

KNOWLEDGE, ATTITUDES AND PERCEPTIONS ABOUT DIABETES  
MELLITUS AMONG  
AN URBAN ADULT POPULATION IN WINDHOEK, NAMIBIA

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A mini –thesis submitted in fulfilment of requirements for the degree of Master of Public Health (MPH) at the School of Public Health, University of the Western Cape



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## **KEY WORDS**

Diabetes Mellitus

Knowledge

Perceptions

Attitudes

Risk factors

Urban

Surveys

Non-communicable diseases

Windhoek

Namibia



## DECLARATION

I declare that “*Knowledge, attitudes and perceptions about diabetes mellitus among an urban adult population in Windhoek, Namibia*” is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Dorothy Nasilele Kambinda



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Signature



Date: September 2016

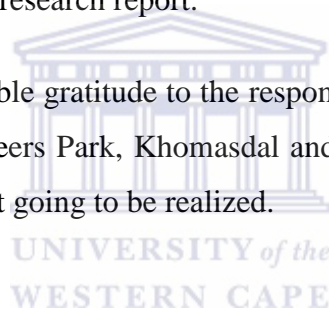
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## **ACRONYMS**

AIDS:	Acquired Immuno Deficiency Syndrome
CVD:	Cardio Vascular Disease
DHIS:	Demographic Health Information System
DM:	Diabetes Mellitus
DLFA:	Diabetes Leadership Forum Africa
GPG:	Global Property Guide
HIV:	Human Immuno Deficiency Virus
IDF:	International Diabetes Federation
KAP:	Knowledge, Attitude and Practice
MI:	Myocardial Infarction
MoHSS:	Ministry of Health and Social Services
NCDs:	Non Communicable Diseases
NHIS:	National Health Information System
PAR:	Population Attribute Risk
WHO:	World Health Organization



## DEFINITION OF CONCEPTS

**Diabetes:** Diabetes mellitus is a condition where the blood sugar level is higher than normal.

**Type 1 diabetes mellitus:** Is a condition caused by an autoimmune reaction, where the body's defence system attacks the insulin-producing beta cells in the pancreas. The disease can affect people of any age, but usually occurs in children or young adults.

**Type 2 diabetes:** Type of diabetes and usually occurs in adults, but is increasingly seen in children and adolescents. In type 2 diabetes, the body is able to produce insulin but either this is not sufficient or the body is unable to respond to its effects, also known as insulin resistance, leading to a build-up of glucose in the blood.

**Gestational diabetes:** Condition that occurs in women who develop a resistance to insulin and subsequent high blood glucose during pregnancy. Gestational diabetes tends to occur around the 24<sup>th</sup> week of pregnancy.

**Insulin:** A hormone secreted by the pancreas that allows glucose from food to enter the body's cells where it is converted into energy needed by muscles and tissues to function.

**Knowledge:** This refers to what is known by an individual regarding diabetes mellitus, such as signs and symptoms, prevention, complications and treatment of diabetes.

**Attitude:** This refers to the thinking or feeling of a person towards a healthy lifestyle including causes and prevention of diabetes

**Risk factors:** Contributory risks that leads to getting diabetes mellitus, such as family history of diabetes, obesity and overweight, inactive lifestyles, poor dietary intake.

**Obesity:** Abnormal or excessive fat accumulation that may impair health.

**Neuropathy:** The disease or dysfunction of one or more peripheral nerves and usually caused by diabetes mellitus.

**Hypoglycemia:** Low blood sugar.

**Hyperglycemia:** Elevated blood sugar level which over time leads to organ damage.

## ABSTRACT

**Background:** Namibia is one of the sub-Saharan African countries where diabetes mellitus ranks among the top ten health conditions contributing to the disease burden and among the top 15 in-patient causes of death. An understanding of the population's knowledge, attitudes and perceptions is required to inform health education and interventions targeting diabetes mellitus.

**Aim:** The aim was to assess the level of knowledge, attitudes and perceptions about diabetes mellitus among an adult population living in Windhoek, Namibia.

**Methodology:** A quantitative cross-sectional descriptive survey design was used. Data was collected from 300 adult respondents using a structured questionnaire administered by research assistants. Data was analysed using Epi-Info version 7. Descriptive statistics were used primarily to summarise and describe levels of knowledge, perceptions and attitudes. A scoring framework was developed to categorize responses. Analytical statistics was used to describe association between knowledge, attitudes and perceptions scores and demographic and socio-economic variables. A P-value < 0.05 was regarded as statistically significant.

**Results:** Of the 300 respondents interviewed, 50.3% were males, 49.3% were females and 0.4% were missing. The majority of the respondents were between 26 – 30 years. With regards to employment, majority (62%) were employed full time. About 10.7% of the respondents had post-graduate degree, while 3.3% had no schooling. Knowledge about diabetes mellitus was higher amongst females (51.2%) compared to males (48.2%) and was associated with age. Only 34.7% of respondents had poor perceptions about diabetes (i.e. diet, curability and distribution). About 49.7% respondents had good knowledge about risk factors for diabetes mellitus while 50.3% had poor knowledge thereof.

### **Conclusion:**

This study reveals that the general knowledge of respondents regarding diabetes mellitus was poor in Windhoek. Despite the respondents having good knowledge there were still misconceptions about diabetes related complications, risk factors and its treatment. In addition, attitudes and perceptions of respondents about diabetes were favourable and thus suggesting some level of understanding about diabetes in the different communities in Windhoek. This study shows that there is knowledge about diabetes, however lack of diabetes knowledge among some respondents suggests a need for a systematic education programme for diabetes.

This study highlighted the areas that diabetes education programmes should focus on aspects or issues such as life style and healthy food intake.





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# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

The World Health Organization (WHO) estimates that more than 220 million people worldwide have diabetes mellitus (DM) and without interventions, this number is likely to increase more than double by 2030. Almost 80% of diabetes deaths occur in low and middle-income countries (WHO, 2010). Diabetes mellitus (DM) defined as a metabolic disorder or disease characterised by abnormally high glucose levels in the blood, excessive urination and persistent thirst (MoHSS, 2010) has been on the increase in Namibia.

According to the District Health Information System (DHIS) 2009 from January to December 2009 there was 1.6% new cases of diabetes aged 5 to 17 years in Windhoek. Namibia is one of the sub-Saharan African countries where diabetes mellitus ranks among the top ten health conditions contributing to the disease burden and among the top 15 in-patient causes of death (DHIS) 2009. In 2010 within the same age group the percentage of new diabetes cases increased to 3.9%. In 2009, the incidence of diabetes type 2 among children under 5 years old in Namibia was 2.2%; and according to diabetes records the incidence in the same age group was 4.1%. In addition, in 2010 there were 625 deaths attributable to diabetes in females between the ages of 20 to 69 years in Namibia (Roglic and Unwin, 2010). Such findings suggest the need for diabetes awareness which will assist in the control and prevention of this disease.

During the commemoration of the World Diabetes Day in 2010, in his speech, a Physician Specialist, Dr. I. Katjitae stated that Namibia is commemorating World Diabetes Day 2010 to raise awareness about how to prevent diabetes through following a healthy lifestyle, the signs and symptoms of diabetes including the management of the illness. He noted with concern that, since early diagnosis is critical to reduce diabetic cases, the MoHSS is thus targeting health workers by, alerting them to the fact that with modern lifestyles, non-communicable diseases (NCDs) are on the increase, with diabetes being a major illness (MoHSS, 2010).

Dr. I. Katjitae further highlighted that through improved knowledge, diagnosis and treatment, the country can take control of diabetes. Therefore, both health workers and members of the public should be educated about diabetes mellitus (MoHSS & WHO, 2010).

Type 2 diabetes is the most common form of diabetes and primarily affects the poorest people living in urban areas in sub-Saharan Africa (McManus, Stitt & Bargh, 2006). Studies conducted

show that NCDs are on the increase, and Roglic and Unwin (2010) confirmed that changes in demographic status, development, urbanization and the impact of globalization have resulted in the rapid emergence of NCDs and their risk factors in sub-Saharan Africa, particularly urban areas. It is projected that by 2020, NCDs such as diabetes mellitus and high blood pressure will be the leading causes of death ahead of communicable diseases.

McManus, Stitt and Bargh (2006) acknowledge that Type 2 diabetes is a public health challenge that is escalating in proportion to an ageing population and increasing incidence of overweight and obesity. Furthermore effective interventions have been shown to prevent or delay the onset of diabetes and reduce the risk of chronic complications (McManus, Stitt & Bargh, 2006). It is however noted that, successful transfer of these protective strategies to improved population health remains a major challenge.

## **1.2 Study Aim and Objectives**

### **1.2.1 Aim**

The aim of this study was to assess the knowledge, attitudes and perceptions about diabetes mellitus among the adult population of Windhoek, Namibia.

### **1.2.2 Study Objectives**

1. To describe the knowledge about the symptoms, risk factors and complications of diabetes mellitus as well as the sources of knowledge among adult residents in Windhoek.
2. To describe the perceptions of adult residents in Windhoek about diabetes mellitus.
3. To describe the attitudes of adult residents in Windhoek towards diabetes mellitus.
4. To determine factors associated with the observed levels of knowledge, attitudes and perceptions towards diabetes mellitus among adult residents in Windhoek.

## **1.3 Problem Statement**

The prevalence of diabetes mellitus is increasing in Namibia. Diabetes is widespread in all the regions in Namibia and Kavango region in the north eastern part of the country was ranked the

lowest with 1.8 % (new cases) of diabetics aged 18 years and older in 2009. Of the 13 regions, the most affected region is Khomas. Windhoek which is situated in the Khomas region, was ranked as the region with the highest of diabetes incidence (15.1%) among people aged 18 years and older in 2009, compared to rural Andara district with 4% incidence rate within the same age group in the same year (MoHSS, 2006). The problem of diabetes is escalating and some of the reasons for this increase is the lack of knowledge about the disease, changes in lifestyle, and an increase in obesity in the population of Khomas Region.

Furthermore in 2008, 993 deaths per 100 000 were attributed to diabetes, this rate was higher than that of neighbouring countries namely South Africa, Angola and Botswana (Gojka & Katz, 2008). Diabetes has been cited as a cause for blindness, renal failure, non-traumatic limb amputations, and cardiovascular morbidity and mortality (Aguiree et al, 2013). Many of the complications of diabetes are said to be due to numerous factors such as lack of knowledge about the condition, non-adherence to medication and poor blood glucose control to name a few (Gojka & Katz, 2008). Therefore, there is a need to assess the level of knowledge and perceptions of the general public in order to create appropriate and relevant education programs in the Khomas Region.

#### **1.4 Purpose of the Study**

The prevalence of diabetes in Namibia is increasing and this escalation is influenced by several factors. This study therefore seeks to describe the knowledge, attitudes and perceptions about diabetes among the population of Windhoek. The information acquired in this study will assist in understanding the gaps in knowledge and perceptions about diabetes and therefore assist in the development of appropriate educational programs for both the prevention and the management of the disease.

#### **1.5 Structure of the mini-thesis**

Chapter one briefly describes the background, the problem, the purpose and the approach to the study. It further highlights the rationale for the research topic.

Chapter two discusses the literature review. It explores the context of the research problem through a critical review of past and recent studies on knowledge, attitudes and perceptions of diabetes among urban dwellers.

Chapter three describes the research aim and objectives; methodology and study design; sampling of respondents; data collection methods; data handling and analysis; as well as study limitations and ethical considerations.

Chapter four focuses on the results obtained from the study and includes an interpretation thereof.

Chapter five is a discussion of the study findings in relation to the literature.

Chapter six outlines the conclusion recommendations and that are proposed based on the study.



## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

The review covers theoretical aspects of diabetes mellitus related to knowledge, attitudes and perceptions. It further looks at the implications of these aspects for the current study. The review also summarizes the findings of previous studies on this subject and identifies gaps that this study aims to fill. The methodology as well as the country profile in relation to diabetes mellitus control compared to the regional and global standard is also explored.

### **2.2 Prevalence of diabetes in developing countries and Namibia**

Pullen (2006) asserts that diabetes mellitus is one of the scourges of the whole world, both in developing and developed countries; though in developing countries the urban areas are most affected. According to the International Diabetes Federation (IDF) in Africa an estimated 19.8 million people in 2013 had diabetes and this number is said to increase to 41.4 million by 2035 (Aguiree et al, 2013). The IDF report of 2013 further states that if current demographic patterns continue, the number of people with diabetes will continue to rise.

Moodley et al (2007), highlights that the prevalence of diabetes in African communities is escalating with the ageing of the population and lifestyle changes. Traditional rural communities still have a low prevalence, at most 1 – 2%, whereas 1 – 13% or more adults in urban communities have diabetes mellitus. This shows that diabetes affects people in both urban and rural areas, albeit to different degrees. Relevant preventive interventions should therefore be tailored for both areas.

At the first commemoration of the World Diabetes Day on the 16<sup>th</sup> of November 2010 in Namibia, WHO Country Representative confirmed that: “There is an estimated 12 million people with Type 2 diabetes in Africa, and the numbers are growing by one million every two years. Yet, current resources are channelled into infectious diseases, such as HIV/AIDS, rather than also including the needs and opportunities for interventions against NCDs, through clinical trials, changing lifestyles and public policy” (MoHSS and WHO, 2010: 2). This further confirms the need for interventions in Africa as the number of diabetic patients continue to soar.



Additionally, Maina et al (2010) warn that diabetes is now emerging as an epidemic of the 21<sup>st</sup> Century, and it threatens to overwhelm the health care system in the near future. Unfortunately, the majority of the people with diabetes in developing countries are within the productive age of 45 to 64 years (MoHSS & WHO, 2010) and in Namibia the peak occurrence of type 2 Diabetes is even younger ages of between 20 and 44 years. These are the same individuals who are expected to drive the economy of these countries in order to achieve the agreed international development goals. Besides their reduced productivity, diabetes further imposes a high economic burden in terms of health care expenditure, lost productivity and foregone economic growth.

### **2.3 Risk factors for diabetes mellitus**

Beaglehole and Yach (2003) have mentioned globalization as an important determinant of NCD epidemics because it has direct effects on risks to populations and indirect effects on national economies and health systems. By contrast, the growing burden of NCDs – mainly heart disease, stroke, cancer, diabetes and obesity has been neglected. Regrettably, the global pattern of death will increasingly be dominated by NCDs; hence by 2020 congestive heart disease and stroke are expected to be the leading causes of death and loss of disability-adjusted life years (Beaglehole & Yach, 2003).

Additionally, global trade and marketing developments are driving the nutrition transition towards diets with a high proportion of saturated fat and sugars (Beaglehole & Yach, 2003). Replacement of a traditional diet rich in fruit and vegetables by a diet rich in calories provided by animal fats and low in complex carbohydrates, is happening in all but the poorest countries. This diet, in combination with tobacco use and little physical activity, leads to population-wide atherosclerosis and the widespread distribution of NCD. Such changes will in general lead to increased rates of many NCDs.

Numerous risk factors for diabetes such as urbanization, poor dietary intake and physical inactivity have been cited by many studies (Vorster et al, 2005). Maina et al (2010) reported that urbanization with adoption of western lifestyles has been incriminated in the abandonment of the healthier traditional lifestyles by people in developing countries. In addition, more and more people in sub-Saharan Africa are migrating to urban areas seeking for better life (Maina et al, 2010). It is of concern that 45% of the 973 402 912 population in Sub-Saharan Africa will live in urban areas by 2025; currently, 68% of people with diabetes in sub-Saharan Africa

live in urban areas, and the number is expected to increase to 78% by 2030 (Goedecke & Ojuka, 2014). This will have a significant impact on diabetes prevalence - as the prevalence tends to be higher among urban compared to rural residents (Chen et al, 2015).

Physical inactivity is another risk factor which has been overlooked and ignored by many people (Shafae et al, 2008). Inactivity and being overweight go hand in hand towards a diagnosis of type 2 diabetes mellitus. It should be noted that all risk factors for obesity serve as risk factors for type 2 diabetes, however, not all risk factors for diabetes are guaranteed risk factors for obesity. For example, an individual may have a good diet, exercise regularly while not being obese. However, despite not being obese, this person may still be at risk of developing type 2 diabetes based on genetic disposition (MoPHS, 2008).

Harris et al, (2003) explains that risk factors for the development of type 2 Diabetes and prediabetes are not confined to lifestyle. Other risk factors include ethnicity, low socio-economic status (SES), and lower education. For example, Latino and African American citizens are more likely to develop type 2 Diabetes than whites and non-Hispanics (Harris et al, 2003). Furthermore there are non-modifiable factors that have been suggested to increase the risk of diabetes and these include genetics (Lyssenko & Laakso, 2013). Most importantly there is a plethora of factors and their interplay that leads to the development of diabetes.

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## **2.4 Morbidity due to Diabetes Mellitus**

### **2.4.1 Microvascular complications of diabetes**

Poor glycaemic and blood pressure control commonly found in the Sub-Saharan region are the main contributors to the high prevalence of microvascular complications noted in this region (Levitt, 2008). Gill et al (1995) alerts that mortality and outcomes were studied in a cohort of 64 young black patients with type 1 diabetes followed for 10 years in Soweto. Results of this study showed that renal failure was responsible for the majority of deaths, while diabetic retinopathy was present in 52%, peripheral neuropathy in 42%, autonomic neuropathy in 47%, neuropathy in 28% and 17% of patients had no complications.

Gill and colleagues (1995) agree that evidently, severe diabetic retinopathy was present in 13% of patients and was more frequent in African and Indian patients compared to European ones. In this study, diabetic retinopathy was significantly associated with the duration of diabetes and with low levels of serum C-peptide, adjusted for glucose concentration. Severe degrees of

retinopathy were associated with duration of diabetes, African ethnicity, and macroalbuminuria. It is realized that, poor diabetes control in these subjects, possibly because of the infrequent prescription of insulin, may have been responsible for the increased prevalence of severe retinopathy.

Fowler (2008) also confirms that diabetic retinopathy may be the most common microvascular complication of diabetes and responsible for 10 000 new cases of blindness every year in the United States alone. Notably, the risk of developing diabetic retinopathy or other microvascular complications of diabetes depends on both the duration and the severity of hyperglycemia. Development of diabetic retinopathy in patients with type 2 diabetes was found to be related to both severity of hyperglycemia and presence of hypertension in the United Kingdom.

Diabetic nephropathy is the leading cause of renal failure in the United States. Nephropathy is defined by proteinuria  $>500$  mg in 24hours in the setting of diabetes, but this is preceded by lower degrees of proteinuria, or “macroalbuminuria”. Macroalbuminuria is defined as albumin excretion of 30 – 299 mg / 24 hours. Without intervention, diabetic patients with macroalbuminuria typically progress to proteinuria and overt diabetic nephropathy. This progression occurs in both type 1 and type 2 diabetes (Fowler, 2008). Fowler (2008) further states that despite the lack of specific treatment for nephropathy, many drugs are available to treat its symptoms. However the primary goal should be preventing the worsening of nephropathy as well the glycaemic control.

#### **2.4.2 Macrovascular complications of diabetes**

The central pathological mechanism in macrovascular disease is the process of atherosclerosis, which leads to narrowing of arterial walls throughout the body (Fowler, 2008). Atherosclerosis is thought to result from chronic inflammation and injury to the arterial wall in the peripheral or coronary vascular system. In response to endothelial injury and inflammation, oxidized lipids from LDL particles accumulate in the endothelial wall of arteries. Angiotensin II may promote the oxidation of such particles. Monocytes then infiltrate the arterial wall and differentiate into macrophages, which accumulate oxidized lipids to form foam cells. Once formed, foam cells stimulate macrophage proliferation and attraction of T-lymphocytes. The T-lymphocytes, in turn, induce smooth muscle proliferation in the arterial walls and collagen

accumulation. The net result of the process is the formation of a lipid-rich atherosclerotic lesion with a fibrous cap. The rupture of this lesion leads to acute vascular infarction (Fowler, 2008).

Fowler, (2008) further elaborates that in addition to atheroma formation, there is a strong evidence of increased platelet adhesion and hypercoagulability in type 2 diabetes. The combination of increased coagulability and impaired fibrinolysis likely further increases the risk of vascular occlusion and cardiovascular events in type 2 diabetes. Hence diabetes increases the risk that an individual will develop cardiovascular disease (CVD). CVD is the primary cause of death in people with either type 1 or type 2 diabetes. In fact, cardiovascular disease accounts for the greatest component of health care expenditures in people with diabetes.

Furthermore, according to Fowler, (2008), type 2 diabetes typically occurs in the setting of the metabolic syndrome, which also includes abdominal obesity, hypertension, hyperlipidemia, and increased coagulability. These other factors can also act to promote CVD. Even in this setting of multiple risk factors, type 2 diabetes acts as an independent risk factor for the development of ischemic disease, stroke and death. Among people with type 2 diabetes, women may be at higher risk for coronary heart disease than men. The presence of microvascular disease is also a predictor of coronary heart events.

Gill et al (1995) adds that the association of known cardiovascular disease risk factors with acute myocardial infarction (MI) in sub-Saharan Africa was explored in the Interheart study. Five risk factors - smoking, history of diabetes, history of hypertension, abdominal obesity and Apo B: Apo A1 ratio accounted for 89.2% of the population attributable risk (PAR) for acute MI in the overall African population and an 87.7 PAR in the black African respondents. The strongest individual risk factors in the overall African population with diabetes (OR 3.55, 95% CI 2.53, 4.99) and hypertension (OR 3.44, 95% CL 2.64, 4.48) were similar to the overall international INTERHEART study. These data clearly reveals that diabetes is a major contributor to myocardial infarction in all ethnic groups in sub-Saharan Africa (Gill et al, 1995).

In Africa, mortality rates for diagnosed diabetes vary greatly between 7.6% and 41%. Diabetes is one of the leading causes of non-traumatic lower limb amputations (Mollentze & Levitt, 2010). The Diabetes Leadership Forum in Africa (DLFA) (2010) acknowledges that in Africa, about 12% of all diabetic patients have foot ulcers, and amputation occurs in up to 7% of all

hospitalized diabetic patients. However, effective education and treatment reduces the number of amputations. Most importantly, diabetes seriously damages the blood circulation system and therefore significantly increases the risk of heart disease, blindness, kidney failure, stroke, and limb amputations (DLFA, 2010).

## **2.5 Knowledge about diabetes mellitus**

It is said that many health workers in sub-Saharan Africa lack detailed training in the diagnosis of the symptoms of diabetes, and consequently many people with type 1 diabetes who present with ketoacidosis are likely to die undiagnosed (DLFA, 2010). Therefore, it is necessary to determine the knowledge of the population on diabetes in order to identify areas of deficient knowledge and behaviour so as to create relevant preventive interventions for the population.

Nisar and colleagues (2008) notes that early detection and imparting educational preventive programme is vital. They emphasize that different studies have proved adaptable risk factors of type 2 diabetes such as obesity and physical inactivity increases the risk of diabetes. They also indicate that if these risk factors are detected earlier, the onset of disease can be delayed and prevented (Nisar et al, 2008).

