

**PREVALENCE OF OBESITY AND LEVEL OF PHYSICAL ACTIVITY AMONG HEALTH
CARE PROFESSIONALS IN RURAL HOSPITALS IN SEKHUKHUNE DISTRICT, LIMPOPO
PROVINCE, SOUTH AFRICA**

By

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DEDICATION

This research work is dedicated to the following people:

- My daughter (Tshilidzi), my parents (George and Maria), my brother (Buti Pitso) and my sister (Salome) and her family (Ketetji, Kganya and the little one Rasegwete).

DECLARATION

I declare that **PREVALENCE OF OBESITY AND LEVEL OF PHYSICAL ACTIVITY AMONG HEALTH CARE PROFESSIONALS IN RURAL HOSPITALS IN SEKHUKHUNE DISTRICT, LIMPOPO PROVINCE SOUTH AFRICA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

Seemole Blantina Senwamadi

Date

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ABSTRACT

Background: Obesity and physical inactivity have been reported as the major contributing factors to non-communicable diseases and a public health problem worldwide. According to World health organization the global prevalence of obesity has increased more than doubled between 1980 and 2014. Many healthcare professionals fail to achieve sufficient levels of physical activity and most of them display poor dietary habits. The study conducted in South Africa among health care professionals in urban hospital in Gauteng province confirmed that 20% of them developed at least one NCD of which the contributing factors are obesity and physical inactivity. The aim of the study was to determine the prevalence of obesity and level of physical activity among health care professional in rural hospitals in Sekhukhune district, Limpopo province, South Africa.

Methods: A quantitative descriptive study was conducted on 400 HCPs. The global questionnaire was closed ended. GPAQ was used for physical activity and anthropometric measurements were taken for BMI. A stratified random sampling method was used to sample HCPs. Data was analysed using SPSS version 23.0.

Results: Most participants were females (71%), majority were between 30-39 years of age (46.3%), the highest category were nurses (77.8%), most of them their job title were assistants (44.5) and blacks (99.3%). The results revealed that 40.8% of HCPs were obese and 30.3% were overweight. Majority of (79.3%) were not engaging on work vigorous PA, however were engaging on work moderate PA. Also (60.5%) were not engaging on leisure vigorous PA, though 55.5% were engaging on leisure moderate PA. Majority (88.3%) had high sedentary (sitting) time. (35.50%) engaged in high activity of walking from one place to the other.

In conclusion: There is a need for regular health promotion programmes among health care professionals with regard to obesity and importance of physical activity. The hospitals need to be equipped with onsite fitness centre that will be accessible to all HCPs. Physical activities support groups need to be established such as aerobics

classes and fun run. Policies that guide participation in physical activities need to be drawn and be implemented accordingly in health sector, so as to promote healthy living habits.

Key words: Obesity, Overweight, Level of physical activity, Health care professionals

ABBREVIATIONS

BMI:	Body mass index
CDL:	Chronic diseases of lifestyle
GPAQ:	Global physical activity questionnaire
HCP:	Health Care Professional
NCD:	Non- communicable diseases
PA:	Physical activity
PI:	Physical inactivity
WHO:	World Health Organization

DEFINITION OF KEY CONCEPTS

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure (World Health Organization, 2010). In this study, physical activity will refer to bodily movements that requires energy expenditure by the healthcare professionals.

Exercise is a subset of physical activity that is planned, structured and repetitive for the purpose of conditioning any part of the body, to improve health, maintain fitness and is a means of physical rehabilitation (Farlex Partner Medical Dictionary, 2012). The same definition will be used in this study.

Physical inactivity is lack of physical activity and is an independent risk factor for chronic diseases of lifestyle (WHO, 2010). In this study, physical inactivity will be for those healthcare workers who do not participate in any form of exercise.

Health care professional is an individual who provides preventive, curative, promotional or rehabilitative health care services in a systematic way to people, families or communities. A health professional may operate within medicine, surgery, midwifery, obstetrics, dentistry, nursing, pharmacy, psychology or allied health professionals. A health professional may also be a public or community health expert working for the common good of the society (National Health Act, 20003). In this study health care professionals will include nurses, clinical care professionals and allied healthcare professionals.

Non communicable diseases or chronic diseases of lifestyle are a group of diseases that share similar risk factors as a result of exposure, over many decades, to unhealthy diets, smoking, lack of regular exercise, and possibly stress (Steyn, 2006). The same definition will be used in this study. In this study non-communicable diseases are chronic diseases due to lifestyle behaviours and they include the following conditions hypertension, diabetes mellitus, chronic heart diseases and lung diseases.

Obesity can be described as an imbalance between energy intake and expenditure such that excess energy is stored in fat cells, which enlarge or increase in number and is body mass index (BMI) of $>30 \text{ kg/m}^2$ (Goedecke, Jennings and Lambert, 2006.) This definition will be used to guide this study.

Body Mass Index is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults (WHO, 2006). Body mass index will be operationalized in this study.

Global physical activity questionnaire is an interviewer-administered or self-administered questionnaire that was developed to collect information on physical activity participation and sedentary behaviour in three settings (or domains), that are activity at work, travel to and from places and recreational activities (WHO, 2009).

CHAPTER 1

OVERVIEW OF THE STUDY

1. 1. INTRODUCTION AND BACKGROUND

Obesity and physical inactivity have been reported as the major contributing factors to non-communicable diseases and a public health problem worldwide (World Health Organization, 2008). Non-communicable diseases are the major contributing factors to global mortality and morbidity (Chimeddamba, Peeters, Walls & Joyce, 2015).

The prevalence of obesity is increasing globally (Mitchell, Catenacci, Wyatt & Hill, 2011). According to report by World Health Organisation (WHO, 2015) the global prevalence of obesity has increased more than doubled between 1980 and 2014. Overall, about 13% of world's adult population, which is 11% of men and 15% of women are obese as reported in the study conducted by WHO in 2014 (WHO, 2015). The highest prevalence of greater than 25% were found in countries like Poland, Czech Republic, Portugal, Romania and Albania (Berghofer, Pischon, Reinhold, Apovian, Sharma & Willich 2008). In United State, this increase has been labelled as 'epidemic' of significant public health concern due to association of obesity and long-lasting health problems, increased disability and premature death (Harris, Bradlyn, Coffman, Gunel & Cottrell, 2008). The fundamental causes of obesity are due to an increase intake of energy-dense foods that are high in fat and increase in physical inactivity (WHO, 2015).

South Africa has the highest overweight and obesity rate in Sub-Saharan Africa, seven out of 10 women and four out of 10 men have significantly more fat than what is deemed healthy (Malan, 2014). These results correlate with a 2011 health survey conducted by pharmaceutical company GlaxoSmithKline that pronounced South Africa "the third-fattest nation in the world" and a Medical Research Council study, which found that 61% of the South African population is overweight or obese (Du Toit, Funnel & Partners, 2011). Compared to neighbouring countries such as Namibia (19.8%), Lesotho (24.1%) and Zimbabwe (33.5 %), have smaller proportions of obese women than South Africa according to Malan, (2014). Eritea has been reported to have only 4.7% obese women and Ethiopia 1.8%, which is about 10 to 20 times less than South

Africa according to an article published by Malan, (2014). This is almost double the global rate of nearly 30%, according to the Lancet study (Ng, Fleming, Robinson et al., 2014), which found that the rise in global obesity rates over the past three decades “has been rapid, substantial and widespread, presenting a major public health epidemic in both the developed and developing world” (Ng, Fleming, Robison, et al., 2014). The study further found that men in developed countries had higher rates of overweight and obesity, while women in developing countries exhibited higher rates (Malan, 2014).

Misperceptions about one’s body weight have been recorded. People who are obese tend to think that they are overweight and those who are overweight regard themselves as having normal weight, however when their body mass index are calculated the values do not correspond with their perceptions (Skaal & Pengpid, 2011). The study conducted by Skaal and Pengpid (2011) amongst health care workers in South Africa showed that three out of four healthcare workers (73.6%) who were overweight perceived themselves as being of normal weight, while more than a half of HCW (57.3%) who were obese also perceived themselves as being of normal weight and 40% of them perceived themselves as being overweight. Moreover, 66.8% of those who were severely obese perceived themselves as overweight and 10% of them perceived their weight as being normal.

Physical activity has become widely recognised as a key health behaviour, associated with reducing all-cause morbidity and mortality, as well as chronic diseases of lifestyle (CDL) (Lambert & Kolbe-Alexander, 2006). Regular moderate physical activity such as walking, cycling or participating in sports has significant benefits for health, they are highly recommended in preventing and combating diseases of lifestyle (WHO, 2010). According to World Health Organization (2010) Global Recommendations for Physical Activity, physical activity for adults of 18–64 years old, includes recreational or leisure-time physical activity, transportation (e.g. walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities.

Health care professionals are regarded as role models for the public with regard of promotion healthy lifestyle choices for the general public (Power, Kiezebrink, Allan & Campbell, 2014). However despite this, evidence suggests that 58%-65% of healthcare professionals are overweight or obese (Skaal & Pengpid, 2011; Bogossian, Hepworth, Leong, Flaws, Gibbons, Benefer & Turner, 2012). Many healthcare professionals fail to achieve sufficient levels of physical activity according to Humphreys (2007) and/or display poor dietary habits (Jinks, Lawson & Daniels, 2003).

1.2. PROBLEM STATEMENT

Many healthcare professionals fail to achieve sufficient levels of physical activity (Humphreys, 2007) and most of them display poor dietary habits (Jinks, Lawson & Daniels, 2003). The study conducted by Skaal and Pengpid (2011) in South Africa among health care professionals in urban hospital in Gauteng province confirmed that 20% of them developed at least one non-communicable disease of which the contributing factors are obesity and physical inactivity.

The impact of overweight and obesity in health care professionals is significant and wide ranging negatively affecting not only the individual's own health but also healthcare provider resources, quality of service delivery and patient care (Power et al., 2014). Most studies to determine the prevalence of obesity and level of physical activity were conducted among health care professionals working in urban areas (Chou & Johnson, 2008; Skaal & Pengpid, 2011 and Kunene & Taukobong, 2015). There is insufficient literature that reports on prevalence of obesity and the level of physical activity among health care professionals in rural hospitals. Therefore, there is a need to develop interventions to improve physical activity among health care professionals in rural hospitals. These interventions will contribute towards the reduction of obesity among health care professionals. For interventions to be developed, information on the level of physical activity and the burden of obesity is of great importance, which leads to the conducting of the current study.

1.3. LITERATURE REVIEW

The literature review is about what is obesity, the prevalence of obesity, the effects of obesity and prevention strategies of obesity. It further reviews physical activity, prevalence of physical activity, guidelines for physical activity, the benefits of physical activity, and dangers of physical activity, strategies to improve physical activity and health care professionals and healthy lifestyle. It will be discussed in details in Chapter 2.

1.4. PURPOSE OF THE STUDY

1.4.1. Aim of the study

The aim of the study was to determine the prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo province, South Africa.

1.4.2. Research objectives

- To describe the socio-demographic characteristics of health care professionals in rural hospitals in Sekhukhune district.
- To determine prevalence of obesity among health care professionals in rural hospitals in Sekhukhune district.
- To determine the level of physical activity among health care professionals in rural hospitals in Sekhukhune district.
- To make recommendations to improve physical activity and reduce the burden of obesity among HCP in rural hospital in Sekhukhune district.

1.5. RESEARCH QUESTION

What is the burden of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district?

1.6. METHODOLOGY

Research setting and design, including sampling methods and data collection and data analysis together with validity, reliability and bias will be elaborated in Chapter 3.

1.7. ETHICAL CONSIDERATIONS

The aspects of ethical considerations such as seeking permission to conduct the study, confidentiality, harm and the beneficence of participating in the study will be dealt with in Chapter 3.

1.8. SIGNIFICANCE OF THE STUDY

Most studies about prevalence of obesity and level of physical activity and prevention strategies to combat obesity have been conducted in developed countries. In developing countries most studies have been conducted in urban areas. There are few studies that have been published about prevalence of obesity and level of physical activity among health care professionals in rural areas.

The results of this study are hoped to assist in making the recommendations to the Department of Health and Health Promotion Unit to take health care professionals in rural hospital into consideration when they are planning or implementing obesity management and prevention intervention strategies and physical activity intervention strategies.

1.9. OUTLINE OF CHAPTERS

The subsequent chapter will discuss literature review about the study in Chapter 2. Chapter 3 will explain the methods of conducting the study such as, sampling and data collection. Chapter 4 will outline the results of the study and Chapter 5 will discuss the results of the study.

1.10. SUMMARY

This chapter has outlined the background of the study, the rationale of why the study was conducted, the research question, ethical considerations and the significance of the proposed research.

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

The previous chapter has outlined the overview of the study. This chapter will look into literature review about the study under various subtitles. The literature review was conducted by reviewing various articles, which were dealing with the issue of obesity and level of physical activity.

2.2. OBESITY

Obesity is an imbalance between energy intake and expenditure such that excess energy is stored in fat cells, which enlarge or increase in number. It is a body mass index (BMI) of $>30 \text{ kg/m}^2$ (Goedecke, Jennings & Lambert, 2006). The fundamental causes of obesity is increase in intake of energy-dense foods that are high in fat and increase in physical inactivity (WHO, 2015). It is a major contributing factor to Non Communicable Diseases (WHO, 2008).

2.2.1. Prevalence of obesity

The prevalence rates of obesity are increasing globally (Mitchell, Catenacci, Wyatt & Hill et al., 2011). The worldwide prevalence of obesity more than doubled between 1980 and 2014 (WHO, 2015). Globally at least 2.8 million people die due to overweight and obesity and about 2.3% of disability-adjusted life years are due to overweight and obesity (WHO, 2016). Overall, about 13% of world's adult population, which is 11% of men and 15% of women were obese in 2014 (WHO, 2015). The rates in United State have doubled since 1980 (Dumith, Hallal, Reis & Kohl III, 2011). In 2009-2010, the prevalence of obesity was 35.5% among adult men and 35.8% among adult women, with no significant change compared with 2003-2008 in United State (Flegal, Carroll, Kit & Ogden, 2012). The highest prevalence of obesity of about 26% are present in America and lowest of 3% in South East Asia (WHO, 2016). In Europe, Eastern Mediterranean and America, 23%, 24% and 29% of women respectively are obese according to WHO (2015). Women have double the obesity of men in Africa, Eastern Mediterranean and

South East Asia (WHO, 2015). The highest prevalence of greater than 25% were found in countries like Poland, Czech Republic, Portugal, Romania and Albania (Berghofer et al., 2008) . In United State, this increase has been labelled as 'epidemic' of significant public health concern due to association of obesity and long-lasting health problems, increased disability and premature death (Harris et al., 2008), though in Canada the prevalence of obesity is not as high as in United State, of which only 25% of adults were obese by 2008 (Dumith et al., 2011). Central and South America have the rise of obesity which is above that of United State and Canada, by 2008 more than 30% of women and more than 25% of men in this countries were obese (Dumith et al., 2011).

