FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS IN THE GREATER-TZANEEN MUNICIPALITY OF THE LIMPOPO PROVINCE, SOUTH AFRICA.

BY

MALEPE MATLALE MOUSCHLEY

STUDENT NUMBER: 11603310

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SUPERVISOR: DR N.S. MASHAU

CO-SUPERVISOR: DR M. MOHLALA

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DECLARATION

I, Malepe Matlale Mouschley, declare that this mini- dissertation titled **"Factors associated with hypertension among workers in the Greater-Tzaneen Municipality of the Limpopo Province, South Africa",** hereby submitted for the degree Masters in Public Health (MPH) at the University of Venda, has not been submitted previously by me at this university or any other institution, and that it is my own work in design and in execution. All sources I have quoted have been indicated and acknowledged by means of complete references

Signature:  Date :17 July 2020

M.M Malepe

DEDICATION

This study project is dedicated to my wonderful parents, Mr Elijah Malepe and Mrs Welheminah Malepe for their encouragement and support throughout the study. To my lovely husband Mr Cornel Maphoru for his guidance and emotional support. To my younger brother, Lefelane Malepe I have made a good example for you to follow. To my children Theophilus and Redeemer, for giving me hope.

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ABSTRACT

Introduction: Hypertension has become a public health challenge in both developing and developed countries. However the cause of hypertension is unknown. There are various factors that lead to hypertension.

Aim: The aim of study was to investigate factors associated with hypertension among workers in the Greater-Tzaneen Municipality of the Limpopo Province, South Africa.

Methodology: A quantitative approach was adopted using a cross-sectional descriptive design. The population comprised of all registered workers in the Greater-Tzaneen Municipality. Simple random sampling was used to select 344 participants in the study however, due to withdrawal from participation; the final sample size was 316. Data was collected using questionnaires and an electronic blood pressure machine (a Baumanometer). Validity and reliability of the instrument was ensured. The basic principles of ethics were observed. Data collected was analysed using the Statistical Package for Social Sciences (SPSS), version 25.0.

Results: The sample comprised of 316 of workers, 226 were females and 90 males. The findings of this study showed that socio economic factors are associated with the development of hypertension (p=0.000). Age and gender also showed an association with the development of hypertension (p=0.000). Lifestyle factors such as alcohol drinking, diet and physical activity also showed an association (p<0.005) and tobacco smoking appeared not to be associated with the development of hypertension. The findings of the study showed lack of a knowledge regarding hypertension. On prevalence there were 142(44.9%) who had normal blood pressure.

Conclusion: An increase in health education and awareness should be employed regarding the risk factors associated with hypertension in the study.

Keywords: Factors, Hypertension, workers

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ACRONYMS AND ABBREVIATIONS

CVD:	Cardiovascular disease
GBD:	Global Burden Disease
HPT:	Hypertension
NCDs:	Non communicable disease
NHANES:	National Health and Nutrition Examination Survey
SES:	Socioeconomic status
WHO:	World Health Organisation

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

According to Abed and Abu-Haddaf, (2015), non-communicable diseases (NCDs) are the main cause of mortality and morbidity worldwide. The incidence of NCDs is increasing worldwide and this increases the risks of disability among the population. The inclination of NCDs has also become a threat world-wide; hence, it tends to affect the economy and social development, as well as the lives and wellbeing of society. NCDs are a major problem in the developed countries and are rapidly increasing in the developing countries. Hypertension is one of the leading factors in cardiovascular diseases (CVD) and stroke.

Globally, hypertension has begun to be one of the main public health challenges. It is estimated that about 45% of hypertension is a disease burden in developing and developed countries; however the causes of hypertension are unknown. There are various factors that have an influence on the development of hypertension. The factors are biological, behavioural and psychological Soubeiga, Millogo, Bicaba, Doulougou and Kouanda, (2016). The World Health Organisation reports that hypertension caused about 7.5 millions of deaths and 57 millions of disability in 2010. It was further reported that 22% of the workers aged 18 years and older are suffering from hypertension.

Davila, Kuklina, Valderrama, Yonn, Rolle and Nsubunga, (2017), describe hypertension as being the silent killer in the United States of America because many people might not be aware of the condition. The National Health and Nutrition Examination Survey (NHANES), (2014) has reported that about 70% of the workers are hypertensive. In the same study, it was also revealed that the increase in hypertension among workers was determined according to the work needs and demands. Some types of job are stressful in nature and when the individual is stressed, the risk of developing hypertension is high. Some jobs are possibly contributors in the development of hypertension.

In Europe, hypertension is the mediator for CVD, especially myocardial infarction, kidney diseases and other manifestations of ischemic diseases. The nature of the work and contributing biological and lifestyle factors vary according to the workplaces or type of the employment. If the employees engage in a type of work that does not involve increases of intensity or an activity while eating fast foods, there is a higher possibility of chances of developing hypertension. These are one of the lifestyle behaviours that influence the

development of hypertension. In the European Union it was estimated that about 200 million of the workers were living with hypertension, from which about 7.5 million died (Rumball-Smith, Nandi & Kaufman, 2014).

A study conducted by Eng, Moy and Bulgiba, (2016) in Malaysia, revealed that an increase in hypertension among workers affects the economy of the country because when the workers are sick, the production of that company decreases. According to the National Health and Morbidity Survey (2014), about 5.8 million people living with hypertension and in 2009 most of them were workers. According to Vincent-Onabajo, Mohammad and Umeonwuka, (2016) hypertension has also become a major problem in Nigeria. These authors found that about 58% of the workers were hypertensive. It was further indicated that most of the office workers and drivers were affected because they spend much time sitting and not engaging themselves in physical activity.

Buso, (2015) reports that in Africa, hypertension has become worse since 2010, it tends to affect workers at a young age and it is classified as the third leading cause of mortality. Buso, (2015) also reports that hypertension among the youth occurs due to the lifestyles that they engage in. Young adults-engage in tobacco smoking and excessive alcohol drinking which influence the development hypertension. Furthermore, the increase in globalisation and urbanisation also has an influence on the increase in hypertension. The same study also revealed that in 2011, the Global Burden of Disease (GBD) reported that about 40% of workers were hypertensive.

According to Statistics South Africa (2015) hypertension is the leading cause of death in the country, about 48.7% of deaths in the country occur due to hypertension. The epidemiology that was conducted in South Africa indicates that most of the employees are hypertensive and a few of them were not aware that they were hypertensive as they did not take it seriously (Silvia, Milner, Kolbe-Alexandra, Greyling, & Patel, 2014).

According to Statistics South Africa, (2014), in the Mopani District in the Limpopo province hypertension causes about 3.4% of the deaths and 3.7% of the disabilities. Therefore, this study aims to investigate the factors that are associated with hypertension among workers in the Greater-Tzaneen Municipality of the Limpopo Province, South Africa.

Table 1 Statistics of mortality rate caused by hypertension in Limpopo Province (Stats SA)

Districts	2013	2014	2015	2016
Capricorn District	4.5%	5.3%	5.8%	6.4%
Greater Sekhukhune District	4.9%	5.1%	5.5%	6.9%
Mopani District	2.0%	3.4%	6.1%	7.4%
Vhembe District	1.7%	2.0%	3.1%	3.9%
Waterberg District	3.7%	4.7%	6.2%	6.7%

1.2 STATEMENT OF THE PROBLEM

The Minister of Health in South Africa has developed a Strategic Plan in Prevention and Control of Non-communicable diseases. The main aim of this plan was to achieve public health awareness and promote health among the population. This strategic planning was developed in order to decrease the burden of NCDs, especially those that are related to lifestyle risk factors, including hypertension. In addition, there are wellness programmes developed at workplaces to decrease the burden of NCDs. The wellness programmes include physical activity, the promotion of healthy-eating lifestyle and smoke–free areas in workplaces.

Despite of the efforts of the Minister of Health, hypertension remains a major challenge. Therefore the increase in the mortality rate in the Mopani District caused by hypertension drew the researcher's attention and motivated her to conduct a study among municipal workers, to investigate the factors associated with hypertension.

1.3 RATIONALE FOR THE STUDY

There are no known studies conducted in the Greater-Tzaneen municipality which have investigated the factors associated with hypertension among municipal workers. Most studies have focused on the general population and were conducted in other areas of the Limpopo Province. For example, the study that was conducted by Ntuli, Maimela, Alberts, Choma and Dikotope, (2015), in the Capricorn District in the Limpopo Province was focused on the "Prevalence and associated risk factors of hypertension amongst adults in a rural

community of Limpopo". Another study conducted by Peltzer and Phaswana-Mafunya, (2015) focused on "Hypertension and associated factors in older adults in South Africa." Therefore it is important to conduct a study among the Greater-Tzaneen municipality workers to fill the gap.

1.4 SIGNIFICANCE OF THE STUDY

Recommendations from the study might benefit the workers by enabling awareness of the factors associated with hypertension in order to reduce the increase in hypertension. The findings of the study might assist the Department of Health to review the wellness programmes at workplaces. They might also assist policy makers to review and monitor the laws which might eliminate some of the factors associated with hypertension.

1.5 AIM OF THE STUDY

To investigate the factors associated with hypertension among workers in the Greater-Tzaneen Municipality of the Limpopo Province, South Africa.

1.6 OBJECTIVES

The following objectives were developed in order to guide the study:

1.6.1 To assess the socioeconomic factors associated with hypertension among the workers in the Greater-Tzaneen municipality of the Limpopo Province, South Africa.

1.6.2 To investigate the biological factors associated with hypertension among the workers in the Greater-Tzaneen municipality of the Limpopo Province, South Africa.

1.6.3 To determine the lifestyle factors associated with hypertension among the workers in the Greater-Tzaneen municipality of Limpopo Province, South Africa.

1.6.4 To assess the prevalence of hypertension among workers in the Greater-Tzaneen Municipality of the Limpopo Province, South Africa.

1.6.5 To assess knowledge regarding hypertension among workers in the Greater- Tzaneen Municipality of the Limpopo Province, South Africa.

1.7 Theoretical framework

The purpose of exploring theoretical literature around the research topic is to gain insight and contextual knowledge about the participants in order to raise questions; it provides a detailed description and critical analysis of the current state of knowledge (Rezaeian, 2016). Models are recognized as providing an orderly way to prepare assessment. This study is guided by multi-factorial causation theory, which explained below.

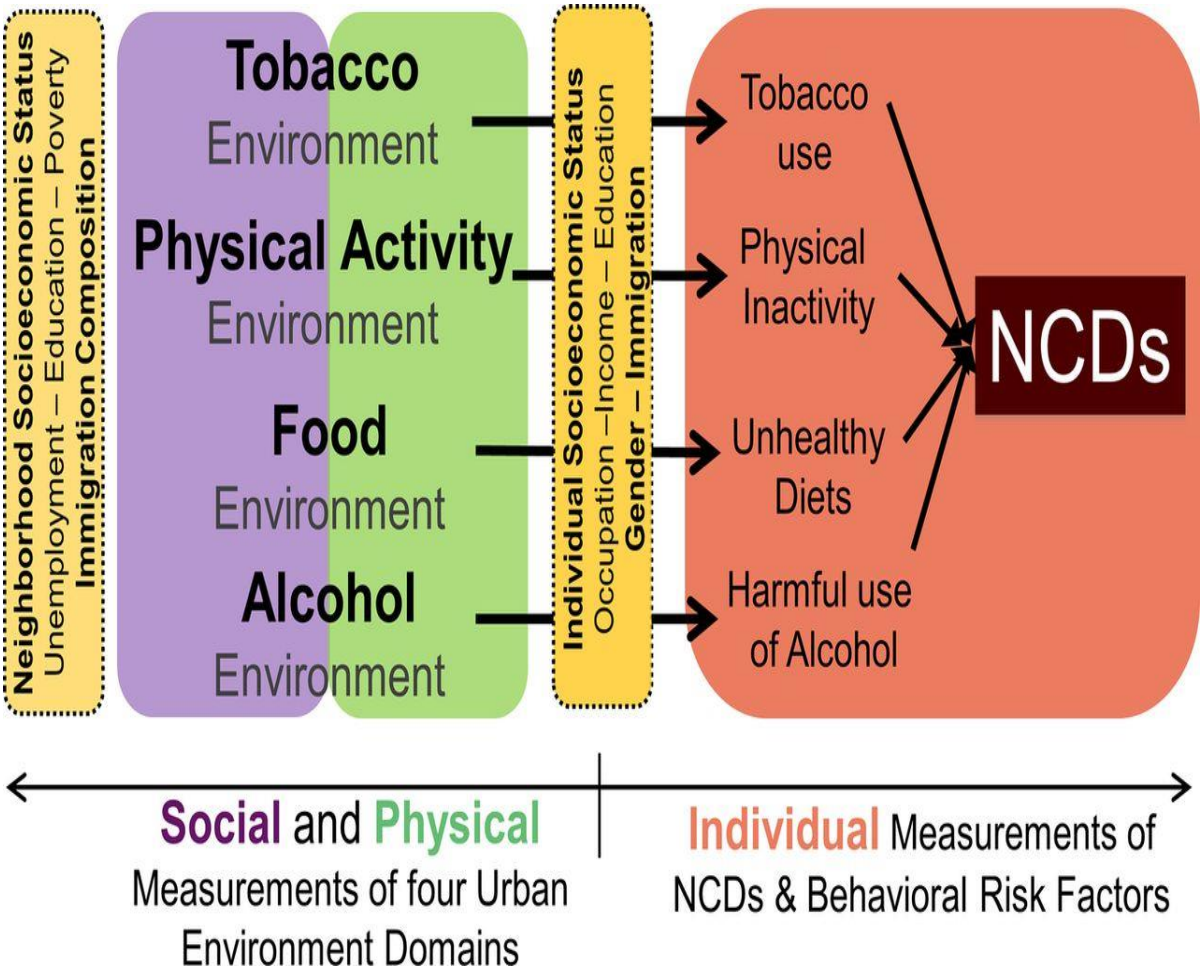

Figure 1 A scheme for the multi- factorial causation model

Source https://goo.gl/images.co.za

1.7.1 MULTIFACTORAL CAUSATION MODEL

According to Krieger (1994), a model is the theory of frequency of diseases, its distribution and assessment of the possible determinants or possible causes of the disease. According to the model a disease can be caused by not just one factor but numerous factors. A combination of factors in the body causes disease. Multifactoral causation theory is divided into two domains which are: Environmental domain and physical domain, as explained as follows.

1.7.2 ENVIRONMENTAL DOMAIN

The environmental domain contains the social and physical aspects. In the social aspect it focuses on the socioeconomic status, which includes the level of education, poverty, income and occupation as well as the knowledge. The social domain addresses the socioeconomic status of the development of hypertension. The physical aspect consists of the biological aspects, namely gender, age and heredity.

1.7.3 INDIVIDUAL MEASUREMENTS

In this phase of multi-factorial causation theory, the behavioural risk factors are emphasised. The behavioural risk factors are the lifestyle factors which have an influence on the development of HPT. These lifestyle factors include tobacco use, physical inactivity, unhealthy diet and harmful use of alcohol.

1.8 DEFINITION OF KEY TERMS

The following key terms were defined conceptually and operationally:

1.8.1 Factors

Factors refer to circumstances, facts or influences that contribute to results, one of the things that cause something to happen (Meriam, 2015). For the purpose of this study, the phrase referred to the aspect that causes the development of hypertension.

1.8.2 Hypertension

Hypertension refers to the systolic blood pressure which equals to 140 mmHg and above and a diastolic blood pressure of 90 mmHg and above (WHO, 2015). For the purpose of this study, the phrase referred to a systolic blood pressure ranging from 140 mmHg and diastolic blood pressure of 90 mmHg and patients who reported with hypertension.

1.8.3 Workers

Workers refer to any person who engages in a particular activity, in order to get reward or earnings (Meriam, 2015). In this study, the concept referred to all individuals working in the Greater -Tzaneen municipality.

1.9 OUTLINE OF THE DISSERTATION

This dissertation is divided into five chapters as follows:

Chapter 1: Introduced the study, stated the problem, purpose, significance, aim, objectives and definition of key terms.

Chapter 2: Literature review

Chapter 3: Outlines research approaches that were used in data gathering, collection, presentation and analysis.

Chapter 4: The results of the study.

Chapter 5: Discussion, conclusions and suggested recommendations.

1.10 SUMMARY

This chapter introduced the background of the study. It outlined the prevalence of hypertension globally, internationally and in the Limpopo province. It further included the problem statement of the study, rationale of the study, significance of the study, definition of the study and outlined of the dissertation. The following chapter (2) describes the literature review.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews some of the studies carried out concerning the factors associated with hypertension among workers. Data based literature reviewed that covers the socioeconomic factors, biological factors and lifestyle factors associated with hypertension among workers.

2.2 SOCIOECONOMIC FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

Socio-economic factors is influences the development of hypertension. Socio-economic factors it includes the social and economic wellbeing of people.

According to Samson, Edwards, Jahangir, Munro, Wariboko, Wassef, Fazio, Mensah, Kabagambe, Blot and Lipworth, (2014) socio-economic status refers to the level of education, income and occupation of a person. These authors report that socio- economic status (SES) has an influence on the development of hypertension (HPT), as individuals with low socioeconomic factors were more affected by HPT than those of with middle and high socioeconomics factors. Individuals with a middle and high socioeconomic factor their chances of developing hypertension are very slim compared to those that are in low socio-economic factors.

In study conducted by Bayray, Meles and Sibhatu, (2018) Ethiopia found that about 30% of the individuals affected by hypertension were the high and low socio-economics factors groups, while among the middle socio-economics groups was 25%. The same authors in the same study also reports that workers with low socio-economics factors has lot of stressed due to too much of debt. It was further reported that stress is one of the risk factors for developing hypertension. When an individual is stressed because of low socio- economics factors, their hypertension become elevated.

According to Miyaki Song, Taneichi, Tsutsumi, Hashimoto, Kawakami, Takahashi, Shimazu, Inoue, Kurioka, Shimbo, (2015), education is the most basic component of SES, as it influences the lifetime occupation and earnings (income). It also provides knowledge and skills which allow the levels of gains and access to health promotion. Furthermore, education increases the health knowledge and improves the health behaviours of the workers. In a study carried out in Japan by Miyaki et al., (2015) it was revealed that the level of education has an influence on the health of the workers. It was further found that a low education level

has more influence on the development of HPT among most of the workers than middle educated workers. In the same study it was found that education is more advantageous in employment opportunities. A higher level of education is associated with health care benefits, healthier working conditions and high income. Income and education have independently showed a relationship of increasing of HPT among workers. In the same study it was also found that about 34.9% of the workers were affected due to their low education level.

Businye, Arabshahi, Subasinghe, Evans, Riddell and Thrift, (2014) reported that level of education is intensely related to the health status of all populations in the world, regardless of ethnicity and race. In the same study, it was revealed that the level of education is important in the awareness of HPT among workers. It was also found that in most rural areas people are not educated. This implies that there is a high population with little knowledge on the factors associated with HPT. Therefore, SES has reported a positive relationship with developing HPT in the worldwide. In their findings it was also reported that individuals with high and low education reacted more positively than those with middle education.

Wu, Yao, Peng, Yao, Zou, Liu and Xin, (2014), in a study conducted in China revealed that lower SES individuals are at risk for developing HPT. In the same study it was reported that individuals with lower education and income have an increased chance of developing HPT. Their findings also revealed that workers with a low education level were more affected than those with higher education in this country. They point out that in the olden days HPT was described as the disease for rich people but nowadays it affects even the poor. This is because poor individuals can buy fatty foods as they are cheap.

Kumar and Sundaram, (2014), in their study conducted in India, it was revealed that low income and occupation have an influence on the development of HPT among workers. It was further revealed that the development of HPT depends on the work that the individual is involved with. In their study about 53% of the workers were reported to be hypertensive and most of them were office workers.

A study that was conducted in Ethopia by Fikadu and Lemma, (2016), showed that workers earning middle incomes and high incomes were more affected than those with low income. It was further revealed that for 21% of the population, education and HPT are associated with the development of HPT. It was also reported that occupation has an influence on the development of HPT. In the same study it was reported that the type of work that the individual engages in daily can have an influence on the development of HPT. It was thus found that some jobs are stressful and involve low physical activity.

In South Africa, the World Health Organisation, (2014) reports that individuals at risk for developing HPT are those with low and middle incomes compared to the high income employees. It was further revealed that poverty was the leading cause of HPT in the country. In their study, it was found that most of the workers with low income and middle income in most cases are not well-educated. Lack of knowledge regarding diseases kills many people in South Africa.

Weimann, Dai and Oni, (2015), in their epidemiological study carried out in Limpopo showed that SES has the most disadvantages in the healthy living of workers around the province. In the same study it was found that SES affects about 2.4% of the workers in which it is the leading cause of HPT among those employees. It was also reported that in many of the districts low education is dominant, hence low education is associated with low knowledge regarding the peoples' health and wellbeing. It was further found that about 8.2% of the workers with low income and 5.6% of the employees were socioeconomically affected.

Cois and Ehrlich, (2014), in their study conducted in Limpopo, found that education is associated with the development of HPT. It has also been proven epidemiologically that education and occupation are related to the development of HPT among many workers in Limpopo. In the same study it was found that most of the workers have little education related to a healthy living lifestyle. SES was found to have a negative impact on increasing HPT among workers, as it increases the development of HPT. Limpopo is characterised by inequality and poverty. It is likely that most of the workers have little knowledge of health risks and motivation, thus increases, the risk of SES in HPT.