Kiawi et al, (2006) observed that diabetes, obesity, and physical inactivity are common in urban areas in sub-Saharan Africa. Therefore, it was realized that health education about diabetes and its main risk factors was a requirement. Hence, health education should be informed by lay perspectives to make the most of the appropriateness of the messages and their effect on knowledge, attitudes, and behaviour.

For example, in rural and remote areas health education should be levelled to what is appropriate to the people, that is, one cannot talk about cakes of which people know little or none at all, but rather use examples of what they have and know. For instance, in some rural areas people believe that being fat or obese is a sign of leading a good life. This also indicates why it is crucial to investigate attitudes and behaviours relating to diabetes and its main risk factors among the population.

Thus Moodley et al, (2007) acknowledge that the greatest weapon in the fight against diabetes mellitus is knowledge. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, thereby motivate them to take charge of their disease for

their lifetime (Moodley & Rambiritch, 2007). Norris and colleagues (2001) concur that if patients are to contribute to the effective control of their diabetes, their knowledge, self-caring skills, self-control, and attitude to diabetes are necessary. Therefore, people's knowledge and understanding of the disease is crucial.

Nisar et al, (2008) confirm that knowledge about the disease plays a very important role in future development of disease and its early prevention and detection. It is believed that wherever vast education regarding diabetes mellitus is provided to the general population, it resulted in significant increase in knowledge about the disease. For example, the Singapore study demonstrates the importance of health education on diabetes as the only way population can know about the disease including its risk factors (Nisar et al, 2008).

Ulvi et al, (2009) in a study conducted in Tarlai (Rural Islamabad) explain that the data collected during the survey grossly indicates that a significant number of the population had little or no awareness of diabetes mellitus. Those who were aware only know the disease by the name "sugar," and have failed to hear the words "diabetes mellitus". The results further showed that those awareness of the disease was due to an affected family member rather than the national health education system. Shockingly enough, even people who were currently diabetic, failed to give positive replies to some of the survey questions. It had also previously been shown that the level of awareness was poor amongst adult diabetics. Almost five years later, the study showed the same results.

In another study, Ulvi et al, (2009) stress that adults had poor diets, refrained from physical activity, and sometimes even knowingly put themselves at risk for diseases such as diabetes, hypertension, and heart disease. Finally, it was seen that amongst even the most populated city of Pakistan, the risk factors of diseases such as diabetes mellitus were rampant and the need for patient education and public awareness was necessary.

Ulvi et al, (2009) firmly state that the study had shown that the rural communities of Pakistan were unaware about the risks and complications of diabetes mellitus. It was noted that the majority of people who were aware of diabetes were only so because a family member was affected. Therefore, to raise the awareness of diabetes, a formal, structured approach should be designed to deliver the necessary educational information to the less developed areas of Pakistan, through mass media and outreach health education programmes. This could easily be

accomplished by distributing pamphlets of information which could be handed out at small makeshift group stations set up on locations. Alternatively, large public speaking sessions could be arranged addressed to the general public. As mentioned earlier, the study highlighted the need for both patient and public education regarding diabetes mellitus.

Additionally, Maina et al, (2010) confirm that knowledge is the greatest weapon in the fight against diabetes mellitus. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take control of their disease.

As indicated before, many of the complications of diabetes are said to be due to lack of knowledge about the condition, therefore, there is need to assess the level of knowledge and perception of diabetics and non-diabetics in order to create appropriate and relevant educational programs.

## **2.6 Overall Management of Diabetes Mellitus**

According to Smeltzer et al, (2009) the main goal of diabetes treatment is to normalize insulin activity and blood glucose levels to reduce the development of vascular and neuropathic complications. Therefore, the therapeutic goal for diabetes management is to achieve normal blood glucose levels (euglycemia) without hypoglycaemia while maintaining a high quality of life. Treatment varies because of changes in lifestyle and physical and emotional status as well as advances in treatment methods. Therefore, diabetes management involves constant assessment and modification of the treatment plan by health professionals and daily adjustments in therapy by the patient. Although the health care team directs the treatment, it is the individual patient who must manage the complex therapeutic regimen. For this reason, patient and family education is an essential component of diabetes treatment and is as important as all other components of the regimen. Diabetes management has five components:

### **2.6.1 Nutritional Therapy**

Smeltzer et al (2009) explains that nutrition, meal planning, and weight control are the foundation of diabetes management. The most important objectives in the dietary and nutritional management of diabetes are control of total caloric intake to attain or maintain a reasonable body weight, control of blood glucose levels, and normalization of lipids and blood pressure to prevent heart disease (Smeltzer et al, 2009).

### **2.6.2 Exercise**

Smeltzer et al (2009) elaborates that exercise is extremely important in diabetes management because of its effects on lowering blood glucose and reducing cardiovascular risk factors. Exercise lowers blood glucose levels by increasing the uptake of glucose by body muscles and by improving insulin utilization. It also improves circulation and muscle tone. For example, resistance (strength) training, such as weight lifting, can increase lean muscle mass, thereby increasing the resting metabolic rate. These effects are useful in diabetes in relation to losing weight, easing stress, and maintaining a feeling of well-being.

However, Smeltzer et al cautions that there are general precautions for exercise in people with diabetes and they should be advised to - use proper footwear and, if appropriate, other protective equipment; avoid exercise in extreme heat or cold; inspect feet daily after exercise; and avoid exercise during periods of poor metabolic control (Smeltzer et al, 2009).

### **2.6.3 Monitoring Glucose Levels**

Smeltzer et al, 2009 adds that blood glucose monitoring is a cornerstone of diabetes management, and self-monitoring of blood glucose levels by patients has dramatically altered diabetes care. Using frequent self-monitoring of blood glucose and learning how to respond to the results enable people with diabetes to adjust their treatment regimen to obtain optimal blood glucose control (Smeltzer et al, 2009).

### **2.6.4 Pharmacologic Therapy**

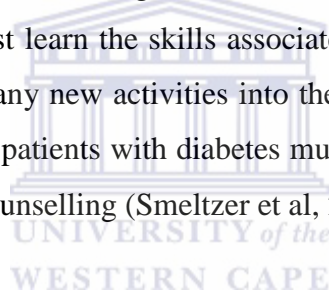
Smeltzer et al, 2009 explains that insulin is secreted by the beta cells of the islets of Langerhans and works to lower the blood glucose level after meals by facilitating the uptake and utilization of glucose by muscle, fat, and liver cells. In the absence of adequate insulin, pharmacologic therapy is essential. In type 1 diabetes, exogenous insulin must be administered for life because the body loses the ability to produce insulin. In type 2 diabetes, insulin may be necessary on a long-term basis to control glucose levels if meal planning and oral agents are ineffective. In



addition, some patients in whom type 2 diabetes is usually controlled by meal planning alone or by meal planning and an oral antidiabetic agent may require insulin temporarily during illness, infection, pregnancy, surgery, or some other stressful event. Because the insulin dose required by the individual patients is determined by the level of glucose in the blood, accurate monitoring of blood glucose levels is essential; thus self-monitoring of blood glucose has become a cornerstone of insulin therapy (Smeltzer et al, 2009).

### **2.6.5 Patient Education**

Smeltzer et al, (2009) elaborates that diabetes mellitus is a chronic illness that requires a lifetime of special self-management behaviours. Diabetics must learn daily self-care skills to prevent acute fluctuations in blood glucose, and they must also incorporate into their life-style many preventive behaviours for avoidance of long-term diabetic complications. Patients must become knowledgeable about nutrition, medication effects and side effects, exercise, disease progression, prevention strategies, blood glucose monitoring techniques and medication adjustment. In addition, they must learn the skills associated with monitoring and managing diabetes and must incorporate many new activities into their daily routines. An appreciation for the knowledge and skills that patients with diabetes must acquire can help nurses provide effective patient education and counselling (Smeltzer et al, 2009).



## **CHAPTER 3: METHODOLOGY**

### **3.1 Introduction**

This chapter describes the study setting, study design, study population, selection of respondents and the methods used for data collection and data analysis. It further highlights the aims and objectives of the study.

### **3.2 Study Setting**

The study was conducted in the City of Windhoek which is located in the Khomas region in the central part of Namibia. Namibia is situated in the South-Western Africa with a surface area of approximately 824, 000 square kilometres with a population of 2,182,859 (NDP, July 2013). It is bordered by the Atlantic Ocean to the west, Botswana and Zimbabwe in the east, South Africa in the South, and Angola and Zambia in the north. The City of Windhoek consists of a population estimation of 342,000.

The health care provision in Namibia consists of public and private health care providers. The private and mission hospitals make essential contributions to the health sector. But undoubtedly, the public sector through the MoHSS is the main service provider. The public sector services 80% of the population, while the private sector services 20% of the population in the country. The public sector has roughly 1,150 outreach points, 260 clinics, 40 health centres, 30 district hospitals, 3 intermediate hospitals, and 1 national referral hospital and numerous social welfare services (MoHSS, 2009). The diabetic services are established in all health facilities. There is the National Diabetic Association situated in Oshakati in the Oshana region. Three locations were selected for this survey, namely, Katutura, Khomasdal and Pioneers Park in Windhoek.

### **3.3 Research Method and Study Design**

#### **3.3.1 The research method**

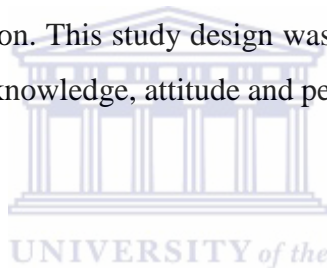
The quantitative research method was used to assess and explore the level of knowledge of diabetes mellitus among the adult population of Windhoek. The researcher chose quantitative research after considering the aim of the study and the type of data that was expected to achieve this purpose. Polit and Beck (2004), explain that the quantitative methodology uses deductive reasoning to generate hunches that are tested in the real world. Therefore, to quantify and

measure the knowledge, attitude and perceptions of the respondents regarding diabetes mellitus a quantitative research method was the most suitable method of enquiry.

The objective of the study was to describe the knowledge, attitude and perceptions of diabetes mellitus and to determine factors associated with the observed levels of knowledge, attitudes and perceptions towards diabetes mellitus among adult residents in Windhoek. Notably a qualitative approach could have offered a good exploration or an expanded analysis of respondents' knowledge; however that was not the purpose of the current study.

### **3.3.2 The Study Design**

The research design refers to the structured approach followed by a researcher to answer a particular research question (Joubert et al, 2007). A descriptive cross-sectional design was used to conduct this study. Polit and Beck (2004) explains that a cross-sectional design involves the collection of data at one point in time; therefore, the phenomena under study are captured during one period of data collection. This study design was chosen as it provides a proficient and rapid means of revealing the knowledge, attitude and perceptions of respondents related to diabetes mellitus.



### **3.4 Study Population**

The study population was male and female adults aged 18 years and above residing in Katutura, Khomasdal and Pioneers Park residential areas in Windhoek.

### **3.5 Sample Size and Sampling Technique**

#### **3.5.1 Sample size calculation**

The size calculation was calculated using Raosoft sample size calculator based on the following variables: population size of 66 690 in Katutura, 24 759 residents in Khomasdal and 8 885 residents in Pioneers Park, 95% confidence interval and margin of error of 10%, with the response distribution of 50%. Therefore a recommended sample size was as follows:

- Katutura: 96
- Khomasdal: 96
- Pioneers Park: 96

The sample size totalled 288. The non-response rate was estimated at 0.040%. The total sample size was then calculated at 300. Therefore, 300 adult residents were interviewed, that is, 100 in Katutura, 100 in Khomasdal and 100 in Pioneers Park.