According to the study conducted by (Abubakari & Bhopal, 2008) in West Africa the prevalence of obesity was 10.0%. Women were more likely to be obese than men in West Africa (Abubakari & Bhopal, 2008) like in Europe, Eastern Mediterranean and America, 23%, 24% and 29% of women respectively are obese according to WHO 2016. In West Africa urban residents were more likely to be obese than rural residents, of which the prevalence of obesity has doubled by 14% over 15 years in urban West Africa (Abubakari, Lauder, Agyemang, Jones, Kirk & Bhopal, 2008). In Tonga the prevalence of obesity exceeded 50% in men and in Kuwait, Kiribate, Federal State of Micronesia, Libya, Qatar, Tonga and Samon, it also exceeded 50% in women (Ng, Fleming, Robins, et al., 2014). In North and East Africa the prevalence of obesity is on the rise as well, for example in Sauda Arabia 28% of men and 44% of women are obese (Dumith et al., 2011). The prevalence of obesity in African countries has also increased, according to the study conducted in Nigeria, whereby it has shown 53.3 % of overweight people and 21% of obesity (Wahab, Sani, Yusuf, Ghadamosi, Ghadamosi and Yandutse, 2011). The study conducted among nurses in Nigeria in 2009, confirmed that 62 % of the nurses were obese (Ogunjimi, Ikorok, Yusuf & Olayinka, 2009).

The prevalence of obesity is also on the rise in Southern African Development Community, which previously was not the case as the countries were struck by under-nutrition according to study conducted by Harvard School of Public Health (Flegal et al., 2012). For Example Democratic Republic of Congo in 2008 was having a BMI of 19.9 in

men which was the lowest in the world (Flegal et al., 2012). South Africa has highest prevalence of obesity of 61% as compared to the neighbouring countries such as Namibia (19.8%), Lesotho (24.1%) and Zimbabwe (33.5%), have smaller proportions of obese women than South Africa. Eritea has 4.7% obese women and Ethiopia 1.8% (Ng, Fleming, Robins, et al., 2014). According to the study that was conducted in Tanzania revealed that the more the health care professionals are obese, the more it affects the way they give advice to their patients about healthy lifestyle according to Wallace (2010).

The prevalence of obesity has also increased among health care professionals in South Africa. The studies that were carried out in South Africa in 2010 and 2011 respectively, confirmed that 41% of HCP were obese according to Onyebukwau (2010) and 47% of HCP were obese according to the study conducted by Skaal and Pengpid (2011). The study that was conducted by Skaal and Pengpid (2011) furthermore found that the HCP had more than one chronic disease. The study that was conducted at Ga-Mothapo village in Limpopo indicated high prevalence of obesity and dyslipidaemia in the rural population (Sengwanyo, Moraba & Motaung, 2012). The study that was conducted in Vhembe and Capricorn districts among nurses revealed that there is prevalence of 44.4% of obesity in nurses (Goon, Maputle, Olukoga, Lebese, Khoza & Anyawu, 2013). Though there is no sufficient literature on health care professionals in rural hospitals, the rate of obesity among nurses in Limpopo province is comparable with that of general population in South Africa.

2.2.2. Effects of obesity

The high prevalence of obesity impact negatively on health conditions as a predisposing factor to non-communicable diseases such as diabetes mellitus type 2, hypertension, dyslipidaemia, insulin resistance and cancers (Mitchell et al., 2011). The obesity epidemic is spreading to low-income and middle-income countries as a result of new dietary habits and sedentary ways of life, fuelling chronic diseases and premature mortality (Cecchini, Sassi, Lauer, Lee & Guajardo - Barron & Chisholm. 2010).

Underpinned by the forces of globalization including increased amounts of international trade, travel, and shared communication. Obesity epidemic is rapidly becoming a worldwide problem.

Chronic diseases of lifestyle (CDL) are a group of diseases that share similar risk factors as a result of exposure, over many decades, to unhealthy diets, smoking, lack of regular exercise, and possibly stress. The major risk factors are high blood pressure, tobacco addiction, high blood cholesterol, diabetes, and obesity. These result in various long-term disease processes, culminating in high mortality rates attributable to strokes, heart attacks, tobacco- and nutrition-induced cancers, chronic bronchitis emphysema, renal failure, and many others (Steyn, 2006). Chronic diseases are a growing cause of death and disability in South Africa. The pattern of chronic disease is changing as the determinants and risk factors for chronic diseases develop in this society in transition – a process dubbed ‘the epidemiological transition’ (Steyn, 2006).

This epidemiological transition, therefore, is predicated upon demographic and nutritional transitions as socioeconomic development and increasing globalisation alter the patterns of chronic diseases in South Africa (WHO, 2008). The burden of cardiovascular diseases and other non-communicable diseases is rising rapidly in developing countries. In South Africa it is estimated that 43% of deaths are due to non-communicable diseases (WHO, 2015). Rapid urbanization in many sub-Saharan African countries contribute to epidemiological transition in the region. Previous studies demonstrate a positive rural-urban gradient in terms of prevalence of risk factor (Assah, Ekelund, Brage, Mbanya & Wareham, 2011) The impact of urbanisation on the emergence of CDL risk factors in sub-Saharan African countries is one of the major influences on the population, which is undergoing unprecedented levels of migration from century-old traditional lifestyles in rural areas to the large peri-urban settlements of cities in the region. Urbanisation has an effect on almost all the aspects of the migrants’ lifestyle that contributes to increasing levels of CDL risk according to Assah et al., (2011). This includes the influence on the migrants’ diets, exercise patterns and the amount of tobacco products they use.

Unfortunately, prevention of the emergence of risk factors receives the least attention in South Africa's activities relating to health (Steyn, 2006), however the need for adequate prevention is the focus of the World Health Organization according to World Health Organization, 2002 Report. Yach most pertinently asks why the public health community gives such a low priority to effective preventive measures for chronic diseases seeing that their cost-effectiveness have been shown to be so high (Yach, 2002). He suggests possible answers to the question and argues that slowing the incidence of new cases of almost entirely preventable CDL can be achieved by cost-effectively addressing CDL risk factors such as tobacco use, unhealthy diets and physical inactivity. He also emphasises the principles set out in the Ottawa Charter for Health Promotion, and the need to tackle risks together and within the social, economic, and political context of countries (WHO, 1986). This approach to health promotion highlights another issue that is often ignored in sub-Saharan African countries when preventive actions are introduced. Frequently, health promotion material and programmes developed in the industrial world are implemented in this region without the necessary consideration of the local culture or the realities of people living in poor settings. Such an approach is doomed to fail. The only way to achieve success is to develop either new locally appropriate health promotion programmes, or carefully adopting material from other settings to fulfil local requirements (Yach, 2002).

According to the study that was conducted in Tanzania, it revealed that the more the health care professionals are obese, the more it affects the way they give advice to their patients about healthy lifestyle (Wallace, 2010). This is emphasised by Power, et al., (2014), that the impact of overweight and obesity in health care professionals is significant and wide ranging negatively affecting not only the individual's own health but also healthcare provider resources, quality of service delivery and patient care.

2.2.4. Prevention strategies for obesity

World Health Organization (2010) has also recommended strategies for diet, physical activity and health, in an effort to combat non communicable diseases and prevention of

this diseases at population level and influence policy-makers at national level. Several population-based prevention policies can be expected to generate substantial health gains while entirely or largely paying for themselves through future reductions of health-care expenditures. These strategies include health information and communication strategies that improve population awareness about the benefits of healthy eating and physical activity; fiscal measures that increase the price of unhealthy food content or reduce the cost of healthy foods rich in fiber; and regulatory measures that improve nutritional information or restrict the marketing of unhealthy foods to children (Cecchini, 2010).

Cost-effectiveness information, together with strong financial and budgetary analysis, has a key part to play in identification of core packages of chronic disease interventions that can be realistically scaled up in countries at different levels of income, thus contributing to the business case for large-scale investment and action (Ng, Fleming, Robins, et al., 2014). Organization for Economic Co-operation and Development (OECD) and WHO developed a microsimulation model called chronic disease prevention (CDP) model that implements a so-called causal web of lifestyle risk factors for selected chronic diseases (Cecchini et al., 2010).

2.3. PHYSICAL ACTIVITY

Physical activity has become widely recognised as a “key” health behaviour, associated with reducing all-cause morbidity and mortality, as well as chronic diseases of lifestyle (CDL) (Lambert & Kolbe-Alexander 2006). The associated health benefits of physical activity accrue in a dose-dependent manner, and early adaptations in the transition from sedentary living to becoming moderately active seem to have the greatest effect on risk reduction for CDL in men and women (Lambert & Kolbe-Alexander 2006). Generally, the health benefits of physical activity increase with increasing frequency, duration, and intensity of physical activities. There are various types of physical activities that can be done, which incorporates recreational or leisure-time physical activity, transportation (e.g. walking or cycling), occupational (i.e. work), household chores, play, games, sports

or planned exercise, in the context of daily, family, and community activities (WHO, 2010).

2.3.1. Prevalence of physical activity

To implement effective non-communicable disease prevention programmes, policy makers need data for physical activity levels and trends. Worldwide, 31.1% of adults are physically inactive, with proportions ranging from 17.0% in South East Asia to about 43% in the Americas and the eastern Mediterranean. Inactivity rises with age, is higher in women than in men, and is increased in high-income countries. The proportion of 13–15-year-olds doing fewer than 60 min of physical activity of moderate to vigorous intensity per day is 80.3%; boys are more active than are girls. (Hallal, Andersen, Bull, Guthold, Haskell, Ekelund & Lancet Physical Activity Series Working Group et al., 2012.) The prevalence of physical activity is low globally (Dumith et al., 2011), with 21.4% physical inactivity among women than men and 27.8 % higher in developed countries.

In Nigeria the prevalence of physical activity among adults were fairly high, with overall 68.6 %, though it seems to decline with age, being married and blue collar work (Adewale, Adetoyeye, Zainab & Fatima, 2013). The prevalence of inactivity in West Africa was 13% in 2014. An association was found between physical inactivity and being older (≥ 50 years), female gender and urban residence (Abubakari, Lauder, Agyemang, Jones, Kirk & Bhopal. 2008.). Physical inactivity are important public health issues in urban West Africa, with similar prevalence's to wealthy industrialized countries. There is an urgent need for policy makers, politicians and health promotion experts to put measures in place to encourage active lifestyles and control diabetes in urban West Africa (Abubakari et al., 2008.)

South Africa has high prevalence of physical inactivity with 49% of women and 43% of men, compared with global average of 17% or Africa's average of 10% (Finucane, Stevens, Cowan, Danaei, Lin, Paciorek, Singh, Gutierrez, Lu, Bahalim & Farzadfar, 2011). In SANHANES (2013) one out of four males (27.9%) and one out of two females (45.2%) are physically inactive. Preliminary data on the patterns and prevalence of

physical activity among black men and women living in the Cape Peninsula were presented (Lambert & Kolbe-Alexander, 2006). Most of the participants were employed in occupations requiring minimal physical activity (57%), and one quarter had occupations requiring moderate amounts of exercise (25%). A subsequent study was conducted in the North West Province in an urban and rural community (Kruger, Venter & Vorster, 2003). More than half of the subjects participating in this study were not sufficiently active as only 29% and 28% were classified as either inactive or moderately active. Men and urban dwellers were significantly more physically active than the women and those living in rural areas. Similar results were obtained from a peri-urban community of mixed ancestry (coloured) men and women (Kruger et al., 2003). Approximately half of the total sample (49.7%) did not participate in 150 minutes or more of physical activity per week, which is the minimum recommendation required for achieving a health benefit (Lambert & Kolbe-Alexander, 2006).

2.3.2. Dangers of physical inactivity

Physical inactivity has been identified as the fourth leading risk factor for global mortality (6% of deaths globally). This follows high blood pressure (13%), tobacco use (9%) and high blood glucose (6%). Overweight and obesity are responsible for 5% of global mortality (WHO, 2010). Levels of physical inactivity are rising in many countries with major implications for the general health of people worldwide and for the prevalence of NCDs such as cardiovascular disease, diabetes and cancer and their risk factors such as raised blood pressure, raised blood sugar and overweight.

Physical inactivity is estimated as being the principal cause for approximately 21–25% of breast and colon cancer burden, 27% of diabetes and approximately 30% of ischaemic heart disease burden (WHO, 2010). Worldwide, we estimate that physical inactivity causes 6% (ranging from 3.2% in Southeast Asia to 7.8% in the Eastern Mediterranean region) of the burden of disease from coronary heart disease, 7% of type 2 diabetes, 10% of breast cancer, and 10% of colon cancer (Friedenreich, Norat, Steindorf et al., 2006). Inactivity causes 9% of premature mortality (Lee, Shiroma,

Lobelo, Puska, Blair, Katzmarzyk & Lancet Physical Activity Series Working Group, 2012).

Elimination of physical inactivity would increase the life expectancy of the world's population by 0.68 (range 0.41–0.95) years. In addition, NCDs now account for nearly half of the overall global burden of disease. It is estimated currently that of every 10 deaths, 6 are attributable to non-communicable condition (WHO, 2008). Strong evidence shows that physical inactivity increases the risk of many adverse health conditions, including major non-communicable diseases such as coronary heart disease, type 2 diabetes, and breast and colon cancers, and shortens life expectancy (Lee et al., 2012.). Physical inactivity has a major health effect worldwide. Decrease in or removal of this unhealthy behaviour could improve health substantially.

2.3.3. Benefits of physical activity

Regular moderate physical activity such as walking, cycling or participating in sports has significant benefits for health, they are highly recommended in preventing and combating diseases of lifestyle (WHO, 2010).The benefits of physical activity are well outlined, according to the Physical Activity Guidelines for Americans (2008), being physically active on a regular basis improves chances of living longer and healthier. It helps to protect from developing heart disease and stroke or its precursors. It also helps to prevent developing high blood pressure and undesirable blood lipid patterns, certain cancers such as colon, breast and lung and endometrial cancer. PA further helps to prevent type 2 diabetes and metabolic syndrome and osteoporosis. It reduces the risk of falling and improves cognitive function among older adults. Relieves symptoms of depression and anxiety and improves mood. Prevents weight gain, promotes weight loss (when combined with a lower-calories diet), and helps keep weight off after weight loss, improves heart-lung and muscle fitness and improves sleep.

In the European study conducted by Friedenreich et al., (2006) there was a reduction of colon cancer by 22% among the most active participants compared with inactive participants. In the study conducted in Danish there was no association between the

risk of colon cancer and physical activity and in Japanese men there was a risk of developing colorectal cancer among men, only (Kruk, 2007). Women who are physically inactive are 3.8 times higher risk of developing breast cancer as compared to those who are physically active (Kamarudin, Shah & Hidayach, 2006). In Europe there was a reduction of breast cancer in association with household physical activity, especially with premenopausal women at 29% and 19% in postmenopausal women (Lahmann, Friedenreich, Schuit et al., 2007). Moderate physical activity has also proved to improve sleep, quality of life and mood, especially in older adults (Reid, Baron, Lu, Naylor, Wolfe & Zee, 2010.).