2.3 BIOLOGICAL FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

Biological factors are also known as uncontrollable or non-modified risk factors which occur naturally. These factors include: genetics, age and gender.

2.3.1 GENETICS

Heredity plays a major role in the development of high blood pressure; however, it does not contribute to one's genes but their complexity. The number of chromosomes, intermediate phynotypes and genomes has shown to be a significant contributor. The relationship between these genes has an impact on the development of hypertension and it can move from generation to generation (Shih & O'Connor, 2014).

It is estimated that everyone has an about 25 000 genes in their chromosomes and every gene holds a genetic code for the product the body needs to make itself grow, heal and allow itself to perform well. Family history is a major contributing factor in the development of diseases. Hypertension develops from a single mutation called the Mendelian form. In this mutation of the epithelial, sodium channel of the distal renal tubule results in mutation and in the development of HPT (Dreisbach & Batuman, 2014).

According to Dalai, Cui, Yan, Rile, Li and Su, (2014) in their study conducted in China, found that genetic, which is found in the DNA of each individual from peripheral blood leukocytes. In their findings they reported that if an employee has this gene in the DNA which can be inherited from one family member to another, they can develop hypertension. When an employee has inherited this gene, they have more chances of developing HPT at a later stage.

Another study that was carried out in Sri Lanka by Ranasinghe, Cooray, Jayawardena, and Katulanda, (2015), found that family history has an influence on the development of HPT. In their findings it was revealed that most workers reported being hypertensive. Their close family members were also hypertensive. It was further reported that the genes responsible for the development of HPT can travel throughout the entire family. In the same study it was reported that about 48% of the population who reported being hypertensive had relatives suffering from hypertension.

2.3.2 GENDER

In a study conducted by WHO, (2017) in Palestine, it was reported that gender is a contributing factor in the development of HPT. It was further found that most people that were affected were women. In the same study it was found that the majority of the women were obese and did not participate in physical activity. It was revealed that obesity is the risk factor for developing HPT. This is why more women than men were affected. In their study, it was found that 66.7% of the women were reported being hypertensive and 33.3% of men were affected.

In developed countries, a study conducted by Ibrahim and Damasceno, (2015) revealed that women had an increased risk of the occurrence of disease than men. It was also found that women constituted 52.7% and men constituted 40.6% of those with hypertension, while developed countries women constituted 61.7% and men 49.2% of those affected. In the same study it was reported that most of the women developed HPT during their pregnancy.

Owolabi, Owolabi, Olaolorun, and Amole, (2015) in a study conducted in Nigeria, revealed that gender difference influences in the development of HPT. It was further reported more female employees than male employees reported being hypertensive. In their study it was found that about 55.9% of the women were hypertensive while among men it was 44.1%. It was further found that there was an association between gender and HPT. In a study carried out by Steyn, et al., (2014) in the Cape Peninsula, it was found that more women were hypertensive than men. They indicated that gender difference has influence on the development of HPT.

Skaal and Pengpid, (2016), in their study conducted in South Africa, revealed that more female workers were affected than males. In their findings it was reported that 52.5% of the workers that reported being hypertensive were females, compared to 39.5% males. In their findings gender difference was also found to have an influence in developing HPT. In the same study it was revealed that most of the women in South Africa believed that being obese is healthy and most men prefer obese women. It was reported that obesity increases their risks of developing HPT.

2.3.3 AGE

Age as a biological factor, the study conducted by Adeoye, (2016) in Nigeria, it was found that age was associated with the development of HPT among workers. In the same study it was reported that as workers grow older, the chances of being hypertensive increases. In their findings it was also found that when an individual grows older, the heart muscles become weak and it works harder to pump more blood to the body, as a result the individual's blood pressure increases. It was further revealed that 70% of the workers aged 25 and 65 years were hypertensive.

Oladimeji, Fawole, Nguka and Nsubuga, (2015), in their study conducted in Kudana State, revealed that epidemiologically it has been shown that age is associated with the development of HPT among workers. In their study it was found that 80% of the workers aged 25 years to 75 years reported being hypertensive. In the same study it was reported that the increase in age is also increasing the blood pressure. It was further revealed that older adults reported being having high blood pressure.

In the study conducted by Divan, Chauhan, Panchai, and Bansal, (2014), in Surat Municipality, India, it was reported that ageing influences the development of HPT. In their study it was found that workers aged from 20-75 years were hypertensive. In the same study

it was further revealed that about 85% of participants were hypertensive due to the increase in age. It was also reported that ageing significantly influences of development of HPT.

Manocci, Pignalosa, Saulle, Sernia, De-Sanctis, Consentino, Gialdi, C.Nicosia and La Torre, (2015), in their study conducted in Italy revealed that ageing was associated with the development of HPT. In their study it was found that workers aged 20 years to 65 years were at risk of developing HPT. It was further revealed that ageing was significantly related to the development of HPT. In their study it was found that most of the workers who reported being hypertensive were aged 35 to 45 years. It was further found that about 60% of the workers aged 35-45 were suffering from HPT.

According to Mutner, Gu, Wu, Duan, Wenqi and Whelton, (2016) in Canada, an increase in age is typically associated with an increase in high blood pressure incidence in most of the population. It was found that adults aged 35years and above reported suffering from HPT and it was occurring among middle aged individuals and the elderly, who were receiving medication for high blood pressure.

Wolf-Maier, Cooper, Kramer, Benegas, Glampaoli, Joffres, et al., (2015) in their study conducted in China reported that ageing is the contributing factor in the development of HPT, as an increasing incidence occurs in individuals aged 22 year and older. In the same study it was revealed that when an individual grows older, he/she becomes more vulnerable to diseases. In the same study it was further found that most women were protected by the hormone estrogen as they grow older. The hormone loses its function and thus makes them develop HPT. In a study conducted amongst Israeli civil workers by Khan, Stewart, Christian, Schulze, Wu, Leclerg, Khatry and West, (2014), they reported that hypertension is associated with the increase in aging. In their findings it was found that increasing in age is associated with the HPT.

The study that was conducted by Maepe and Outhoff, (2016), in South Africa revealed that workers who reported being hypertensive were middle aged and older. In their study, 15.97% of the workers aged 18-29 years reported suffering from HPT, and 83.02% of the workers aged 30-69 years also reported from suffering of HPT. In the same study, it was reported that workers aged 30-69 years had a high percentage of those suffering HPT. It was further revealed that when the individual grows older they become more vulnerable to disease occurrences, as their immune system also deteriorates. It was also reported that as the individual increase in age they become more at risk of developing HPT.

2.4 LIFESTYLE FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

The lifestyle factors include lifestyle behaviour such as a sedentary lifestyle, poor diet, smoking and alcohol consumption. These factors are also known as controllable risk factors. They occur due to lifestyle behaviours and are modifiable.

2.4.1THE REVIEWED LITERATURE ON A SEDENTARY LIFESTYLE AND DIET

Globally, physical inactivity is associated with diet, if an individual eats an unbalanced diet which contains a lot of trans fats as well as food which contains too much sugar and salt. It was reported that sugar in the body forms energy and when the energy is not used, it forms fat, which tends to be cholesterol. It was also found that cholesterol is deposited in the arteries and heart arteries and forms plaque, which makes the arteries narrow. It was further revealed that after the formation of plaque it makes the blood struggle to pass through, which puts the heart under additional pressure to pump blood to the rest of the body and increases blood pressure (Thompson, Gordon, & Pescatello, 2014).

A sedentary lifestyle also refers to physical inactivity, which means that an individual is not participating in regular physical activity. It was reported that when individuals are not participating in regular physical activity they are more at risk of developing HPT. In their study it was found that most of the workers who reported being hypertensive were not engaging in regular physical activity. In the same study, it was found that most of the employees did not give themselves time to participate in physical activity (Martins, Lopes, Guedes, Nunes, Diniz & Carvalho, 2015).

Printo, Pereira, Ki, and Power, (2014), in their study conducted in Australia, reported that individuals engaging in sedentary behaviours and occupations that do not involve physical activity contributed to HPT. In the same study it was reported that the individuals also eat an unhealthy diet, which puts most of the individuals at risk of developing diseases. In their study it was found that individuals working in offices spend most of their time sitting and not engaging themselves in physical activity after work, which increases their chances of having cardiovascular diseases and HPT. In the same study it was found that few people participated in physical activity and ate a healthy diet. It was also reported that a balanced diet is a diet that consists of vegetables, fruits, carbohydrates, and proteins.

A study that was conducted by Birdee, Byne, McGown, Rothman, Rolando, Holmes and Yarbrough, (2016) in USA, revealed that employees who reported doing physical activity less than once per week constituted 17.6%. It was also found that 12% of the workers reported suffering from HPT. The majority of them were female employees. In the same study it was found that most of the employees who did not engage in physical activity were office workers.

In Nigeria in a study carried out by Aliyu, Chiroma, Jajere and Gujba, (2015), it was reported that most of the employees did not participate in physical activity as they believed that their daily work is part of physical activity. It was further revealed that about 19.2% of the employees reported being physically inactive. Apart from these, 10.2% of individuals were suffering from hypertension. Physical inactivity is the other contributory risk factor for developing HPT.

According to Newlove, Owusa, and Charles, (2014), in their study carried out in Asia, it was reported that junior employees were participating regular physical activity more than the senior employees. It was also revealed that the senior employees reported shortage of time as a reason for not participating in physical activity. Furthermore, it was found that 44.4% of the senior employees were hypertensive and 12.8% of the junior employees were non-hypertensive. In the same study it was reported that the employees knew about the health risk of not participating in regular physical activity and the benefits of participating in physical activity.

Kunene and Taubokong, (2015) reported that most of the employees in South Africa had low physical activity. It was revealed that 31% of the workers were participating in high- intensity physical activity while 29% of engaged in moderate physical activity. Furthermore 40% of the workers did not participate in physical activity. In the same study it was found that most of the employees who participated in regular physical activity were senior employees while the junior employees reported low physical activity. About 20% of the junior employees reported being hypertensive. Physical inactivity shows that it is significantly a risk factor in the development of HPT.

According to Addo, Nyarko, Sackey, Akweongo and Sarfo, (2015), failure to participate in physical activity and eating fast food increases the cholesterol in the body, which will lead to obesity. It was further found that obesity is associated with metabolic diseases and HPT, which means if an individual is obese, that individual is at risk of developing HPT. In the same study it was also revealed that some of the job descriptions can make an individual obese or overweight, such as spending a lot of time sitting in offices, wherein there is a

personal assistant to assist the worker with other work which involves moving out of the office.

According to WHO (2015), eating a large amount of carbohydrates will form plenty of glucose in the body, which is changed into energy. It was also reported that if the energy is not used during exercise that glucose transforms into fats in the body, which increases the level of cholesterol and lead to obesity.

A study conducted in the Republic of Ireland by Gearney, Fitzgerald, Harrington, Kelly, Griener, and Perry, (2015) revealed that few employees were consuming a healthy diet and most were consuming fast foods. It was reported that about 4.8 % of the employees consumed healthy diet. It was found that a few of them were hypertensive. Those who consumed fast food constituted 5.9% and were hypertensive. The study indicated that most of the employees they lack knowledge about a healthy diet.

According to Awosan, Ibrahim, Essien,Yusuf and Okolo, (2014), in their study conducted in Nigeria it was found that most of the employees engaged in unhealthy diets. It was reported that in most cases the employees prefer fast foods from the nearby shops. It was also found that most of the employees drink carbonated drinks and snack frequently. It was also found that carbonated drinks contains plenty sugar which it forms energy in the body. It was also reported that if the energy is not used it forms cholesterol, which narrows the heart arteries, makes the heart work harder to pump blood to the rest of the body. This puts the heart under pressure which makes the blood pressure to rise. In the same study it was reported that about 49.9% of the employees were eating plenty of snacks and fatty foods. Apart from the employees who consumed unhealthy diets most of them were obese and overweight and reported being hypertensive. Furthermore, it was reported that unhealthy diets were significant in the development of HPT.

Melaku, Temesgen, Deribew, Tessema, Deribe, Sahle, Abera, Bekele, Lemma, Amera, Seid, Endris, Hiruye, Worku, Adams, Taylor, Gill, Shi, Afshin, and Forouzanfar, (2016), in their study conducted in Ethopia, revealed that poor diet burdens the rate of HPT. In their study it was reported that most of employees consume a diet with low fruit and vegetables but rich in sodium. In the same study it was found that about 22.8% of the employees were consuming a diet with low fruits and vegetable but a high level of sodium. Apart from the sampled employees it was found that individuals that reported from suffering from HPT were consuming a diet with low fruit and vegetable but a high level of sodium. It was further found that diet plays a significant role in the development of HPT.

A study carried out in South Africa by Naicker, Venter, MacIntyre, and Ellis, (2015), revealed that many of employees consume dairy food, fried snacks and sweets. It was further found that those foods reacted positively and were associated with the development of abdominal obesity. It was also reported that most South African employees consume foods with plenty of fats and sugar. Furthermore, it was revealed that an unhealthy diet has a relationship with the incidence of developing HPT. In the same study, it was found that healthy diets which were rich in fruit and vegetables, wholegrain and meat, are not significantly related to the development of HPT.

2.4.2 THE REVEIWED LITERATURE ON SMOKING

Globally, Ezzatti and Riboli, (2015), reported that cigarettes contain nicotine and tar which produce carbon monoxide. In a study that was conducted by Ambrose and Burua, (2015), it was found that nicotine that is present in the cigarettes plays a role in smoking-related diseases. In the same study it was found that tobacco smoking constricts the blood vessels and makes the heart put more effort in pumping blood to the rest of the body. It was further found that when the heart is under pressure, the blood pressure increases. Ezzatti and Riboli (2015), revealed that tobacco smoking and second-hand smoking causes about 6.3 % of the global burden diseases in low and middle income countries. It was further reported that cigarette smoking is a contributory risk factor for the development of HPT.

Agbana, Azulu. Faroso and Owoeye, (2016) in their study conducted in Nigeria, revealed that smoking is one of the risk factors for HPT. It was found that about 57.8% of the workers were smokers and reported suffering from HPT and among non- smokers it was 42.2%. In the same study it was revealed that few employees whom were non-smokers reported suffering from HPT. A study conducted by Tshisenge and Mabuza, (2015) in Botswana reported that tobacco smoking is one of the risk factors in HPT. It was found that about 58% of the workers who smoked tobacco were hypertensive and 26% of those who smoked snuff were hypertensive. In the same study it was found that tobacco products were not significantly different to those that did not smoke.

Milner, Da Silva, Patel and Salau, (2016), in their study conducted in Johannesburg, South Africa, revealed that smoking is the major problem among young employees. It was further reported that most young employees engage in smoking due to peer pressure and being ignorant about the warnings on the labels boxes. It was found that employees who were smokers constituted of 20.3% and those who were former smokers constituted 18.6%. In

the same study it was reported that among smokers and former smokers about 70.8% reported suffering from HPT. It was also revealed that smoking is a significant factor in the development of HPT.

2.4.3 THE REVIWED LITERATURE ON ALCOHOL CONSUMPTION

Alcohol travels throughout the brain, heart and muscle. When drinking a large amount of it, it deteriorates the heart muscles which can influence the lungs, livers, brain and other body systems. It is capable of inducing high blood pressure and heart failure, which raises the risks of heart attack or stroke. A reasonable intake of alcohol, which is one drink per day for women, and one to two drinks for men, reduces the risks of developing diseases and death rate due to the effect of alcohol in the body. Large amounts of alcohol consumption have one of the highest ordinary causes of reversible HPT (O'Keefe, Bhatti, Bajwa & PharmD, 2014).

Fuchs Chambless, Whelton, Nieto and Heiss, (2016), revealed that epidemiologically it was proven that there was a relationship between excessive alcohol intake and incidence of hypertensive. In their study it was found that more workers who drink alcohol daily reported being hypertensive than individuals who drink occasionally or one glass of wine per week. In the same study it was reported that excessive drinking of alcohol raises the blood pressure. Furthermore, it was found that in most cases workers consume plenty of alcohol in order to release job-related stress, not knowing that it is harmful to their health.

In the epidemiological studies conducted by Virtanen, Jokela and Nyberg, (2015), it was revealed that consumption of excessive alcohol occurs mostly in high income populations. It was further revealed that most employees engage in alcohol consumption as a relief from job strains. In the same study it was further reported long working hours also lead to excessive alcohol consumption. It was found that employees who drink plenty of alcohol were not aware of the risks of excessive alcohol drinking. It was also reported that most of the employees who were engaged in alcohol drinking reported being pre-hypertension and some reported to be suffering from HPT.

Briasoulis, Agarwa, and Messerli, (2014), in their study conducted in New York, reported that alcohol consumption is a health risk factor for employees. It was revealed that most employees engaged in a lifestyle of drinking alcohol due to work stress and peer pressure. In the same study it was reported that most of the employees consumed more than 50g per day, which is the recommended amount. Furthermore, it was reported that most of the workers drink more than the recommended amount were hypertensive.

A study carried out in Nigeria by Diwe, Enwere, Uwakwe, Duru and Chineke, (2015) revealed that alcohol consumption is the other behavioural risk factor that causes HPT. It was found that about 50% of the workers who consumed alcohol were hypertensive. In the same study it was found that when a worker presents at work place drunk, they decrease productivity and increase absenteeism at work.

Lee, Kim and Hong, (2014), in their study carried out in Asia; found that most workers who drink alcohol reported doing so to relieve work stress. In the same study, it was found that in doing so many workers engaged in excessive drinking, which is a risk factor is for HPT. It was also found that about 55.9% of the workers were hypertensive. Furthermore, it was found that most of the workers believed that drinking makes them be relieved the stress from work. It was further reported that apart from the workers who were hypertensive, most were the ones who drank daily and every weekend.

A study that was conducted in South Africa Zatu, Van Rooyen, Kruger and Schutte, (2016) found that excessive alcohol consumption is a major problem in South Africa, especially among young adults. In their findings it was found that most employees engage in excessive alcohol drinking due to peer pressure and having fun ignoring the effects of harmful alcohol use to their health. In the same study it was found that some of employees who consume excessive alcohol reported being hypertensive. Furthermore it was found that 39.8 % of the workers were hypertensive. It was also found that hypertension was rated the second diseases in South Africa which increases its rate rapidly due to behavioural risk factors. Zatu et al., (2016), revealed that alcohol consumption has been shown to be behavioural risk factor for developing HPT.

2.5 KNOWLEDGE OF HYPERTENSION AMONG WORKERS

Knowledge of the risk factors of hypertension plays a major role in the development of HPT. According to Ojo, Hawley, Desai, Akiteng, Guwatudde and Schwartz, (2017), in their study conducted in Uganda, the majority of the workers who reported suffering from hypertension lacked knowledge about the diseases. It was revealed that some of the individuals got sick without knowing the cause. It was also reported that lack of knowledge about diseases increase the prevalence rate.

A study conducted in Colombia by Legido-Quigley, Camacho, Lopez, Balabanova, Perel, Lopez-Jaramillo, Nieuwlaat, Schwalm, McCready, Yusuf, and McKeen, (2015), revealed that few workers were knowledgeable about hypertension, which puts many people at risk of

being hypertensive. It was also reported that most workers were not aware of the factors that contribute to hypertension and that it may be symptomless. It was further revealed that there was no information at health facilities or work-places regarding awareness of hypertension and the factors that could contribute to it.

Salaudeen, Musa,Babatunde, Atoyebi, Durowade and Omokanye, (2014), in their study conducted in Nigeria, found that about 22% of the workers were knowledgeable and aware of hypertension. It was revealed that despite the information that the workers had, they were just still ignorant about the factors that could contribute to hypertension. It was further reported that socioeconomic factors influenced the knowledge and awareness of hypertension. Salaudeen, et al., (2014) reported that workers who were educated were more knowledgeable about HPT than those who were uneducated.

According to Iwelunmor, Plange-Rhule, Airhihenbuwa, Ezepue and Ogedegbe, (2015), in their study carried out in Sub-Saharan Africa, most workers were not knowledgeable and were unaware of the factors that contribute to hypertension. It was also reported that lack of knowledge among workers results in workers suffering from stroke. It was further revealed that health teams in workplaces did not provide information and awareness through brochures, as most workers knew about the condition when they had stroke.

According to Mpinda, Tumbo, Govender and Mills, (2014), in their study conducted in South Africa, most South African workers who reported being hypertensive seemed to have much/substantial knowledge about hypertension and its factors. It was found that participants were just being ignorant by not involving themselves in the healthy programs that can reduce the prevalence of hypertension. It was revealed that instead they were engaging in diets that consist of a large amount of sugar and salt, together with smoking and alcohol intake.

2.6 THE SOUTH AFRICA STRATEGIC PLAN FOR THE CONTROL AND PREVENTION OF NCDS.

According to the strategic plan for the control and prevention of NCDs (2013), the Minister of Health in South Africa has developed some strategies that will help to control and prevent NCDs in society. In the epidemiology that was conducted in South Africa they identified the main behavioural risk that increases the burden of NCDs. On tobacco smoking they strengthened the laws on smoking and manufacturers of tobacco complied to label the dangers of smoking among society. Regarding alcohol consumption, there is an increase in price to minimize drinking. The creation of physical activity awareness and health promotion

programmes is another initiative rolled out. Lastly they encourage the community to eat diets which are rich in fruits and vegetables. In low socioeconomic communities government educates them to plant vegetables on their own.