### **3.5.2 The Sampling Technique**

In this study multi-stage stratified sampling technique was utilized. Stratified sampling was used to select the 3 geographic areas. These areas were selected according to economic strata, namely Katutura an area with low-income earners, Khomasdal with middle-income earners and Pioneers Park an area with elite or high-income earners.

In the three areas, streets were randomly selected from a list of street names. Thereafter, households were selected using systematic sampling where the house was selected. At household level adults who consented to participate were included in the study until the required sample size was reached.

## **3.6 Data Collection Procedure**

### **3.6.1 Data Collection Method**

Data was collected through interviews using a structured questionnaire which was administered by the researcher and trained research assistants. This method was found to be more appropriate as it decreased the difficulties of recording the answers, especially considering the low literacy levels of a few respondents (Burns & Grove, 2005). Unfortunately, the researcher admits that there are some disadvantages related to this method. It is realized that there is a risk of interviewer bias and the method prevents respondent anonymity because some of the interviewers knew some of the respondents personally (Musasa, 2011).

The questionnaire was translated from English to Afrikaans as these are the languages mostly spoken in Windhoek and ru-Kavango was another extra language. The structured questionnaire was used mainly to help explore the knowledge, attitudes and perceptions of diabetes mellitus and its main risk factors among the population in Windhoek district.

### **3.7 Data Analysis**

Data was analysed using Epi-Info version 7. The questionnaire was checked for completeness, legibility and missing values that could be corrected. Descriptive statistics such as frequency, percentage, median and interquartile range were used primarily to summarise and describe

levels of knowledge, perceptions and attitudes. A scoring framework was developed to categorize responses. The measurement for knowledge about diabetes mellitus comprised of questions entailing the nature, causes, signs and symptoms and complications of diabetes mellitus. In order to correct for guessing, the column 'I don't know' was included as an answer. Using graded scores, the respondents were categorised into varying levels of knowledge namely 'good' and 'poor'. All respondents with a score of <50% were included among those with poor knowledge while respondents scoring 50% and above were regarded as having good knowledge.

Three questions were included to examine the respondents' attitudes towards diabetes. A scoring system was also devised for attitudes. Good attitude received a score of 1 while bad attitude received a score of 0.

Perceptions about diabetes were also scored. A score of 0 was given to those who had poor perception and 1 for good perception. A total score less than 50% was viewed as poor perceptions about diabetes while a score of 50% and above was seen as good perceptions about diabetes.

Analytical statistics was used to describe association between KAP scores and demographic and socioeconomic variables such as age, gender, level of education. Pearson chi-square reported with 95% confidence level was used to determine significant differences between variables. A P-value of < less than 0.05 was regarded as statistically significant.

### **3.8 Validity and Reliability**

The instrument was translated into the language widely spoken in the three study sites. A different translator translated the questionnaire into English to ensure its validity.

Internal validity in this study was ensured through the piloting of the questionnaire in order to improve the data collection and to also identify any problems relating to understanding of the tool by respondents. Since the data was collected in different places, the samples were regarded as independent samples and consistency in responses assist in assessing the validity of the data. In addition, data collectors were trained by the researcher and constant supervision and monitoring of the data collection process was conducted. To further ensure reliability the research instruments were administered by the same researchers in all the research sites.

### **3.9 Generalisability**

With regard to external validity, the fact that the study context was specifically within the environment of urban areas, the sampling method and the sample size suggested that the findings might not necessarily be generalized to be the same in rural areas that is not similar to urban areas, because urban lifestyle differs from rural lifestyle.

### **3.10 Ethical Considerations**

Ethical approval for the study was received from the University of the Western Cape Research and Ethics Committee. The permission to conduct this study in Windhoek was received from: The Permanent Secretary of Health and Social Services on the recommendation by the Health Research Unit (**Appendix D**).

A coding system was used to ensure anonymity of study respondents. Names or unique personal identifiers were not recorded. All information that was provided by correspondents will be kept confidential and the data will be used for research purposes only.

Written consent was obtained from study respondents before commencing data collection to seek for their permission (**Appendix B**). It was explained to respondents that participation is voluntary and that anonymity and confidentiality would be maintained throughout the study by using questionnaire that did not require divulging their identity (**Appendix A**). Following the interviews, an information pamphlet addressing the respondents' concerns or queries about their participation in the study was given to all respondents (**Appendix C**).

Data was entered in the computer and a password-protection for files was used. Hence, these data would only be accessed by the researcher and others directly involved in the analysis of data.

### **3.11 Study Limitations**

As the study was a cross-sectional design, the researcher was not able to establish causality. The study was unable to infer the reasons for the observed levels of knowledge, attitudes and practices; however, it was able to give indication of correlations that were associated with understanding of diabetes mellitus.

The study's reliance on self-reports of respondents was another limitation, such as attitudes or practices were not observed and respondents could provide their assumed preferable responses. But the researcher made efforts to clarify the objectives of the study and the need for sincere and accurate responses.

Refusal to participate in the study: The respondents selected to be interviewed might have refused to participate in the study as there was no token of appreciation which could have been given to them for participating in the study. But the researcher made efforts to convince the respondents to realize the importance of the study.

Variations in socio-economic factors as well as geographic location of the different communities could affect the results obtained in this study. Thus this study cannot be generalized to different setting in Namibia.

### **3.12 Conclusion**

This chapter discussed the methodology used to assess the level of knowledge, attitudes and perceptions about diabetes mellitus among an urban adult population in Windhoek. The quantitative research method was used in consideration with the aim of the study and the type of data that was expected to achieve this purpose. A cross-sectional design was used to conduct this study as it involves the collection of data at one point in time. The population sample size was calculated using Raosoft sample size calculator based on the population size of Katutura, Khomasdal and Pioneers Park residential areas.

A sample size of 300 respondents were selected and interviewed face-to-face by the trained research assistants using a structured questionnaire. About 100 respondents from each residential area were interviewed. Data analysis, study limitations, validity, reliability and ethical considerations were covered and discussed thoroughly. This study design provided a proficient and rapid means of revealing the knowledge, attitude and perceptions of respondents regarding diabetes mellitus.

## CHAPTER 4: RESULTS

### 4.1 Introduction

The results of the analysis of the data collected from the respondents through questionnaires are reported according to the objectives of this study. The background and demographic characteristics of respondents included age, gender, race/ethnic group, nationality; education and employment status is presented followed by descriptive information of the study observations of respondents' knowledge, attitudes and perceptions related to diabetes. In addition, the association between socio-demographic characteristics and knowledge was presented.

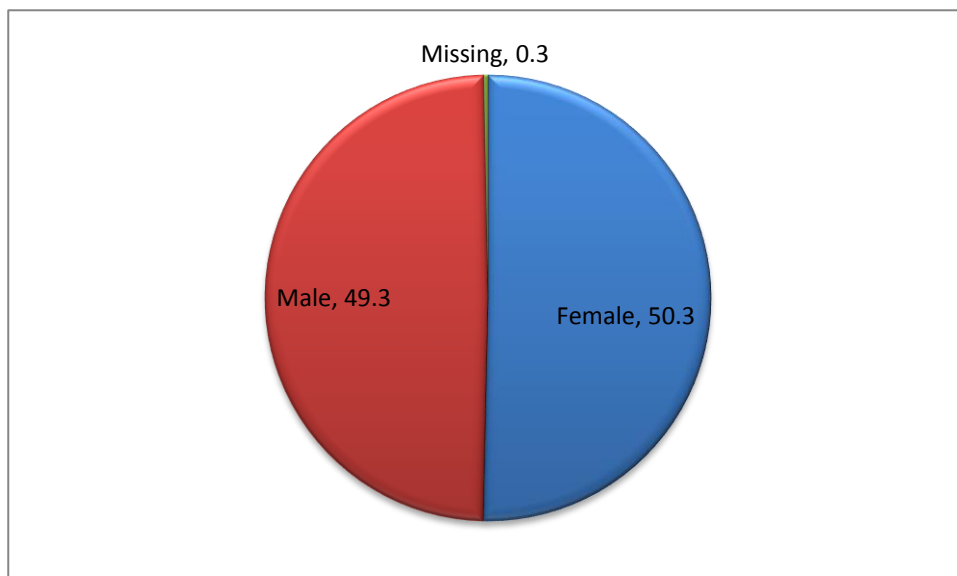
All 300 individuals who were approached to participate in the study consented to participate and were interviewed resulting in a response rate of 100%.

### 4.2 Demographic Characteristics of the Respondents

The respondents who were interviewed were adult (18 years and older) males and females residing in Katutura, Khomasdal and Pioneers Park suburbs of Windhoek, Namibia.

#### 4.2.1 Age, Gender and Ethnicity of Respondents

As shown in Figure 1, there were almost an equal number of males and females in this study. In this study 49.3% of the respondents were females while 50.3% were males.



**Figure 1:** Distribution of respondents by gender (n=300)

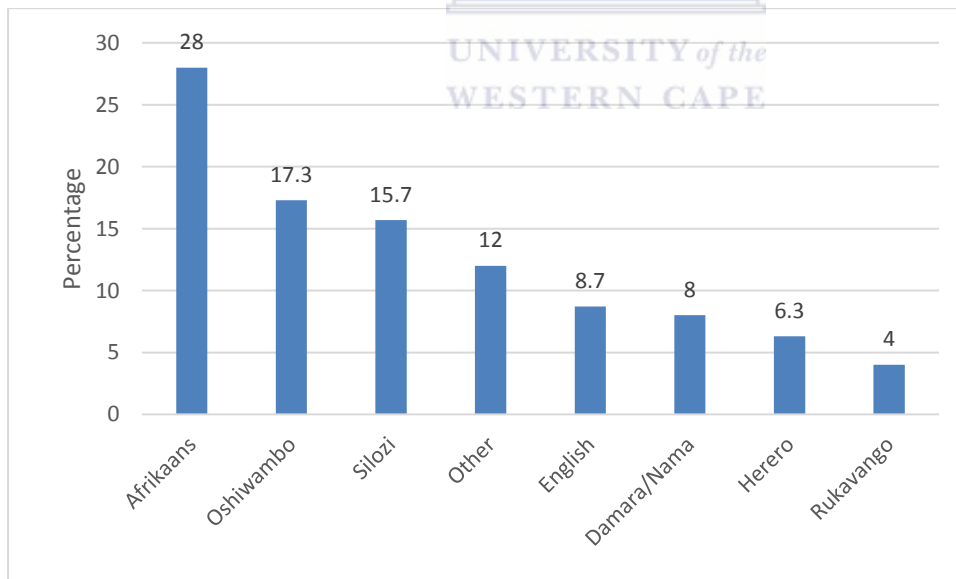


Table 1 shows that the majority of the respondents (31%) were in the age categories of 31 - 40 years, followed by the age group of 21-30 years (30.7%). The lowest proportion of respondents (3.3%) was in the age category of 18 – 20 years.

**Table 1:** Distribution of Respondents by Age Groups (n=300)

Age	Frequency	Percent
18-20 years	10	3.3
21-30 years	92	30.7
31-40 years	93	31
41-50 years	64	21.3
51 and above	41	13.7

Figure 2 illustrates the various languages most spoken at home in the three communities. Majority (28%) of the respondents spoke mostly Afrikaans at home, while Oshiwambo language (17.3%) was the second most spoken language. Rukavango was the least spoken language with only (4%) reporting that this was the language utilised at home.



**Figure 2:** Respondents’ language most spoken often at home (n=300)

#### 4.2.2 Level of Education

As indicated in Table 2, only (2.3%) respondents never attended school. Only 4.2% of the respondents had primary school education (i.e. grade 1-7), while the majority of respondents

(35.3%) had post grade 12 qualification which was either a certificate or a diploma. Interestingly more than a quarter of the respondents participating in this study had a Bachelor's degree (18.3%) or a Post graduate qualification (10.7%).