2.3.4. Strategies to improve physical activities

Continued improvement in monitoring of physical activity would help to guide development of policies and programmes to increase activity levels and to reduce the burden of non-communicable diseases (Hallal et al., 2012). Physical activity should be accessible in all setting through changing of physical environments, like schools and work place (WHO, 2002). Adults should participate in at least moderate intensity physical activity 150 minutes per week, which is at least 30 minutes per day (WHO, 2010). Job related, transportation, recreational and house chores should be in cooperated as part of physical activity to promote healthy lifestyles (Craig, Marshall, SjÅ–StrÅ et al., 2003).

Policy interventions can affect whole populations for long periods. For the physical activity field, policy provides guidance for collective and individual behaviour and can be informal or formal legislative or regulatory actions taken by governmental or non-governmental organisations. Policies can affect physical activity at local (school or workplace), regional government, or national levels (WHO, 2010).They usually require partnerships and actions outside the health sector to improve conditions, support services, and environments that enable physical activity, and are an integral part of national physical activity planning. Policies can mandate investments in resources (e.g., bike paths, parks, and sports programmes) or develop relevant public health regulations (e.g., pavement specifications, stair design standards, and payment for physical activity

counselling in health care) (Bauman, Reis, Sallis, Wells, Loos, Martin & Lancet Physical Activity Series Working Group, 2012).

2.3.5. Guidelines for physical activity

World Health Organization (2010) Global Recommendations for Physical Activity for adults of 18–64 years old, physical activity includes recreational or leisure-time physical activity, transportation (e.g. walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities. In order to improve cardiorespiratory and muscular fitness, bone health and reduce the risk of NCDs and depression the following are recommended:

- Adults aged 18–64 years should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week, or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate and vigorous-intensity activity.
- Aerobic activity should be performed in bouts of at least 10 minutes duration.
- For additional health benefits, adults should increase their moderate-intensity aerobic physical activity to 300 minutes per week, or engage in 150 minutes of vigorous-intensity aerobic physical activity per week, or an equivalent combination of moderate- and vigorous-intensity activity.
- Muscle-strengthening activities should be done involving major muscle groups on 2 or more days a week.

2.4. HEALTH CARE PROFESSIONALS AND HEALTHY LIFESTYLE

Most health care professionals learn about non-communicable diseases, physical activity and nutrition in their curricula's at an undergraduate level at school. For example physiotherapists are the expert of physical activities as this is the main focus of their scope of practice, dieticians and nutritionist are well taught in the area of nutritional management and healthy eating habits, medical officers know all about biomedical effects of non-communicable diseases and their management thereof, as they study in depth about different diseases in family medicine and nurses study all about caring

management of non-communicable diseases, healthy eating practices and the benefits of physical activity in prevention and management of diseases (National Health Act, 2004). However it has been reported that this population has a high prevalence of certain health risk behaviors, like smoking and not seeking information about health risk factors (Skaal and Pengpid, 2011).

According to the study carried out on nurse's knowledge about chronic diseases, there were significant improvements in nurses' knowledge of hypertension and diabetes management over six months of training. Knowledge about asthma and COPD management decreased in all districts and nurse categories according to Naidoo, Mahomed, Asmall & Taylor, (2014).

Health care professionals are regarded as role models for the public through their promotion of healthy lifestyle choices (Power et al., 2014). However despite this, evidence suggests that 58%-65% of healthcare professionals are overweight or obese according to Bogossian et al., (2012) in a cross sectional study they conducted in New Zealand and is supported by another study conducted by Skaal and Pengpid (2011) in South Africa. Many healthcare professionals display poor dietary habits (Jinks et al., 2003) and/or fail to achieve sufficient levels of physical activity according to Humphreys (2007).

2.5. SUMMARY

The chapter has discussed what obesity is, the prevalence of obesity worldwide, the effects of obesity and prevention strategies for obesity. It further reviewed what physical activity, prevalence of physical activity, is guidelines for physical activity, the benefits of physical activity, and dangers of physical inactivity, strategies to improve physical activity and health care professionals and healthy lifestyle. The next Chapter will deal with the methods followed in conducting the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. INTRODUCTION

The literature review about the study has been discussed in the previous Chapter. This chapter discusses the methods and materials used in the study. It further describes the study design followed, research setting chosen and the study population. Sampling procedure and size are also clarified, as well as inclusion and exclusion criteria. Data collection tools used to collect data and the measures taken to ensure validity and reliability of the tools are also explained. Factors to minimise bias are outlined. Data analysis and statistical tests are explained in this chapter as well as ethical considerations.

3.2. RESEARCH METHOD

Research design is the overall plan for gathering data in a research study (Brink, Van der Walt & Van Rensburg, 2012). The design for this study was quantitative method which involves measurements, observation, interpretation and definition of a phenomenon to provide information to measure the association of variables within the population of interest (Merrill, 2013). Cross sectional descriptive design investigates association between variables and outcomes of interest (Andre, Vuyk, Ahmed, Graamans & Nolst Trenite, 2009) among health care professionals in selected rural hospitals of Sekhukhune district. This study design allowed the researcher to gather information of different variables at a single point in time without manipulating them (Struwig & Stead, 2007). The research design enabled the researcher to compare the prevalence of obesity and level of physical activity among health care professionals according to their categories or strata.

3.3. Research setting

The study was conducted at rural Matlala district hospital and St Rita's regional hospital in Sekhukhune district Limpopo province, South Africa. Matlala hospital is a small district hospital with 228 approved beds capacity, situated at Tsimanyane village in the rural area of Sekhukhune district, Ephraim Mogale local municipality, 38 km from Marble

hall town in Limpopo province. St Rita's hospital is a big regional hospital with 400 approved beds capacity, which is a referral or secondary hospital in the Sekhukhune district. It is situated in Glen Cowie village in Makhuduthamaga local municipality, 18 km from Jane Furse town.



Figure 3.1: A map of Sekhukhune district

Source: <http://www.localgovernment.co.za/districts/view/26/Sekhukhune-District-Municipality#map>

Figure 3.1 is a map of Sekhukhune District municipality showing local municipalities

3.4. Study population

The study population was health care professionals such as nurses in different categories such as operational managers, registered nurses, enrolled nurses and enrolled nurse assistant; clinical care professionals namely: doctors, pharmacists, pharmacist assistant, dentists, dentist assistants, psychologist, registered counsellors and psychometrists and allied health care professionals in different disciplines, namely:

physiotherapists, occupational therapists, occupational therapist assistants, speech and audiologists, optometrist, social workers, radiographers, dietitians and medical orthotists and prosthetist who were employed in Matlala district and St Rita's regional hospitals on full and part time basis during the time of the study. Both males and females of all ages were included in the study. Matlala hospital had population of 301 health care professionals of which 229 were nurses in different categories, 43 clinical care professionals and 29 allied health care professionals. St Rita's hospital had population of 519 Health care professionals, 394 of which were nurses in different categories, 82 clinical care professionals and 43 allied health care professionals.

3.4.1. Sampling

The sampling procedure for this study was stratified random sampling as it ensured that different disciplines of health care professionals in the population is fairly represented in the sample (Struwig & Stead, 2007). The participants were selected according to their professional strata from a list that was obtained from Human Resource of each hospital. Those who agreed to participate in the study were given informed consent forms to sign, to ensure that they understood what the study is all about and that they are giving permission in participating in the study. They were allocated numbers written on the piece of paper after signing informed consent forms. The numbers were then selected randomly for those who were supposed to participate in the study.

The sample size needed for the study was determined according to Krejcie and Morgan (1970), calculated at 95% confidence interval level and 5% margin of error. The formula is $s = \frac{n}{1+n(0.05)^2}$, whereby s= sample size, n =population size. According to the calculation in a population of 301, a sample of 171 was selected at Matlala hospital, though 174 of participants took part in the study. At St Ritas hospital 226 sample size was considered for the study out of the population of 519. An additional 10% of the study population was not sampled as all questionnaires were filled completed and properly.

Therefore in a stratified sampling method, in order to have a fair representation of each strata, the participants were sampled as follows:

Table 3.1: Stratified sampling method

STRATA	POPULATION(n)	SAMPLE (s)
MATLALA HOSPITAL		
Nurses	229	140
Allied health care	29	16
Clinical care	43	18
Subtotal	301	174
ST RITA'S HOSPITAL		
Nurses	394	171
Allied health care	43	32
Clinical care	82	23
Subtotal	519	226
Total	820	400

Table 3.1 Stratified sampling method followed to get the sample size of participants.

3.4.2. Inclusion criteria

All health care professionals working at Matlala and St. Rita's hospital in Sekhukhune district on full time and contract basis were included in the study.

3.4.3. Exclusion criteria

Health care professionals who were working on part time basis were excluded from the study.

3.5. Data collection

Data collection is gathering of necessary information needed to address a research problem and answer research questions in the study (Polit, Beck & Hungler, 2001).

3.5.1. Data collection tool/ instrument

The WHO STEPwise approach to Surveillance (STEPS) for NCD risk factors (Ng, Hakimi, Van Minh et al., 2009 and Maimela, Alberts, Modjadji, Choma, Dikotope, Ntuli & Van Geertruyden, 2016) was adapted to collect data on physical activity. Anthropometric measurements were taken for body mass index (WHO, 2006). Questionnaire (See attached Appendix E) was divided into three sections which were: Section A – Socio-demographic data, Section B – Global Physical Activity Questionnaire and Section C – Anthropometric measurements for body mass index. The anthropometric measurements included measuring of weight using bathroom scale and height using tape measurer or stadiometer. The measurements were used in calculating the body mass index of the health care professionals. BMI wheel was used for quality control of BMI calculations.

3.5.2. Recruitment

The necessary arrangements to conduct the study at the facilities was made with the clinical managers, nursing operational managers, training officers and allied managers. The sectional heads were informed that there will be a process of research that will take place and they subsequently informed their subordinates about the study that will be conducted. Appointment dates on recruiting the participants were made with the managers.

3.5.3. Data collection procedure

On the day of data collection the researcher reported to the Chief Executive Officers office and to the managers, before commencing with data collection. Information sessions were given to the health care professional in their various sections, the wards and those who were not in their service points were given information individually. All health care professionals were given time to read the information leaflet and a chance to decide if they wanted to participate in the study or not.

Those who were available to participate in the study were given informed consent to complete, then fill in the questionnaire and taken anthropometric measurements. Those

who were busy during the distribution of the questionnaire were given time to complete Section A and B, then taken anthropometric measurements later when the questionnaires were collected.

3.5.4. Pilot study

To ensure the reliability a pilot study was conducted among 15 health care professionals in different strata at Groblersdal hospital and the necessary inputs were implemented, such as the term ethnicity in Section A, it was replaced by race. Section B (GPAQ) on time questions was amended according to the inputs given.

3.5.5. Bias

Bias is an influence that produces an error or distortion which can affect the quality of evidence in both quantitative and qualitative studies (Brink et al., 2012). Researcher bias can occur when a researcher tries to interfere with the participant's answers or making an opinion on respondents. This was eliminated by using research assistant during data collection.

Sampling bias is the over or under presentation of a segment of the population, which will impact on the validity and the purpose of the study (Polit & Beck, 2008). Sampling bias can occur when a certain category of health care professionals is given more preference than other categories. The researcher adhered to stratified random sampling technique by allowing all health care professionals of all categories to have equal chance of being included in the study.

Presentation bias was eliminated by the researcher by addressing herself as a student from the University of Limpopo and by not wearing her professional uniform and nametag. Respondent's bias was minimised by using standardised questionnaire which was written in English as all health care professionals can read and write the language well. Measurement bias was taking weight and height twice and the weighing scale and stadio meter or measuring tape were calibrated every time when the new

measurements were taken. The BMI calculations were verified by trained research assistant and BMI wheel was also used for quality control.

3.5.6. Validity

A test is valid if it demonstrates or measures what the researcher thinks or claims it does (Welman, Kruger and Mitchell, 2005). Content validity is the extent to which the method of assessment or measurement includes all various major and important aspects of a specific construct (De Vos, Strydom, Fouche & Delpont, 2007). The Global physical activity questionnaire was submitted to the supervisor and physiotherapy colleagues for content validity. Though the GPAQ was validated internationally. Section A about socio-demographic data was submitted to University Statistician and Section C about BMI was submitted to dietitian and supervisor for content validity.

3.5.7. Reliability

Reliability is the consistency and dependability of a research instrument in measuring a variable, equivalence and internal consistency (Brink et al., 2012). To ensure the reliability a pilot study was conducted among 15 health care professionals in different strata at Groblersdal hospital and the necessary inputs were implemented.

3.6. Data analysis

The data that was collected was analysed by using statistical package for social sciences (SPSS) version 23.0 with assistance from the supervisors. The descriptive statistical method was used to analyse frequencies, correlation and means. Pearson Chi-square was used to test associations between socio-demographic profile, body mass index and level of physical activity and level of significance was determined. WHO recommended guidelines for physical activity was used to determine the level of physical activity of HCP (Physical activity guidelines, 2008).

Data was presented using graphs in the form of pie and bar to present socio-demographic data and tables were used to present frequency distributions and associations.

3.7. Ethical consideration

- **Seeking permission**

The research proposal was submitted for internal review at University of Limpopo Department of Public Health. Then was submitted to University of Limpopo Senior Degree Committee for approval and Turfloop Research Ethics Committee for ethical clearance (See attached Appendix F). The letters seeking permission from Limpopo Provincial Research Committee (See attached Appendix G), Sekhukhune district (See attached Appendix I) and from the Chief executive officers of each hospital (See attached Appendix K and M) were submitted. The approval to conduct the study at Matlala and St Ritas hospitals were obtained from Limpopo Provincial Research Committee (See attached Appendix H), Sekhukhune district (See attached Appendix J) and from the Chief executive officers of each hospital (See attached Appendix L and N) respectively.

- **Confidentiality**

Confidentiality was maintained throughout the study and the participants were allowed to participate in the study anonymously. All data collected was kept strictly confidential by using a personal pocket file that was always in possession of the researcher. Data will be made available to all the relevant stakeholders where necessary.

- **Harm**

The study was conducted in such a way that embarrassment, physical and psychological harm to the participants in the study was avoided by all means. The participants were advised not to answer any question they feel uncomfortable about and they were informed that they are participating on their free will and will not be prejudiced should they withdraw from the study. No participant got emotional during data collection, however if they did they were going to be referred to the psychologist for intervention.

- **Beneficence**

There was no monetary benefit for participating in the study. Information was given about the benefits of participating in regular physical activity and the participants got to know their body mass index status.

3.8. Summary

This chapter discussed methods which includes study design, site, population, sampling, data collection, validity and reliability, data analysis and ethical considerations. The results will be presented in the next chapter.

CHAPTER 4

STUDY RESULTS

4.1. INTRODUCTION

This chapter presents the results of data collected from sample of 400 health care professionals at Matlala and St Rita's hospitals in Sekhukhune district, Limpopo province. SPSS version 23.0 was used to analyse data. The results will be presented in the form of graphs and tables.