2.7 SUMMARY

In the reviewed literature it was reported that socioeconomic status showed that poor individuals reported to be one at risk of developing HPT. Regarding age it was revealed that as the individual grows older, they become more vulnerable to developing HPT. Gender differences revealed that women were more prone to develop HPT than men. On lifestyle factors it was reported that smoking tobacco or eating tobacco products has an influence on the development of HPT. Excessive alcohol consumption also has an influence on the development of HPT. Physical inactivity and eating unhealthy diets were reported to be the risk factors for developing HPT. The methods of the study will be discussed in chapter 3.

CHAPTER 3: RESEARCH METHODS

3.1 INTRODUCTION

Research methods refer to the systematic process of methods that were used in the study for data gathering (Rezaeian, 2016). This chapter outlines the following: study design and approach, study setting, population of the study, sampling methods, inclusion criteria, pre-testing of the instrument, procedure for data collection, data analysis and ethical considerations.

3.2 STUDY DESIGN AND APPROACH

A study design refers to a consistency of plan and procedures which broad aspect of data collection and analysis (Rezaeian, 2016). The study adopted a quantitative technique as it provides a high level of quantity as well as a high degree of reliability. Furthermore a quantitative technique is advantageous, as it minimizes the researcher's bias, compared to qualitative approach where-in there is interaction with the participants in the process of data collection. Furthermore the study used a cross-sectional descriptive design. Kumar (2019) describes a cross- sectional descriptive design as observations of a sample, or cross sections of a population or phenomenon that are made at one point in time. Therefore by describing the participants' responses in proportions, frequencies or percentages assisted in bringing out the factors that are associated with hypertension among workers in the Greater-Tzaneen municipality.

3.3 STUDY SETTING

The study was conducted in the Greater-Tzaneen municipality in the Mopani District of the Limpopo province, South Africa. It is a local municipality which is categorized as a B municipality. It is situated in the eastern quadrant of the Limpopo province within Mopani District. The municipality is bordered by the Greater-Letaba area to the north, Lepelle-Nkumpi to the south, Ba-Phalaborwa and Maruleng to the east and Polokwane to the west. It is located in the town of Tzaneen. It also comprises of 390095 residents and is surrounded by industrial and business development. It consists of residents with high levels of education and employment.

Figure 2 Greater-Tzaneen Municipality map (adopted on municipalities' website).

3.4 STUDY POPULATION

According to Kumar, (2019), a population is the total number of possible participants or elements that can be included in the study. The population of the study included all workers in the Greater-Tzaneen municipality. There were about 1442 workers within the Greater-Tzaneen municipality, as shown in Table 2.

Table 2 Population frame

Work categories	Total Number of workers
Office workers	147
Sectional managers	30
Engineers	787
Drivers	42
General workers	436
Total	**1442**

3.5 SAMPLING

Cresswell and Creswell, (2017), define sampling as an element of the population considered for inclusion in the study. Simple random sampling was used to select participants in this study. Walliman, (2016), defines simple random sampling as the type of probability techniques that is used to select participants in a large population; it gives all participants an equal chance to be included in the study. Therefore, the researcher used this technique to sample the participants. A 'yes' or 'no' was written on small pieces of papers. The papers were folded and placed in a box. An individual was requested to pick a paper out of the box and all participants who picked a 'yes' were included in the study. The process was repeated until all work categories were completed and the sample size reached.

3.5.1 INCLUSION CRITERIA

Kumar, (2019), defines inclusion criteria as the characteristics of the participants which makes them be included in the study. The study included all female and male permanent workers in the Greater-Tzaneen municipality aged between< 20 years and 55 and above years because it includes all age groups that are within the municipality.

Table 3Sampling frame

Work category	Total No. of sample in each block	Percentage
Office workers	313/1442 x 147= 32	(10.91%)
Sectional managers	313/1442 x30 = 7	(2.08%)
Engineers	313/1442 x 787 = 170	(54.58%)
Drivers	313/1442 x 42 = 9	(2.91%)
General workers	313/1442 x 436 = 95	(30.24%)
Total	313	100%

3.5.2 SAMPLE SIZE

Kumar, (2019) define the sample size as the group of sampled participants in a population. The Slovin's formula, as cited by Ansar (2017) was used to calculate the sample size required to represents all Municipal workers. A total of 313 municipal workers from all the municipal population were calculated. However the sample size was increased by 10% in order to accommodate for non responses, giving a total of 344. Only 316 participated in the study and the majority of them were general workers (cleaners). This was because engineers and drivers withdrew from participating. They said they are always busy and do not have time to participate in other activities except their work. This calculation helps the researcher because it was impossible to cater for all population due to time constraints.

The calculation was as follows:

Slovin's formula, where N is the total population, n is the sample size and e is the level of errors; in this study e is 0.05.

$$n = \frac{N}{1+N\,(e)^2}$$

$$n = \frac{1442}{1 + 1442\,(0.05)^2}$$

$$n = 1442 / (1 + 1442 \times (0.05)^2)$$

$$n = 313$$

The sample size was 313;

Ten percent of 313 is 31+313=344.

3.6 TOOLS FOR DATA COLLECTION

The researcher used two instruments for data gathering namely: a questionnaire and an electronic blood pressure machine (Baumanometer).

3.6.1 Questionnaire

A questionnaire is a research instrument which contains a series of questions in order to collect information from the participants (Walliman, 2016). In this study the researcher adopted a close ended questionnaire to collect data.

For the purpose of the study, the researcher used a self-administered questionnaire adopted from World Health Organisation' stepwise instrument for NCD risk factors surveillance version 3.2 (WHO, 2017), and literature from previous studies (Appendix 3). The questionnaire was written in English and was translated to "Sepedi" by a language practitioner, in order to accommodate workers who cannot read or understand English. It was also translated back to English by a language practitioner, in order to maintain consistency in the meaning of the content. The questionnaire was comprised of five sections: section A: demographic information, section B: socioeconomic factors, section C: biological factors, section D: lifestyle factors and section E: knowledge of hypertension.

3.6.2 OTHER TOOL FOR DATA COLLECTION

An electronic blood pressure machine (Baumanometer) was used to measure participants' blood pressure.

3.7 VALIDITY AND RELIABILITY

Validity and reliability was ensured in the study. Validity is defined as the ability of the instrument to measure what it intends to measure (Kumar, 2019).

3.7.1 VALIDITY

This study was ensured of validity by means of face and content validity.

3.7.1.1 Face validity

Face validity is the form in which the contents of the questionnaire seem to be on uppermost (Cresswell and Cresswell, 2017).

The researcher presented the questionnaire to the supervisors and the Higher Degree Committee for assessment in order to ensure face validity. The researcher modified the instrument according to the feedback.

3.7.1.2 Content validity

Content validity is an assessment of the screening to check the adequacy of relevant questions covering all aspects being studied, to avoid the use of repetition and irrelevant questions (Cresswell and Cresswell, 2017). In order to test for content validity, the questionnaire was constructed after an extensive literature review.

The questionnaire was assessed by the supervisors of this research. The supervisors went through it and made corrections before it could be used. They assessed whether the questions were in line with the objectives of the study.

3.7.1.3 Validity of the other instrument

A new calibrated electronic blood pressure machine was used. The researcher checked the batteries, to find out whether they were still operating well, in order to get an accurate measurement.

3.7.2 RELIABILITY

Reliability is defined as the accuracy and consistency of a measurement, a matter of whether a particular technique applied repeatedly to the same object yields the same result each time (Kumar, 2019).

3.7.2.1 Reliability of the questionnaire

The reliability of the questionnaire was supported by test re-test method. To ensure the consistency and accuracy of the outcomes, a questionnaire was given to 34 workers in the Greater-Tzaneen municipality who did not form part of the study two weeks before the actual data. The questionnaire was re-administered after two weeks to check the consistency. The correlation coefficient was r=0.7 which indicated the relationship. Testing reliability of the questionnaire helped the researcher in correcting the instrument to make sure that there is consistency.

3.7.2.2 Reliability of the other instruments

To ensure that the instrument electronic blood pressure is reliable, the researcher was taking the measurement twice in 5 minutes apart.

3.8 PRE-TEST

The instrument was pre-tested among workers at Maruleng municipality as they share the same characteristics as the Greater-Tzaneen municipality workers. Ten percent of the sampled size (34 workers) was measured. The aim of the pre-test was to adjust the instruments and make corrections where deemed necessary, according to the comments from the participants. These participants were excluded from the main study. The questionnaires were administered in English or Sepedi depending on the language choice of the participants. The necessary corrections of the questionnaire were done on the questions relating to the factors associated with hypertension among workers.

3.9 PROCEDURE FOR DATA COLLECTION

After getting ethical clearance from the University of Venda, permission to conduct the study was requested in writing from the Municipal Manager at the Greater-Tzaneen municipality. After getting permission from the Municipal Manager, the researcher then requested for a room or hall for data collection and a hall was provided by the Municipal Manager. Thereafter, the researcher made appointments with the participants for data collection. All participants who volunteered to participate in the study were gathered in the hall during lunch time and the researcher distributed the questionnaires.

The nature and purpose of the study was explained to the participants, including the ethical considerations, as indicated in the information sheet (Appendix 6). The participants were required to sign the informed consent form (appendix 7) before taking part in the study, to indicate that they understand the nature and process of the study. The researcher was present during data collection in order to clarity where the participants do not understand and also to help those that were unable to read and write. For those who cannot read and write, the researcher read out the questions and wrote the exact answers as they are given by the participants.

The researcher also made further appointments with the participants to measure their blood pressure. Participants were advised to avoid caffeine or alcoholic beverages and smoking 30 minutes before the test. Furthermore, participants were allowed to rest for a period of five minutes before the measurements.

The researcher instructed the participants to sit upright and were supported by the researcher. The arm was lifted to the heart level and the cuff monitor was wrapped around the left upper arm. The SBP (systolic blood pressure) and DBP (diastolic blood pressure) readings were then recorded. Participants who had a blood pressure of 140/90 or more were referred to the clinic. During the measurements the researcher measured participants separately to ensure privacy of the participants.

3.10 DATA ANALYSIS

All data from the questionnaire was coded using Microsoft Excel 23. The researcher used codes instead of participants' real names and checked the data by frequency, in order to

detect omitted or improper values. Data from the questionnaire was converted to statistical data thus, into frequency, percentage and mean. The Statistical Package for Social Science (SPSS) version 25.0 software was used to analyse the data. The level of significant association was set at $p<0.05$. Various descriptive statistics were calculated. Chi square which is a measure of non- parametric investigation was used to analyse the association between the independent and dependent variables. Results emanated from the analysis were presented in the form of tables and charts.

3.11 ETHICAL CONSIDERATIONS

Ethical measures were ensured throughout the study, in order to protect the rights of the participants. The researcher sought permission to conduct the study, and ensured voluntary participation, confidentiality, privacy and protection of participants from any harm.

3.11.1 Ethical clearance

The research proposal was presented to the School of Health Sciences Higher Degree Committee by the researcher for quality assessment and later to the University of Venda Higher Degrees committee for quality assurance and approval. An application was made to the Research Ethics Committee of the University of Venda for ethical clearance (Appendix 1) to conduct the study and it was granted.

3.11.2 Permission to conduct the study

After getting ethical clearance from the Research Ethics Committee, permission to conduct the study was requested in writing from the Municipal Manager. A written permission (Appendix 2) to conduct the study was obtained from The Greater Tzaneen Municipality.

3.11.3 Informed consent

An informed consent form was drafted and given to those willing to participate were given the consent form to complete (Appendix 7). Consent form were given to participants as a means of accepting responsibility of to play a part in the study. The researcher ensured that the participants were conscious of the kind of information required, why the information is required, what purpose it will put to, how they are anticipated to contribute in the study and how it will openly and affect them.

3.11.4 Information sheet

Participants were provided with information regarding the purpose and objectives of the study, the voluntary nature of participation and the time it took to do the measurement and fill the questionnaire. The information sheet was translated into “Sepedi” by a language practitioner in order to accommodate participants who cannot read or understand English (Appendix 6).

3.11.5 Voluntary participation

Before engaging the participants in the research, the researcher ensured that they know that participation would be done at their own free will and they have the right to withdraw from taking part at any time they feel uncomfortable or threatened by the research process. Participants were not forced in any way to participate in this study.

3.11.6 Confidentiality and Privacy

To ensure confidentiality, participants were assured that the consent form was put separately from the data sheet and questionnaire, to ensure that their names are not traced back to their data sheet and questionnaire. They were informed that the information given was only accessed by the researcher and the supervisors and the data sheet and questionnaire will be locked up in the cupboard, where no other person was access them.

To ensure privacy, data was collected in an empty hall in the absence of other participants. The participants were given consent forms, measured and given a questionnaire and two envelopes. They were instructed to put their documentation in the envelopes after completion, seal them and hand it back to the researcher. They were advised not to write their names on the questionnaire. In case of illiterate participants the researcher explained that their names were not included on the questionnaire. Also they were advised to complete the informed consent form and put it in a separated envelope.

3.11.7 Protection of participants from any harm

Kumar, (2019) states that when using humans as research subjects, harm and risks should be minimised whilst the benefits are maximized. Furthermore, any ethnic, religious, political, social, gender or other differences in a research population should be sensitively and properly handled by the researchers at all stages of the research. The researcher ensured

that no physical, psychological or emotional harm will occur to the participants. The researcher constructed the questionnaire in an appropriate manner that is not judgmental, to avoid inflicting anxiety and psychological trauma during the process of measurement and completing the questionnaire. Furthermore, if by accident some participants are harmed, the researcher would refer the participant for counselling.

3.12 SUMMARY

In Chapter 3, the research methods were discussed. The chapter outlined techniques which were used in order to address the objectives. It covered the research approach and design, sampling procedures, data collection procedures, instrumentation, ethical considerations and data analysis. Results are presented in the following chapter 4.

CHAPTER 4: RESULTS

4.1 INTRODUCTION

This chapter presents the findings from the study under the following headings: demographic information of participants, socioeconomic factors, biological factors, lifestyle factors and knowledge of hypertension among workers. Association between variables was tested using the Chi-square test, of which the significance level was set at p≤0.005, mean and standard deviation of the ages of participants were also calculated.

4.2 DEMOGRAPHIC INFORMATION

Table 4 indicates the age distributions of the participants. The results show that 138(43.7%) of the participants were between the ages of 32-43 years whilst 16 (5.1%) were <20 years with SD=0.97, mean=2.99.

Table 4 Age distribution (n=316)

Age									
< 20 years		21-31 years		32-43 years		44- 55 years		55> years	
n	%	n	%	n	%	n	%	n	%
16	5.1	78	24.7	138	43.7	60	19.0	24	7.6

Figure 3 represents the number and percentages of females and males who participated in the study. The analysed data reveals that the majority of participants 226 (71.5%) were females, whilst there were only 90 (28.5%) males.

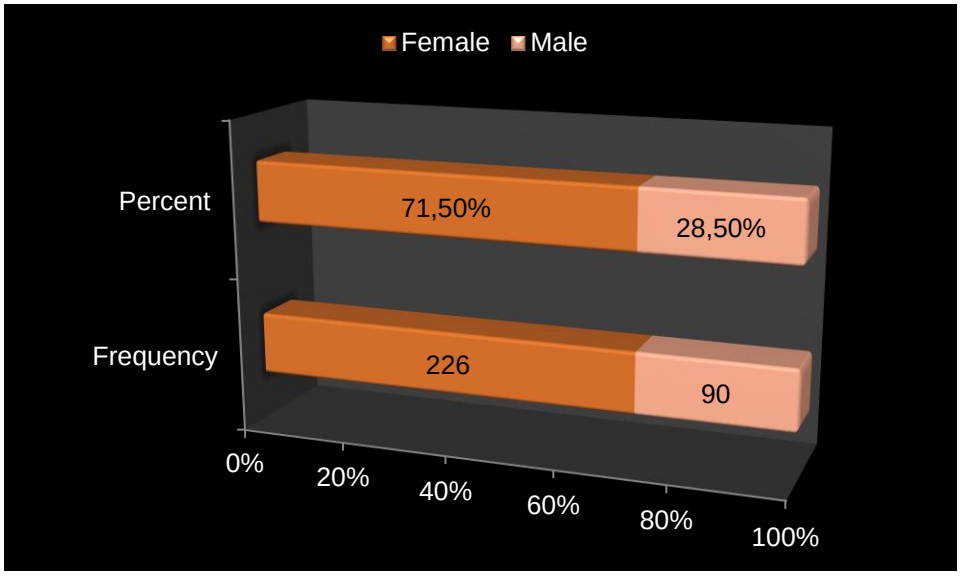

Figure 3 Gender distribution (n= 316)

Figure 4 illustrates the responses of participants on their marital status. Marital status of the participants reveals that the majority of the participants were single 206(65.2%). There were 16 (5.1%) revealed to be separated.

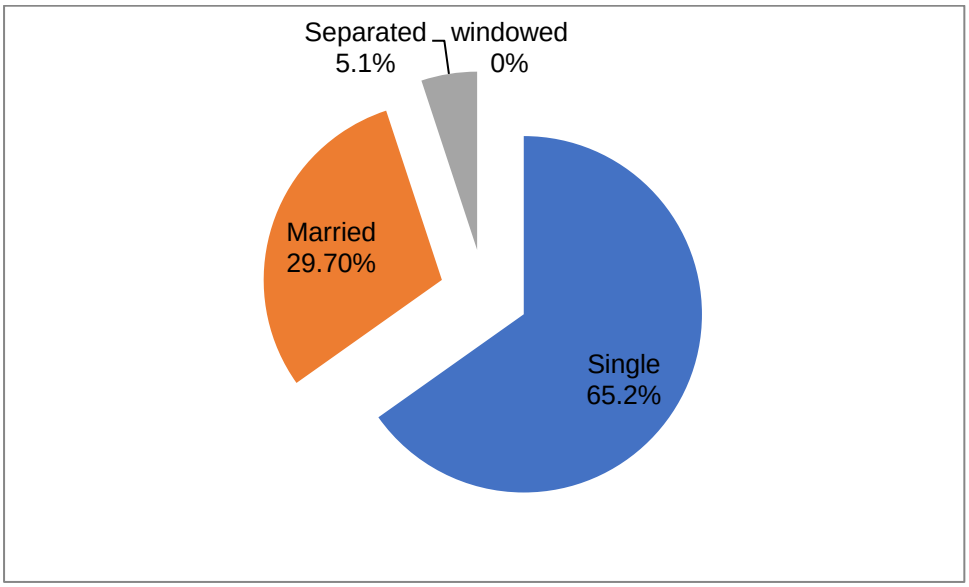

Figure 4 Marital status (n=316)

4.3 SOCIO ECONOMIC FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

Socio economic factors refer to level of education, occupation and income.

4.3.1 PARTICIPANTS' LEVEL OF EDUCATION

Table 5 shows the responses of participants on their level of education.108 (34.2%) participants indicated that they had grade 12, whilst 8(2.5%) did not attend school.

Table 5 Level of education (n=316)

Variable	Frequency	Percentage
Not attended school	8	2.5%
Grade 8-10	56	17.7%
Grade 11	48	15.2%
Grade 12	108	34.2%
Degree/Diploma	96	30.4%
Other	0	0%

Figure 5 illustrates the responses of participants regarding their work categories. The results show that the majority 165(52.2%) of participants were cleaners and a few 11 (3.5%) participants were others as shown.

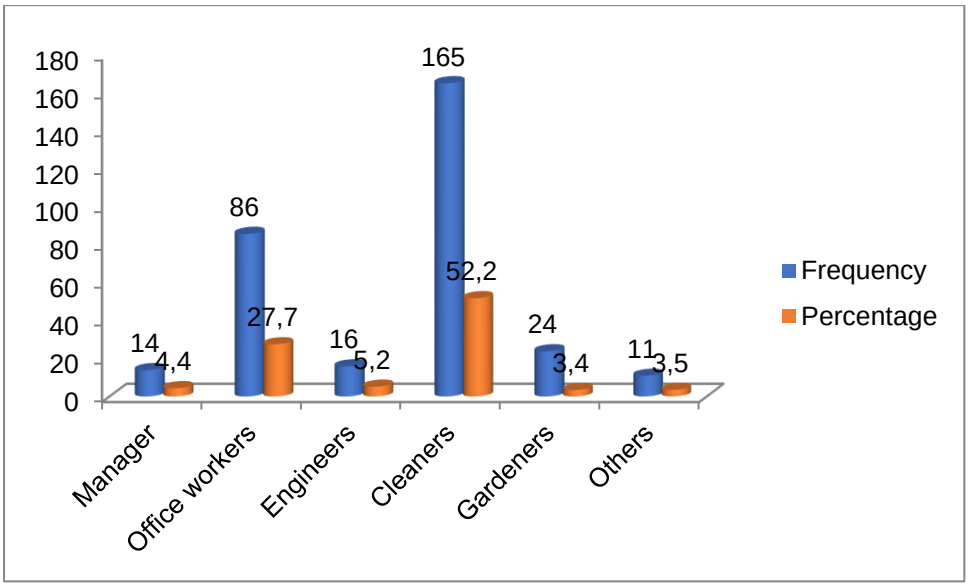

Figure 5 Work category (n=316)

Figure 6 indicates the responses of participants on the amount of money they earn. The majority 240 (75.9%) of the participants earn <10 000 and a few 9(2.8%) of the participants earn 21-30 000.