**Table 2:** Educational attainment among the respondents (n=300)

Education Levels	Frequency	Percent
No schooling	7	2.3
Grade 1 - 7	13	4.3
Grade 8 -11	34	11.3
Grade 12	53	17.7
Certificate / diploma	106	35.3
Bachelor	55	18.3
Post graduate	32	10.7

#### 4.2.3 Employment Status

The majority of respondents in this study were employed (62%) full-time, while only 3.3% had part-time employment. The proportion of unemployed respondents was 12.3% while only 7% of the respondents were self-employed (Table3).

**Table 3:** Employment Status of Respondents (n=300)

Type of employment	Frequency	Percent
Unemployed	37	12.3
Part-time Employed	10	3.3
Full-time employed	186	62.0
Pensioner	8	2.7
Self employed	21	7.0
Students	36	12.0
Missing	2	.7

#### 4.2.4: Sources of Income

Table 4 shows that 197 (65.7%) of respondents' main source of income was a salary, while 46 (15.3%) relied on remittances from family members. Only 2.7% and 2.3% of the respondents mentioned pension and other forms of grants or donations respectively as sources of income.

**Table 4:** Main Source of Household Income (n=300)

Types of Household Income	Frequency	Percentage
Salary	197	65.7
Contributions from family members	46	15.3
Pension	8	2.7
Grants / Donations	7	2.3
Other	31	10.3
No Income	7	2.3
Missing	4	1.3

Despite many of the respondents mentioning salary as a main source of income, respondents reported social grants as another source of income. The child support grant (20%) was the most reported type of grant, followed by Social relief of distress grant (16.7%). War veteran's Pension (8.3%) was the least reported type of grant received by respondents (Table 5).

**Table 5:** Types of Grants and Pension received by Respondents (n=300)

Types of Grants	Frequency	Percent
Child Support	60	20
Disability Grant	34	11.3
Grant in Aid	30	10
Pension (Previously Unemployed)	28	9.3
Pension from Work	34	11.3
Social Relief of Distress	39	13
War Veterans Pension	25	8.3
No grants	50	16.7

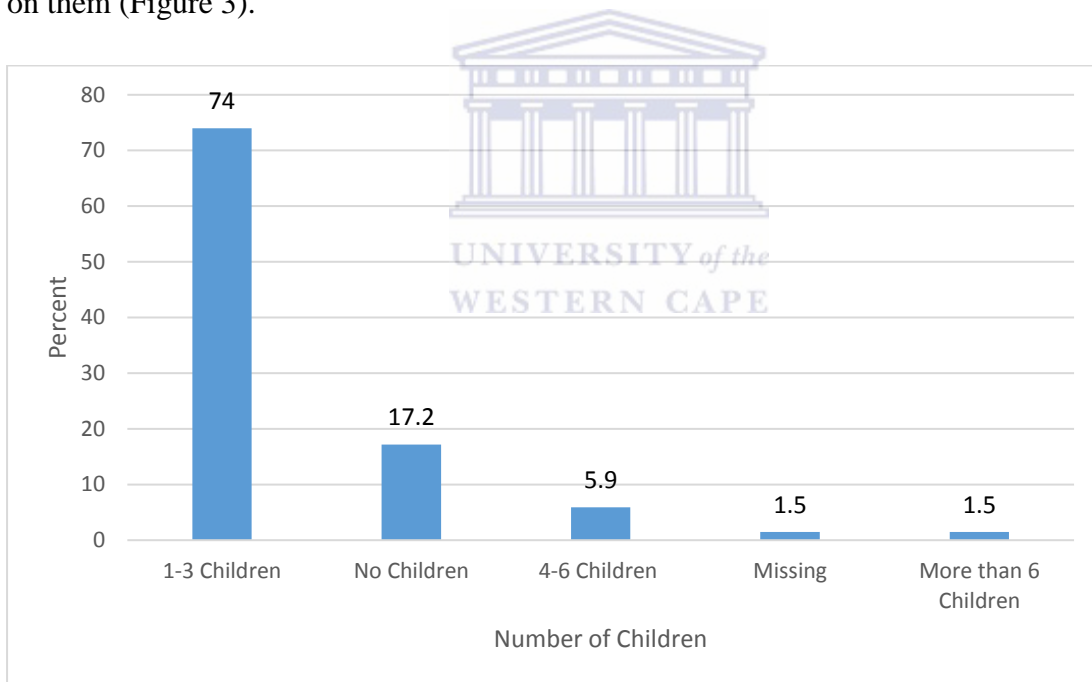
#### 4.2.5 Children within Households

Table 6 shows that majority of respondents had 1 - 3 children (55.7%), while only 2.6% of respondents had more than 6 children. On the other hand 32% of respondents had no children.

**Table 6:** Number of children in the Household (residing and dependent) (n=300)

Number of Children	Frequency	Percent
No of Children	96	32
1 - 3 Children	167	55.7
4 - 6 children	29	9.6
More than 6 Children	8	2.6

Of the 204 respondents who reported having children, 74% mentioned that their children depend on them, while 17.2% of the respondents reported that their children did not depend on them (Figure 3).



**Figure 3:** Proportion of own Children that are dependent on the respondent (n=204)

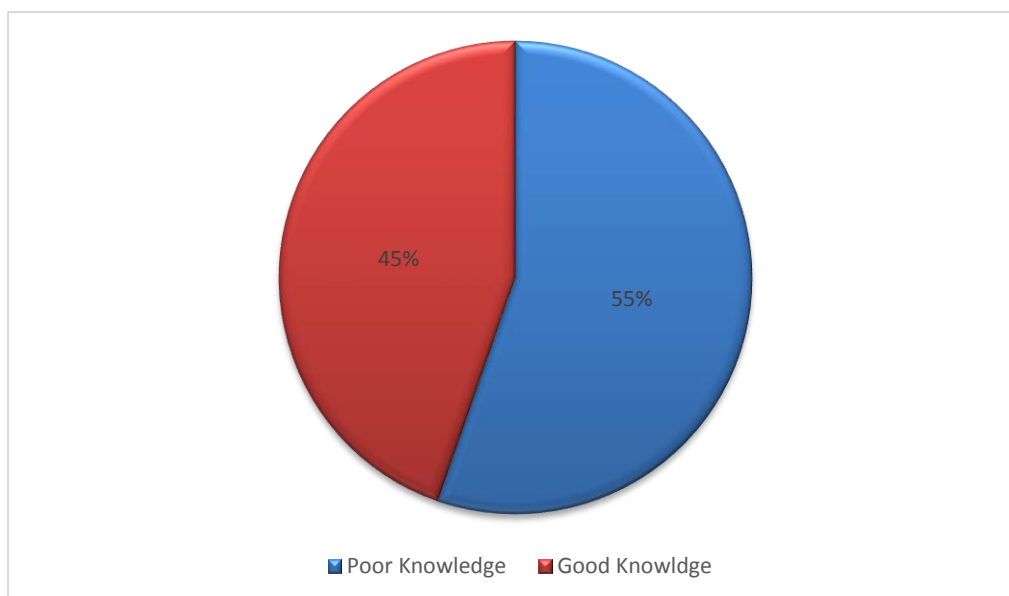
Although majority of respondents had their own children they still cared for other people's children. As shown in Table 7, 40% of respondents cared for children who were not their own. Of the 120 respondents who cared for children who were not theirs, 68.3% mentioned that 1 - 3 children depended on them, while a quarter of the respondents had 4 - 6 children depended on them.

**Table 7:** Proportion of non-biological children in the respondents' care

	Frequency	Percent
<b>Caring for non-biological children (n=300)</b>		
Yes	120	40
No	178	59.3
Missing	2	0.7
<b>Number of non-biological children dependents (n=120)</b>		
No Children	2	1.7
1 - 3 Children	82	68.3
4 - 6 Children	30	25.1
More than 6 Children	6	5

#### 4.3 Diabetes Mellitus Knowledge

A total of 24 items on diabetes mellitus knowledge questions were included in the structured questionnaire. The aim was to assess the knowledge about various aspects of diabetes mellitus and the respondents were required to indicate the best answer. Figure 4 represents the overall knowledge scores of respondents, and shows that a high proportion of respondents had poor knowledge about diabetes.



**Figure 4:** Diabetes knowledge among respondents

Table 8 presents the most known knowledge questions and the distribution of responses. Looking at Table 8 it is clear that certain questions were better known than others. It is evident that there were questions that the respondents were better knowledgeable about and these included questions mainly related to causes of diabetes and its complications.

**Table 8:** Six most known questions about diabetes mellitus

<u>Questions</u>	<u>Know</u>		<u>Don't know</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
Lack of effective insulin in the body	200	66.7	100	33.3%
In an treated diabetes, the amount of sugar in the blood usually increases	219	73	81	27
Knowledge of an insulin reaction is caused by eating too much food.	181	60.3	119	39.7
Diabetics should take extra care when cutting their toenails.	183	61	117	39
Diabetes can damage kidneys.	184	61.3	116	38.7
Diabetes can cause loss of feeling in my hands, fingers and feet.	187	62.3	113	37.7

Table 9 shows that males (53%) were more knowledgeable compared to female counterparts (47%). However, the difference between the genders was minute. Respondents in the age category 31-40 years were the most knowledgeable about diabetes compared to other age groups. While a large proportion of respondents aged between 51 and above (17.9%) as well as 18 -20 (4.5%) were the least knowledgeable about diabetes. Among those with good knowledge, respondents with certificate / diploma (33.6%) had the highest knowledge scores. Respondents living in Pioneers' Park (38.1%) had the highest knowledge compared to the other two residential areas. Respondents who were employed full-time (65.7%) were more knowledgeable compared to others. However, there were slight differences in knowledge based on gender, education, place of residence and employment status, these associations were not significant. The significant association was found between knowledge about diabetes and age (p-value less than 0.05).

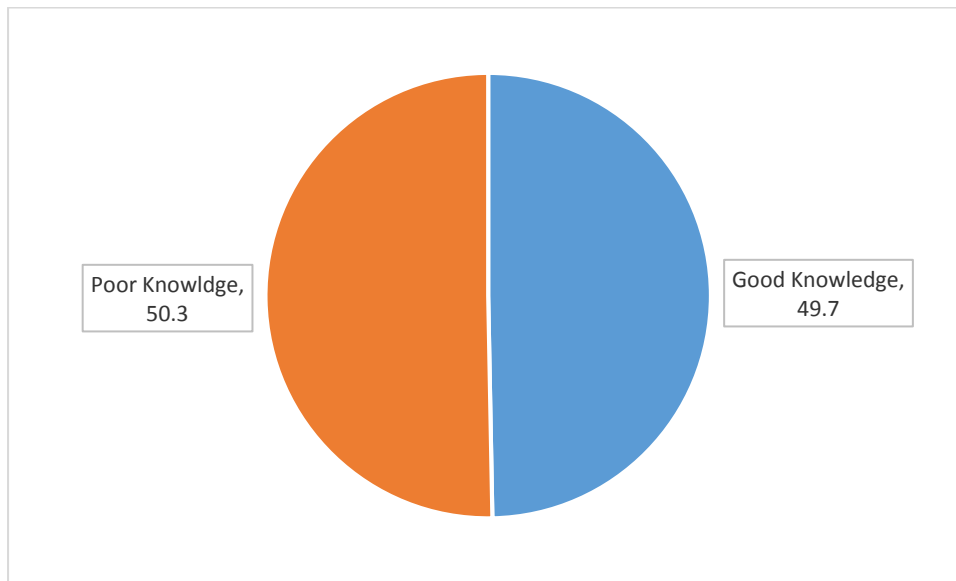
**Table 9:** Association between knowledge and socio-demographic characteristic