4.2. SOCIO-DEMOGRAPHIC DATA OF THE PARTICIPANTS

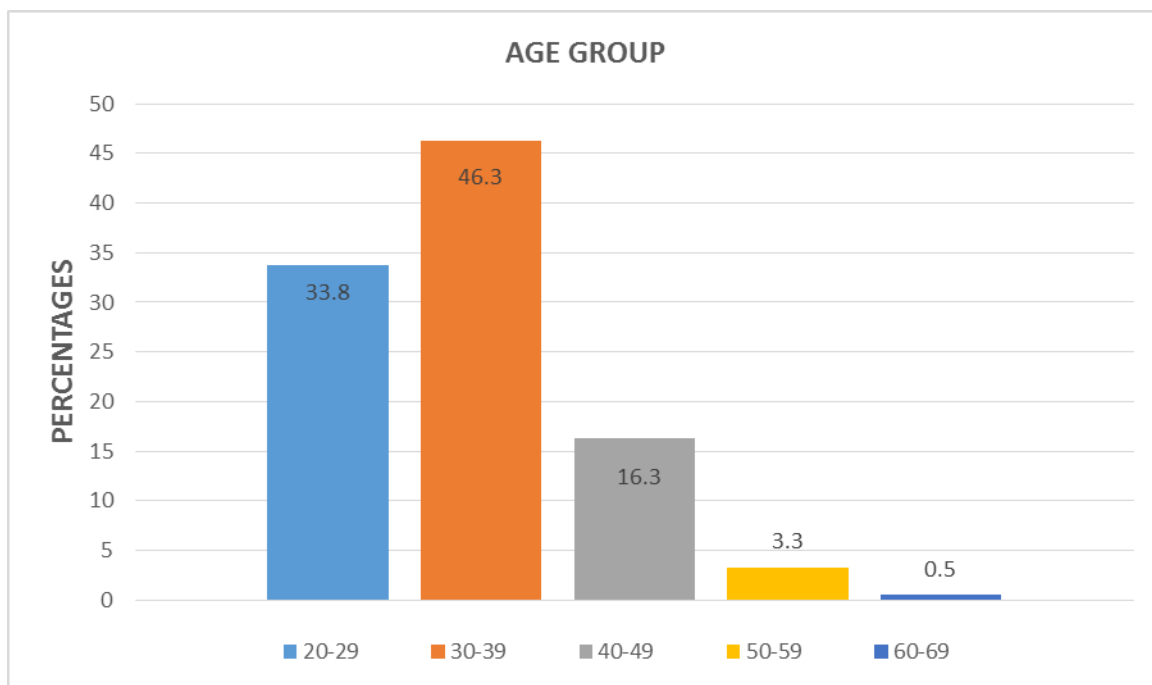


Fig 4.1: Age distribution of the participants

Fig 4.1 shows that most of the participants were between the ages of 30-39 years (46.3%), followed by those between 20-29 years (33.8%) and the least were those between 60-69 years (0.5%).

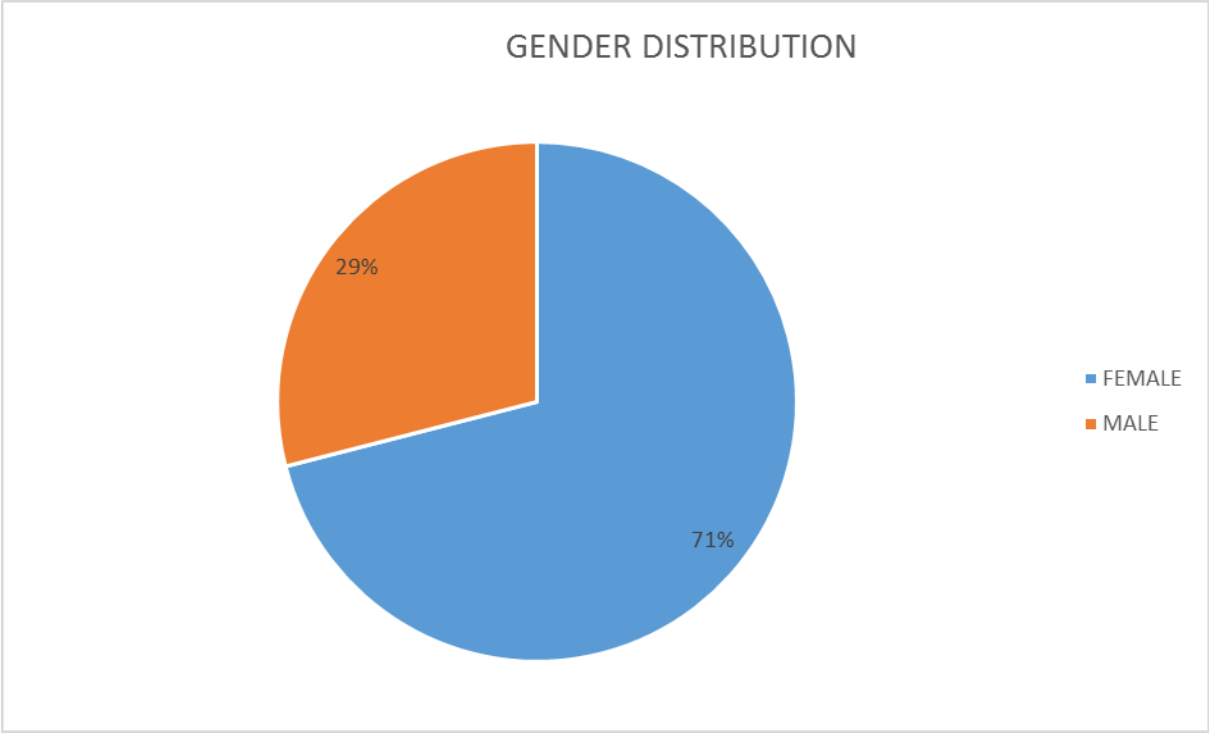


Fig 4.2: Gender distribution of participants

Fig 4.2 shows that 71% of participants were females and 29% were males.

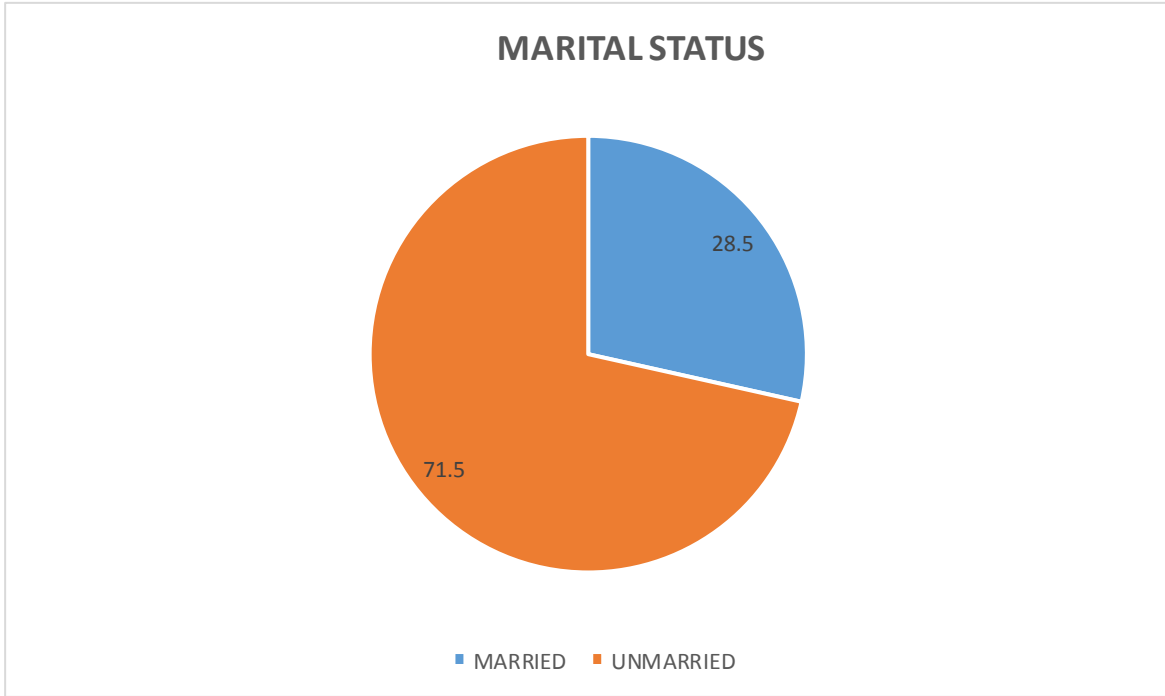


Fig 4.3: Marital status of participants

Fig 4.3 above shows that 71.5% of participants were unmarried and 28.5% were married.

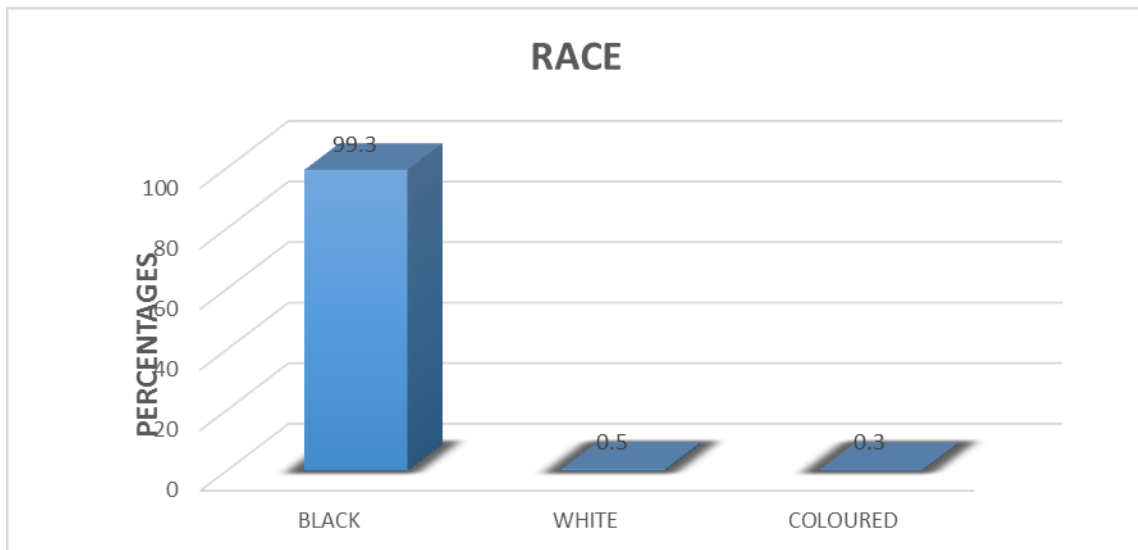


Fig 4.4: Race distribution of participants

Fig 4.4 shows that 99.3% of participants were blacks, 0.5 % whites and 0.3% coloured.

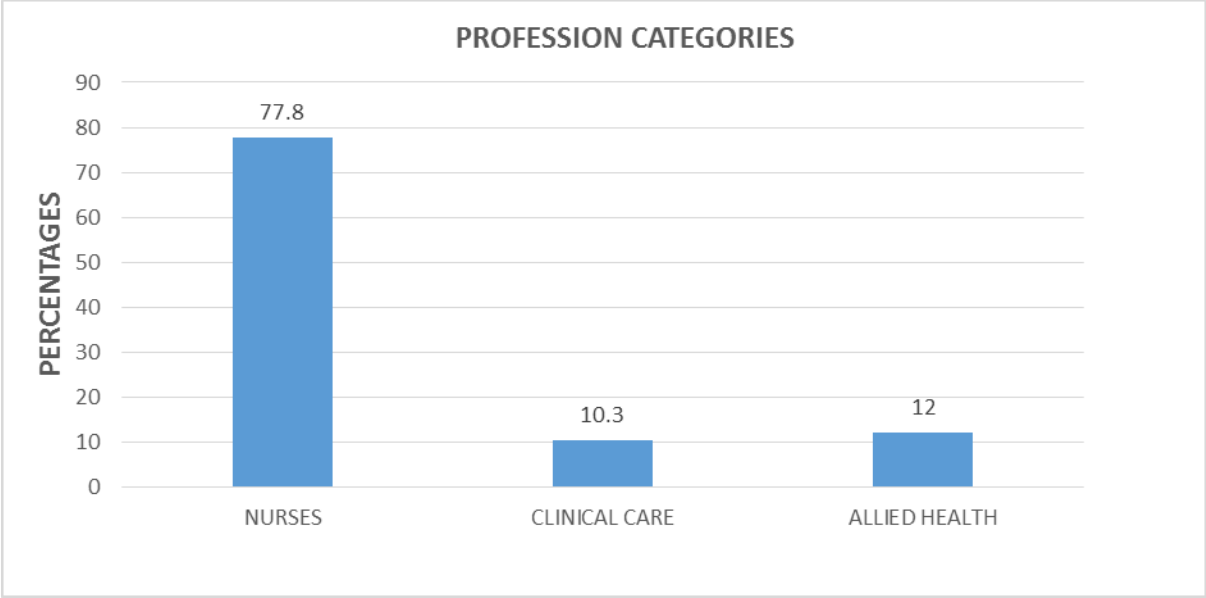


Fig 4.5: Profession category of participants

Fig 4.5 shows that 77.8 % of participants were nurses, 12 % clinical care and 10.3 % allied health professions.

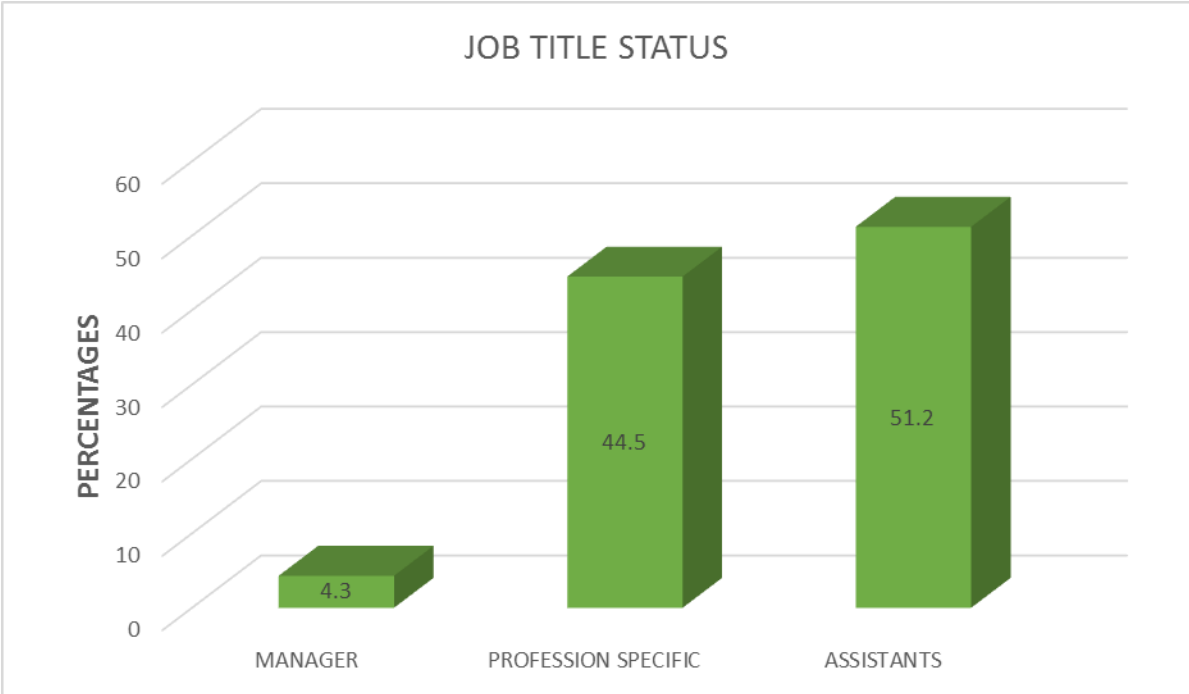


Fig 4.6: Job titles of participants

Fig 4.6 shows that the most of participants were assistants (51.2%), followed by profession specific (44.5%) and managers (4.3%).