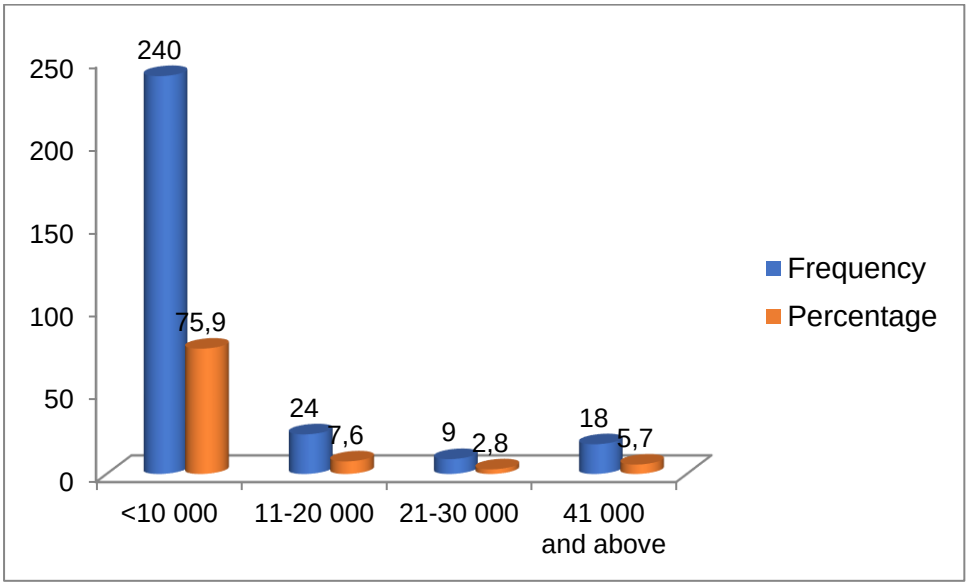

Figure 6 Income in rand (n=316)

4.4 BIOLOGICAL FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

Table 6 indicates the frequency and percentage of participants' responses regarding the question that they were asked about biological factors associated with hypertension.

The majority 255 (80.7%) participants reported not having been diagnosed with blood pressure, 270 (85.4%) reported that their doctor did not tell them that they had hypertension. Two hundred and sixty two (82.9%) reported not to have been taking drugs or medication prescribed by a doctor or health worker for blood pressure in the past two weeks. During the past 12 months, 278(88.0%) participants reported not to have been diagnosed with blood pressure. There were 142(44.9%) participants who reported not having a family history of hypertension, whereas only not sure 58(18.4%) were not sure.

Table 6 Frequency of biological factors associated with hypertension among workers (n=316)

Ever been diagnosed with blood pressure					
Yes		**No**		**Not sure**	
n	%	n	%	n	%
38	12.0%	255	80.7	23	7.3
A doctor or health worker tell you that you have hypertension					
Yes		**No**		**Not sure**	
n	%	n	%	n	%
24	7.6	270	85.4	22	7.0
Been diagnosed with hypertension in the past 12 months					
Yes		**No**		**Not sure**	
n	%	n	%	n	%
24	7.6	278	88.0	14	4.4
Taken drugs or medication in past two weeks					
Yes		**No**		**Not sure**	
n	%	n	%	n	%
26	8.2	262	82.9	28	8.9
Family history					
Yes		**No**		**Not sure**	
n	%	n	%	n	%
116	36.7	142	44.9	58	18.4

4.5 LIFESTYLE FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

Lifestyle factors are also called behavioural factors which include: physical activity, diet, alcohol consumption and tobacco smoking.

4.5.1 PARTICIPANTS'ENGAGEMENT OF PHYSICAL ACTIVITY

Table 9 indicates the participants' frequency of engagement in physical activity at work and after work.

On engagement of physical activity at work and after work, the majority 152(48.1%) of participants reported that their work does not involve virgorous intensity activity, however, 121(38.3%) responded that their work involved moderate intensity activity. There were 147(46.50%) participants who engaged in moderate activity after work.

Table 7 Participants 'engagement on physical activity (n=316)

N=316	Yes	No	Not sure
Engaging in vigorous intensity activities at work	n(%) 117(37.0)	n(%) 152(48.1)	n(%) 47(14.9)
Engaging in moderate intensity activity at work	121(38.3)	121(38.3)	74(23.4)
Engaging in moderate intensity activities after work	147(46.50)	103(32.6)	66(20.9)

In Figure 7, participants were requested to mention the number of days they participate in physical activity. There were 131(41.5%) participants who spend three days doing physical activity and there were no participants who reported to spend six days doing physical activity.

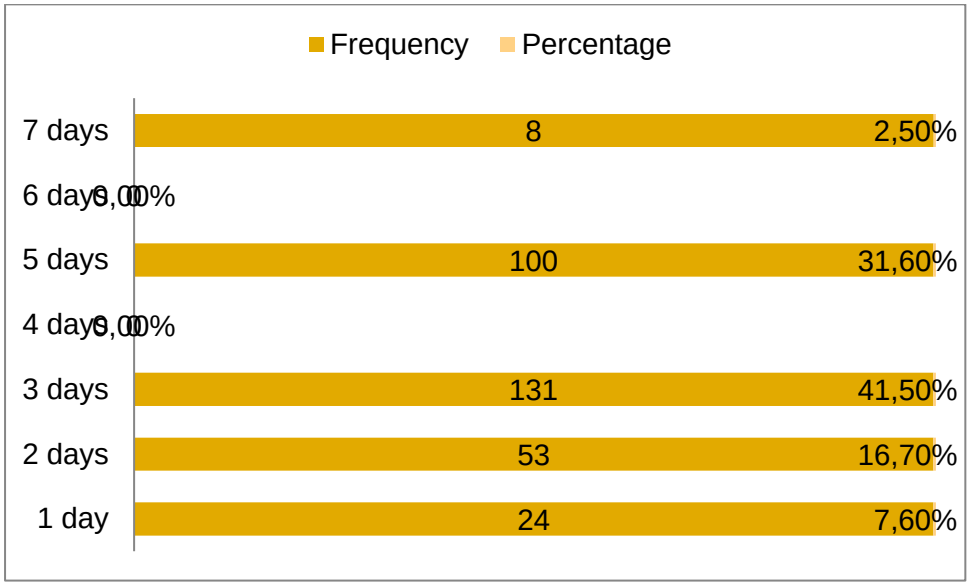

Figure 7 Number of days spent doing physical activity (n=316).

Figure 8 demonstrated the responses of participants on the time they spend doing physical activity. In this study there were 125(39.60%) participants who reported they do not check the time they spend doing physical activity, whilst only 8(2.5%) spend 45 minutes doing physical activity.

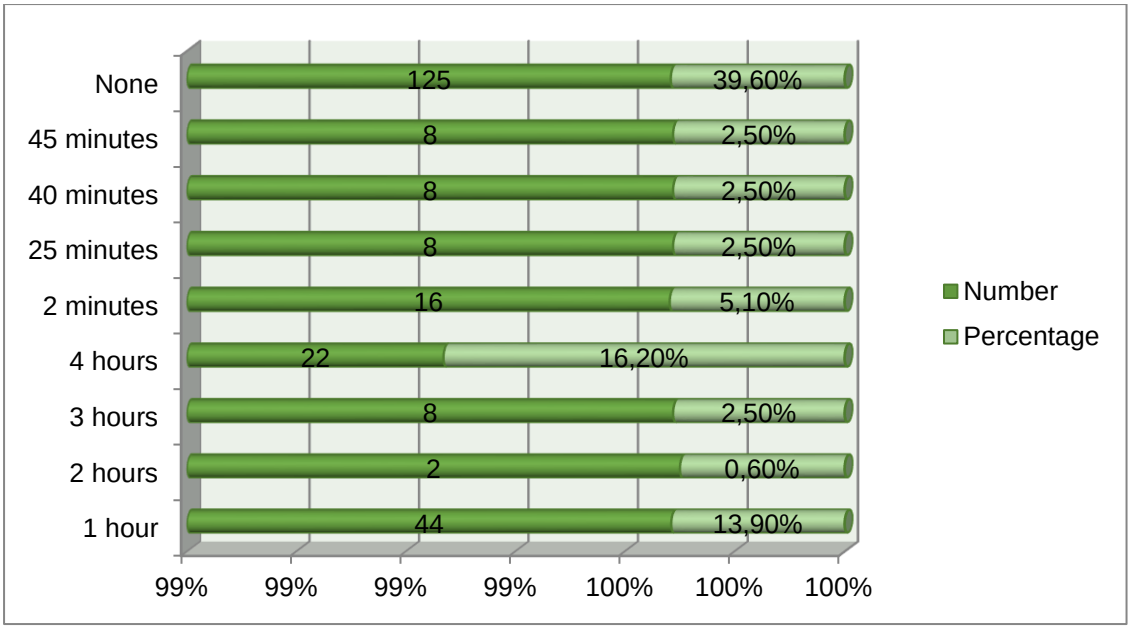

Figure 8 Time spend doing physical activity (n=316).

Figure 9 shows the responses given by the participants on the time they spend sitting or reclining. The results show that 117 (37.0%) participants spend their time sitting or reclining 1 hour, whilst 8(2.50%) spend their time sitting or reclining for 8 hours.

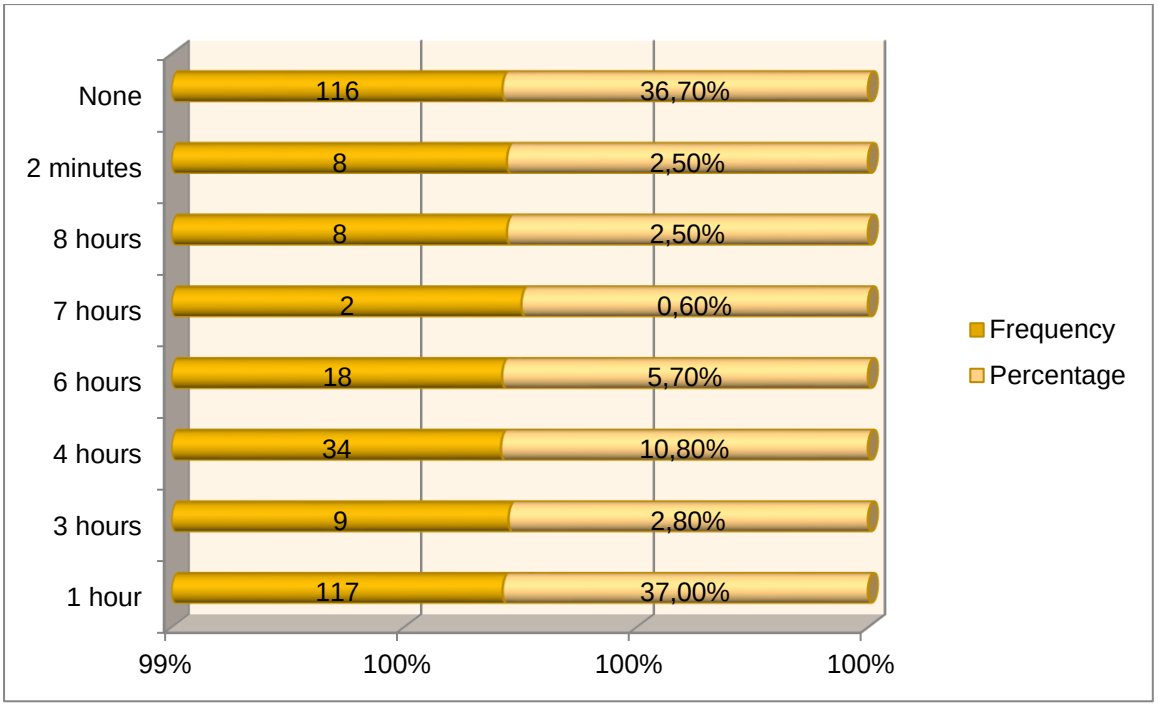

Figure 9 Time spent sitting or reclining on a typical day (n=316).

4.5.2 THE PARTICIPANTS'DIET THAT THEY EAT

Participants were asked that how many fruits they eat. Figure 10 illustrates the responses of the participants regarding fruit intake.

There were 65(20.6%) participants who do not eat fruit, and 5(1.6%) participants reported that they eat fruit two to three days per week. It shows the significant difference between income and eating fruits.

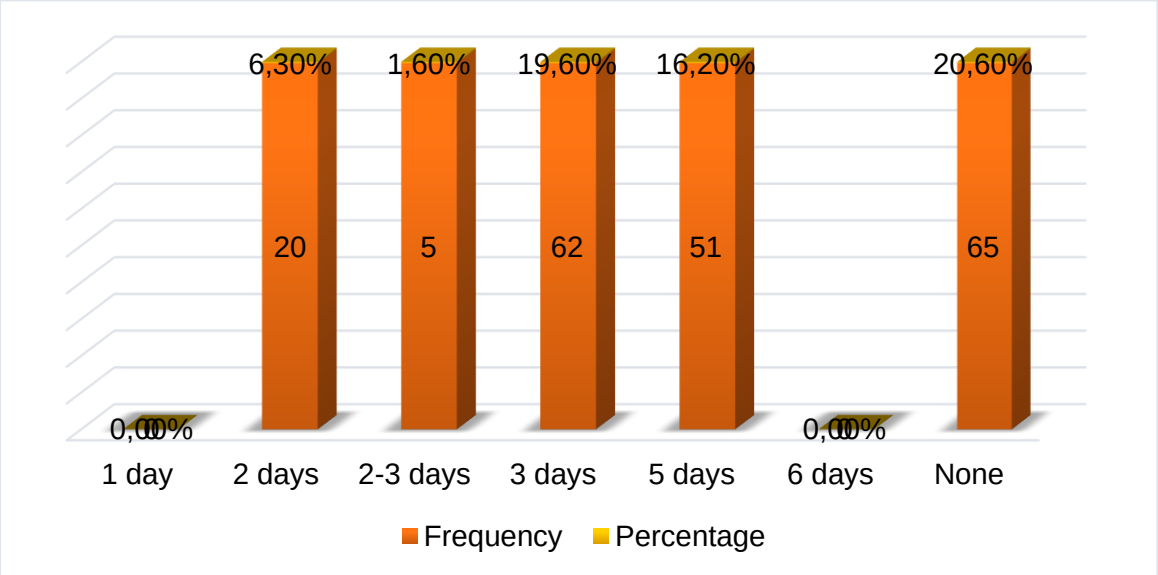

Figure 10 Number of days fruits is eaten (n=316)

Figure 11, participants were asked about the amount of fruit servings they eat, 90(28.60%) participants reported that they eat three servings of fruits per week and 8(2.50%) reported zero fruit servings.

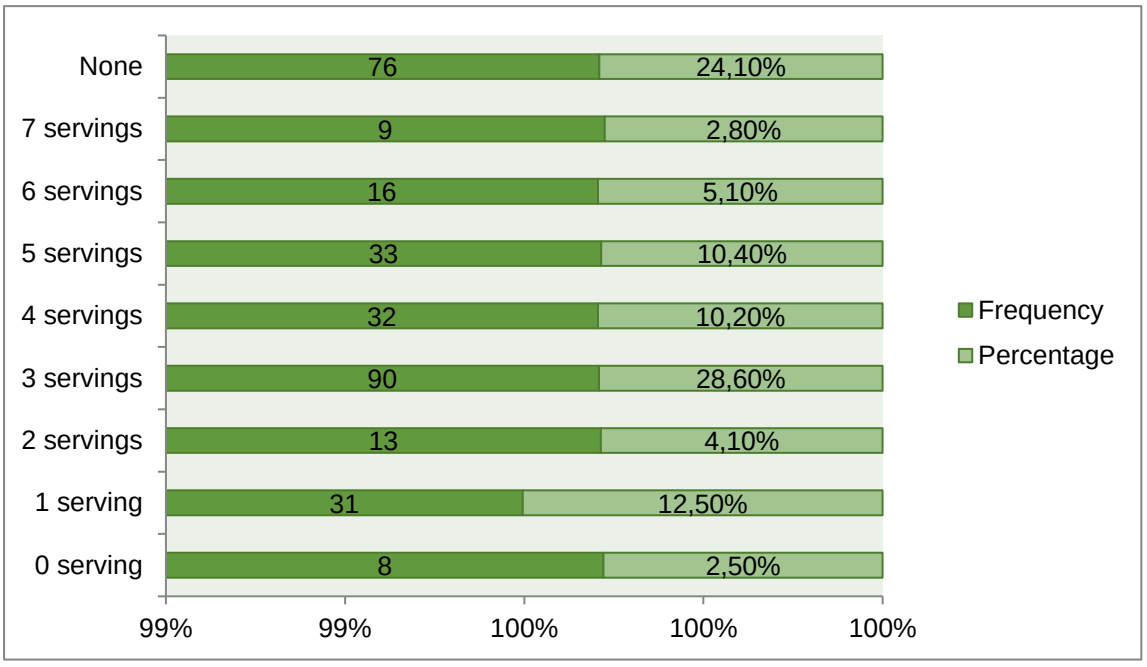

Figure 11 Number of fruit servings (n=316)

Figure 12 demonstrates the number of days participants eat vegetables, the results reveal that 69(21.8%) participants who eat vegetables 7 days of the week and 4(1.3%) participants reported that they eat vegetables only one day of the week.

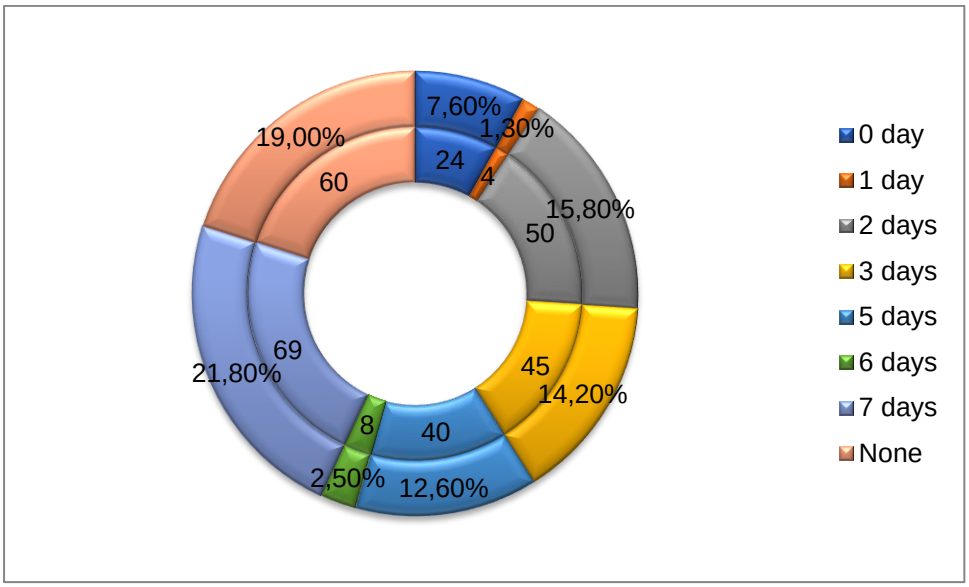

Figure 12 Number of days eating vegetable (n=316)

Figure 13 it demonstrates the responses of participants regarding vegetables servings.

Ninety-eight(31.0%) participants eat three serving of vegetables and few 8(2.5%) participants eat 6 servings of vegetables.

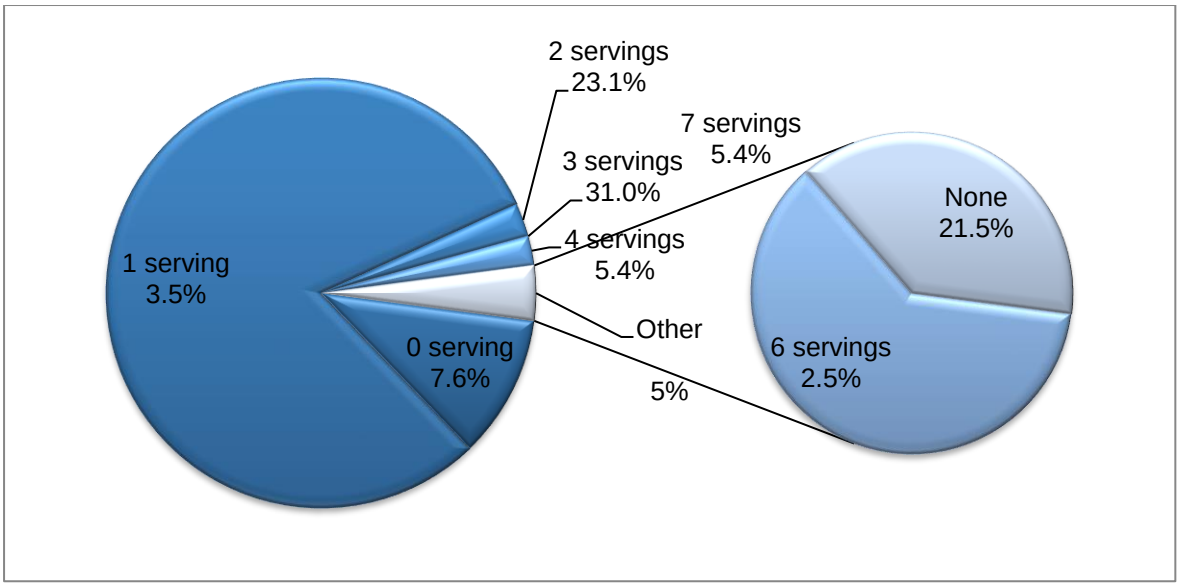

Figure 13 Number of vegetable servings (n=316)

Table 8 indicates the responses on the level of agreement regarding controlling salt intake. One-hundred and thirty-five (42.7%) participants agreed that it is important to limit salt intake on a regular basis and 111(35.1%) participants agreed that it is important to look at salt or sodium content on food labels. On whether to buy low salt/ sodium ailments, 145(45.9%) participants agreed that it is important to buy low salt/sodium ailments while 8(2.5%) of participants strongly disagreed that it is important to by low salt/sodium ailments. One-hundred and thirteen (35.8%) participants also agreed that is important to use spice other than salt when cooking, 113(35.8%) agreed that is important to avoid food prepared outside the home whilst 113 (35.8%) participants also agreed that is important to do other things specifically to control salt intake.