	No of respondents (n=300)	Poor Knowledge	Good Knowledge	P-Value
		n(%)	n(%)	
Gender				0.494
<b>Male</b>	151	80 (48.2)	71 (53)	
<b>Female</b>	148	85 (51.2)	63 (47)	
<b>Missing</b>	1	1 (0.6)	0	
Age				<b>0.039</b>
<b>18 - 20 years</b>	10	4 (2.4)	6 (4.5)	
<b>21 - 30 years</b>	92	62 (37.3)	30 (22.4)	
<b>31 - 40 years</b>	93	48 (28.9)	45 (33.6)	
<b>41 - 50 years</b>	64	35 (21.1)	29 (21.6)	
<b>51 years and above</b>	41	17 (10.2)	24 (17.9)	
Education Level				0.148
<b>No School</b>	7	5 (3)	2 (1.5)	
<b>Grade 1 - 7</b>	13	8 (4.8)	5 (3.7)	
<b>Grade 8 - 11</b>	34	13 (7.8)	21 (15.7)	
<b>Grade 12</b>	53	33 (19.9)	20 (14.9)	
<b>Certificate/Diploma</b>	106	61 (36.7)	45 (33.6)	
<b>Bachelor</b>	55	33 (19.9)	22 (16.4)	
<b>Post Graduate</b>	32	13 (7.8)	19 (10.7)	
Place of Residence				0.180
<b>Khomasdal</b>	99	53 (31.9)	46 (34.3)	
<b>Pioneers Park</b>	102	51 (30.7)	51 (38.1)	
<b>Katutura</b>	99	62 (37.3)	37 (27.6)	
Employment Status				0.853
<b>Unemployed</b>	37	21 (12.7)	16 (11.9)	
<b>Part-time employed</b>	10	7 (4.2)	3 (2.2)	
<b>Full-time employed</b>	186	98 (59)	88 (65.7)	
<b>Pensioner</b>	8	4 (2.4)	4 (3)	
<b>Self Employed</b>	21	12 (7.2)	9 (6.7)	
<b>Students</b>	36	23 (13.9)	13 (9.7)	
<b>Missing</b>	2	1 (0.6)	1 (0.7)	

#### 4.3.1 Knowledge on risk factors

In this section the respondents were asked to tick the most appropriate statement through options of "true", "false" and "don't know". This section was meant to test the respondent's knowledge on risk factors of diabetes. There was a small difference in the proportion of

respondents with poor and good knowledge about the risk factors of diabetes as shown in Figure 5.



**Figure 5:** Knowledge about risk factors for diabetes (n=300)

Table 10 shows that respondents with good knowledge about risk factors for diabetes were mainly male (56.4%). In addition, they were between the ages of 21 to 30 years 35.6%. Among respondents with varied education levels, those who had attained a certificate or diploma were the most knowledgeable. There were no significant differences among respondents living in Katutura, Pioneers Park and Khomasdal. However, Katutura residents (36.2%) were more knowledgeable about the risk factors. Full-time employed respondents (53.7%) had more knowledge about the risk factors than respondents from other employment categories. However, among those who were full-time employed a greater number had poor knowledge about risk factors. There was no significant association with any of the socio-demographic characteristics.



**Table 10:** Association between knowledge about risk factors of diabetes & socio-demographic characteristics (n=300)

	No of respondents	Good Knowledge	Poor Knowledge	P-Value
		n (%)	n (%)	
<b>Gender</b>				0.061
Male	151	84 (56.4)	67 (44.4)	
Female	148	64 (43)	84 (55.6)	
Missing	1	1 (0.7)	0	
<b>Age</b>				0.477
18 - 20 years	10	5 (3.4)	5 (3.3)	
21 - 30 years	92	53 (35.6)	39 (25.8)	
31 - 40 years	93	43 (28.9)	50 (33.1)	
41 - 50 years	64	30 (20.1)	34 (22.5)	
51 years and above	41	18 (12.1)	23(15.2)	
<b>Education Level</b>				0.116
No School	7	4 (2.7)	3 (2)	
Grade 1 - 7	13	8 (5.4)	5 (3.3)	
Grade 8 - 11	34	16 (10.7)	18 (11.9)	
Grade 12	53	30 (20.1)	23 (15.2)	
Certificate/ Diploma	106	56 (37.6)	50 (33.1)	
Bachelor	55	27 (18.1)	28 (18.5)	
Post Graduate	32	8 (5.4)	24 (15.9)	
<b>Place of Residence</b>				0.107
Khomasdal	99	53 (35.6)	46 (30.5)	
Pioneers Park	102	42 (28.2)	60 (39.7)	
Katutura	99	54 (36.2)	45 (29.8)	
<b>Employment Status</b>				0.099
Unemployed	37	22 (14.8)	15 (9.9)	
Part-time employed	10	7 (4.7)	3 (2)	
Full-time employed	186	80 (53.7)	106 (70.2)	
Pensioner	8	5 (3.4)	3 (2)	
Self Employed	21	13 (8.7)	8 (5.3)	
Students	36	20 (13.4)	16 (10.6)	
Missing	2	2 (1.3)	0	

#### 4.4 Attitudes about Diabetes

Three questions were used to assess respondents' attitudes to diabetes and these questions concentrated on the seriousness of diabetes, its distribution and curability.

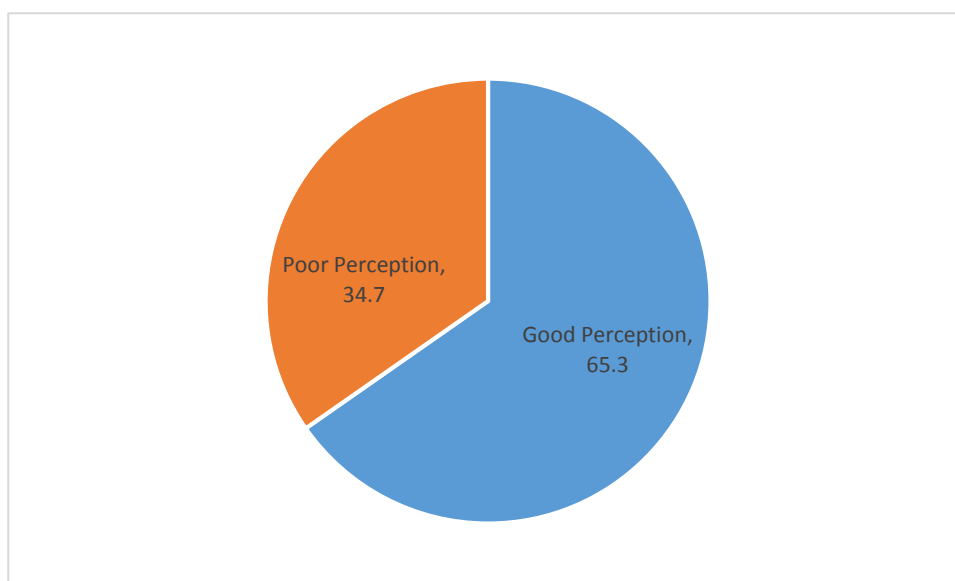
**Table 11:** Attitudes of Respondents about diabetes (n=300)

Attitude	Yes n (%)	No n (%)	Don't know n (%)
Is diabetes a serious national health issue in Namibia?	214 (71.3)	30 (10)	56 (18.7)
Traditional healers can cure diabetes mellitus with herbs.	78 (26)	152 (50.7)	70 (23.3)
Diabetes mellitus is a disease for the rich and white people.	39 (13)	161 (53.7)	100 (33.3)

Majority of the respondents (71.3%) reported that diabetes is a serious health issue in Namibia. On the other hand 26% of respondents reported that diabetes can be cured through herbs. Interestingly, 55.7% reported that diabetes is not a disease of the rich and white people while 31.3% of respondents did not know the distribution of diabetes. Generally, the respondents exhibited positive attitudes despite the disturbing number of respondents who did not know the responses to the questions. The proportion of respondents who responded that they do not know represent a portion of respondents who are impartial about the seriousness, distribution of the disease and its curability.

#### 4.5 Respondent's Perceptions of Diabetes Mellitus

This section included a total of 9 statements and questions meant to measure the respondent's perceptions about diabetes mellitus, consisting of answer options of "yes", "no" and "don't know". This section assessed what the respondents perceived about diabetes mellitus or what they believed of it to be.

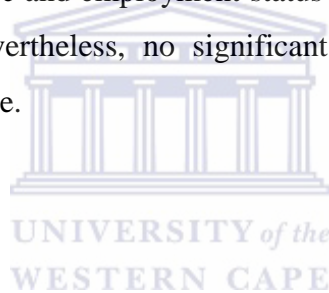


**Figure 6:** Respondents' Perception about Diabetes (n=300)

Generally respondents in this study had a good perception about diabetes as shown in Figure 6. Poor perception about diabetes was observed in 34.7% of the respondents.

Table 12 shows that respondents with good perception about diabetes were predominantly females (60.2%) and were between the ages of 31 and 40 years. Furthermore, they possessed either a certificate or diploma meaning that they had a post grade 12 qualification. The difference in perception between Pioneers Park (36.2%) and Katutura (35.7%) residences was huge and in both areas the respondents had poor perception about diabetes. Contrary Khomasdal had the highest number of respondents with poor perception about diabetes. Full-time employed respondents were the group with the highest proportion of respondents exhibiting good perceptions.

When the relationship between perceptions and socio-demographic was explored; gender, education level, place of residence and employment status were significantly associated with perceptions about diabetes. Nevertheless, no significant association was found between perceptions about diabetes and age.



**Table 12:** Association between perception about diabetes & socio-demographic characteristics (n=300)

	<b>No of respondents</b>	<b>Good Perception n (%)</b>	<b>Poor Perception n (%)</b>	<b>P-Value</b>
<b>Gender</b>				.000
Male	151	78 (39.8)	67 (44.4)	
Female	148	118 (60.2)	30 (28.8)	
Missing	1	0	1 (1)	
<b>Age</b>				0.339
18 - 20 years	10	9 (4.6)	1 (1)	
21 - 30 years	92	59 (30.1)	33 (31.7)	
31 - 40 years	93	63 (32.1)	30 (28.8)	
41 - 50 years	64	42 (21.4)	22 (21.2)	
51 years and above	41	23 (11.7)	18 (17.3)	
<b>Education Level</b>				0.000
No School	7	2 (1)	5 (4.8)	
Grade 1 - 7	13	3 (1.5)	10 (9.6)	
Grade 8 - 11	34	15 (7.7)	19 (18.3)	
Grade 12	53	41 (20.9)	12 (11.5)	
Certificate / Diploma	106	71 (36.2)	35 (33.7)	
Bachelor	55	40 (20.4)	15 (14.4)	
Post Graduate	32	24 (12.2)	8 (7.7)	
<b>Place of Residence</b>				0.044
Khomasdal	99	55 (28.1)	44 (42.3)	
Pioneers Park	102	71 (36.2)	31 (29.8)	
Katutura	99	70 (35.7)	29 (27.9)	
<b>Employment Status</b>				0.000
Unemployed	37	21 (10.7)	16 (15.4)	
Part-time employed	10	4 (2)	6 (5.8)	
Full-time employed	186	139 (70.9)	47(45.2)	
Pensioner	8	3 (1.5)	5 (4.8)	
Self Employed	21	5 (2.6)	16 (15.4)	
Students	36	22 (11.2)	14 (13.5)	
Missing	2	2 (1)	0	

## CHAPTER 5: DISCUSSION

The findings of this study are in line with the literature and the research questions.