4.3. PREVALENCE OF OBESITY

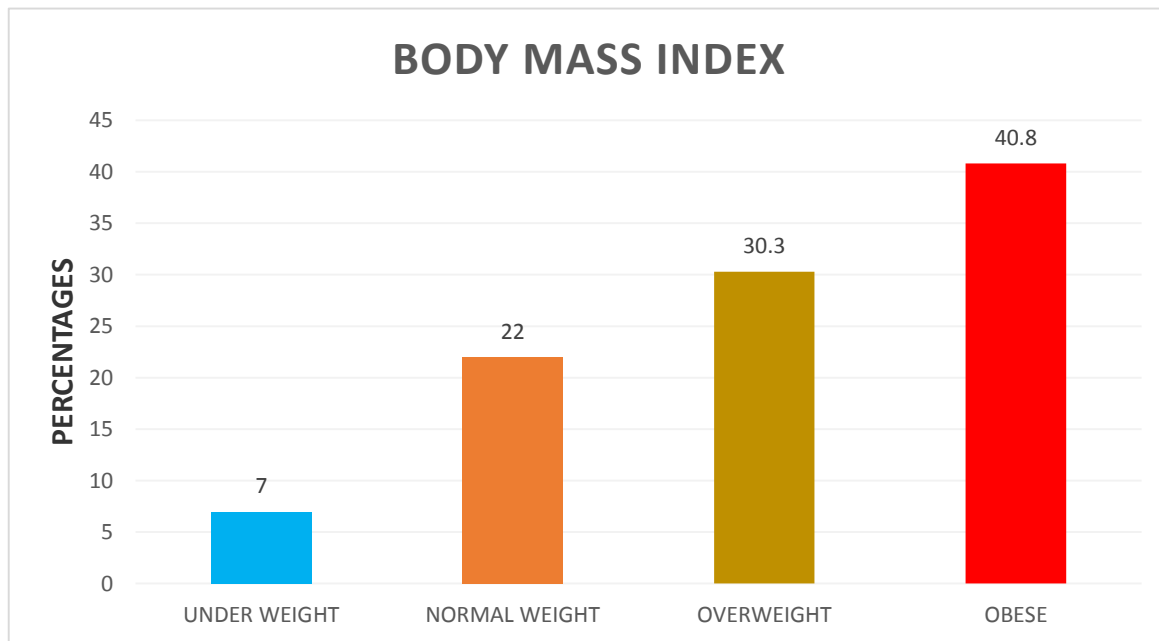


Fig 4.7: Body mass index classification of participants

Fig 4.7 shows that 40.8 % participants were obese, 30.3% overweight and only 22 % had normal weight.

TABLE 4.1: The cross tabulation of socio demographic data and body mass index classification

SOCIO DEMOGRAPHIC DATA		BODY MASS INDEX CLASSIFICATION				P –VALUE AND CHI SQUARED TEST
		UNDER WEIGHT	NORMAL WEIGHT	OVERWEIGHT	OBESE	
		N (%)	N (%)	N (%)	N (%)	
GENDER	FEMALES	19 (6.7)	55 (19.4)	89 (31.3)	121(42.6)	X ² = 4.433 P= .218
	MALES	9 (7.8)	33 (28.4)	32(27.6)	42(36.2)	
AGE	< 39 YEARS	23(7.2)	72(22.5)	94(29.4)	131(40.9)	X ² =.681 P =.878
	>39 YEARS	5(6.3)	16(20.0)	27(33.8)	32(40.0)	
MARITAL STATUS	MARRIED	6(5.3)	22(19.3)	34(29.8)	52(45.6)	X ² =2.151 P =.542
	UNMARRIED	22(7.7)	66(23.1)	87(30.4)	111(38.8)	
PROFESSIONAL CATEGORY	NURSES	15(4.8)	69(22.2)	93(29.9)	134(43.1)	X ² =14.824 P =.022*
	CLINICAL CARE	8(19.5)	7(17.1)	12(29.3)	14(34.1)	
	ALLIED HEALTH	5(10.4)	12(25.0)	16(33.3)	15(31.3)	
JOB TITLE STATUS	MANAGER	2(11.8)	1(5.9)	4(23.5)	10(58.8)	X ² =7.279 P =.296
	PROFESSION SPECIFIC	13(7.3)	46(25.8)	55(30.9)	64(36.0)	
	ASSISTANTS	13(6.3)	41(20.0)	62(30.2)	89(43.4)	

** indicate significant association @ 95% CI*

Table 4.1: shows no significance association between BMI and gender, age, marital status and job title at (P= .218; P=.878; P=.542 and P= .296) respectively. There was a significant association BMI to profession category (P= 0.022), whereby the nurse were more obese (43.1%) as compared to clinical care and allied health professions.

4.4. LEVEL OF PHYSICAL ACTIVITY

TABLE 4.2: The frequency distribution of the participants according to the level of work vigorous physical activity

PHYSICAL ACTIVITIES	FREQUENCY	PERCENTAGE
WORK VIGOROUS PHYSICAL ACTIVITY		
YES	83	20.8%
NO	317	79.3%
WORK TIME VIGOROUS PHYSICAL ACTIVITY		
NO ACTIVITY	314	78.5%
< 30 MINUTES	20	5.0%
30 OR MORE MINUTES	66	16.5%
WORK DAYS VIGOROUS PHYSICAL ACTIVITY		
NO ACTIVITY	311	77.8%
< 3 DAYS	21	5.3%
3 OR MORE DAYS	68	17.0%
WORK VIGOROUS CLASSIFICATION		
NO ACTIVITY	312	78.0%
LOW ACTIVITY	29	7.2%
HIGH ACTIVITY	59	14.8%

Table 4.2 above shows that 79.3 % of participants did not engage in vigorous activities at work. Majority of the participants (78.5%) did not meet recommended time for work vigorous physical activity. Also, 77.8 % of the participants had no activity days for work vigorous physical activity. The majority of the participants (78.0%) their level for work vigorous physical activity is inadequate.

TABLE 4.3: The frequency distribution of the participants according to the level of work moderate physical activity

PHYSICAL ACTIVITIES	FREQUENCY	PERCENTAGE
WORK MODERATE PHYSICAL ACTIVITY		
YES	272	68.0%
NO	118	32.0%
WORK TIME MODERATE PHYSICAL ACTIVITY		
NO ACTIVITY	122	30.5%
< 30 MINUTES	21	5.3%
30 OR MORE MINUTES	257	64.3%
WORK DAYS MODERATE PHYSICAL ACTIVITY		
NO ACTIVITY	122	30.5%
< 3 DAYS	15	3.8%
3 OR MORE DAYS	263	65.8%
WORK MODERATE CLASSIFICATION		
NO ACTIVITY	122	30.5%
LOW ACTIVITY	36	9.0%
HIGH ACTIVITY	245	60.5%

Table 4.3 shows that 68.0% of participants did moderate physical activity at work. Almost two thirds (64.3%) did 30 or more minutes of moderate work physical activity. 65.8% do work moderate physical activity for 3 or more days. Also, 60.5% of participants have high activity level for work moderate physical activity.

TABLE 4.4: The frequency distribution of the participants according to the level of leisure vigorous physical activity

PHYSICAL ACTIVITIES	FREQUENCY	PERCENTAGE
LEISURE VIGOROUS PHYSICAL ACTIVITY		
YES	158	39.5%
NO	242	60.5%
LEISURE TIME VIGOROUS PHYSICAL ACTIVITY		
NO ACTIVITY	244	61.0%
< 30 MINUTES	15	3.8%
30 OR MORE MINUTES	141	35.3%
LEISURE DAYS VIGOROUS PHYSICAL ACTIVITY		
NO ACTIVITY	244	61.0%
< 3 DAYS	42	10.5%
3 OR MORE DAYS	114	28.5%
LEISURE VIGOROUS CLASSIFICATION		
NO ACTIVITY	244	61.0%
LOW ACTIVITY	51	12.8%
HIGH ACTIVITY	105	26.3%

TABLE 4.4 shows that 60.5% of participants did not engage in vigorous leisure physical activities. 35.3 % of participants did vigorous leisure physical activity for 30 or more minutes and 3.8% were doing vigorous leisure activities for less than 30 minutes. About 28.5% of participants were engaging in leisure vigorous physical activity for 3 or more days and only 10.5% were engaging in vigorous physical activity for less than 3 days. Over a quarter (26.3%) of participants were classified as having high activity level and only 12.8% were classified under low activity level.

TABLE 4.5: The frequency distribution of the participants according to the level of leisure moderate physical activity

PHYSICAL ACTIVITIES	FREQUENCY	PERCENTAGE
LEISURE MODERATE PHYSICAL ACTIVITY		
YES	178	44.5%
NO	222	55.5%
LEISURE TIME MODERATE PHYSICAL ACTIVITY		
NO ACTIVITY	222	55.5%
< 30 MINUTES	23	5.8%
30 OR MORE MINUTES	155	38.8%
LEISURE DAYS MODERATE PHYSICAL ACTIVITY		
NO ACTIVITY	222	55.5%
< 3 DAYS	26	6.5%
3 OR MORE DAYS	152	38.0%
LEISURE MODERATE CLASSIFICATION		
NO ACTIVITY	222	55.5%
LOW ACTIVITY	45	11.3%
HIGH ACTIVITY	133	33.3%

Table 4.5 above shows that 44.5% of participants did participate in moderate leisure physical activity. About 38.8% of participants engage in leisure moderate physical activity for 30 or more minutes and only 5.8% did moderate leisure physical activity for less than 30 minutes. Thirty eight percent of participants engage in leisure moderate physical activity for 3 or more days and only 6.5 % engage in leisure moderate physical activity for less than 3 days. Thirty three point three percent of participants are classified under high activity level of leisure moderate physical activity and 11.3% under low activity level of moderate leisure physical activity.

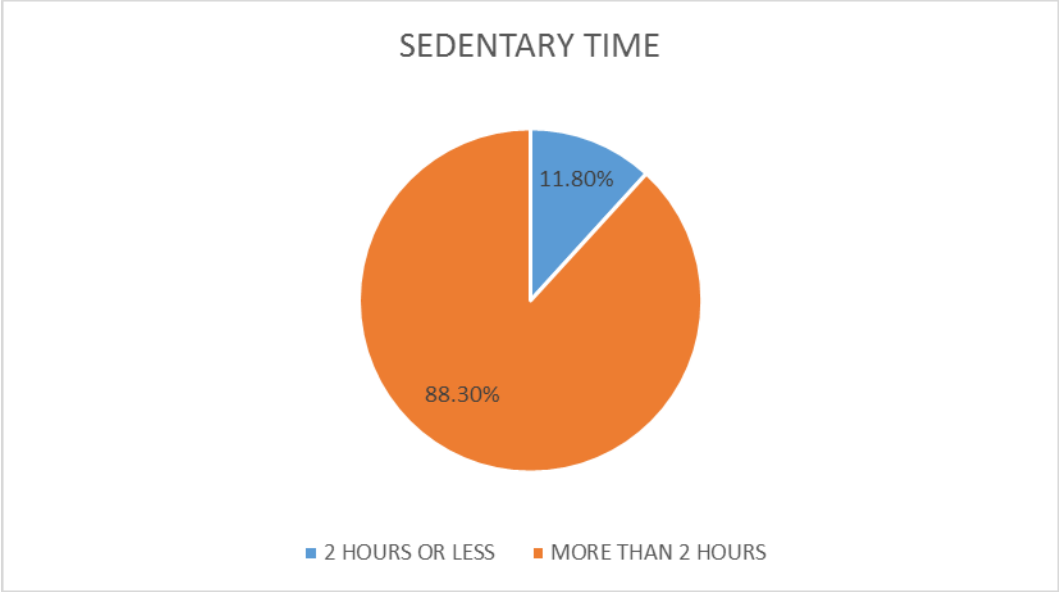


Fig 4.8: Sedentary time of participants

Fig 4.9 above shows that the majority of participants (88.3%) had sedentary behaviour of more than 2 hours and only (11.8%) had 2 hours or less sedentary behaviour.

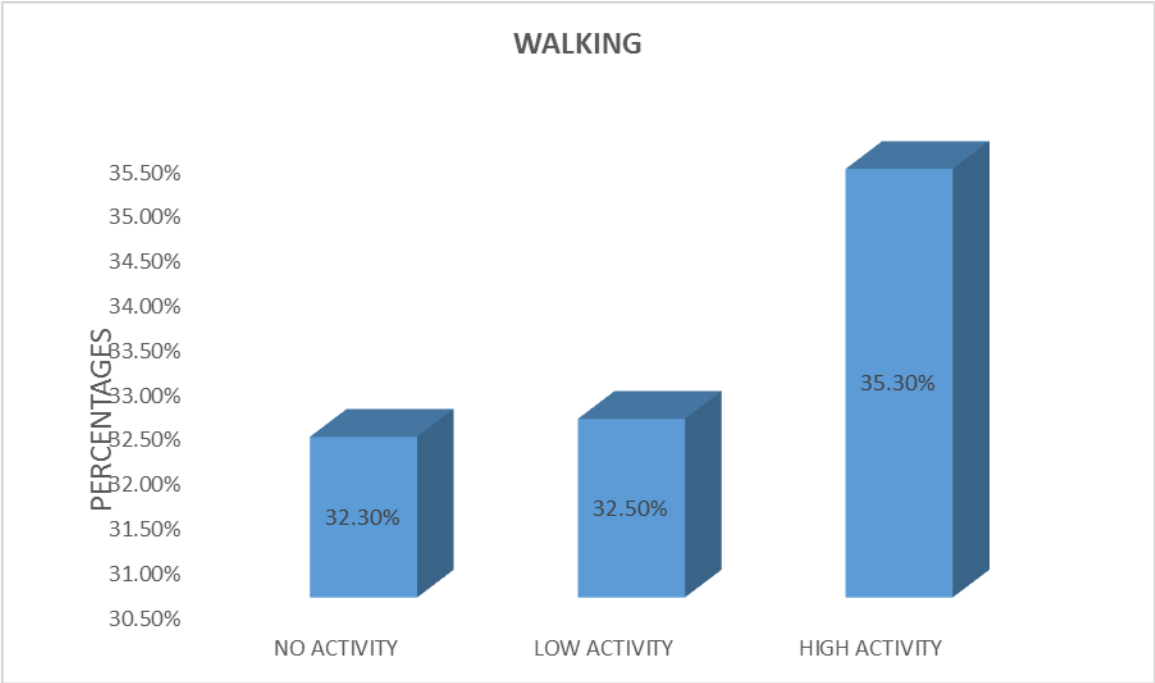


FIG 4.9: Walking activity of participants

Fig 4.10 above shows that 35.30 % of participants engaged in high activity of walking, 32.50% low activity and only 32.30% did not engage in recommended walking per day.