Table 8 Participants' agreement level of importance of controlling salt intake.

Items	n (%) N=316				
	Strongly Agree	Agree	No opinion	Disagree	Strongly disagree
Limiting consumption of processed food.	109(34.5)	135(42.7)	35(11.1)	29(9.2)	8(2.5)
Look at the salt or sodium content on food labels.	104(32.9)	111(35.1)	69(21.8)	32(10.1)	0(0)
Buy low salt/ sodium ailments.	84(26.6)	145(45.9)	63(19.9)	16(5.1)	8(2.5)
Use spices other than salt when cooking.	52(16.5)	113(35.8)	105(33.2)	46(14.6)	0(0)
Avoid food prepared outside home.	30(9.5)	113(35.8)	74(23.4)	75(23.7)	24(7.6)
Do other things specifically to control your salt.	69(21.8)	113(35.8)	94(29.7)	32(10.1)	8(2.5)

Figure 14, it indicates the responses of participants to the question of the kind of cooking oil they use in meal preparation. The majority 254(80.4%) of participants reported using cooking oil when preparing meals, whilst a few 5(1.6%) participants reported that they do not know the oil or fat that are using in meal preparation.

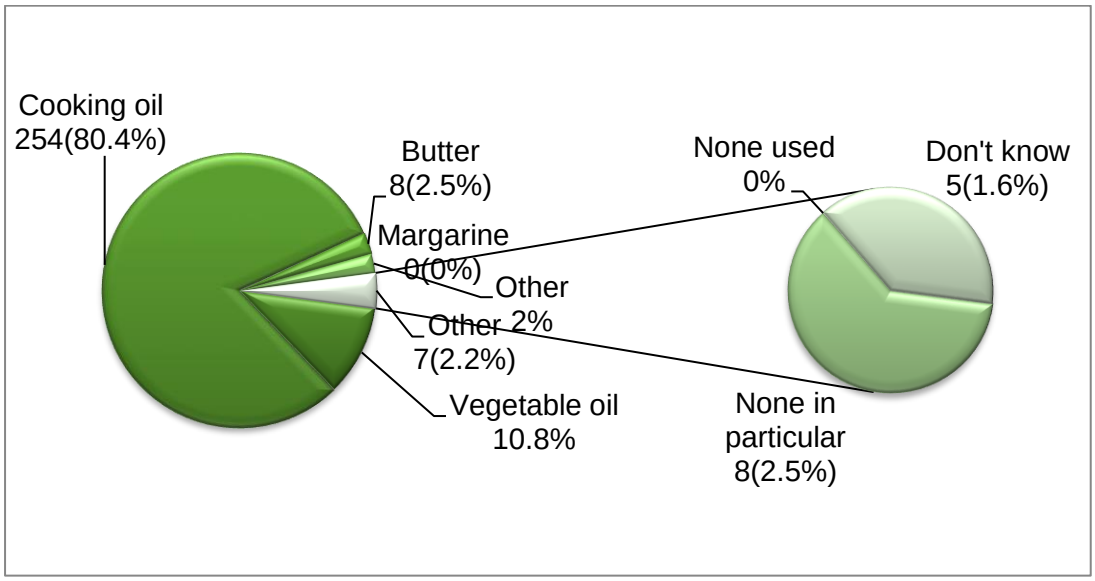

Figure 14 Types of oil or fat used for meal preparation in household (n=316)

4.5.3 PARTICIPANTS' ALCOHOL CONSUMPTION

When asked if they consume any alcohol drinks, more than half 180(57.0%) of the participants reported that they drink alcohol, and only 1(0.3%) reported to be unsure. One-hundred and forty-seven (46.50%) reported that they had consumed any alcohol in the last 12 months.

Two- hundred and forty-nine (78.8%) participants revealed that they did not stop drinking due to health problems.

Table 9 Consumption of alcohol

Items	N=316	n (%)	
	Yes	**No**	**Not sure**
Alcohol drinking	180(57.0)	135(42.7)	1(0.3)
Drinks any alcohol within the last 12 months	147(46.50)	139(44.0)	30(9.5)
Stopped drinking due to health reasons such as a negative impact on your health or on advice of your doctor or another health worker.	41(13.0)	249(78.8)	26(8.2)

Figure 15 demonstrates the responses of participants regarding the number of standard alcohol units they consume. One-hundred and thirty-five(42.7%) participants reported they did not consume standard alcohol units whilst only 8(2.5%) reported to have one standard alcohol units in one to two days per week

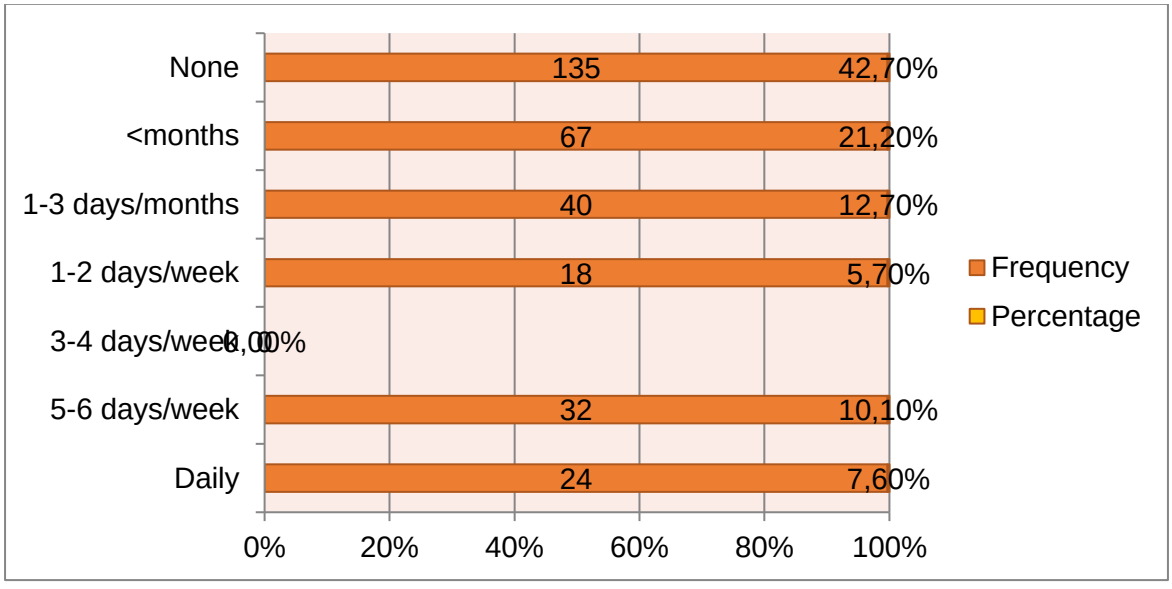

Figure 15 Number of days drinks standard alcohol (n=316)

Figure 16, it illustrates the responses of the number of alcohol drinks that participants consumed in the past 30 days. The majority 210(66.5%) of participants reported to drink 2 alcohol drinks whilst 2(0.60%) participants reported to drink 1 alcohol drink and 8(2.5%) reported to drink 21 alcohol drinks.

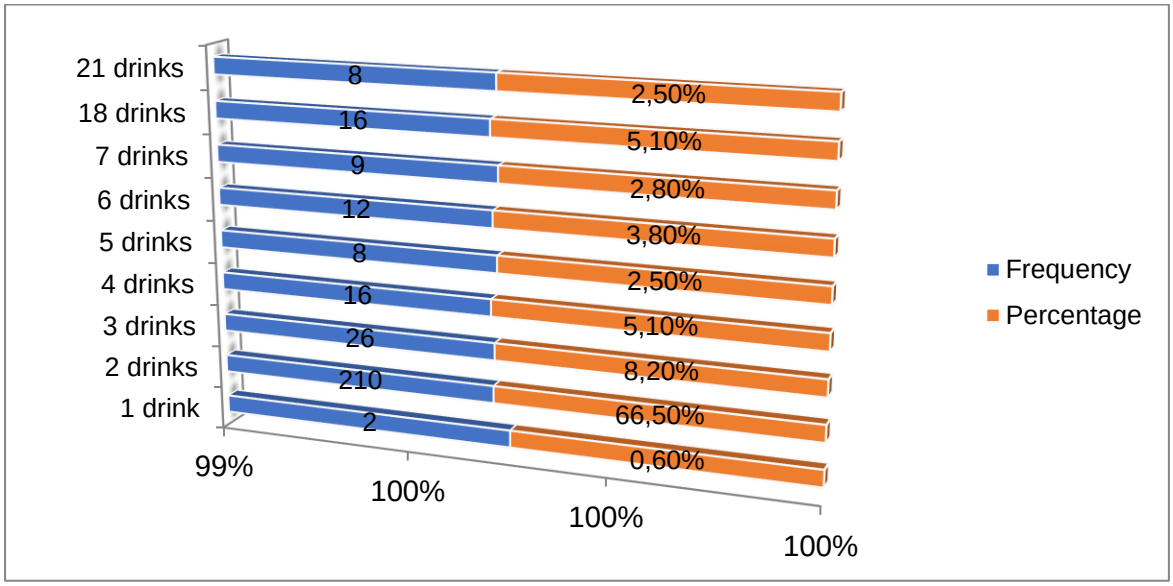

Figure 16 The number of alcohol drinks (n=316).

Table 10 indicates the responses of the participants on whether they needed a first drinks in the morning after a heavy drinking session the night before. Two-hundred and fifty-five (79.1%) participants responded that they had never tried to stop drinking in the past 12 months and 16(5.1%) of participants responded that they were able to stop drinking daily/ almost daily.

Furthermore, table 10 indicates that 292(92.4%) participants reported that they did not need a first drink of alcohol in the morning after a heavy alcohol drinking session, while 8 (2.5%) participants reported to need a first drink in the morning after a heavy session weekly.

Table 10 Tried to stop drinking alcohol

	n (%) N=316				
	Daily/almost daily	Weekly	Monthly	<month	Never
Stopped drinking once you had started	16(5.1)	20(6.3)	24(7.9)	0(0.0)	255(80.7)
Needed a first drink in the morning after a heavy drinking session	8(2.5)	16(5.1)	0(0.0)	0(0.0)	292(92.4)

4.5.4 THE USE OF TOBACCO SMOKING AMONG THE PARTICIPANTS

On the quest of smoking, 45(14.2%) participants reported that they were smoking while 271(85.8) did not smoke and the same number reported that they smoke daily.

Figure 17 demonstrate the response of ages of participants when they started smoking cigarette. The majority 164(53.5%) of participants reported that they did not smoke, while 8(2.5%) reported that they started smoking at the age of 18 years.

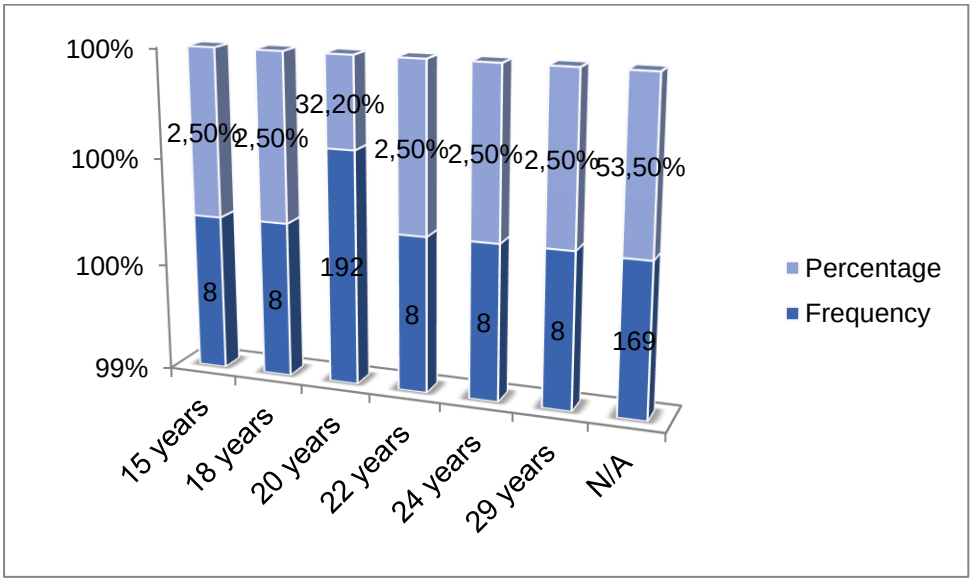

Figure 17 Ages of participants started smoking (n=316).

Participants were asked to indicate whether they smoke or not the response were 45 (14.2%) participants reported that they smoked manufactured cigarette daily while those who smoked were 16(5.1%) and 8(2.5%) smoked tobacco pipe.

Table 11 demonstrates the responses of participants on the question that was asked whether they tried to stop smoking in the past 12 months and whether they were former smokers. Two-hundred and twenty-six (71.5%) reported that they had not tried to stop smoking, on the other hand 61(19.3%) of participants were not sure whether they tried to stop smoking.

As illustrated in table 11, the results show that 220(69.6%) participants responded that they were not advised to quit smoking on the other hand 80(25.3%) of participants reported that they did not visit a doctor or health worker and 16(5.1%) of participants reported that in their visit to a doctor or health worker were advised to quit smoking.

Two hundred and twenty- seven (71.8%) reported to have not smoked any tobacco products in the past. Furthermore, 251(79.4%) participants responded not to have smoked daily in the past, and 29(9.2%) participants tried to stop smoking in the past 12 months.

Table 11 Tried to stop smoking and former smokers

	n (%) N=316		
Item	**Yes**	**No**	**Not sure**
Tried to stop smoking in the past 12 months	29(9.2)	226(71.5)	61(19.3)
	Yes	No	Not visited
A doctor advised to quit smoking in the past 12 months	16(5.1)	220(69.6)	80(25.3)
	Yes	No	Not sure
Former smokers.	48(15.2)	227(71.8)	41(31.0)

Table 12 indicates the responses of the ages of the participants on the ages they started smoking. The majority 290(91.8%) of participants reported they were not smoking and never smoked, on the other hand 8(2.5%) stopped smoking at the age of 12 years, and 2 (0.6%) stopped smoking at the age of 20 years.

Table 12 Participants' age stopped smoking (n=316)

Ages	Frequency	Percentage
12 years	8	2.5%
20 years	2	0.6%
22 years	8	2.5%
24 years	8	2.5%
N/A	290	91.8%

N/A-Not Applicable

Participants were asked whether they use smokeless tobacco. Out of 316 participants, 24 (7.6%) of them responded to use any smokeless tobacco products such as snuff, or chewing tobacco

Table13, demonstrates responses on smokeless tobacco use within a week or month. Sixteen (5.0%) of the participants reported to having used smokeless tobacco products such as snuff, chewing tobacco weekly, while 300(94.9%) reported to not using smokeless products. Furthermore, 8(2.5%) reported to use snuff by mouth daily and 8(2.5%) reported to chewing tobacco weekly

Table 13 Monthly and weekly ago (n=316)

Months, Weekly ago	Frequency	Percentage
Weekly	16	5%
Monthly	0	0.0%
N/A	300	2.5%

N/A-Not Applicable

In this study the results reveal that 261(82.6%) participants did not use smokeless products daily and 23(7.3%) were not sure whether they used smokeless products daily. The present study found that 8(2.5%) smoked snuff every day in the past, while the other 8(2.5%) reported that they are chewing tobacco every day.

Two-hundred and sixty-eight (84.8%) participants reported not smoking The majority 203(64.3%) participants reported that there was no one smoked in their homes during the past 30 days, and 12(3.8%) responded were not sure if someone who smoked in their home during the past 30 days table14.

As indicated in the Table 14, 181(57.3%) participants indicated that there was no one who smoked in closed areas at workplaces (inside the building), on the other hand 99(31.3%) indicated that there were people who smoked in their working places during the past 30 days and 36(11.4%) participants reported to be not sure whether someone smoked in their workplace in the past 30 days

Table 14 Use smokeless tobacco products daily and smoking in a closed area

	n (%) N=316		
	Yes	No	Not sure
Currently use smokeless	32(10.1)	261(82.6)	23(7.3)
Ex-smokeless tobacco such as snuff, chewing tobacco daily	32(10.1)	268(84.8)	16(5.1)
During the past 30 days, someone smoked in your home.	101(32.0)	203(64.2)	12(3.8)
			Don't know if it was in a closed area
Someone smoked in closed areas in your work areas or inside the building or specific offices during the past 30 day's areas or specific offices.	99(31.3)	181(57.3)	36(11.4)

4.6. KNOWLEDGE OF HYPERTENSION AMONG WORKERS IN THE GREATER-TZANEEN MUNICIPALITY

Table 15, indicates the responses of participants regarding the knowledge of hypertension. In this present study that majority of the participants 241(76.3%) did not heard any information about hypertension in their workplace and 31(9.8) have heard information about hypertension. One hundred and seventy one (54.1%) of participants responded to not know that if an individual has a systolic blood pressure of 140mmHg or higher and a diastolic blood pressure of 90 mmHg have hypertension and 42(13.3%) reported that individual whose systolic blood pressure is 140 mmHg or higher and a diastolic 90 mmHg or higher have hypertension table 15.

One hundred and eighty (59.8%) reported that it is important for a hypertensive patient to take his/her medication and 20 (6.3%) reported to be not sure whether it is not important for a hypertensive patient to take his/her medication. Furthermore in this present study it was found that 110(34.8%) of participants responded to be not sure whether they know the risk factor of hypertension while 98(31.0%) of participants responded that they don't know the risk factor of hypertension and 108(34.2%) of participants reported to know the risk factors of HBP, Those who reported to know the risks factor of hypertension where asked to stipulate and the responses was faint and shortness of breath which are the symptoms table 15.

One-hundred and forty-six (46.2%) reported that to be unsure that when an individual drinks alcohol/ coffee increases his/her risk of developing hypertension, 134(42.4%) reported that the individual who drinks alcohol/coffee increases his/her chances of developing hypertension and 36(11.4%) reported that individual who drinks alcohol/ coffee increases his/her risk of developing hypertension as illustrated in table15.

Table 15 Knowledge of hypertension among workers

	n (%) n=316		
Item	Yes	No	Don't remember
Ever heard any information on hypertension at your workplace	32(9.8)	241(76.3)	44(13.9)
	Yes	No	Don't know
A systolic blood pressure of 140mmHg or higher and a diastolic blood pressure of 90 mmHg indicated that the person is hypertensive	42(13.3)	103(32.6)	171(54.1)
	Yes	No	Not sure
Importance of hypertensive patient to take her/his medication	189(59.8)	20(6.3)	107(33.9)
Knowledge of any risk factor for hypertension	108(34.2)	98(31.0)	110(34.8)
Drinking alcohol/coffee increase the risk of developing hypertension	134(42.4)	36(11.4)	146(46.2)

Table 16 illustrates the responses of participants on the level of agreement on knowledge regarding hypertension. One-hundred and twenty-three (38.9%) agreed and 41(13.0%) strongly agreed that a person who smokes increases his/her risk of developing hypertension, on the other hand 4(1.3%) disagreed and 16(5.1%) strongly disagree that a person who smokes increase his/her risk of developing hypertension.

Out of 316 participants, 130(41.1%) participants reported to have no opinion on uncontrolled hypertension leads to stroke, heart disease and kidney failure while 117(37.0) and 69(21.8%) participants strongly agreed and agreed that uncontrolled hypertension lead to stroke, heart disease and kidney failure.

One-hundred and thirty-five (42.7%) and 108(34.2%) participants strongly agreed and agreed that it is important to monitor blood pressure at homes or clinics, on the other hand 8(2.5%) participants disagreed that is important to monitor blood pressure at homes or clinics.

In this study it was revealed that 179(56.6%) and 116(36.7%) of participants strongly agreed and agreed that is important to reduce salt, sugar and fat intake, while 21(6.6%) participants reported to have no opinion whether to reduce salt, sugar and fat intake.

There were 140(44.3%) and 115(36.4%) participants who strongly agreed and agreed that engaging in physical activity lowers blood pressure, and only 8(2.5%) participants disagreed that engaging in physical activity lowers blood pressure.