Many studies conducted on diabetes knowledge tend to focus on the knowledge, attitudes and perceptions of diabetic patients and therefore exclude the general population that may be at risk of developing diabetes. This study was thus conducted in order to gain a broad perspective on the knowledge, attitude and practices of the population from different residential areas within Windhoek, Namibia. Furthermore, the information acquired in this study will be useful for designing and implementing population based strategies for the prevention and control of diabetes mellitus.

In this study knowledge about diabetes was generally good, despite the small difference between those with good and poor knowledge pertaining to complications, symptoms and treatment. General knowledge was associated with age and seemingly good knowledge decreased with age. These findings are similar to those by Guariguata and colleagues (2015) who found that increasing age was associated with good knowledge about diabetes. However, these findings were reported after controlling for age, sex, education, insurance and job type in the analysis. Furthermore, this decrease in good knowledge is of concern as people who are mostly affected by diabetes are in age groups of 35 years and older. The few number in Namibia of knowledgeable respondents younger than 20 years should also be viewed with concern as results of the District Health Information System (DHIS) (2009) revealed that there was 1.6% new cases of diabetes aged 5 to 17 years in Windhoek, suggesting early onset of diabetes. It should also be noted that people who lack sufficient knowledge about diabetes and its complications may also engage in behaviour which may increase their risk of developing diabetes mellitus (Maina et al, 2010).

In this study there were almost an equal proportion of respondents with good (50.3%) and poor (49.7%) knowledge about diabetes risk factors. However the small difference in knowledge could be attributed to the high number of respondents who did not know much about diabetes. On the contrary, in another study conducted in Namibia amongst formal sector employees it was found that most respondents could not correctly identify risk factors for diabetes (57.3%) (Guariguata et al, 2015). Understanding the risk factors could assist in reducing the incidence of diabetes. The prevention of diabetes largely depends on modifying lifestyle including

changing societal perceptions of 'health' and improving knowledge about the risk factors of diabetes and thus steps to promote healthy behaviours and must receive urgent attention of policy makers and health care planners (Mohan et al, 2005).

The higher number of respondents with good knowledge in this study was higher amongst respondents with a post grade 12 qualification.

This is concurred by Maina and colleagues (2010) who found that the level of education directly influences the level of knowledge about a particular health problem. Numerous other studies done on knowledge, attitudes and perceptions on diabetes among people have shown similar knowledge scores in countries in Asia, Africa and even in developed countries (Mukhopadhyay, et al, 2010; Musasa, 2010). These findings underscore very important aspects of providing diabetes education to communities as found out by Al-tamimi and Peterson (1998) in which they reported a historical deficiency in knowledge about diabetes and inequalities in the quality of education reaching each region in the country and that the low level of community knowledge of diabetes was reflection of the extent of health promotion intervention for most chronic NCDs.

Attitudes about aspects regarding a disease can have an impact on people's receptiveness to knowledge. In this study three questions were used to assess attitudes towards diabetes and these concentrated on the seriousness of diabetes, its distribution and curability. Although many acknowledged the seriousness of the disease almost 29% of the respondents either did not know or thought that diabetes was not a serious problem in Namibia. This may suggest that there are other diseases that take priority and therefore viewed as more serious. In addition, not knowing the seriousness of a condition could be due to lack of education interventions that can assist in sensitizing communities about these health conditions. Misunderstandings about curability of diabetes using traditional herbs could be an indication that communities are seeking alternative care outside the formal health system. Furthermore, it had been found that the use of herbs for diabetes may lead to delays in seeking appropriate treatment, thus resulting in diabetes related complications and associated disability and mortality (Rutebemberwa et al, 2013). Diabetes being a disease of the rich is a myth which was dispelled by majority of the respondents (53.7%). On the other hand the proportion of respondents who did not know whether diabetes is a disease of the poor or not is a concern. Poor attitudes such as this could easily result in complacency in the general public.

This study found that there was poor knowledge about diabetes complications among respondents in the study areas. This finding implies that households were unable to identify the ramifications of diabetes in relation to other illnesses affecting them at household level. Understanding the complications of diabetes could assist people to be more concerned about prevention and modification of own lifestyle as they will know the negative repercussions on the diseases when not controlled. Furthermore, knowledge could encourage people to be more curious about screening and this will assist in early detection of the diseases as well as prevent the early onset of diabetes.

Despite the respondents in this study having good perceptions about diabetes it is important to note that perceptions about traditional healers and diabetes in this context are still prevalent. Interestingly, more than a quarter of respondents (26%) stated that traditional healers can cure diabetes. This is an illustration of the importance of traditional healers in Namibia. Furthermore the findings highlight the need to include traditional healers as they are still a critical part of healthcare. Witchcraft and evil spirits were still perceived as a cause of diabetes by some respondents (33.6%). Such findings suggest that interventions in communities where traditional medicine still plays a significant role need to consider these perceptions as well as try to clear such misconceptions. In addition, the study may suggest the importance of including traditional healers or practitioner in health promotions activities within communities. Determining the knowledge as well as attitudes and perceptions about diabetes could be useful in the development of interventions for improving knowledge. Furthermore, improving knowledge of the people can improve their attitude towards diabetes and in the long run change their practice to embrace healthier lifestyles (Maina et al, 2010). Improvement in practice may minimize the risk of diabetes in the general public and delay the onset of complications in those already with diabetes. It is therefore important to identify interventions that reinforce people's attitudes despite their levels of knowledge of a particular subject.

## CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

### 6.1 CONCLUSION

This study reveals that the general knowledge on diabetes mellitus was good in all the three suburbs in Windhoek. Despite the respondents having good knowledge there were still misconceptions about diabetes related complications, risk factors and its treatment. In addition, attitudes and perceptions of respondents about diabetes were favourable and thus suggesting some level of understanding about diabetes in the different communities in Windhoek.

This study demonstrates knowledge in the area of diabetes which requires the active involvement of the various actors in health education. Accounting for the disparities and uniqueness of the community will facilitate the development of appropriate strategies that will be culture sensitive as well as context specific. Furthermore, strategies will improve knowledge and therefore clear misconceptions thus leading to improvements in practices that promote healthy living.

### 6.2 RECOMMENDATIONS

Following the findings of this study, the following recommendations are made:

#### 1. Health Education and Promotion:

- A comprehensive health education and promotive programme for diabetes is necessary in order to raise awareness. Additionally, awareness should cover areas such as diabetes prevention, management and treatment as well as risk factors.
- Diabetes prevention interventions need to focus on health education directed to the needs of heterogeneous communities in order to increase knowledge.
- Intensive awareness through health education and information sharing needs to be advocated from a health perspective on diabetes to inform and educate the public at large.
- Knowledge on management of diabetes and strategies for dealing with the condition was poor thus suggesting that management of diabetes should be included in education of the general public. Such action will allow non-diabetics to be able to have information that will help in assisting and supporting those with diabetes.



- A more systematic education programme for diabetes education is necessary and should be implemented at all levels of healthcare, from the community to the highest referral level.
- Such community health education interventions for diabetes need to take into account the disparity and uniqueness that exist between genders, age groups, place of residence, education level and employment status.

## **2. Policy Issues:**

- Community Health and Health Promotion Strategies of the Ministry of Health and Social Services should be tasked with health education and promotion related to diabetes in order for diabetes to be constantly on the agenda.
- Health education on diabetes should be included in the continuing education programme for health care workers.
- Health education on diabetes should be incorporated into the school health curriculum and be taught at all levels of education so that people can be aware of the condition very early in life.

## **3. Management Issues:**

- Health education and promotion should be included in the national, regional and district health plans.
- Diabetes awareness campaigns should be allocated financial and human resources under the district, regional and national level budgets.

## **4. General Issues:**

- It is important to make diabetes management everybody's business due to the fact that everyone is affected directly or indirectly, that is, individual, families, communities, churches, schools, all government sectors, nongovernmental organizations, business communities and industries.
- Include and encourage healthy lifestyle practices into the social and cultural ways of the lives of communities' health education and awareness.

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## APPENDIX A: SAMPLE OF QUESTIONNAIRE

**GENERAL INSTRUCTION TO THE INTERVIEWER: CIRCLE THE CODE NEXT TO THE APPROPRIATE RESPONSE PROVIDED BY THE INTERVIEWEE. IF INDICATED READ THE ANSWER OPTIONS.**

*Thank you for agreeing to participate in this research. As explained to you the purpose of this study is to assess your knowledge and perceptions about diabetes mellitus and its risk factors. To do this, I will need you to respond to the following questions. If unclear about any question you are free to ask me any time.*

### SECTION A1: DEMOGRAPHIC AND PERSONAL CHARACTERISTICS OF RESPONDENTS

1.1 How old were you at your last birthday? (Age of the respondent)

--	--

1.2 (Do not ask; record sex) Sex of the respondent

<b>Male</b>	<b>Female</b>
<u>1</u>	<u>2</u>

1.3 What is your race/ethnic group?

Damara/Nam a	White	Oshiwambo	Coloured	Rukavango	Herero	Other
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>

1.4 Are you the head of the household?

<b>Yes</b>	<b>No</b>
<u>1</u>	<u>2</u>

1.5 What is your nationality?

Namibian citizen	<u>1</u>
Other (specify)	<u>2</u>

1.6 What is your home language? (Language spoken most often at home)

English	<u>1</u>	Oshiwambo	<u>5</u>
Afrikaans	<u>2</u>	Lozi	<u>6</u>
Herero	<u>3</u>	Other (specify)	<u>7</u>
Rukavango	<u>4</u>		

1.7 **Circle one answer only.** What is your highest educational qualification?

a No schooling	<u>01</u>
b Up to Std 1/Gr 3	<u>02</u>
c Std 2- Std 3/Gr 4- Gr 5	<u>03</u>
d Std 4 – Std 5/ Gr 6 –Gr 7	<u>04</u>
e Std 5 – Std 7/ G8 – Gr 9	<u>05</u>
f Std 8 / Gr 10	<u>06</u>

g Std 9 Gr 11	<u>07</u>
h Std 10 / Gr 12 / Matric	<u>08</u>
i Certificate or Diploma with Gr 12	<u>09</u>
j Bachelors Degree	<u>10</u>
k Post-graduate degree (Hons/Masters/Phd)	<u>11</u>

1.8 In the last 12 months, have you been away from your home for more than one month altogether?

<u>Yes</u>	<u>No</u>
<u>1</u>	<u>2</u>

1.9 In the last week, how many nights have stayed away from home?

1.10 How many children do you have of your own? (i.e. by birth)

*If he/she has children, go to 1.12*

1.11 How many of these children are dependent on you?

1.12 Do you have any other dependents who are not your natural children?

(i.e. caring for e.g. step children, parents or nieces) *If no go to 1.14*

<u>Yes</u>	<u>No</u>
<u>1</u>	<u>2</u>

1.13 If Yes, how many other dependants do you have?

1.14 How would you describe your present employment situation?

<u>a Housewife, homemaker, not looking for work</u>	<u>01</u>
<u>b Housewife, homemaker, looking for work</u>	<u>02</u>
<u>c Unemployed, looking for work</u>	<u>03</u>
<u>d Unemployed, not looking for work</u>	<u>04</u>
<u>e Work in informal sector, not looking for permanent work</u>	<u>05</u>
<u>f Old age pensioner</u>	<u>06</u>
<u>g Sick/disabled and unable to work</u>	<u>07</u>
<u>h Student/ pupil/ learner</u>	<u>08</u>
<u>i Self-employed – full time (40 hours or more per week)</u>	<u>09</u>
<u>j Self-employed – part time (less than 40 hours per week)</u>	<u>10</u>
<u>k Employed part-time (if none of the above) (less than 40 hours per week)</u>	<u>11</u>
<u>l Employed full time (40 hours or more per week)</u>	<u>12</u>
<u>m Other, specify: .....</u>	<u>13</u>

