemberwa *et al.* 2013: 1).
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Due to the current ill effects and prevalence of the disease, the need for assessing knowledge, attitude and perceptions of people with Type 2 diabetes as related to self-management practices is a priority. This is essential in order to place emphasis on the importance of tight early glycaemic control through health education programmes and prevent further complications and death.

The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.

This study will employ a quantitative cross-sectional descriptive survey design. This study will be conducted at the diabetic clinics of the four (4) public hospitals and two (2) community healthcare centres in the Ugu District of KZN. Two (2) hospitals and the two (2) community health centres are situated in rural areas of the Ugu District. Three (3) hospitals and two (2) community health centres refer their patients to Port Shepstone Regional hospital. The target population for this study will be all patients with chronic type 2 diabetes attending the diabetic clinics at the four (4) public hospitals and the two (2) community health centres in the Ugu District of KZN. For the purpose for this study chronic diabetic patient is one who has had the disease for the past one (1) year.

Recruitment will be done with the aid of an advertisement placed at the various institutions while the patients are awaiting nursing and medical consultation. A quiet area with seating arrangements will be identified at the institutions for completion of the questionnaires. The researcher and research assistant will be present to advise and guide the participants in completion of the questionnaires.

I hereby kindly request your written permission to conduct the pilot study at Shelly Beach Clinic, in order to test the usefulness of the questionnaires and to detect flaws.

I have provided you with a copy of my proposal which includes copies of the data collection tool, consent form and patient information letter. A provisional ethical approval from the Institutional Research Ethics Committee (IREC) of Durban University of Technology is attached. Participation in the study is voluntary and rights of patients regarding confidentiality will be respected and maintained.

If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 23: Permission letter to Chief Executive Officer: G J Crookes Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Chief Executive Officer
G J Crookes Hospital

Dear Madam/ Sir

Request for Permission to Conduct Pilot study.

My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

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Due to the current ill effects and prevalence of the disease, the need for assessing knowledge, attitude and perceptions of people with Type 2 diabetes as related to self-management practices is a priority. This is essential in order to place emphasis on the importance of tight early glycaemic control through health education programmes and prevent further complications and death.

The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals

and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.

This study will employ a quantitative cross-sectional descriptive survey design. This study will be conducted at the diabetic clinics of the four (4) public hospitals and two (2) community healthcare centres in the Ugu District of KZN. Two (2) hospitals and the two (2) community health centres are situated in rural areas of the Ugu District. Three (3) hospitals and two (2) community health centres refer their patients to Port Shepstone Regional hospital. The target population for this study will be all patients with chronic type 2 diabetes attending the diabetic clinics at the four (4) public hospitals and the two (2) community health centres in the Ugu District of KZN. For the purpose for this study chronic diabetic patient is one who has had the disease for the past one (1) year.

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If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 24: Permission letter to Chief Executive Officer: St Andrews Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Chief Executive Officer
St Andrews Hospital

Dear Madam/ Sir

Request for Permission to Conduct research study.

My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

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The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals

and two (2) community health centres in the Ugu District of KZN. Interventions will be formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.

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Recruitment will be done with the aid of an advertisement placed at the various institutions while the patients are awaiting nursing and medical consultation. A quiet area with seating arrangements will be identified at the institutions for completion of the questionnaires. The researcher and research assistant will be present to advise and guide the participants in completion of the questionnaires.

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I have provided you with a copy of my proposal which includes copies of the data collection tool, consent form and patient information letter. A provisional ethical approval from the Institutional Research Ethics Committee (IREC) of Durban University of Technology is attached. Participation in the study is voluntary and rights of patients regarding confidentiality will be respected and maintained.

If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 25: Permission letter to Chief Executive Officer: Gamalakhe CHC

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

The Chief Executive Officer
Gamalakhe Community Care Centre

Dear Madam

Request for Permission to Conduct research study.

My name is Veslutchmei Nagura, a Masters student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation is titled: **Knowledge, Attitude and Perceptions of people with Type 2 diabetes as related to Self-Management practices in the Ugu District of KZN.**

There is currently an alarming increase in the rate of Type 2 diabetes and its complications among patients in the country. Type 2 diabetes is becoming a major medical and public health concern globally. With the increase in the number of people living with Type 2 diabetes, it is critical that knowledge and self-management be explored, to form interventions for early diagnosis and prompt treatment. With the right treatment plan, diabetes mellitus can be managed allowing one to lead a long, healthy and active life (Rutebemberwa *et al.* 2013: 1).