Table 16 Level of agreement regarding knowledge of hypertension among workers

Item	n (%) N=316				
	Strongly Agree	Agree	No opinion	Disagree	Strongly disagree
A person who smokes increase his/her risk of developing hypertension.	41(13.0)	123(38.9)	132(41.8)	4(1.3)	16(5.1)
Uncontrolled hypertension leads to stroke, heart diseases and kidney failure.	117(37.0)	69(21.8)	130(41.1)	0(0)	0(0)
It is important to monitor blood pressure at home	135(42.7)	108(34.2)	65(20.6)	8(2.5)	0(0)
It is important to reduce salt, sugar and fat intake.	179(56.6)	116(36.7)	21(6.6)	0(0)	0(0)
Engaging in physical activity lower blood pressure	140(44.3)	115(36.4)	53(16.8)	8(2.5)	0(0)

4.7 PREVALENCE OF HYPERTENSION AMONG WORKERS

Table 17 indicates the prevalence of blood pressure among workers which was classified according to World Health Organisation (2015). Blood pressure classification: Normal blood pressure is systolic blood pressure of ≤ 120 mmHg and diastolic blood pressure ≤ 80 mmHg, pre-hypertension is a systolic blood pressure of 130-139 and a diastolic blood pressure of 80-89, stage 1 hypertension is a systolic blood pressure of 140-159 and a diastolic blood pressure 90-99 mmHg and stage 2 hypertension is a systolic blood pressure of ≥ 160 mmHg and a diastolic of ≥ 100 mmHg

The findings of the study showed that 142(44.9%) of the participants had normal blood pressure, followed by pre-hypertension among 92(29.1%) participants and 55(17.4%) participants had stage 1 hypertension, while 27(8.5%) participant had stage 2 hypertension (mean =3.895 and SD= 5.97).

Table 17 Prevalence of hypertension among workers (n=316)

Blood Pressure classification	n	%
Normal blood pressure ≤120/80 mmHg	142	44.9
Pre-hypertension 130-139/80-89 mmHg	92	29.1
Stage 1 hypertension 140-159/90-99 mmHg	55	17.4
Stage 2 hypertension ≥ 160/100 mmHg	27	8.5
Total	316	100.0

4.8 Associations between demographic information and the responses on socioeconomic factors.

The association between socioeconomic factors (level of education, income and work category) and demographic information (age, gender and marital status) was set at p- value of 0.005. Cross tabulation between demographic information and socioeconomic factors was used to determine the association using Chi-square.

Table 18 illustrated the results of the association in which it was found that age and demographic information to be associated (p≤0.005).

Table 18 Association between demographic and level of education (n=316)

Association	χ^2	p-value
Level of education		
Age and level of education	37.428	0.000
Gender and level of education	57.462	0.000
Marital status and level of education	49.352	0.001

χ^2-Chi square

On table 19, it showed the association between work category and demographic information (p≤0.005).

Table 19 Association between demographic and work category (n=316)

Association	χ^2	**p-value**
Work categories		
Age and work categories	38.295	0.000
Gender and work categories	35.523	0.002
Marital status and work categories	53.801	0.000

χ^2-Chi square

Table 20 indicated the association between demographic information (age, gender and marital status) and income of the participants p≤0.005). The results revealed that age and marital status showed an association while gender and income showed dissociation (p>0.005).

Table 20 Association between income and demographic information (n=316)

Association	χ^2	p-value
Work categories		
Age and income	114.044	0.000
Gender and income	19.438	0.013
Marital status and income	25.877	0.001

χ^2 -Chi square

4.9 Association between demographic information and views on biological factors

In this study, the association between biological factors and demographic information (age, gender and marital status) p-value was set at ≤0.005. Chi square was used to test the association between demographic information and views on biological factors

The results revealed that age was associated with the biological factors table 21.

Table 21 Association between age and responses on biological factors associated with hypertension among workers (n=316)

Age	Ever been diagnosed with blood pressure	X^2	**P-value**
		117.698	0.000
Age	A doctor or health worker tell you that you have hypertension	X^2	**P-value**
		153.064	0.000
Age	Been diagnosed with hypertension in the past 12 months	X^2	**P-value**
		139.00	0.000
Age	Taken drugs or medication in past two weeks	X^2	**P-value**
		158.310	0.000
Age	Family history	X^2	**P-value**
		67.248	0.000

X^2 –Chi square

Table 22 indicates the association between gender and views on biological factors p value is less than 0.005.

Table 22 Association between gender and views on biological factors associated with hypertension among workers (n=316)

Item	Gender		
		X^2	P-value
Ever been diagnosed with blood pressure		7.663	0.022
A doctor or health worker tell you that you have hypertension	Gender	X^2	P-value
		21.440	0.000
Been diagnosed with hypertension in the past 12 months	Gender	X^2	P- value
		17.201	0.000
Taken drugs or medication prescribed by a doctor or health worker in past two weeks	Gender	X^2	P-value
		11.375	0.003
	Gender		
Family history		X^2	P-value
		96.689	0.000

χ^2 – Chi square

Table 23 showed an association between marital status and responses on biological factors in which the association was set at p≤0.005

Table 23 Association between marital status and biological factors associated with hypertension among workers (n=316)

Marital status	Ever been diagnosed with blood pressure	**X^2**	**P-value**
		132.007	0.000
Marital status	A doctor or health worker tell you that you have hypertension	**X^2**	**P-value**
		206.639	0.000
Marital status	Been diagnosed with hypertension in the past 12 months	**X^2**	**P-value**
		210.918	0.000
Marital status	Taken drugs or medication in past two weeks	**X^2**	**P-value**
		203.513	0.000
Marital status	Family history	**X^2**	**P-value**
		22.410	0.000

χ^2-Chi square

4.10 Association between lifestyle factors and demographic information

The association between age and lifestyle factors (physical activity, diet, salt intake, alcohol consumption, tobacco smoking and knowledge of hypertension) was set at p≤0.005 and Chi-square was used to determine the association.

On table 24, physical activity, diet, salt intake, alcohol consumption and knowledge of hypertension showed to an association with age groups. Even though on salt intake, age and avoid food prepared outside home and tobacco smoking showed dissociation.

Table 24 Association between lifestyle factors and age (n=316).

Association	χ^2	p-value
Physical activity		
Age and engaging in vigorous activities at work	29.995	0.000
Age and engaging in moderate intensity at work	112.432	0.002
Age and engaging in moderate intensity activities after work	90.880	0.001
Diet		
Age and fruit intake	31.034	0.002
Age and vegetable intake	98.594	0.00
Salt intake		
Age and limiting consumption of processed food	66.513	0.00
Age and look at the salt or sodium content on food labels	79.098	0.001
Age and buy low salt/sodium ailments	53.580	0.000
Age and use of spices other than salt when cooking	96.995	0.004
Age and avoid food prepared outside home	13.340	0.024
Age and do other things to specifically to control your salt	59.361	0.003
Alcohol consumption		
Age and alcohol drinking	41.383	0.000
Age and drinks any alcohol within the last 12 months	63.954	0.001
Age and stopped drinking due to health reasons such as negative impact on your health or on advice of your doctor or another health worker.	92.735	0.000
Tobacco smoking		
Age and smoking tobacco	7.074	0.215
Age and Ex-smokers	50.942	0.000
Age and current smokeless	24.062	0.07
Age and ex-smokeless tobacco such as snuff or chewing tobacco daily	40.163	0.000
Age and During the past 30 days, someone smoked in your home	84.534	0.000
Age and someone smoked in a closed area in your work areas or inside the building or specific offices during the past 30 day's areas or specific offices	108.377	0.000
Knowledge of hypertension		

Age and ever heard any information on hypertension at your workplace	69.245	0.000
Age and a systolic blood pressure of 140 mmHg or higher and a diastolic blood pressure of 90 mmHg or high indicate that the person is hypertensive	102.608	0.002
Age and importance of hypertensive patient to take her/his medication	29.537	0.000
Age and knowledge of any risk factors for hypertension	163.414	0.000
Age and drinking alcohol/ coffee increase the risk of developing hypertension	51.321	0.003
Age and a person who smokes increase his/her risk of developing hypertension	63.956	0.000
Age and uncontrolled hypertension lead to stroke, heart diseases and kidney failure	96.217	0.004
Age and it is important to monitor blood pressure at home	66.718	0.000
Age and it is important to reduce salt, sugar and fat intake	65.607	0.003
Age and engage in physical activity lower blood pressure	56.777	0.001

χ^2-Chi square

On table 25 revealed that physical activity, fruit intake, alcohol consumption, other variable on salt intake and knowledge of hypertension showed to be associated with gender were p value is ≤0.005. However, some of variable on knowledge of hypertension, tobacco smoking and vegetable intake showed dissociation (p>0.005)

Table 25 Association of gender and lifestyle factors (n=316)

Association	χ^2	p-value
Physical activity		
Gender and engaging in vigorous activities at work	128.269	0.000
Gender and engaging in moderate intensity at work	145.882	0.000
Gender and engaging in moderate intensity activities after work	132.626	0.003
Diet		
Gender and fruit intake	41.441	0.018
Gender and vegetable intake	1.234	0.42
Salt intake		
Gender and limiting consumption of processed food	80.133	0.003
Gender and look at the salt or sodium content on food labels	48.435	0.001
Gender and buy low salt/sodium ailments	42.620	0.002
Gender and use of spices other than salt when cooking	35.108	0.000
Gender and avoid food prepared outside home	65.773	0.000
Gender and do other things to specifically to control your salt	15.132	0.023
Alcohol consumption		
Gender and alcohol drinking	84.588	0.000
Gender and drinks any alcohol within the last 12 months	69.712	0.004
Gender and stopped drinking due to health reasons such as negative impact on your health or on advice of your doctor or another health worker.	36.435	0.000
Tobacco smoking		
Gender and smoking tobacco	3.411	0.063
Gender and current smokeless	34.584	0.004
Gender and ex-smokeless tobacco such as snuff or chewing tobacco daily	10.369	0.654
Gender and During the past 30 days, someone smoked in your home	51.114	0.003

Gender and someone smoked in a closed area in your work areas or inside the building or specific offices during the past 30 day's areas or specific offices	201.80	0.001
Knowledge of hypertension		
Gender and ever heard any information on hypertension at your workplace	13.456	0.223
Gender and a systolic blood pressure of 140 mmHg or higher and a diastolic blood pressure of 90 mmHg or high indicate that the person is hypertensive	28.962	0.003
Gender and importance of hypertensive patient to take her/his medication	54.280	0.001
Gender and knowledge of any risk factors for hypertension	12.692	0.56
Gender and drinking alcohol/ coffee increase the risk of developing hypertension	14.304	0.74
Gender and a person who smokes increase his/her risk of developing hypertension	24.787	0.001
Gender and uncontrolled hypertension lead to stroke, heart diseases and kidney failure	13.206	0.234
Gender and it is important to monitor blood pressure at home	42.564	0.000
Gender and it is important to reduce salt, sugar and fat intake	71.766	0.002
Gender and engage in physical activity lower blood pressure	77.765	0.000

χ^2 -Chi- square

Table 26 indicated the association between marital status and lifestyle factors, in the table (26), it showed that marital status to be associated with physical activity, diet, salt intake, alcohol consumption and knowledge of blood pressure. However, tobacco smoking and vegetable intake showed dissociation with marital status.

Table 26 Association between marital status and lifestyle factors (n=316)

Association	χ^2	p-value
Physical activity		
Marital status and engaging in vigorous activities at work	120.806	0.000
Marital status and engaging in moderate intensity at work	73.824	0.003
Marital status and engaging in moderate intensity activities after work	75.264	0.001
Diet		
Marital status and fruit intake	94.253	0.004
Marital status and vegetable intake	15.947	0.432
Salt intake	20.806	0.002
Marital status and limiting consumption of processed food		
Marital status and look at the salt or sodium content on food labels	52.787	0.000
Marital status and buy low salt/sodium ailments	21.960	0.003
Marital status and use of spices other than salt when cooking	41.404	0.000
Marital status and avoid food prepared outside home	45.282	0.002
Marital status and do other things to specifically to control your salt	32.662	0.000
Alcohol consumption	63.414	0.000
Marital status and alcohol drinking		
Marital status and drinks any alcohol within the last 12 months	96.542	0.002
Marital status and stopped drinking due to health reasons such as negative impact on your health or on advice of your doctor or another health worker.	69.172	0.001
Tobacco smoking		
Marital status and smoking tobacco	17.896	0.543
Marital status and current smokeless	13.700	0.002
Marital status and ex-smokeless tobacco such as snuff or chewing tobacco daily	10.818	0.634
Marital status and During the past 30 days, someone smoked in your home	60.936	0.002

Marital status and someone smoked in a closed area in your work areas or inside the building or specific offices during the past 30 day's areas or specific offices	30.315	0.000
Knowledge of hypertension among workers		
Marital status and ever heard any information on hypertension at your workplace	114.514	0.000
Marital status and a systolic blood pressure of 140 mmHg or higher and a diastolic blood pressure of 90 mmHg or high indicate that the person is hypertensive	58.884	0.000
Marital status and importance of hypertensive patient to take her/his medication	65.756	0.001
Marital status and knowledge of any risk factors for hypertension	42.905	0.000
Marital status and drinking alcohol/ coffee increase the risk of developing hypertension	43.644	0.003
Marital status and a person who smokes increase his/her risk of developing hypertension	34.548	0.002
Marital status and uncontrolled hypertension lead to stroke, heart diseases and kidney failure	73.801	0.000
Marital status and it is important to monitor blood pressure at home	48.435	0.002
Marital status and it is important to reduce salt, sugar and fat intake	63.406	0.000
Marital status and engage in physical activity lower blood pressure	41.220	0.001

χ^2 -Chi square

4.11 Association between blood pressure classification and demographic information

This section indicated the association between blood pressure classification (normal blood pressure, pre-hypertensive, stage 1 hypertension and stage 2 hypertension) and demographic information (age, gender and marital status).

The results showed dissociation at the age of <20 years, (P>0.005), and at age ranging from 21-31 years, up to 55 and above years showed an association (p<0.005) table 27.

Table 27 Association between age and blood pressure classification

Age	Blood pressure classification n N=316				
	Normal BP (≤120/80 mmHg)	Pre-hypertension 120-139/80-89 mmHg)	Stage 1 hypertension (140-159/90-99 mmHg)	Stage 2 hypertension (≥160/100 mmHg)	χ^2 P-value
<20 years	12	0	0	0	13.834 0.222
21-31 years	61	27	6	0	29.537 0.002
32-43 years	26	43	38	19	52.385 0.000
44-55 years	26	16	9	0	30.413 0.000
55 and above years	17	6	2	8	39.823 0.001
Total	142	92	55	27	

BP-Blood pressure χ^2-Chi square

Table 28 represents the association between gender and blood pressure classification, out of 316 participants, there were 226 females participated in the study, only 82 females reported to have normal blood pressure and 17 females reported to be on stage 2 hypertension. There were 90 males participated in the study, 60 of them reported to have normal blood pressure, 10 found to be on stage 2 hypertension. Furthermore, it was indicated the association between gender and blood pressure classification (p≤0.005).

Table 28 Association between gender and blood pressure classification

Gender	Blood pressure classification n		N=316		
	Normal BP (≤120/80 mmHg)	Pre-hypertension 120-139/80-89 mmHg)	Stage 1 hypertension (140-159/90-99 mmHg)	Stage 2 hypertension (≥160/100 mmHg)	χ^2 P-value
Female	82	65	38	17	61.566 0.000
Male	60	27	17	10	49.589 0.004
Total	142	92	55	27	

BP-Blood pressure χ^2-Chi square

Table 29 showed the association between blood pressure classification and marital status ($p<0.005$).

Table 29 Association between marital status and blood pressure classification

Marital status	Blood pressure classification n N=316				
	Normal BP (≤120/80 mmHg)	Pre-hypertension 120-139/80-89 mmHg)	Stage 1 hypertension (140-159/90-99 mmHg)	Stage 2 hypertension (≥160/100 mmHg)	χ^2 P-value
Single	84	56	48	18	84.754 0.000
Married	50	32	5	7	22.493 0.001
Separated	8	4	2	2	29.965 0.000
Divorced	0	0	0	0	
Widowed	0	0	0	0	
Total	142	92	55	27	

BP-Blood pressure χ^2-Chi square

4.8 SUMMARY

This chapter was the presentation of the study results. The results of the study show that age ranges from 32-43 years were the dominant ones, there were more females than males, and most of the participants were single. The results of the study indicated that the majority of participants have grade 12 and earn <10 000. Socio-economic factors have an influence in the development of hypertension. Age, gender and marital status were associated with biological factors. Lifestyle factors such as alcohol consumption, diet and physical activity were associated with hypertension. Tobacco smoking was not associated with the development of hypertension. Regarding the knowledge of hypertension, most of participants have not heard any information about hypertension at their workplaces. Furthermore, the results of the study show that most the participants were not sure on knowing the risk factors of hypertension. The majority of participants had normal blood

pressure and were pre-hypertensive. The following chapter (5) is the discussion of the findings.

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter outlines the discussion of the results based on the objectives, in relation to the purpose of the study as well as reviewed literature. Furthermore, this chapter presents the summary of the study, dissemination of the results, conclusion and suggested recommendations based on the findings of the study.

The previous chapter laid a foundation for these discussions. The discussion is presented according to the following: demographic information, socioeconomic factors, biological factors, lifestyle factors associated with hypertension, knowledge regarding hypertension and prevalence of hypertension.

5.2. Demographic information

The demographic characteristics used in this study were age, gender and marital status. The age categories that were used range from <20 years to 55 and above in order to accommodate all workers in the Greater-Tzaneen municipality. The results of the study indicated that the dominance ages were age ranges between 32-43 years. This is conciseness to the study conducted by Tsolekile, Schneider and Puoane, (2018) in Khayelitsha Cape Town where the majority of community health workers were aged 35-45 years.

The study conducted in Kenya by Olack, Mangen, Smeeth, Montgomery, Kiwanuka and Brieman, (2017) indicated that the majority of the participants were aged 35-44 years. This is because the majority of elderly workers go to pension. However, at the age of 40 years is where diseases develop, one of the diseases is hypertension as age the one biological factor that associated with hypertension.

The findings of the study showed that the majority of participants were females. The results of this present study is comparable with the findings of the study conducted by Singh, Shankar and Singh (2017). Although gender as one of the physical aspect seems to be associated with the hypertension.

In this present study it was found that the majority of participants were single. This is similar to the study conducted by Pyakurel Tripathy, Oo, Acharya, Pyakurel, Singh, Subedi, Yadar, Poudel, Pandey, Budhathoki, Lohani and Jha, (2019) in Triyuga Municipality who found that the majority of participants were single.

5.3SOCIOECONOMIC FACTORS ASSOCIATED WITH HYPERTENSION

In this study, the findings of the study indicate that the majority of participants were cleaners and had grade 12. However, this study found level of education among the participants which might cause them to earn lower income. Furthermore, the present study found that the majority of the workers earn <10 000. These results showed a low socioeconomic factors however, socioeconomic factors are shown to be associated with the development of hypertension (p=0.000). The majority of workers were single parents, which puts them under a lot of stress because of the amount they earn as they were not able to provide for their children's needs. Poverty is the leading cause of low levels of education. Usually, income seems to be associated with levels of education and the type of occupation (Liu, Xiang, Shi, Schenck, Yi, Ni & Liu, 2017).

This is comparable with the study conducted by Liu, Xiang, Shi, Schenck, Yi, Ni and Liu, (2017), in China which illustrated that low income and less education were associated with the development of hypertension. This figure is comparable with the studies conducted among Ethiopians by Esaiyas, Teshome and Kassa, (2018), and Asfaw, Gebrehiwot, and Shiferaw, (2016), who reported that the majority of the participants earn <10 000 and had Grade 12. It also showed that income and level of education are associated with the development of hypertension (p=0.001).

The study conducted among Nigerian by Ajani, et al., (2017) contradicts the finding of the present study which showed that the majority of workers were those of middle income status. Furthermore, it shows that there was no association between income and educational level where (p= 0.49). It also showed no influence in the development of hypertension. This is because they might not have a lot of stress on how they were going to afford their needs. The study conducted by Ezejimofor, Uthman, Cheng, Ezejimofor, Ezeabasili, Stranges and Bakwin, (2018), in Nigeria, showed an association between income and educational level (p=0.001).

It also showed not to have an influence in the development of hypertension. This is because they might not have a lot of stress on how they going to afford their needs. On the study conducted by Ezejimofor et al., (2018) in Nigeria showed income and educational level to be associated with the development of hypertension (p=0.001).

Keetile, Navaneetham and Letamo, (2018) in their study that was conducted in Botswana showed that a high level of education and high income were not associated with hypertension and showed the significant difference between income and level of education together with work categories.

5.4 BIOLOGICAL FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

This present study showed age to be associated with hypertension (p=0.000), which implies that age is associated with the development of hypertension. This is because the heart is no longer functioning like a young person, thus the heart muscles are weakened which leaves the heart to works harder to pump blood throughout the body. When the heart works harder it increases the blood pressure which leads the majority of old people to get hypertension (Egbi, Rotifa, S. & Jumbo, 2019).