Table 4.6: The cross tabulation of socio demographic data and work vigorous physical activity classification

SOCIO DEMOGRAPHIC DATA	WORK VIGOROUS PHYSICAL ACTIVITY CLASSIFICATION				
		No activity N (%)	Low activity N (%)	High activity N (%)	P –VALUE AND CHI SQUARED Test
GENDER	FEMALES	222(78.2)	16(5.6)	46(16.2)	X ² =4.922 P =.085
	MALES	90(77.6)	13(11.2)	13(11.2)	
AGE	< 39 YEARS	255(79.7)	22(6.9)	43(13.4)	X ² =2.763 P =.251
	>39 YEARS	57(71.3)	7(8.8)	16(20.0)	
MARITAL STATUS	MARRIED	80 (70.2)	12(10.5)	22(19.3)	X ² =5.848 P =.054
	UNMARRIED	232(81.1)	17(5.9)	37(12.9)	
PROFESSIONAL CATEGORY	NURSES	227(73.0)	27(8.7)	57(18.3)	X ² =20.588 P =.000*
	CLINICAL CARE	39(95.1)	1(2.4)	1(2.4)	
	ALLIED HEALTH	46(95.8)	1(2.1)	1(2.1)	
JOB TITLE STATUS	MANAGER	12(70.6)	5(29.4)	0(0.0)	X ² =16.078 P =.003*
	PROFESSION SPECIFIC	144(80.9)	10(5.6)	24(13.5)	
	ASSISTANTS	156(76.1)	14(6.8)	35(17.1)	

* indicate significant association @ 95% CI

Table 4.6 shows no significant association between level work vigorous and gender, age and marital status at (P= .085, P=.251 and P= .054 respectively). There was a significant association between level of work vigorous physical activity and profession category (P= 0.00), whereby majority of allied health professions and clinical care professionals did not engage in work vigorous physical activity, compared to nurses (73.0%). There is also significant association according to job title (P=0.003), where more assistants engaged in high activity than any other professions.

Table 4.7: The cross tabulation of socio demographic data and work moderate physical activity classification

SOCIO DEMOGRAPHIC DATA	WORK MODERATE PHYSICAL ACTIVITY CLASSIFICATION				P –VALUE AND CHI SQUARED TEST
		No activity N (%)	Low activity N (%)	High activity N (%)	
GENDER	FEMALES	88(30)	20(7.0)	176(62.0)	X ² =4.597 P =.100
	MALES	34(29.3)	16(13.8)	66(56.9)	
AGE	< 39 YEARS	97(30.3)	29(9.1)	194(60.6)	X ² =0.030 P =.985
	>39 YEARS	31.3(25)	7(8.8)	48(60.0)	
MARITAL STATUS	MARRIED	32 (28.1)	15(13.2)	67(58.8)	X ² =3.450 P =.178
	UNMARRIED	90(31.5)	21(7.3)	175(61.2)	
PROFESSIONAL CATEGORY	NURSES	86(27.7)	29(9.3)	196(63.0)	X ² =7.317 P =.120
	CLINICAL CARE	17(41.5)	5(12.2)	19(46.3)	
	ALLIED HEALTH	19(39.6)	2(4.2)	27(56.3)	
JOB TITLE STATUS	MANAGER	12(70.6)	3(17.6)	2(11.8)	X ² =18.765 P =.001*
	PROFESSION SPECIFIC	54(30.3)	17(9.6)	107(60.1)	
	ASSISTANTS	56(27.3)	36(9.0)	242(60.5)	

* indicate significant association @ 95% CI

Table 4.7 shows a significant association between difference of job title and moderate level of work physical activity (P= 0.001), where (60.5 %) of assistants engage in high activity level of work moderate physical activity as compared to (60.1%) and (11.8%) of profession specific and managers respectively. There is no significant association according to moderate level of work vigorous physical activity according to gender (0.100), age (0.985), marital status (0.178) and profession category (0.120).

Table 4.8: The cross tabulation of socio demographic data and leisure vigorous physical activity classification

SOCIO DEMOGRAPHIC DATA	LEISURE VIGOROUS PHYSICAL ACTIVITY CLASSIFICATION				P –VALUE AND CHI SQUARED TEST
		No activity	Low activity	High activity	
		N (%)	N (%)	N (%)	
GENDER	FEMALES	175(61.6)	36(12.7)	73(25.7)	X ² =.177 P =.915
	MALES	69(59.5)	15(12.9)	32(27.6)	
AGE	< 39 YEARS	199(62.2)	36(11.3)	85(26.6)	X ² 3.253 P =.197
	>39 YEARS	45(56.3)	15(18.8)	20(25.0)	
MARITAL STATUS	MARRIED	74(64.9)	15(13.2)	25(21.9)	X ² =1.555 P =.460
	UNMARRIED	170(59.4)	36(12.6)	80(28.0)	
PROFESSIONAL CATEGORY	NURSES	188(60.5)	43(13.8)	80(25.7)	X ² =2.193 P =.700
	CLINICAL CARE	25(61.0)	5(12.2)	11(26.8)	
	ALLIED HEALTH	31(64.6)	3(6.3)	14(29.2)	
JOB TITLE STATUS	MANAGER	6(35.3)	9(52.9)	2(11.8)	X ² 27.054 P =.000*
	PROFESSION SPECIFIC	114(64.0)	16(9.0)	48(27.0)	
	ASSISTANTS	124(60.5)	26(12.7)	55(26.8)	

* indicate significant association @ 95% CI

Table 4.8 shows significant association of job title and vigorous level of leisure physical activity (P= 0.000), where (27.0 %) of profession specific engage in high activity level of leisure vigorous physical activity as compared to (26.8%) of assistants and (11.8%) of and managers. There is no significant association according to vigorous level of leisure physical activity according to gender (0.915), age (0.197), marital status (0.460) and profession category (0.700).

Table 4.9: The cross tabulation of socio demographic data and leisure moderate physical activity classification

SOCIO DEMOGRAPHIC DATA	LEISURE MODERATE PHYSICAL ACTIVITY CLASSIFICATION				
		No activity	Low activity	High activity	P –VALUE AND CHI SQUARE
		N %	N %	N %	
GENDER	FEMALES	160(56.3)	27(9.5)	97(34.2)	X ² =3.010 P =.222
	MALES	62(53.4)	18(15.5)	36(31.0)	
AGE	< 39 YEARS	175(54.7)	38(11.9)	107(33.4)	X ² =2.180 P =.336
	>39 YEARS	47(58.8)	7(8.8)	26(32.5)	
MARITAL STATUS	MARRIED	70 (61.4)	11(9.6)	33(28.9)	X ² =2.252 P =.324
	UNMARRIED	152(53.1)	34(11.9)	100(35.0)	
PROFESSIONAL CATEGORY	NURSES	165(53.1)	41(13.2)	105(33.8)	X ² =12.496 P =.014*
	CLINICAL CARE	32(78.0)	1(2.4)	8(19.5)	
	ALLIED HEALTH	25(52.1)	3(6.3)	20(41.7)	
JOB TITLE STATUS	MANAGER	12(70.6)	3(17.6)	2(11.8)	X ² =6.003 P =.199
	PROFESSION SPECIFIC	101(56.7)	15(8.4)	62(34.8)	
	ASSISTANTS	109(53.2)	27(13.2)	69(33.3)	

* indicate significant association @ 95% CI

Table 4.9 show significant association of profession category and moderate level of leisure physical activity (P= 0.014), where (41.7%) of allied health professions engage in high activity level of leisure moderate physical activity as compared to (33.8%) and (19.5%) of nurses and clinical care professions respectively. There is no significant association according to moderate level of leisure physical activity according to gender (0.22), age (0.336), marital status (0.326) and job title (0.199).

TABLE 4.10: The frequency distribution of the participants according to sedentary time

SOCIO DEMOGRAPHIC DATA		SEDENTARY TIME	
		2 HOURS OR LESS	MORE THAN 2 HOURS
		N (%)	N (%)
GENDER	FEMALES	32 (11.3)	252 (88.7)
	MALES	15 (12.9)	101 (87.1)
AGE	< 39 YEARS	33 (10.3)	287 (89.7)
	>39 YEARS	14 (17.5)	66 (82.5)
PROFESSIONAL CATEGORY	NURSES	36 (11.6)	275 (88.4)
	CLINICAL CARE	6 (14.6)	35 (85.4)
	ALLIED HEALTH	5 (10.4)	43 (89.6)
JOB TITLE STATUS	MANAGER	7 (41.2)	10 (58.8)
	PROFESSION SPECIFIC	18 (10.1)	160 (89.9)
	ASSISTANTS	22 (10.7)	183 (89.3)

** indicate significant association @ 95% CI*

Table 4.10 shows that the majority of females and males engage in sedentary behaviour for more than 2 hours, (88.7% and 87.1%) respectively. Participants of < 39 years (89.7%) engage in sedentary behaviour of more than 2 hours and (82.5%) of > 39 years. About (89.6%) of allied health professional engage in sedentary behaviour of more than 2 hours, followed by nurses at (88.4%) and clinical care professional at (85.4%). (89.9%) of profession specific engage in sedentary behaviour of more than 2 hours, followed by (89.3%) of assistants and (58.8%) of managers.

TABLE 4.11: The frequency distribution of the participants according to travelling activity/ walking time

SOCIO DEMOGRAPHIC DATA		TRAVELLING/ WALKING		
		NO ACTIVITY	LOW ACTIVITY	HIGH ACTIVITY
		N (%)	N (%)	N (%)
GENDER	FEMALES	93 (32.7)	85 (29.9)	106 (37.3)
	MALES	36 (31.0)	45 (38.8)	35 (30.2)
AGE	< 39 YEARS	100 (31.3)	110 (34.4)	110 (34.4)
	>39 YEARS	29 (36.3)	20 (25.0)	31 (38.8)
MARITAL STATUS	MARRIED	43 (37.7)	31 (27.2)	40 (35.1)
	UNMARRIED	86 (30.1)	99 (34.6)	101 (35.3)
PROFESSIONAL CATEGORY	NURSES	93(29.9)	94(30.2)	124(39.9)
	CLINICAL CARE	19 (46.3)	15 (36.6)	7 (17.1)
	ALLIED HEALTH	17 (35.4)	21 (43.8)	10 (20.8)
JOB TITLE STATUS	MANAGER	8 (47.1)	6 (35.3)	3 (17.6)
	PROFESSION SPECIFIC	65(36.5)	64 (36.0)	49 (27.5)
	ASSISTANTS	56 (27.3)	60 (29.3)	89 (43.4)

* indicate significant association @ 95% CI

Table 4.11 shows that (37.7%) of married participants engaged in no activity of walking and (35.3%) of unmarried participants engage in high activity of walking. (46.3%) of clinical care professional engaged in no activity of traveling and (43.8% and 20.8%) of allied health professionals engage in low and high activity of walking respectively. Managers (47.1 %) engaged in no activity of walking and assistants (43.4%) engaged in high activity of activity of walking.

4.5. Summary

This chapter presented the results of data analysis. The data was analysed using SPSS 23.0 software for windows. The next chapter will present the discussion of the data analysis, the conclusion and finally the recommendations of the whole study.

CHAPTER 5

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

5.1. INTRODUCTION

This chapter will discuss the results presented in Chapter 4 with consideration of the previous studies and literature on obesity and level of physical activity. In addition, conclusion, recommendations and limitations of the study will also be discussed.

The aim of the study was to determine the prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo province, South Africa. The results of data analysis were discussed with consideration of the objectives of the current study which are:

- *To describe the socio-demographic characteristics of health care professional in rural hospitals in Sekhukhune district.*
- *To determine prevalence of obesity among health care professionals in rural hospitals in Sekhukhune district.*
- *To determine the level of physical activity among health care professional in rural hospitals in Sekhukhune district*
- *To make recommendations to improve physical activity and reduce the burden if obesity among HCP in rural hospital in Sekhukhune district.*

5.2. DISCUSSION

Objective 1: *To describe the socio-demographic characteristics of health care professionals in rural hospitals in Sekhukhune district.*

The results of this study revealed that the majority of health care professionals were less than 40 years of age. Young workforce can be of advantage in that these are workers who are still eager to do anything in order to advance in their careers, including working overtime, and thinking on their toes. Unlike older workforce, who have been found to be having low staff morale as they are approaching retirement and are unlikely to progress further with their careers. In a study conducted by (Göbel & Zwick, 2012) it

was found that younger workers had high morale compared to older ones, who were found to have low morale, which further confirms that the older one gets, the lower their staff morale becomes. Also, older nurses prefer to work in health centres where they work specific number of hours and with less rush. This again correlates with South African Nursing Council (SANC), where it was reported that most elderly nurses (60- 69 years) preferred to work at Primary health care facilities and other health care professionals at the later stage opt for private practices, managerial positions at various sectors and being academics at various learning institutions (SANC, 2014), and this also applies to other health care professionals, according to Health Care Professionals of South Africa Bulletin (2016). Because the majority of health care professionals were found to be less than 40 years of age, it is expected that they will be highly physically active than older ones, because studies have found that the older one gets, the less physically active they are and vice versa (Kunene & Taukobong, 2015).

The results of this study revealed that the majority of the health care professionals were females as compared to males. This was expected as the health care profession, especially nursing profession, is specifically dominated by females in South Africa (SANC, 2014), as well as allied health care professionals as reported by HPCSA Bulletin (2016) and only pharmacy professionals and doctors are found to be dominated by males (Health Systems Trust, 2017). Within the health sector, in many countries, women comprise over 75% of the workforce, making them indispensable as contributors to the delivery of health care services (WHO, 2008).

Females have been found to be less active compared to males (Wallace, 2010; Dumith et al., 2011 and Al-Zalabani, Al-Hamdan & Saeed, 2015), therefore, in this study which is dominated by females, it is expected that they will be overweight and less active. This finding is in accordance with previous studies in Kingdom of Saudi Arabia, other Gulf countries and other WHO regions, in which men were found to be more active than women, in general (Mabry, Reeves, Eakin & Owen, 2010; WHO, 2013 and Al-Zalabani et al., 2014). Also, the biggest difference in the prevalence of physical activity between

the two genders has been observed in the eastern Mediterranean region and Africa (Mabry, Reeves, Eakin & Owen, 2010; WHO, 2013 and Al-Zalabani et al., 2014).