There is an increase in co-morbidities, amputations, foot ulcerations, disabilities and mortality rate among Type 2 diabetic patients at Port Shepstone Regional Hospital, in the Ugu District of KZN (KZN). In addition, frequent hospitalization has proved very challenging regarding availability of beds for patients. Type 2 diabetes is the fast-growing chronic non-communicable disease in the Ugu district of KZN. Port Shepstone Regional Hospital records reflect that as from November 2016 to February 2018, adult inpatient morbidity 213 patients, adult inpatient mortality 22, outpatient morbidity 2803, a hundred new patients were diagnosed with Type 2 diabetes and 217 cases related to amputations were reported.

Due to the current ill effects and prevalence of the disease, the need for assessing knowledge, attitude and perceptions of people with Type 2 diabetes as related to self-management practices is a priority. This is essential in order to place emphasis on the importance of tight early glycaemic control through health education programmes and prevent further complications and death.

The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be

formulated subsequent to findings. Interventions could be in the form of health promotion programmes to increase knowledge and understanding in the prevention of complications. May recommend changes in protocol based on the findings, Furthermore, to monitor their treatment regime in order to stabilise their blood sugar levels, it is significant in chronic diabetes to prevent and delay the onset of complications which is debilitating and expensive to treat.

This study will employ a quantitative cross-sectional descriptive survey design. This study will be conducted at the diabetic clinics of the four (4) public hospitals and two (2) community healthcare centres in the Ugu District of KZN. Two (2) hospitals and the two (2) community health centres are situated in rural areas of the Ugu District. Three (3) hospitals and two (2) community health centres refer their patients to Port Shepstone Regional hospital. The target population for this study will be all patients with chronic type 2 diabetes attending the diabetic clinics at the four (4) public hospitals and the two (2) community health centres in the Ugu District of KZN. For the purpose for this study chronic diabetic patient is one who has had the disease for the past one (1) year.

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If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 26: Permission letter to Chief Executive Officer: Turton CHC

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Chief Executive Officer
Turton Community Care Centre

Dear Madam/ Sir

Request for Permission to Conduct research study.

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The aim of this study is to assess the knowledge, attitudes and perceptions of people with Type 2 diabetes as related to self-management practices at four (4) hospitals and two (2) community health centres in the Ugu District of KZN. Interventions will be

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If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 27: Permission letter to Deputy Nurse Manager: Port Shepstone Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Deputy Nurse Manager
Port Shepstone Hospital

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If you require any further information, kindly contact me on 0828591860 and email, shireennagura@gmail.com.

Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 28: Permission to Deputy Nurse Manager: Murchison Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Deputy Nurse Manager
Murchison Hospital

Dear Madam

Request for Permission to Conduct research study.
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Thanking you for your time.

Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 29: Permission to Deputy Nurse Manager: G J Crookes Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Deputy Nurse Manager
G J Crookes Hospital

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Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 30: Permission letter to Deputy Nurse Manager: ST Andrews Hospital

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November 2019

Deputy Nurse Manager
St Andrews Hospital

Dear Madam/ Sir

Request for Permission to Conduct research study.
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Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 31: Permission letter to Deputy Nurse Manager: Gamalakhe CHC

Mrs V. Nagura
Flat 2 Lletonmawr complex
Uvongo
KZN
4270
26th November

Deputy Nurse Manager
Gamalakhe Community Care Centre

Dear Madam

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Mrs V. Nagura
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Uvongo
KZN
4270
26th November 2019

Deputy Nurse Manager
Turton Community Care Centre

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Yours sincerely

Veslutchmei Nagura: student no 21644761

ANNEXURE 33: Editor's certificate

Durban
SA
10 November 2020

To whom it may concern

Title: The Knowledge, Attitude and Perceptions of People with T2DM as Related to Self-Management Practices in the Ugu District of KZN

Student: Veslutchmei Nagura

I have edited the student's work and provided substantive comment about the structure and grammar for them to address. I am satisfied that my comments have been addressed and that the thesis is ready for submission. I am trusting that the supervisor will have the final say on the contents of the document.

Regards

Ms Carrin Martin
Academic Editor
MSocSci, PGDPH