This is similar to the study that was conducted in Nigeria by Egbi, et al., (2019) which showed that an increase in age is associated with hypertension (p<0.001). The process of aging is associated with the development of hypertension. Furthermore, the study conducted by Gupta, Rai, Toppo, Kasar and Nema, (2018) in India also shows that increasing in age is associated with the development of hypertension (p<0.000). However, Jung, (2017) in a study conducted among Americans, shows the same results which shows hypertension to be associated with age.

The findings of the study showed that there is an association between biological factors associated with hypertension among workers and gender. More females reported to be associated with hypertension than males (p=0.022), however these results might be due to the higher number of females than males in the sample and this could be that as they grow older, females estrogen production deteriorates which makes them be associated with hypertension. Estrogen protects females from developing hypertension (Khademi, Babanejad, Asadmobini & Karim, 2017).

This is similar to the study conducted among Koreans by Baek, Lee, Lim and Park, (2018) reveals that the majority of women reported to be diagnosed with hypertension than men

(p=0.003) .The findings of the study conducted by Choi, Kim and Kang, (2017) showed that the majority of the participants were women and women showed to be associated with hypertension at a significant level (p <0.001).

This present study also shows an association of family history and hypertension (p=0.000). This finding is similar to the study conducted by Kurian, Joseph and Manjula, (2017) were hypertension was associated with family history (p=0.002) and Matthews, Sebzda and Wenner, (2019) also found family history of HPT to be associated with the development of HPT. This shows that genetics has an impact on the development of hypertension. Thus, shows that genetics plays a major role in the development of hypertension.

5.5 LIFESTYLE FACTORS ASSOCIATED WITH HYPERTENSION AMONG WORKERS

This section discusses the findings of this study on lifestyle factors which are: physical activity, diet, alcohol consumption and tobacco smoking. Amongst participants 48.1% their work does not involve virgorous activities, it further showed an association with blood pressure p=0.000. Participating in physical activity lowers the risks of developing hypertension and decreases the process of aging. Engaging in physical activity strengthens the heart muscles, thus decreases the development of hypertension as the heart can work efficiently.

This is similar to the study conducted by Schouw, Mash and Kolbe-Alexander (2018) and Holtermann, Marrot, Gyntelberg, SØguard, Saudicani, Mortensen, Prescott and Schnohip, (2018) also found that 64.1% of the participants their work does not involve virgorous activities. The findings of the study again shows that 38.3% their work involves moderate intensity activity, as in the studies conducted by Drame, Houeahanou, Sogbohossou, Pare, Ekambi, Mizohoun-Adissoda and Dismand, (2018) and Taylor, Paxton, Shegog, Coan, Dubin, Page and Rempel,(2016) who reported that 27.8% their work involves moderate intensity activity. Moderate participation in physical activity is also beneficial to the wellbeing of an individual. However, some of the participants engage in virgorous and moderate intensity activities after work.

Even though their work does not involve physical activity, according to the findings of this present study showed that workers in the Greater-Tzaneen Municipality, might know the benefit of exercise as they are engaging in physical activity after work. Those that were not engaging in physical activities after work they responded that they do not have time to engage in physical activities as they have some errands to run after work. This is

comparable with the study conducted by Dalagers, Justeen and Sjogaardl, (2017) which reveals that 70 % of the workers engage in physical activity after work.

On this present study, 20.6% of the participants do not eat fruit. This could be that they could not afford to buy fruits and vegetables to eat every day, due to low income. Shortage of time might make workers not plant fruits and vegetables at their homes. The majority of the participants eat three servings of fruits (28.6%). However, 21.8% eat vegetables daily. The majority of them eat three servings.

In the studies conducted by Agaba, Akanbi, Ocheke, Gimba, Fannap, Iliya and Agaba, (2017) and Acheampong, et al., (2018) among Ghanaians, they found that participants eat <3 fruits and vegetables servings were 13.9% eat fruits and vegetables daily while the majority of the participants were not eating fruit and vegetables daily. This phenomenon was not peculiar with the study conducted among Indians by Joy, Green, Agrawal, Aleksandrowicz, Bowen, Kinra, Macdiarmid, Haines and Dangour, (2017) illustrated that the majority of workers were eating fruits and vegetables daily.

The majority of participants agreed or strongly agreed that it is important to limit salt intake and showed an association p=0.000. It could be said that the participants might know that too much is not good to their health. This finding is similar to the study conducted by Charlton, Pieterse, Menyanu, Britiwum, Naidoo, Pieterese, Madurai, and Jeanine, (2016) in South Africa, which indicated that the majority of workers reported that it is important to lower salt intake in their diet and also the study conducted among Nigerians by Akinlua, Meakin, Bashir and Freemantle, (2018) which showed the same results. However, a study conducted among Indians by Bhattacharya, et al., (2018) contradicts with the results of the study were that the majority of workers disagreed that it is important to lower salt intake.

In this present study found that the majority of the participants were using cooking oil other than the vegetarian oils or others; this is because cooking is cheaper. The other reason is that the participants used cooking oil because it can be used repeatedly. This result is the same as the results of the studies conducted by Jung, et al., (2018) among South Africans and Amegah, Brahuah and Stranges, (2019) among Ghanains workers and by Idun-Acquah, Obeng and Mensah, (2016) among Nigerian health workers reported to use cooking oil in meal preparation.

The study indicated that the majority of the workers consume alcohol. Furthermore, alcohol consumption showed an influence in the development of hypertension (p=0.000). However, this might be job stress, where workers end up drinking in order to reduce work related stress and others might also drink due to peer pressure, or just to have fun. These findings

are similar to the study conducted by Adeoye (2016), among Nigerian workers were the majority of workers drink alcohol, and Yu's, (2017) study conducted among Korean workers which found that the majority of workers consume alcohol almost daily. Furthermore, the study conducted among South African worker by Landsbergis, Kaufman, Meyer, Koutsouras, Shimbo, Shrager, Stukovsky and Szklo, (2016) showed the same results as this present study where the majority of workers drink alcohol. However, alcohol consumption is really a problem among workers. Drinking a large amount of alcohol puts them at risk of developing hypertension.

This present study reveals that the majority of workers were not smoking and tobacco smoking was not associated with the risks of hypertension ($p>0.005$). The findings of the study showed that few of the participants smoked cigarettes. It also indicated participants were aware of the danger of smoking cigarette. Apart from the smokers few of them started at an early age of 15 years. Ex-smokers were 15.2% and 9.2% smoked daily. Although 10.1 %, used smokeless tobacco products daily while 32.0% reported that someone smoked in their homes and 31.3% reported that someone smoked in a closed area in their workplaces. This is similar to the study conducted by Portela, Griep, Landbergis and Rotenberg, (2016), which showed that few of the workers were smokers, hence that the majority of the workers were non-smokers, and 10.6% use smokeless tobacco.

This phenomenon is in contradiction with the results of the study conducted in India by Mohankumar, Gopalakrishnan and Muthulaksmi, (2018) which showed that the majority of workers were smokers and it was further revealed that cigarette smoking were associated with the development of hypertension.

5.6 KNOWLEDGE OF HYPERTENSION AMONG WORKERS

The majority of workers indicated that they had never heard any information about hypertension at their workplace. The findings indicate that participants do not know the risk factors of hypertension. This was shown when participants were asked to stipulate any risk factor that they know; they stated the symptoms rather than the risk factors. The findings of this present study showed that there is a shortage of knowledge regarding the risk factors associated with hypertension. This present study findings are the same as the study conducted in Lesotho by Mugomeri and Moletsane, (2017) where it indicated that the majority of workers never heard any information about hypertension and its risks at their workplace.

Hacking, Haricharan, Brittain, Lau, Cassidy and Heap, (2016), also reported a lack of knowledge regarding hypertension and its risk factors. However, the findings of the present study contradict the results of the study conducted in Kenya by Osalusi, Uantioje, Ogun, Afe and Adeeko, (2017) where the majority of participants had heard of information about hypertension and risk factors that are associated with it at their workplace. Furthermore, the study conducted in China by Zhang, Meng, Yang, Luo and Liu (2018) showed that the majority of workers had a high level knowledge of hypertension and risk factors associated with it.

5.7 PREVALENCE OF HYPERTENSION AMONG WORKERS

The findings of the present study showed that the prevalence of hypertension was 25.9% of which 17.4% were in stage 1 hypertension 8.5% were in stage 2 hypertension. The results of the study further indicate that 29.1% were pre-hypertensive. For those who showed to be pre-hypertensive, it simply indicates the higher risk of developing hypertension. There were 44.9% illustrated to have normal blood pressure, however the participants who had normal blood pressure were not asked if they were on anti-hypertensive drugs or medication. The other thing which should be concerning about the participants who showed to be on pre-hypertension as they are at risk of developing hypertension.

The findings of the present study is comparable with the study conducted by Obarisiagbon, Osayi and Wagbatsoma, (2018) which shows that the majority of the participants had normal blood pressure and 13.0% were pre-hypertension. However, the findings of the study contradict with the findings of the study conducted among Nigerians by Ajayi, Sowemimo, Akpa and Ossai, (2016) where the majority of participants were pre- hypertensive.

5.8 DISSEMINATION OF THE RESULTS

The final copy of the dissertation will be submitted to the University of Venda library. A copy will be submitted to the Greater-Tzaneen municipality. The results of the study will be presented in national and international conferences and will be published in accredited journals. The results will also be presented to the Greater-Tzaneen Municipality in the form of research feedback.

5.9 SUMMARY

The purpose of the study was to investigate factors associated with hypertension among workers in the Greater-Tzaneen municipality of the Limpopo province, South Africa. The study was delimited to assess socioeconomic factors, investigate the biological factors, determine the lifestyle factors, assess prevalence and knowledge regarding hypertension among sampled workers in the Greater-Tzaneen municipality of the Limpopo Province, South Africa. The study adopted a quantitative approach using a cross sectional descriptive design. A self-administered questionnaire was used to collect data which was developed from the WHO stepwise instrument for NCD risk factor surveillance and an electronic blood pressure machine was used to measure blood pressure.

Data was collected from 316 workers according to their work categories (226 females and 90 males) and analysed with the Statistical Package for Social Science (SPSS) version 25.0 descriptively (frequency, percentages, mean and standard deviation Chi square test was used to test the association ($p<0.005$) between the variables.

The findings of this present study showed an association with low socioeconomics and the development of hypertension. Biological factors showed an association with hypertension. Lifestyle factors (alcohol consumptions, diet and physical activity) showed an association with the development of hypertension, however tobacco smoking was not shown to be associated with the development of hypertension. The findings of this present study showed a lack of knowledge regarding hypertension amongst participants. On the prevalence of hypertension the majority of workers had normal blood pressure.

5.10 LIMITATIONS OF THE STUDY

- ✓ Most of the engineers and drivers withdrew from participating however, the general workers who were also municipal workers were in the majority.

5.11 CONCLUSIONS

Conclusions are made on based on the findings of the study.

Based on the findings of this study, socioeconomic factors, biological factors, lifestyle factors (alcohol consumptions, diet and physical activity) were associated with the development of hypertension. The prevalence of hypertension was 25.9% of which 17.4% were in stage 1 hypertension 8.5% were in stage 2 hypertension. The results of the study further indicate that 29.1% were pre-hypertensive. The majority of workers in had normal blood pressure. The majority of workers indicated shortage of knowledge of the risk factors of hypertension. Therefore, it could be said that workers in the Greater-Tzaneen municipality are at risk in developing hypertension. This present study can be concluded by saying there is a need for awareness of the risk factors associated with hypertension among workers in the Greater-Tzaneen municipality.

5.12 RECOMMENDATIONS

The following recommendations are made based on the results of the study.

5.12.1 Recommendation for practices

- ✓ The municipality on their wellness programmes should include increasing awareness and health education on risk factors associated with hypertension.

- ✓ The government should enforce the law of indicating the danger of drinking on the alcohol bottle. The government should also ban the advertisement of alcoholic beverages on televisions and radio stations.

- ✓ The government, through the Department of Health should create posters which illustrate the risk factors of hypertension. It is therefore suggested that the Department of Health should organise health education to teach workers about the risk factors of hypertension.

5.13 Recommendations for further research

The researcher noted that there is no previous research conducted in the Greater-Tzaneen municipality of the Limpopo province, South Africa, which focuses on factors associated with hypertension among workers in the Greater-Tzaneen municipality of the Limpopo Province, South Africa, therefore it is necessary to conduct similar study on the same participants as it will bring more factors associated with hypertension.

Further research is needed to assess the psychological factors, socio-cultural factors and body mass index associated with hypertension to light.

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APENDICES

APPENDIX 1: ETHICAL CLEARANCE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms MM Malepe

Student No:
11603310

PROJECT TITLE: **Factors associated with hypertension among workers in the Greater – Tzaneen municipality of Limpopo Province, South Africa.**

PROJECT NO: **SHS/19/PH/13/0605**

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr NS Mashau	University of Venda	Supervisor
Ms M Mohlala	University of Venda	Co - Supervisor
Ms MM Malepe	University of Venda	Investigator – Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: May 2019
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Senior Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR
RESEARCH AND INNOVATION
2019 -05- 20
Private Bag X5050
Thohoyandou 0950

University of Venda
PRIVATE BAG X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060
"A quality driven financially sustainable, rural-based Comprehensive University"

APPENDIX 2:

PERMISSION TO CONDUCT A STUDY IN GREATER-TZANEEN MUNICIPALITY

GREATER TZANEEN MUNICIPALITY
GROTER TZANEEN MUNISIPALITEIT
MASIPALA WA TZANEEN
MASEPALA WA TZANEEN

P.O. BOX 24
TZANEEN
0850

TEL: 015 307 8000
FAX: 015 307 8049

www.tzaneen.gov.za

16 July 2019

Ref.: 4/4/R
TG Hlangwane

University of Venda
Directorate: Research and Innovation
Private Bag x5050
Thohoyandou
0950

Sir/Madam

PERMISSION TO CONDUCT RESEARCH: MALEPE MATLALE MOUSCHLEY

Your letter un-dated has reference.

Kindly note that permission has been granted to conduct research at the Greater Tzaneen Municipality on the topic "Factors associated with hypertension among workers at Greater Tzaneen Municipality, Limpopo Province, South Africa".

The student is welcome to conduct a research according to a structured questionnaire/ and or conduct face to face interview. However the student must undertake the responsibility to provide this Municipality with a copy of the final report.

The student is welcome to liaise for further assistance with the Training Officer, MS. Glacia Hlangwane on tel.no. (015) 307 8378 or by e-mail: glacia@tzaneen.gov.za

It is trusted that you will find this matter in order

Yours faithfully

BS Matlala
Municipal Manager

A Green, Prosperous and United Municipality that Provides Quality Services to All

APPENDIX 3: DATA FORM SHEET

Data form No.....

Date.....

Instruction

- ✓ Please do not write your name on the data form
- ✓ Do not tear any page
- ✓ Please answer all questions honestly and bring minimal clothing
- ✓ Please do not communicate with others when answering the questions
- ✓ For any clarity ask the researcher
- ✓ Just tick in the box

Section A: Demographic information

1. Age

<20 years	21-31 years	32-43years	44-55 years	55 and above years
1	2	3	4	5

2. What is your gender?

Female	Male
1	2

3. Marital status

Single	Married	Separated	Divorced	Widowed
1	2	3	4	5

SECTION B: Socioeconomic factors associated with hypertension among workers

4. What is your highest grade passed?

Not attended school	Grade 8-10	Grade 11	Grade 12	Degree/ Diploma	Other
1	2	3	4	5	6

5. Which of the following describe your work?

Manager	Driver	Office worker	Cleaner	Engineer	Gardener	Other
1	2	3	4	5	6	7

6. What is your average income in rands?

<10 000	11-20 000	21-30 000	31-40 000	41 000 and above
1	2	3	4	5

SECTION C: Biological factors associated with hypertension among workers

7. Have you ever been diagnosed with blood pressure?

Yes	No	Not sure
1	2	3

8. Did your doctor or health worker tell you that you have hypertension?

Yes	No	Not sure
1	2	3

9. Have you been diagnosed with hypertension in the past 12 months?

Yes	No	Not

		sure
1	2	3

10. In the past two weeks, have you taken drugs or medication for blood pressure prescribed by a doctor or health worker?

Yes	1	No	2	None	3

11. Is there anyone in your family or relative who is hypertensive?

Yes	No	Not sure
1	2	3

SECTION D: Lifestyle factors associated with hypertension among workers

Physical activity

12. Does your work involve vigorous intensity activity that causes an increase in breathing or heart rate (like carrying heavy loads) for at least 10 minutes continuously?

Yes	No	Not sure
1	2	3

13. In a typical week how many days do you do virgorous intensity as part of your work?

Number of days		None

14. How much time do you spend doing virgorous intensity activities at work on a typical day?

Hours		Minutes		None

15. Does your work involve moderate intensity that causes an increase in the heart rate and breathing (such as walking)?

Yes	No	Not sure
1	2	3

16. In a typical week, how many days do you do moderate intensity activities as part of your work?

Number of days		None

17. How much time do you spend doing moderate intensity activities at work on typical day?

Hours		Minutes		None

18. How much time do you spend sitting or reclining on a typical day?

Hours		Minutes		None

19. Do you engage in virgorous activities after work, such as sports, at gyms or recreational, jogging or running and playing soccer which increase in breathing or heart rate for at least 10 minutes?

Yes	No	Not sure
1	2	3

20. In a typical week, how many days do you do virgorous activities?

Number of days		None

21. Do you do any moderate-intensity activities that cause a small increase in breathing or heart rate, such as walking for at least 10 minutes?

Yes	No	Not sure
1	2	3

22. In typical week, how many days do you do moderate intensity activities?

Number of days		None

23. How much time do you spend doing moderate intensity activities?

Hours		Minutes		None

Diet

24. In a typical week, how many days do you eat fruit?

Number of days		None

25. How many servings of fruit do you eat on each of those days?

Number of serving		None

26. In a typical week, how many days do you eat vegetables? If zero don't answer the next question.

Number of days		None

27. How many serving of vegetables do you eat on one of those days?

Number of serving		None

28. How often do you add salt or salty sauce such as soya sauce to your food before you eat it or as you are eating it?

Always	Often	Sometimes	Rarely	Never	Don't know
1	2	3	4	5	6

29. How often do you eat processed foods high salt foods such as canned salty food, fast foods, beacon, polony, processed meat (beef), cheese, vienas and Russians?

Always	Often	Sometimes	Rarely	Never	Don't know
1	2	3	4	5	6

30. How much salt or salty sauce do you think you consume?

Far too much	Too much	Just right amount	Too little	Far too little	Don't know
1	2	3	4	5	6

31. How important is it to you to lower salt in your diet?

Very important	Somewhat important	Not at all important	Don't know
1	2	3	4

32. Do you think that too much salt or salty sauce in your diet could cause a health problem?

Yes	1	No	2	Don't know	3

33. It is important to do any of the following on a regular basis to control salt intake.

33.1. Limiting consumption of processed food.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

33.2. Look at the salt or sodium content on food labels.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

33.3. Buy low salt /sodium ailments.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

33.4. Use spices other than salt when cooking.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

33.5. Avoid eating food prepared outside the home.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

33.6. Do other things specifically to control your salt intake.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

33.7. What type of oil or fat is most used for meal preparation in your household?

Vegetable oil	Cooking oil	Butter	margarine	Other	None in particular	None used	Don't know

1	2	3	4	5	6	7	8

Other.....

Alcohol consumption

34. Have you ever consumed alcohol such as beer, wine, and spirits? If no don't answer the next question.

Yes	No	Not sure
1	2	3

35. Have you consumed any alcohol within the last 12 months?

Yes	No	Not sure
1	2	3

36. Have you stopped drinking due to health reasons such as a negative impact on your health or on the advice of your doctor or another health worker?

Yes	No	Not sure
1	2	3

37. During the past 12 months, how frequently have you had at least one standard alcohol drink?

Daily	5-6 days/week	3-4 days/week	1-2 days/week	1-3days/months	<Month	None
1	2	3	4	5	6	7

38. Have you consumed any alcohol within the past 30 days?

Yes	No	Not sure
1	2	3

39. During the past 30 days, on how many occasions did you have at least one standard alcoholic drink?

Number of alcohol		None

40. During the past 30 days, when you drank alcohol, how many standard drinks did you have during one drinking occasion?

Number		None

41. During the past 30 days, how many times did you have six or more standard drinks in a single drinking occasion?

Number of times		None

42. During the past 30 days, what was the largest number of standard drinks did you have on a single occasion, counting all types of alcoholic drinks together?

Number		None

43. During each of the last 7 days, how many standard drinks did you have on each day?

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

44. During the past 7 days, did you consume any homebrewed alcohol or any alcohol brought over the boarder/ from another country or any alcohol not intended for drinking or untaxed?

Yes	No	Not sure
1	2	3

45. On average, how many standard drinks of the following type did you consume during the past 7 days?

Home brewed spirit	Homebrewed beer or wine, palm of fruit wine	Alcohol brought over the border from another country	Alcohol not intended for drinking. E.g alcohol based medicine.	Other untaxed alcohol in the country
1	2	3	4	5

46. During the past 12 months, how often have you found that you were not able to stop drinking once you had started?

Daily/almost daily	Weekly	Monthly	<month	Never
1	2	3	5	5

47. During the past 12 months, how often have you needed a first drink in the morning to get yourself going after a heavy drinking sessions?