The lower prevalence of physical activity among females is more likely to be caused by cultural and social variables rather than biological factors (Fernandes, Reichert, Monteiro, Júnior, Cardoso, Ronque & de Oliveira, 2012). Culturally, it is a taboo to see women being engaged in physical activities in public, more so in black culture and rural area (Im, Chee, Lim, Liu & Kim, 2008). Seeing that this current study was conducted in rural areas of Limpopo province, it was expected that females wouldn't be as active as males, because of these cultural beliefs that exist in rural settings.

Anatomically, females have higher oestrogen levels, which make them to have more body fat than men (Palmer & Clegg, 2015). Males have higher levels of testosterone, which gives them a performance advantage. It enables men to develop larger skeletal muscles as well as larger hearts. Males also have a larger proportion of Type 2 muscle fibres, which generate power, strength and speed (Palmer & Clegg, 2015). Testosterone also increases the production of red blood cells, which absorb oxygen, giving males an even greater aerobic advantage over female counterparts (Palmer & Clegg, 2015). With all these reported variations, it is clear that females are likely to be less active and fatter than males in all health professions in this current study.

The results of this study further revealed that the majority of health care professionals were black as compared to any other race. This is not surprising as Sekhukhune district is a black dominated rural area (Census, 2011). The ratio of black health care professionals in most rural hospitals is higher than other races, according to Mayosi and Benatar, (2014). This is due to the fact that most black people originate from rural area and want to serve their communities (Jobson, 2015).

Lack of resources is another contributing factor for less number of other races in rural settings than urban area (Walker, Keane & Burke, 2010). Most health care professional's diaspora to well-resourced and developed countries, where in most cases

there are different races (Mouton, Boshoff, Kulati & Teng-Zeng, 2007 and Yue, 2011). Cultural and social expectations in rural areas, are some of the barriers that deter the health care professionals to engage in physical activities and end up leading sedentary lifestyle (Griffith, Gunter & Allen, 2011). More-so, for females as are expected to be at home and look after their families and not to do certain activities, like jogging on the streets ,whereas men can easily engage in any form of physical activity without communities judging them (Hochschild & Machung, 2012).

Dietary practices are also contributing factors for obesity, as the main meal is composed of lots of starch than other nutrients, especially in rural areas. However, the accessibility of healthy food is also a challenge more so for health care professionals, as the food outlet (shops or canteen) close to them are prone to selling unhealthy foods like bunny chow, chips, etcetera on their main menu, according to Winston, Johnson & Wilson (2008) and Wong, Wong, Wong & Lee (2010).

Objective 2: *To determine prevalence of obesity among health care professionals in rural hospitals in Sekhukhune district.*

The results of this study revealed that the majority of health care professionals were overweight and obese. This concur with other studies conducted in South Africa which confirmed that health care professionals were overweight and obese (Skaal and Pengpid (2011), Kapitan (2011) and Goon et al., (2013). The results of this study correlate with the studies conducted in other countries as well, whereby the highest prevalence of greater than 25% were found in countries like Poland, Czech Republic, Portugal, Romania and Albania (Berghofer et al., 2008). In the United States, obesity has been labelled as ‘epidemic’ of significant public health concern due to association of obesity and long-lasting health problems, increased disability and premature death (Harris, et al., 2008).

Health care professionals are regarded as role models for the public through their promotion of healthy lifestyle choices (Power et al., 2014), however, despite this

expectation, evidence suggests that 58%-65% of health care professionals are overweight and obese in countries like South Africa, New Zealand, United Kingdom and Ghana according to Bogossian et al., (2012); Power et al., (2014) and Kasu, Ayim & Tampouri (2015). According to this study findings, females found to be more obese as compared to males, and this is not unique to South Africa, as reported in many studies that were conducted worldwide. The study by Wahab et al., (2011) found the significance difference in BMI was due to sedentary lifestyles that women lead and nutrition transition.

According to Venter, Walsh, Slabber & Bester (2009), African culture and social determinants, impact on body weight of women. Seeing that this current study was conducted in rural setting, and on black professionals, it is possible that these professionals are influenced by culture and other socialization issues. The fact that the majority of these females are black in this current study, means that they are also at higher risk of obesity because of their generally low levels of activity and poor nutritional status as they grow older (Kruger, Venter & Vorster, 2003). According to Abubakari & Bhopal, (2008) women were more likely to be obese than men in West Africa, just like in Europe (23%), Eastern Mediterranean (24%) and America (29%) according to WHO (2015) statistical report of obesity trends by country.

South Africa has the highest overweight and obesity rate in Sub-Saharan Africa, whereby seven out of 10 women and four out of 10 men have significantly more fat than what is deemed healthy (Malan, 2014). González-Velázquez and Mendez (2007), found that half of female Healthcare Workers (HCW) had a significantly higher prevalence of obesity ($p < .050$) compared to only 23% of male HCW in Mexico.

Interestingly, the results of this study revealed that the younger participants of less than 40 years were more obese than the older participants. This is contrary to what the other studies have found, whereby older people were more obese than the younger people (Flegal et al., 2010 and Fakhouri, Ogden, Carroll, Kit & Flegal, 2012), as their level of physical activity and eating habits change as they grow old. However in this study the

majority of health care professionals were of less than 40 years, which contributed to younger people seem to be more obese than older people.

This study revealed that the majority of married participants were more obese than those who were unmarried. This concur with the studies that were conducted, where being married was found to be associated to obesity (Amini, Rezvanian, Gouya, Delavari, Alikhani & Mahdavi, 2008 and Wright & Aronne, 2012). This was so because, unmarried subjects may intentionally manage their weight in an effort to be more attractive to potential marital partners, whilst married people have more social support than those who are single, which makes them not to really concern themselves about weight control (Amini, Rezvanian, Gouya et al., 2008) .This marital support can lead to obesity through diet, activity, and social values. The lifestyle of married individuals may provide more stable eating pattern. Shared marital status from living in a common household creates responsibilities for eating together and provides social support of going out and eating at various eating outlets of which the foods are in most cases unhealthy (Wright & Aronne, 2012). Some people control their weight to attract mate, and once they get married weight control may be of less valued so that diet/exercise behaviors for slimness may be de-emphasized or abandoned (Amini, Rezvanian, Gouya et al., 2008).

This study has also revealed that the majority of nurses were more obese than other health care professionals, which concur with other studies that were conducted in South Africa (Onyebukwau, 2010 and Skaal & Pengpid, 2011). The study conducted among nurses in Nigeria in 2009, confirmed that 62 % of the nurses were obese (Ogunjimi et al., 2009). According to the study conducted in Tanzania, the more the health care professionals are obese, the more it affects the way they give advice to their patients about healthy lifestyle (Wallace, 2010). However, the barriers to leading a healthy lifestyle alluded by health care professionals should not overlooked. These findings imply the urgent need to design interventions that are specifically targeting nurses, seeing that they are a group that is at high risk of obesity and therefore at risk of

developing NCDs, as reported by Skaal & Pengpid that at least one in every ten health care professional was suffering from one form of NCDs.

The study further revealed that managers were more obese than other professionals and assistants. This was expected as in most cases, the managers are doing the administrative work (Department of Health Limpopo, 2016), which requires them to sit most of the time. Professionals and assistants are the ones who are doing most of the operational work (Department of Health Limpopo, 2016), like general nursing care for enrolled assistant nurses and treating patients with various treatment techniques by junior professionals as prescribed in their job descriptions.

Objective 3: *To determine the level of physical activity among health care professional in rural hospitals in Sekhukhune district.*

This study revealed that the majority of health care professionals do not engage in vigorous physical activities at work. This is in concordance with the nature of work that the majority of health care professionals are engaged in according to their scope of practice (Department of Health Limpopo, 2016). Majority of health care professionals engage in moderate work physical activities such as brisk walking, carrying light loads, washing and feeding patients and giving medicines. They meet the required time of 30 or more minutes for 3 or more days in a week for physical activity as recommended by Physical activity guidelines (WHO, 2010).

This study revealed that work-related vigorous physical activity was significantly low among allied health professionals, followed by clinical care professionals then nurses. There was high significant association of work-related moderate physical activity among assistants. Whereas professionals and assistants are the ones who are doing most of the operational work, like general nursing care for enrolled assistant nurses and treating patients with various treatment techniques by junior professionals as prescribed in their job descriptions (Wallace, 2010 and Kwak, Berrigan, Van Domelen, Sjöström & Hagströmer, 2016). There are detrimental health effects associated to adopting a

sedentary lifestyle, according to Tremblay, Colley, Saunders, Healy & Owen, (2010). It is one of the contributing factors to obesity and non-communicable diseases (WHO, 2010). Previous studies revealed that about one-third of health care workers reported that they suffered from obesity related non-communicable diseases (Skaal & Pengpid, 2011). These results imply that our health care professionals are at high risk of suffering from one form of NCDs, if they continue to adopt a sedentary lifestyle. Just because staffs participated in some form of physical activity, through doing their work-related chores, doesn't mean that they should be satisfied, because, majority are already overweight and obese, predisposing them to developing NCDs. Over and above these chores, it is advisable that health care professionals should exercise regularly, in order to optimise their cardio-vascular system.

The results of this study revealed that the majority of professionals were not engaging in leisure vigorous physical activity, but were engaging in moderate leisure physical activity. However, the majority did not meeting the required time of 30 or more minutes and 3 or more days in a week of leisure moderate physical activity. There is a significant association between job title and leisure vigorous physical activity (Arias, Caban-Martinez, Umukoro, Okechukwu & Dennerlein, 2015) whereby health care professionals were engaging in high activity compared to managers, meaning, they met WHO-recommended physical activity of more than 3 days and more than 30 minutes in a week (WHO, 2010). There was also a significant association between professional category and leisure moderate physical activity, whereby allied health professionals were the ones who were engaging in high activity compared to other groups. Other studies conducted among shift workers showed that most people who work shifts had low level of physical activity, and they were obese (Wallace, 2010; Lowden, Moreno, Holmbäck, Lennernäs and Tucker, 2010 & Zhao, Bogossian, Song & Turner, 2011).

This study revealed that the majority of health care professionals had sedentary behaviour of more than 2 hours in a day, which was not in relation of recommended time of 2 to 4 hours in a day (Schulte, 2015). The majority of females were engaging in sedentary behaviour than males in this current study. This might be one of the reasons

that more females were overweight and obese than males in this study. According to professional category, allied health professionals were engaging in more sedentary behaviour than nurses and clinical care professionals. This study further revealed that professionals were engaging in more sedentary behaviour than managers and assistants, which is in contrary to scope of practice of professionals and managers, whereby managers are the ones who are doing administrative or office work seated and professionals and assistants are doing production work which expect them to be on their feet most of the time (Department of Health Limpopo, 2016). However, in this study, this might be due to the fact that ratio of professionals to managers is more and therefore are able to cover their work load in time and then have long resting time. It has to be noted that of 103 staffs that participated in this study, only 17 were managers, which can significantly impact on comparison between other groups and managers.

The study has also shown that the majority of participants engaged in high activity of walking. Most health care professionals stay in the vicinity of the hospital, which is a walking distance to work (Cerin, Leslie, du Toit, Owen & Frank, 2007 and McKenzie, 2014), which is also the case in this current study. Majority of clinical care professionals shows no activity of walking, as compared to allied health professionals. This is so, as most allied health professionals walk from their offices to the wards to see patients, whereas clinical care professionals and nurses consult with the patients in their work station or offices. Assistants had high activity of walking, as compared to managers who had no activity. This was expected as managers spend most of their times in the offices doing administrative duties (Department of Health Limpopo, 2016).

5.3. Conclusion

From this study, there was high prevalence of overweight and obesity among health care professionals. The younger health care professionals were more obese than older ones. Females were the ones who were more obese than males. Nurses were the ones who were more obese than other health care professionals. The study showed that managers were more obese than profession specific and assistants.

The study further revealed that the level of physical activity among health care professionals was also low, as they did not meet the WHO-recommended time and number of days in a week for physical activity. Majority of health care professionals were leading sedentary lifestyle, especially females.

5.4. Recommendations

There is a need for regular health promotion programmes among health care professionals with regard to obesity and importance of physical activity. This can also be integrated into continuous professional development programmes and annual health calendars.

The hospitals need to be equipped with onsite fitness centre that will be accessible 24 hours, so that it is available for night shift health care professionals as well. The staff establishment of the hospital should include the fitness instructor specifically for staff members to oversee physical training of staff, consult with staff personally with regard to physical activity, advice staff about the different types of activities that they can participate in. Physical activities support groups need to be established such as aerobics classes, fun run, etc.

Policies that guide participation in physical activities need to be drawn and be implemented accordingly in health sector, so as to promote healthy living habits. The Department Health need to provide health care facilities with infrastructure that will consist of onsite cafeteria / canteen. The menu /food sold in those cafeteria /canteen will need to be monitored by food experts such as Dieticians or Nutritionists to ensure that healthy eating habits are adhered to. The onsite cafeteria /canteen should be opened at least until 20:00 to cater for night shift staff members. The street vendors surrounding health facilities need to be informed about the types of food that they can sell. Disciplinary measures need to be taken in case of non-compliance.

5.5. Limitations

The study was conducted at one district in Limpopo province and only two hospitals, whereas there are other rural hospitals in the province. The study population was approximately 143 with only 103 participants sampled, which cannot be a true representation of the thousands of the population of health care profession in South Africa, hence the same study can be replicated in other parts of the country.

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7. APPENDICES

Appendix A: Time schedule

Table 1: Time schedule

ACTIVITY	2015									2016										2017							
	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
A Develop protocol	X	X	X	X																							
B Submit protocol					X	X	X	X	X	X																	
C Ethics approval and permission											X	X															
D Pilot study													X														
E Data																		X	X								

Appendix B: Budget

The study will be self-funded by the researcher

Table 2: Budget required for the study

	ITEMS	COST /UNIT (R)	TOTAL COST (R)
A	Copies	R 1.00 x 1000	R 1000.00
B	Transportation	R 200/150 km	R 4300.00
C	Data capturing	R 500	R 500.00
D	Language editing and proof reading	R 1000	R 1000.00
E	Printing and binding of dissertation	R 300 X 6	R 1800. 00
		TOTAL	R 8 600.00

Appendix C: Study information leaflet for participants

Dear participant

RE: PARTICIPATION IN A RESEARCH PROJECT

RESEARCH TITLE: Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa.

My name is Seemole Blantina Senwamadi, student number 201508608 a Master's student in Public Health at the University of Limpopo. You are kindly requested to participate in the study. This study has been approved by Research and Ethics Committee of the University of Limpopo and Department of Health Limpopo Province.

The aim of this study is to assess prevalence obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, as physical inactivity has been identified as the fourth leading risk factor for global mortality rate causing estimated 3.2 million deaths globally and the most contributing factor to obesity. Whereas physical activity reduces the risk of cardiovascular diseases, diabetes, colon and breast cancer, depression, hip or vertebral fracture and help to control weight. You will asked to complete a self-administered questionnaire with two sections A and B. Your information will be kept confidential by requesting the participants to participate in the study anonymously. When I write my report or article about this research, your identity will be protected to the maximum extent possible.