1.15 What is the **main** source of your household income?

a Formal salary /earnings on which you pay income tax	<u>1</u>
b Contributions by <b>adult</b> family members or relatives	<u>2</u>
c Contributions by <b>younger</b> family members or relatives (<18 years)	<u>3</u>
d Government pensions/grants (e.g. old age pension, disability grant)	<u>4</u>
e Grants/donations by private welfare organizations	<u>5</u>
f Other sources, specify main source: .....	<u>6</u>
g No income	<u>7</u>

1.16 In the **last 12 months**, how often have you or your family gone without the following?

Read each statement	<b>Often</b>	<b>Sometimes</b>	<b>Rarely</b>	<b>Never</b>
a Shelter	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
b Enough fuel to heat your home or cook	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
c Enough clean water to drink and cook	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
d Medicines or medical treatment that you needed	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
e Enough food to eat	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
f A cash income	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>

1.17 Do you receive any form of grant or pension?

<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>No Response</b>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>

*If No, Don't know, No response, go to 1.19*

1.18 **Read each statement and circle the appropriate response**

Are you receiving any assistance from:	<u>Yes</u>	<u>No</u>
a Old Age Pension (Social Grant)?	<u>1</u>	<u>2</u>
b Foster Care Grant?	<u>1</u>	<u>2</u>
c Child Support Grant?	<u>1</u>	<u>2</u>
d Disability Grant/temporary disability grant?	<u>1</u>	<u>2</u>
e Care dependency grant (CSG) (Disability grant for a person below 18)?	<u>1</u>	<u>2</u>
f War Veterans Pension?	<u>1</u>	<u>2</u>



g <u>Grant in Aid?</u>	<u>1</u>	<u>2</u>
h <u>Pension from work?</u>	<u>1</u>	<u>2</u>
i <u>Unemployment Insurance?</u>	<u>1</u>	<u>2</u>
j <u>Workmen's Compensation?</u>	<u>1</u>	<u>2</u>
k <u>Social relief of distress?</u>	<u>1</u>	<u>2</u>

If yes for **d** and **e** above complete 1.18a

1.18a If the respondent receives a disability grant, what is the disability?

a <u>Physical (spinal injury, loss of a limb, etc.)</u>	<u>1</u>
b <u>Sensory disability (sight, hearing)</u>	<u>1</u>
C <u>Mental illness/psychiatric reasons</u>	<u>1</u>
d <u>Intellectual disability</u>	<u>1</u>
e <u>Chronic illness (e.g. TB, HIV/AIDS, diabetes, hypertension)</u>	<u>1</u>
f <u>Other:</u>	<u>1</u>

1.19 Is there a government funded disability grant that people with chronic illnesses including HIV/AIDS can apply for?

<b><u>Yes</u></b>	<b><u>No</u></b>	<b><u>Don't know</u></b>
<u>1</u>	<u>2</u>	<u>3</u>

1.20 Should a person get a government grant just because he/she has a chronic illness?

<b><u>Yes</u></b>	<b><u>No</u></b>
<u>1</u>	<u>2</u>

1.21 Should a person who has HIV/AIDS get a government grant?

<b><u>Yes</u></b>	<b><u>No</u></b>
<u>1</u>	<u>2</u>

1.22 Is your mother alive?

<b><u>Yes</u></b>	<b><u>No</u></b>	<b><u>Don't know</u></b>
<u>1</u>	<u>2</u>	<u>3</u>

If **Yes** or **don't know**, go to 1.24

1.23 If **No**, how old were you when she passed away? Years.....

--	--

23a If respondent does not know his/her age at the time, please circle '1'

<u>1</u>
----------

1.24 Is your father alive?

<b><u>Yes</u></b>	<b><u>No</u></b>	<b><u>Don't know</u></b>
<u>1</u>	<u>2</u>	<u>3</u>

If **yes** or **don't know**, go to 2.1

1.25 If **No**, how old were you when he passed away? Years.....

--	--

1.25a If respondent **does not know** his/her age at the time, please circle “1”

1
---

## SECTION A2: RESPONDENT’S DIABETES MELLITUS KNOWLEDGE TEST

*The following questions will assess your knowledge about various aspects of diabetes mellitus.*

### 2.1 Please indicate the best answer

	Questions	Ye s	No	Don’t know
2.1.1	Eating too much sugar and other sweet foods is a cause of diabetes.			
2.1.2	The usual cause of diabetes is lack of effective insulin in the body.			
2.1.3	Diabetes is caused by failure of the kidneys to keep sugar out of the urine.			
2.1.4	Kidneys produce insulin.			
2.1.5	In untreated diabetes, the amount of sugar in the blood usually increases			
2.1.6	If I am diabetic, my children have a higher chance of being diabetic.			
2.1.7	Diabetes mellitus can be cured.			
2.1.8	A fasting blood sugar level of 210 is too high.			
2.1.9	The best way to check my diabetes is by testing my urine.			
2.1.10	Regular exercise will increase the need for insulin or other diabetic medication.			
2.1.11	There are two main types of diabetes: Type 1 (insulin-dependent) and Type 2 (non-insulin dependent).			
2.1.12	An insulin reaction is caused by eating too much food.			
2.1.13	Medication is more important than diet and exercise to control my diabetes.			
2.1.14	Diabetes often causes poor blood circulation.			
2.1.15	Cuts and abrasions on diabetics heal more slowly.			
2.1.16	Diabetics should take extra care when cutting their toenails.			
2.1.17	A person with diabetes should cleanse a cut with iodine and alcohol.			
2.1.18	The way I prepare my food is as important as the foods I eat.			
2.1.19	Diabetes can damage my kidneys.			

2.1.20	Diabetes can cause loss of feeling in my hands, fingers and feet.			
2.1.21	Shaking and sweating are signs of high blood sugar.			
2.1.22	Frequent urination and thirst are <b>signs</b> of low blood sugar.			
2.1.23	Tight elastic hose or socks are <b>not</b> bad for diabetics.			
2.1.24	A diabetic diet consists mostly of special foods.			

### SECTION A3: RESPONDENTS ATTITUDE ABOUT DIABETES MELLITUS.

Table 13: Attitudes of Respondents about diabetes (n=300)

Attitude	Yes	No	Don't know
Is diabetes a serious national health issue in Namibia?			
Traditional healers can cure diabetes mellitus with herbs.			
Diabetes mellitus is a disease for the rich and white people.			

### SECTION A4: RESPONDENTS KNOWLEDGE OF THE RISK FACTORS OF DIABETES MELLITUS

*(Tick appropriate answer)*

**4.1 If a parent is diabetic the children have a higher chance of being diabetic.**

[4.1.1] True

[4.1.2] False

[4.1.3] don't know

**4.2 People with prediabetes (high fasting blood glucose), are at 50% higher risk of heart disease and stroke than people who do not have prediabetes.**

[4.2.1] true

[4.2.2] false

[4.2.3] don't know

**4.3 Having an immediate family member (father, mother, sister or brother) with diabetes increase the risk of developing diabetes mellitus.**

[4.3.1] true

[4.3.2] false

[4.3.3] don't know

**4.4 Diabetes is linked to being obese or being overweight.**

[4.4.1] true

[4.4.2] false

[4.4.3] don't know

**4.5 All pregnant women should be screened for gestational diabetes during their pregnancy.**

[4.5.1] true

[4.5.2] false

[4.5.3] don't

**4.6 If a woman previously developed diabetes during pregnancy a test should be done before the 13<sup>th</sup> week of pregnancy.**

[4.6.1] True

[4.6.2] False

[4.6.3] don't know

**4.7 Physical activity or exercise is very important in managing diabetes.**

[4.7.1] True

[4.7.2] false

[4.7.3] don' know

**4.8 Diabetes seriously damages the blood circulation and thereby increasing the risk of blindness and kidney failure.**

[4.8.1] True

[4.8.2] False

[4.8.3] don't know

**4.9 When obesity, overweight and lack of exercise are detected earlier, diabetes can be delayed and prevented.**

[4.9.1] True

[4.9.2] False

[4.9.3] don't know

**4.10 Regular and vigorous physical activity accompanied by food rich in fiber, whole grain-based diet rich in vegetables and fruits is forsaken by many people.**

[4.10.1] True

[4.10.2] False

[4.10.3] don't know

**4.11 Cakes, sweet puddings and ice-creams are foods described as "sweets" and should be eaten at the end of a meal.**



[4.11.1] True

[4.11.2] False

[4.11.3] don't know

**4.12 Babies born of women who have gestational diabetes are also at some risk of developing diabetes later in life.**

4.12.1 True

4.12.2 False

4.12.3 Don't know



**APPENDIX B: CONSENT FORM**  
**UNIVERSITY OF THE WESTERN CAPE**



**School of Public Health**

Private Bag X 17, **BELLVILLE** 7535, South Africa

Tel: +27 21 959 2809, Fax: +27 21 959 2872

**CONSENT FORM FOR RESPONDENTS**

EXPLORATION OF KNOWLEDGE, ATTITUDES AND PERCEPTIONS ABOUT  
DIABETES MELLITUS AMONG THE POPULATION IN WINDHOEK – KHOMAS  
REGION, NAMIBIA

The study has been explained to me in the language that I understand. I freely and voluntarily agree to participate. My concerns and questions about the study have been cleared and answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in anyway. Confidentiality will be maintained at all times during the study. No names will appear on any reports.

Respondent's name.....

Respondent's signature.....

Witness.....

Date.....

# APPENDIX C: INFORMATION SHEET

## UNIVERSITY OF THE WESTERN CAPE



### School of Public Health

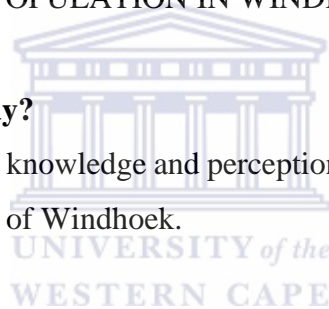
Private Bag X 17, BELLEVILLE 7535, South Africa

Tel: +27 21 959 2809, Fax: +27 21 959 2872

## KNOWLEDGE, ATTITUDES AND PERCEPTIONS ABOUT DIABETES MELLITUS AMONG AN URBAN ADULT POPULATION IN WINDHOEK, NAMIBIA

### What is the purpose of this study?

The aim of this study is to explore knowledge and perceptions of diabetes mellitus and its main risk factors among the population of Windhoek.



### The interview process

This will consist of an individual interview using a questionnaire. I will read out each question to you and ask for your answer. Answering the question will take approximately thirty minutes and will be conducted in an isolated room. Only the researcher will hear your answers.

### What are the risks of this research?

None, your name will remain anonymous, the same as your answers. Nothing will happen to you or any of your family members, you will be treated with respect.

**What are the benefits of this research?** This research will help to improve care for people affected and not affected with diabetes mellitus. It will also help to pave the way in educating the people about diabetes so that they will be able to prevent and control it effectively.

**When I have started with the research, am I allowed to stop participating at any time?**

Yes, you are allowed to stop without giving any explanation of why you are stopping. This will not affect you in anyway.

**What if I have questions?**

You can ask any question at any time to get more clarity regarding this research.

This research is being conducted by the UNIVERSITY OF THE WESTERN CAPE; this is the institution through which I am studying. If you have any questions about the research study itself, please contact me at the following address: Ministry of Health and Social Services

Harvey Street, Primary Health Care

Block B, Office No. 3, Windhoek

Or you may contact me at: Tel: +264 61 203 2785

Cell: +264 814125559

Fax: +264 61 246904

E-mail: [dkambinda@gmail.com](mailto:dkambinda@gmail.com)





## APPENDIX D: PERMISSION LETTER

9-0/0001