Daily/ almost daily	Weekly	Monthly	<month	Never
1	2	3	4	5

Tobacco use

48. Do you currently smoke any tobacco products, such as cigarette, nyaope, or marijuana?

Yes	No	Not sure
1	2	3

49. Do you currently smoke tobacco products daily?

Yes	No	Not sure
1	2	3

50. How old were you when you started smoking?

Age		N/A

51. Do you remember how long ago in years.....or monthly.....or weekly .....

52. On average, how many of the following products do you smoke per day/ week?

	Daily	Weekly
Manufactured cigarette		
Hand-rolled cigarette		

Pipe full of tobacco		
Marijuana		
Others		

Specify the others.....

53. During the past 12 months, have you tried to stop smoking?

Yes	No	Not sure
1	2	3

54. During any visit to a doctor or other health worker in the past 12 months, were you advised to quit smoking tobacco?

Yes	No	Not visited
1	2	3

55. In the past did you ever smoke any tobacco products?

Yes	No	Not sure
1	2	3

56. In the past did you ever smoke daily?

Yes	No	Not sure
1	2	3

57. How old were you when stopped smoking?

Age (years)		None

58. How long did you stop smoking? Years ago..... months ago..... weeks ago.....

59. Do you currently use any smokeless tobacco products such as snuff, chewing tobacco?

Yes	No	Not sure
1	2	3

Monthly ago.....weekly ago.....

60. Do you currently use smokeless tobacco products daily?

Yes	No	Not sure
1	2	3

61. On average, how many times/ week do you use the following?

Product	Daily	Weekly
Snuff by mouth		
Snuff by nose		
Chewing tobacco		
Others		
Specify		

62. In the past, did you ever use smokeless tobacco products such as snuff, chewing tobacco daily?

Yes	No	Not sure
1	2	3

63. During the past 30 days, did someone smoke in your home?

Yes	No	Not sure
1	2	3

64. During the past 30 days did someone smoke in closed areas in your workplace (inside the building, in work areas or specific offices)?

Yes	No	Don't know if it was in a closed area
1	2	3

SECTION E: KNOWLEDGE OF HYPERTENSION AMONG WORKERS

65. Have you ever heard any information on hypertension at your workplace?

Yes	No	Don't remember
1	2	3

66. When an individual has a systolic blood pressure of 140 mmHg or higher and a diastolic blood pressure of 90 mmHg, does the person have hypertension?

Yes	No	Don't know
1	2	3

67. Is it important for a hypertensive patient to take her/his medication?

Yes	No	Not sure
1	2	3

68. Do you know any risk factor of hypertension?

Yes	No	Not sure
1	2	3

If yes specify.....

69. Does an individual who drinks alcohol/ coffee increase his/her risk for developing hypertension?

Yes	No	Not sure
1	2	3

70. A person who smokes increase his/her risk of developing hypertension.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

71. Uncontrolled hypertension leads to stroke, heart disease and kidney failure.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

72. It is important to monitor blood pressure at home or clinics.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

73. It is important to reduce salt, sugar and fat intake.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

74.Engaging in physical activity lower blood pressure.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

Aphendikisi 4: Dipotšišo

(Translated questionnaire)

Nomoro ya foromo.....

Letšatši kgwedi.....

Ditaelo

1. O se ke wa ngwala leina la gago mo forormong ye.
2. Ka kgopelo, o se ke wa kgeila letlakala.
3. Ka kgopelo, araba dipotšišo ka botshepegi.
4. Ka kgopelo, o se ke wa boledišana le o mongwe ge o araba dipotšišo tše.
5. Ge o sa kwešiše botšiša molekodi.
6. Maraka ka lepokisaneng feela.

KAROLO A: Hlagišo seetša ya batho ba marabe.

1. Mengwaga

<20 Mengwaga	21-31 Mengwaga	32-43 Mengwaga	44-55 Mengwaga	55 goiša godimo Mengwaga
1	2	3	4	5

2. Na bong bja gago ke bo fe?

Mosadi	Monna
1	2

3. Maemo a gago a lenyalo?

A se wa nyalwa	O nyetšwe	Le kgaogane	O hladilwe	O hlokofaletšwe
1	2	3	4	5

KAROLO B: Maemo a gago a dithuto le ditšhelete ao a amanago le madi a magolo go bošomi

4. Ka tša dithuto o fihlile kae?

Ga se wa selokolong	Mphato wa 8-10	Mphato wa 11	Marematlou	Digarata/dipoloma	Tše dingwe
1	2	3	4	5	6

5. Ke eng tšeo dilatelago di hlalošago mošomo wa gago?

Menentšere	Mootledi	Mošomi wa kantorong	Mohlwekiši	Moentšeneere	Mošomi wa serapana	E mengwe
1	2	3	4	5	6	7

6. Tekano ya letseno la mašelego a gago?

<10 000	11-20 000	21-30 000	31-40 000	41 000 goiša godimo
1	2	3	4	5

KAROLO C: Tša hlago tšeo di amanago le bolwetši bja madi a magolo go bašomi

7. O kile wa ba le bolwetši bja madi a magomo?

Ee	Aowa	Ga kena bohlatse bjo
1	2	3

8. Na ngaka goba mošomi wa maphelo o kile a go botša gore o na le madi a magolo?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

9. Na o kile wa ba le bolwetši bja madi a magolo dikgweding tše lesome pedi tšeo difetilego?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

10. Mo dibekeng tše pedi tšeo difetilego, o kile wa tšea diokobatši goba mereana ya madi a magolo yeo o e filego ke ngaka goba mošomi wa maphelo?

Ee	Aowa	Ga ke gopole
1	2	3

11. Na go na le o mongwe wa leloko goba ka lapeng yo anago le bolwetši bja madi a magolo?

Ee	Aowa	Ga ke tsebe

KAROLO D: Maphelele ao a sepelelanago le madi a magolo go bašomi

Boitšhidullo

12. Na mmereko wa gago o amana le dilo tšeo dika oketšago go hema goba go betha ga pelo (go swana le go kuka dilo tša go imela) go ya metsotsong ye lesome go ya pele?

Ee	Aowa	A ken a bohlatse bjo
1	2	3

13. Ka beke feela, na o dira boitšhidullo ga kae bjale ka karolo ya mošomo wag ago?

Nomoro ya matšatši		Ga a gona	

14. Ke nako ye ka kang yeo o e fetšago o itšhidulla bjalo ka karolo ya mošomo wa gago mo letšatšing?

Iri	1	Metsotso	2	Ka ntle ga tšeo	3

15. Na mošomo wag ago o amana le boitšhidullo bja magareng bjo bo oketšago gobetha ga pelo goba go hema (go swana le go sepela)?

Ee	Aowa	A ke ne bohlatse bjo
1	2	3

16. Mo bekeng, ke a ma kae matšatši ao o dirago boitšhidullo bja magareng bjalo ka karolo ya mošomo wa gago?

Nomoro ya matšatši		Ga gona	

17. Mo letšatšing o tšea nako e ka kang o dira boitšhidullo bja magareng mo mošomong?

Diiri		Metsotso		Ga gona	

18. Mo letšatšing o tšea nako e ka kang o kwaetše?

Diri		Metsotso		Ga gona	

19. Na e ka ba o ikgokagantšwe le meraloko ka morago ga mošomo go swana le go raga, go ya tšiming goba go kitima tšeo di oketšago go hema goba go betha ga pelo tekano ya metsotso e lesome?

Ee	Aowa	Ga ke tsebe
1	2	3

20. Mo bekeng, o itšhidulla matšatši a ma kae?

Palo ya matšatši		Go se fetše selo	

21. Na e ka ba o dira boitšhidullo bja magareng bjo bo ka o ketšago go hema ga nnyane goba go betha ga pelo go swana le go sepela tekano ya metsotso e lesome?

Ee	Aowa	Ga kena bohlatse bjo
1	2	3

22. Mo bekeng, ke matšatši a ma kae ao o dirago boitšhidullo bja magareng?

Palo ya matšatši		Go se fetše selo	

23. O fetša nako e ka kang nako e ka kang o dira boitšhidullo bja magareng?

Palo ya matšatši		Go se fetše selo	

Dijo

24. Mo bekeng, ke matšatši a ma kae ao o jago dienywa?

Palo ya matšatši		Go se je selo	

25. Mo matšatšing ao ke dienywa tše kae tšeo o di jago?

Palo ya dienywa		Go se je selo	

26. Mo bekeng, ke matšatši a ma kae ao o jago merogo? Ge ele gore ga gona o se ke wa araba potšišo yeo e latelago?

Palo ya merogo		Go se je selo	

27. Mo matšatšing ao kae merogo ye me kae yeo o e jago?

Palo ya merogo		Ga gona	

28. Ke ga kae mo o tšhelago letswai goba ditšweletšwa tša letswai go swana le tšeo di tšhelwago dijong pelo o eja?

Nako ye nngwe le ye nngwe	Nako ye nngwe	Ka nako ye nngwe	Ga nnyane	Asenke	A ke tsebe
1	2	3	4	5	6

29. Keg a kae mo o jago dijo tša go tšweletšwa tšeo dinago le letswai le le ntši go swana le dijo tša ka kotikoting tša go ba le letswai, palone, nama ya go tšweletšwa, tšhese, biana le rašene?

Nako ye nngwe le ye nngwe	Nako ye nngwe	Ka nako ye nngwe	Ga nnyane	Asenke	A ke tsebe
1	2	3	4	5	6

30. Na o nagana gore o ka ba o eja letswai le le ka kang goba ditšweletšwa tša letswai?

Go feta ka kudu	Ka kudu	La go lekanela	Le lennyane	Go feta ga nnyane	A ke tsebe

31. Go bohlokwa bjang go theoša letswai ka gare ga dijo?

Go bohlokwa kudu	Go bohlokwa ga nnyane	Ga go bohlokwa	A ketsebe
1	2	3	4

32. O nagana gore letswai goba dilo tša letswai le ntši ka dijong tša gago di ka go direla bothata?

Ee	Aowa	Ga ke tsebe
1	2	3

33. Go bohlokwa go dira dilo tše dilatelago go laola letswai ka dijong.

33.1. Go fokotša dijo tšeo ditšweleditšweng tša letswai.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

33.2. Go lebelela boima bja letswai bjo bo le go ka gare ga dijo.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

33.3. Go reka dijo tšeo dinago le letswai le lennyane.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

33.4. Go bereki sepaesese go feta letswai ge o apea.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

33.5. Go se je dijo tšeo di sa apeiwago ka gae.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

33.6 Go dira dilo tše dingwe go lalola go jewa ga letswai la gago.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

33.6. Ke mohuta ofe wa makuhura oa o a šomišago ka kudu go dira dijo ka gae?

Mahura a go dira ka dibetše	Mahura a go apea	Potoro	Matšarini	A mangwe	Ka ntle ga ao	Ga ke a šomiši	Ga ke tsebe
1	2	3	4	5	6	7	8

<u>Go nwa bjala</u>

34. Na o kile wa nwa bjala go swana le bjala bja sekgowa, morara, sepiriti? Gee le gore ke aowa o se ke wa araba potšišo ya go latela.

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

35. Na o kile wa nwa bjala dikgweding tše lesome pedi tša go feta?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

36. Na o emišitše go nwa bjala ka lebaka la bothata bja maphelo go swana le go tliša maemmo ao a sa lekanelago a maphelo goba ka keletšo ya ngaka goba mošomi wa maphelo?

Ee	Aowa	Ga ke na bohlatse bjo

1	2	3

37. Mo dikgweding tše lesome pedi tša go feta, ke makga a ma kae mo o kilego wa nwa bjala bja go lekanela?

Letšatši	5-6 matšatši/beke	3-4 matšatši/beke	1-2 matšatši/beke	1-3 matšatši/kgwedi	<kgwedi	Ga gona le letšatši
1	2	3	4	5	6	7

38. Na o kile wa nwa bjala matšatšing a masome tharo a go feta?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

39. Mo matšatšing a masome tharo ao a fetilego, na ke meletlo ye me kae yeo o ilego wa nwa bjala bja go lekanela?

Nomoro ya bjala		Ga a go	

40. Mo matšatšing a masome tharo a go feta, ke meletlo ye me kae yeo o nwelego bjala bja go lekanela ka moletlo o tee?

Nomoro		Ga le go	

41. Mo matšatšing a masome tharo a go feta, o nwele ga kae bjala bja go lekana tše tshela goba go feta ka moletlo?

Ga kae		Ga gona	

42. Mo matšatšing a masome tharo a go feat, o nwelwe mabjala a ma kae ka moletlo o tee, o bala mehuta ye ka moka ya mabjala?

Nomoro		Ga gona	

43. Mo matšatšing a šupa, o nwele mabjala a go lekana a makae ka letšatši?

Mošupologo	Labobedi	Laboraro	Labone	Labohlano	Mokibela	Sontaga
1	2	3	4	5	6	7

44. Mo matšatšing a šupa a go feta, Na o kile wa nwa bjala bja go apeiwa gae goba bja tšwa nageng ya ka ntle goba bjala bjo bongwe le bjo bongwe bja go se thellwe?

Ee	Aowa	Ga ken a bohlatse bjo
1	2	3

45. Ka tekano, ke ma kga a ma kae ao o nwelego mehuta ya mabjala a a latelago mo matšatšing a šupa a go feta?

Bjala bja go apeiwa gae bja sepiriti	Bjala bja go apeiwa gae bja sekgowa, Morara	Bjala bja go tšwa dinageng tša ka ntle	Bjlala bjo o sa ikemišetšago go nwa go sawna le bja ka gare ga sehlare	A mangwe ao a sa thellwego ka mo nageng
1	2	3	4	5

46. Mo dikgweding tše lesome pedi tša go feta, keg a kae mo o humanego o palelwa ke go emiša go nwa bjala go tloga mo la o thomilego?

Ka letšatši	Bekeng	Kgweding	<Kgwedi	Ga se nke
1	2	3	4	5

47. Mo dikgweding tše masome pedi tša go feta, keg a kae mo o hlokago bjala mo mesong gore o kgone go humana bjo bo ntši?

Ka letšatši	Bekeng	Kgweding	<Kgwedi	Ga se nke
1	2	3	4	5

<u>Go kgoga motšoko</u>

48. Na e ka ba o kgoga ditšweletša tša kwai, sikarete, nyaope le lebake?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

49. Na e ka ba o kgoga ditšweletša tša sekarete ka letšatši?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

50. Na o be o na le mengwaga ye me kae ge o thoma go kgoga?

Mengwaga		Ga e go	

51. Na o gopola gore ke nako mang ye ka kang ka mengwaga.....goba kgwedi..... goba beke.....
52. Ka tekano, ke tše kae tša dilo tše dilatelago tšeo o di kgogago?

	Ka letšatši	Ka beke
Setšweletšwa sa sikarete		
Sikarete ya go rola ka seatla		
Pompi yeo e tletšego ka kwai		
Lebake		
Tše dingwe		

Hlaloša tše dingwe.....

53. Mo dikgweding tše lesome pedi tša go feta na o kile wa leka go tlogela go kgoga?

Ee	Aowa	Ga ke gopole
1	2	3

54. Mo o kilego wa etela ngaka goba mošomi wa maphelo mo dikgweding tše lesome pedi, o kile wa eletšwa ka go tlogela go kgoga?

Ee	Aowa	Ga ke gopole
1	2	3

55. Nakong ye e fetilego o kile wa kgoga setšweletšwa sa kwai?

Ee	Aowa	Ga ke gopole
1	2	3

56. Nakong ye e fetilego o kile wa ka mehla le mehla?

Ee	Aowa	Ga ke na bohlatse bjo
1	2	3

57. Na o be o na le mengwaga ye me kae ge o tlogela go kgoga?

Mengwaga		Ga e gona	

58. Ke nako ye ka kang ye o ilego wa emiša go kgoga..... dikgwedi..... dibeke.....
59. Na o šomiša didirišwa tša go go swana le seneifi goba go sohla kwai?

Ee	Aowa	Ga ke gopole
1	2	3

Kgwedi ya go feta..... beke ya go feta.....

60. Na o kile o šomiša di dirišwa tša kwai ga nnyane ka letšatši?

Ee	Aowa	Ga ke gopole
1	2	3

61. Ka tekano ke ga kae goba beke mo šomišago dilo tše di latelago?

Setšweletšwa	Letšatši	Beke
Seneifi ka molomo		
Seneifi ka nko		
Go ja seneifi		
Tše dingwe		
Hlaloša		

62. Nakong ye e fetilego, na o kile wa šomiša ditšweletšwa tša kwai go swana le seneifi, go ja kwai ka letšatši?

Ee	Aowa	Ga ke sa gopola
1	2	3

63. Mo matšatšing a masome tharo a go feta, na o mongwe o kile a kgoga ka ntong ya gago?

Ee	Aowa	Ga ke sa gopole
1	2	3

64. Mo matšatšing a masome tharo a go feta, na gona le motho yo a kilego a kgoga mošomong wa gago ka gare ga lefelo leo le tswaletšwego (ka gare ga moago, mo o šomelago gona goba kantorong ya gago)?

Ee	Aowa	Ga ke sa gopola gore e be ele lefelo leo le tswaletšwego
1	2	3

KAROLO E: Tsebo ya bolwetši bja madi a magolo go bašomi

65. Na o kile wa kwa ka bolwetši bja madi a magolo mo mošomong wa gago?

Ee	Aowa	Ga ke sa gopole
1	2	3

66. Ge motho a na le madi a go lekana 140mmHg le 90 mmHg goba go ya godimo, na e ka ba o na le bolwetši bja madi a magolo?

Ee	Aowa	Ga ke tsebe
1	2	3

67. Na go bohlokwa gore molwetši yoo a nago le bolwetši bja madi a magolo a tšee dihlare tša gagwe?

Ee	Aowa	Ga ke tsebe
1	2	3

68. Na o tseba kotsi yeo e amanago le bolwetši bja madi a magolo?

Ee	Aowa	Ga ke tsebe
1	2	3

Ge e le gore ke ee hlološa.....

69. Na motho wa go nwa bjala/ kofi o godiša kotse ka ga le bolwetši bja madi a magolo?

Ee	Aowa	Ga ke tsebe
1	2	3

70. Motho yo a kgogago o godiša kotse ya gona le bolwetši bja madi a magolo.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

71. Madi a magolo ao a sa laolwego a hlola bolwetši bja go oma meratlo, bolwetši bja pelo le dipshio.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

72. Go bohlokwa go lekola bolwetši bja madi a magolo ka gae goba klininiking.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

73. Go bohlokwa go fokotša letswai, swikiri le go ja mahura.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

74. Go itšhudulla go fokotša bolwetši bja madi a magolo.

Go dumela kudu	Go dumela	Go se šišinye selo	Go se dumele	Go se dumele kudu
1	2	3	4	5

APPENDIX 5: MEASUREMENTS

Data form no:…..

Systolic blood pressure

Trial 1	Trial 2

Diastolic blood pressure

Trial 1	Trial 2

APPENDIX 6: INFORMATION SHEET

My name is **Malepe Matlale Mouschley (11603310).** I am a student at the University of Venda registered for Masters of Public Health degree (MPH). My research focuses on the **Factors associated with hypertension among workers in the Greater-Tzaneen Municipality in Mopani District of Limpopo Province, South Africa**. You are kindly requested to take part in this study because your participation can make a great difference.

Research data will be collected by the researcher. Before data collection I will explain the purpose of the study, ethical principles to be adhered to and giving the respondents informed consent form, I will conduct the measurement and hand out the questionnaires. Data will be collected from the workers. I will conduct the measurement (blood pressure) and allow the participants to fill the questionnaire while present by ensuring privacy at all cost.

I'm going to handle gathered data in utmost confidentiality, meaning that no unauthorized people will handle the data in any way. The data will be kept classified times and will be discarded as soon as the study complete.

I will explain the procedures for measurements and the format of the questionnaire to the participants and also urge them omit their names or any form of identification to ensure anonymity. Instead I'm going to use code rather than participants names.

In this research project participation is free and voluntary. Participants are encouraged to withdraw from the project at any time they feel uncomfortable or threatened in any way to continue participating in the study.

In this study I will ensure that the benefits surpass the risk. I ensure that no physical, psychological or emotional harm is inflicted on the respondents during the course of the study. Other possible dangers will be looked at and the researcher shall guard against that. The Participants' positive response to participate in the study will enable me to draw conclusion from the findings and be able to give recommendations that can be helpful to the workers.

APPENDIX 7: CONSENT FORM

My name is **Malepe Matlale Mouschley**, I am a Master's student at the University of Venda registered for the Master of Public Health degree (MPH). My research focus on the **Factors associated with hypertension among workers in the Greater-Tzaneen Municipality of Limpopo Province, South Africa**. I am inviting you to participate in this study. Please note that any information you will provide will be treated as confidential and therefore will not be divulged to anyone without your consent. Note that your participation is voluntary, meaning to say you are free to withdraw at any time should you feel uncomfortable during the course of the study.

Signature of the researcher..... Date.....

I.....Have read and understood the contents and terms of this invitation to participate in this study. I hereby declare that I am voluntarily participating in this research.

Participant signature..... Date.....

For more information contact Malepe M.M (Researcher)-0793043689/ malpem.m@gmail.com