There are no known risks associated with participating in this study. The best benefits will be to know about which types physical activities one can participate in. Your participation in this research is voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify. If you have any questions about the research please contact:

Ms S.B Senwamadi
Matlala hospital
Physiotherapy section

Work telephone no: 013 264 5046
Cell no: 072 713 0562
Email address: seemolesb8@gmail.com

Appendix D: Informed consent form

CONSENT FORM TO PARTICIPATE IN THE RESEARCH OF MS S.B SENWAMADI

RESEARCH TITLE: Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa.

The aim of the study has been described to me and I understand it. I freely and voluntarily agree to participate in the study. I understand that I participate in the study anonymously and that I may withdraw from the study without giving any reason at any time and this will not affect me in any way.

Participant's name

Profession.....

Participants signature.....

Date.....

Appendix E: Questionnaires

RESEARCH TITLE: Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa.

Dear participant

Please answer all the questions as per instruction in every section. Do not write your name on the questionnaire. Select your appropriate answer by using [X] or [√] or write your answer in the boxes or spaces provided respectively.

SECTION A: SOCIO DEMOGRAPHIC DATA

1. Gender:

Female	<input type="checkbox"/>	Male	<input type="checkbox"/>
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2. How old are you?

20-29	<input type="checkbox"/>	30-39	<input type="checkbox"/>	40-49	<input type="checkbox"/>	50-59	<input type="checkbox"/>	60-65	<input type="checkbox"/>
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3. Marital status:

Single	<input type="checkbox"/>	Married	<input type="checkbox"/>	Divorced	<input type="checkbox"/>	Widowed	<input type="checkbox"/>
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4. What is your race

5. What is your profession?

6. What is your job title?

SECTION B: GLOBAL PHYSICAL ACTIVITY QUESTIONNAIRE

CORE: Physical Activity

I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.

Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

Question	Response	Code
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Work

1.	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>[carrying or lifting heavy loads, digging or construction work]</i> for at least 10 minutes continuously?	Yes 1 No 2 If No, go to P 4	P 1
2.	In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days	P 2
3.	How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours: minutes	P 3 (a-b)
4.	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking <i>[or carrying light loads]</i> for at least 10 minutes continuously?	Yes 1 No 2 If No, go to P 7	P 4
5.	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days	P 5

6.	How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours: minutes	P 6 (a-b)
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Travel to and from places

The next questions exclude the physical activities at work that you have already mentioned.

Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship.

7.	Do you walk or use a bicycle (<i>pedal cycle</i>) for at least 10 minutes continuously to get to and from places?	Yes 1 No 2 If No, go to P 4	P 7
8.	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days	P 8
9.	How much time do you spend walking or bicycling for travel on a typical day?	Hours: minutes	P 9 (a-b)

Recreational activities

The next questions exclude the work and transport activities that you have already mentioned.

Now I would like to ask you about sports, fitness and recreational activities (leisure), [*Insert relevant terms*].

10.	Do you do any vigorous-intensity sports, fitness or recreational (<i>leisure</i>) activities that cause large increases in breathing or heart rate like [<i>running or football</i>] for at least 10 minutes continuously	Yes 1 No 2 If No, go to P 4	P 10
11.	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (<i>leisure</i>) activities?	Number of days	P 11
12.	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours: minutes	P 12 (a-b)
13.	Do you do any moderate-intensity sports,	Yes 1	P 13

	fitness or recreational (<i>leisure</i>) activities that cause a small increase in breathing or heart rate such as brisk walking, [<i>cycling, swimming, and volleyball</i>] for at least 10 minutes continuously?	No 2 If No, go to P 4	
14.	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (<i>leisure</i>) activities?	Number of days	P 14
15.	How much time do you spend doing moderate-intensity sports, fitness or recreational (<i>leisure</i>) activities on a typical day?	Hours: minutes	P 15 (a-b)
EXPANDED: Physical Activity			
Sedentary behaviour			
The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping.			
16.	How much time do you usually spend sitting or reclining	Hours: minutes	P 16 (a-b)

SECTION C: ANTHROPOMETRIC MEASUREMENTS FOR BODY MASS INDEX

In this section the researcher and the research assistant will calculate your Anthropometric measurements by taking the measurements of your height in metres and your weight in kilograms. You will be requested to stand on the weighing scale for your weight and stand against the wall for your height to be taken using stature metre.

1. Weight =kg

2. Height = m²

Body mass index (BMI) = Weight in kg/ (Height) ² in metres

BMI=

BMI Classification:

Underweight < 18.5 kg/m²

Normal weight = 18.5-24.9 kg/m²

Overweight = 25.0-29.9 kg/m²

Obese = 30.0-39.9 kg/m²

Severely obese ≥40 kg/m²

Appendix F: Approval from University of Limpopo



University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 2212, Fax: (015) 268 2306, Email:noko.monene@ul.ac.za

**TURFLOOP RESEARCH ETHICS
COMMITTEE CLEARANCE CERTIFICATE**

MEETING: 05 July 2016

PROJECT NUMBER: TREC/60/2016: PG

PROJECT:

Title: Prevalence of obesity and level of physical activity among health care professionals in rural hospital in Sekhukhune District, Limpopo Province, South Africa

Researcher: Ms SB Senwamadi

Supervisor: Prof L Skaal

Co-Supervisor: Dr NJ Ramalivhana

Department: Medical Sciences, Public Health and Health Promotion

School: Health Care Science

Degree: Masters in Public Health


PROF. TAB MASHEGO

CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: **REC-0310111-031**

Note:

- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
- ii) The budget for the research will be considered separately from the protocol.
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

Appendix G: Letter seeking for permission from Department of Health Limpopo province

The Head of Department of Health Limpopo Province
No. 18 College Street
Polokwane
0700
Dear Sir/Madam

RE: REQUISITION FOR PERMISSION TO CONDUCT A STUDY IN YOUR INSTITUTION

I am Seemole Blantina Senwamadi, student number: 201509608. I am currently studying Masters of Public Health with the University of Limpopo. I am requesting a permission to conduct my research in your institutions, Matlala and St Rita's hospitals. The title of my research is "Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa."

The study is being conducted under the supervision of Prof. L. Skaal from the University of Limpopo.

Before the commencement of the study, I will obtain approval from Research and Ethics Committee of University of Limpopo and Department of Health Limpopo, so as to make sure that the rights of the participants will be protected and that the research is conducted in an ethical and professional manner.

Participant's consent will be obtained in writing before participating in the study. Participant's confidentiality will be maintained throughout the study. The results of the study will be made available to the institution if needed.

Attached please find the copy of my proposal and the ethical clearance from the University of Limpopo and the Department of Health Limpopo.

Yours faithfully

S.B Senwamadi

Student number: 201509608

Date: 12 July 2016

Appendix H: Approval from department of health Limpopo province



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Latif Shamila (015 293 6650)

Ref:4/2/2

Senwamadi SB
University of Limpopo
Private Bag X1106
Sovenga
0727


Greetings,

RE: Prevalence of obesity and level of physical activity among health care professionals in rural hospital in Sekhukhune District, Limpopo Province, South Africa

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
 - Research must be loaded on the NHRD site (<http://nhrd.hst.org.za>) by the researcher.
 - Further arrangement should be made with the targeted institutions, after consultation with the District Executive Manager.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - The above approval is valid for a 3 year period.
 - If the proposal has been amended, a new approval should be sought from the Department of Health.
 - Kindly note, that the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated.



Head of Department

31/08/2016

Date

18 College Street, Polokwane, 0700, Private Bag x9302, POLOLKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 293 6211/20 Website: <http://www.limpopo.gov.za>

The heartland of Southern Africa – development is about people

Appendix I: Letter seeking permission to Sekhukhune district department of health

The District Executive Manager
Sekhukhune District Department of Health
Private Bag X 80
Lebowakgomo
0737

Dear Sir/Madam

RE: REQUISITION FOR PERMISSION TO CONDUCT A STUDY IN YOUR INSTITUTION

I am Seemole Blantina Senwamadi, student number: 201509608. I am currently studying Masters of Public Health with the University of Limpopo. I am requesting a permission to conduct my research in your institutions, Matlala and St Rita's hospitals. The title of my research is "Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa." The study is being conducted under the supervision of Prof. L. Skaal from the University of Limpopo.

Before the commencement of the study, I will obtain approval from Research and Ethics Committee of University of Limpopo and Department of Health Limpopo, so as to make sure that the rights of the participants will be protected and that the research is conducted in an ethical and professional manner. Participant's consent will be obtained in writing before participating in the study. Participant's confidentiality will be maintained throughout the study. The results of the study will be made available to the institution if needed.

Attached please find the copy of my proposal and the ethical clearance from the University of Limpopo and the Department of Health Limpopo.

Yours faithfully

S.B Senwamadi

Student number: 201509608

Date: 07 September 2016

Appendix J: Approval from Sekhukhune district department of health



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
SEKHUKHUNE DISTRICT

REF : 4/2/2
ENQ : Mashiane P.N
Tel : 015 633 2352

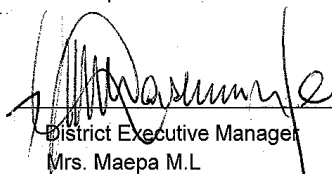
DATE : 19 September 2016

TO : CHIEF EXECUTIVE OFFICERS
MATLALA AND ST RITAS HOSPITAL

FROM: HUMAN RESOURCE UTILIZATION AND CAPACITY DEVELOPMENT

SUBJECT: APPROVAL FOR PERMISSION TO CONDUCT RESEARCH AT MATLALA AND ST RITAS HOSPITALS

1. The above matter bears reference.
2. The Head of Department has granted approval for Senwamadi SB to conduct research in your institution. Senwamadi SB is a student at the University of Limpopo and has registered Master's Degree in Public Health. The title of her research is "**Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune District, Limpopo Province, South Africa**".
3. Take note that the approval is valid for 3 years.
4. The student will present herself, scope and schedule of her work in your institution during the assumption of research.
5. Hope the matter is found to be understandable.


District Executive Manager
Mrs. Maepa M.L

2016/09/19
Date

Private Bag X04
Chuenespoort 0745. Tel: 015 633 2300. Fax 015 633 7927. Website: <http://www.limpopo.gov.za>
The heartland of southern Africa – development is about people

Appendix K: Letter seeking permission from Matlala hospital

The Chief Executive Officer
Matlala District hospital
Private Bag X 9624
Marble hall
0450

Dear Sir/Madam

RE: REQUISITION FOR PERMISSION TO CONDUCT A STUDY IN YOUR INSTITUTION

I am Seemole Blantina Senwamadi, student number: 201509608. I am currently studying Masters of Public Health with the University of Limpopo. I am requesting a permission to conduct my research in your institution. The title of my research is “Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa.” The study is being conducted under the supervision of Prof. L. Skaal from the University of Limpopo.

Before the commencement of the study, I will obtain approval from Research and Ethics Committee of University of Limpopo and Department of Health Limpopo, so as to make sure that the rights of the participants will be protected and that the research is conducted in an ethical and professional manner.

Participant’s consent will be obtained in writing before participating in the study.

Participant’s confidentiality will be maintained throughout the study. The results of the study will be made available to the institution if needed.

Attached please find the copy of my proposal and the ethical clearance from the University of Limpopo and the Department of Health Limpopo.

Yours faithfully

Signature.....

Date.....

S.B Senwamadi

201509608

Appendix L: Approval from Matlala hospital



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
MATLALA DISTRICT HOSPITAL

Ref: 4/2/2
Enquiry: Mrs. Seema PL
013 264 5165

FROM : HUMAN RESOURCE UTILIZATION AND CAPACITY DEVELOPMENT

SUBJECT : APPROVAL FOR PERMISSION TO CONDUCT RESEARCH AT MATLALA HOSPITAL FOR A PERIOD OF 3YEARS

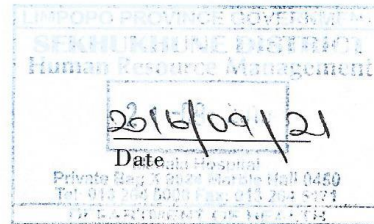
1. It is with pleasure to inform you that your application for conducting research at Matlala Hospital has been approved . The Title for research is “Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune District , Limpopo Province, South Africa.”

2.The approval is for [Three years]

3.Services should not be disrupted during your research

Wish you the best in your career


Chief Executive Officer



Tel: 013 264 9600/02/04
Fax: 013 264 9616

Do It Right

Private Bag X9624
Marble Hall, 0450

Appendix M: Letter seeking permission from St Rita's hospital

The Chief Executive Officer

St Ritas Hospital
Private Bag X 1303
Glen Cowie
1061
27 September 2016

Dear Sir/Madam

RE: REQUISITION FOR PERMISSION TO CONDUCT A STUDY IN YOUR INSTITUTION

I am Seemole Blantina I Senwamadi, student number: 201509608. I am currently studying Masters of Public Health with the University of Limpopo. I am requesting a permission to conduct my research in your institution. The title of my research is "Prevalence of obesity and level of physical activity among health care professionals in rural hospitals in Sekhukhune district, Limpopo Province, South Africa."

The study is being conducted under the supervision of Prof. L. Skaal from the University of Limpopo. I obtained approval from Research and Ethics Committee of University of Limpopo and Department of Health Limpopo, so as to make sure that the rights of the participants will be protected and that the research is conducted in an ethical and professional manner. Participant's consent will be obtained in writing before participating in the study. Participant's confidentiality will be maintained throughout the study. The results of the study will be made available to the institution if needed.

Attached please find the copy of my proposal and the ethical clearance from the University of Limpopo and the Department of Health Limpopo.

Yours faithfully
S.B Senwamadi
(201509608)

Appendix N: Approval from St Rita's hospital



St Rita's Hospital

Kalafu ke Shumisoana (working together for your health)

Private Bag x 1303
Glen Cowie
1067
Tel : (013) 298 1000
Fax : (013) 298-1061

Ref: S5/3/1/2/1
Enq: Phahlamohlaka MA
Ext: 2340
Date: 2016/11/03

To: Senwamadi SB

From: HUMAN RESOURCE UTILIZATION AND CAPACITY DEVELOPMENT

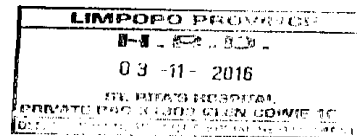
SUBJECT: APPROVAL TO CONDUCT A RESEARCH STUDY ON 'PREVALENCE OF OBESITY AND LEVEL OF PHYSICAL ACTIVITY AMONG HEALTH CARE PROFESSIONALS'.

1. Subsequent to the approvals granted by the Limpopo Department of Health and the Office of the District Executive Manager: Sekhukhune District, your application to conduct research is hereby acknowledged.
2. We are hereby informing you that your application for the above mentioned research at the hospital on prevalence of obesity and level of physical activity among health care professionals is approved.
3. Please notify HRD office of the date to conduct research a week before, so that we can make the necessary arrangements.

Regards


Director: Hospital Services
Mr. M. Chokwe

03/11/2016
Date



P 2/2

REGISTRY 0132981067 >> 0866503447

2016-11-10 15:36