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FACTORS ASSOCIATED WITH DEVELOPING HYPERTENSION AMONG HEALTH CARE WORKERS IN HIPPO VALLEY SUGAR ESTATE, CHIREDZI DISTRICT, 2022 – 2023

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER IN PUBLIC HEALTH IN THE COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

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Abstract

Africa faces a healthcare workforce crisis with a projected shortfall of 6.1 million healthcare workers by 2030. Zimbabwe has experienced a sustained economic crisis that has severely impacted the health system and resulted in a mass exodus of health workers. Healthcare workforce forms the core of any health system and maintaining staff wellbeing is critically important for good population health status, achieving Sustainable Development Goals (SDG) and the ability to combat future pandemics. The study's main aim was to determine risk factors associated with developing hypertension (HTN) among health care workers at Hippo Valley Estate from January 2022 to December 2023. An analytical cross-sectional study was done using both qualitative and quantitative methods for analysis of data in the period of January 2022 to December 2023. A sample size of 107 health care workers was calculated using Epi info version 7.2.6.0. Stratified random sampling method was used in the selection of the participants. Data was collected using a structured interviewer-administered questionnaire, secondary data for lipid profile results and BMI (body mass index) was collected using participants' hospital books and vital measurement was collected using an electronic sphygmomanometer. STATA version 12 was used to generate frequencies, medians and proportions. A total of 107 participants were enrolled into the study. Most of the participants were above 50 years. They were few participants ranging from 18-29 year. Most participants were married, few divorced and widowed. The most common cause of Hypertension was among smokers with a prevalence ratio of 0.55; 95% CI:1.38-4.16; p=0.004 while non-smokers had a 23% prevalence of HTN. Physical inactivity was noted to be associated with high prevalence of HTN with a 0.45 prevalence rate; 95% CI:1.23-4.81; p=0.004). Having a positive family history of hypertension was with HTN at 95% CI:1 25-4.44; p=0.005. There was low prevalence of HTN in participants who were obese and higher age group above 40 years and gender had no effect in prevalence of HTN in this study. It recommends that there is a need for the health system to consider adopting a team-based approach by enabling understanding of regulatory body policies affecting health care professionals and service delivery in the Zimbabwe. The health care policy guidelines and regulatory support should be tailor-made with respect to the redistribution of individual work duties, regular checking of Blood pressure on employees, this may be modified to facilitate team-based care.

Key Words: Hypertension and Healthcare Workers; Hypertension; Hypertension Risk Factors; Body Mass Index; Total Cholesterol; Vital Measurements.

Declaration

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree.

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List of Acronyms and Abbreviations

CVD	Cardiovascular Diseases
HTN	Hypertension
HVE	Hippo Valley Estates
MOHCC	Ministry of Health and Child Care
NCD	Non-communicable Disease
WHO	World Health Organization

Definition of Key Terms

Health	World Health Organization [WHO] (1948) defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.
Hypertension	When the pressure in your blood vessels is too high (140/90 mmHg or higher) (Shimizu, 2023), it is referred to as Hypertension.
The infrastructure	for identifying and managing Non-Communicable Disease (NCD) is weak, resulting in under diagnosis and under treatment. (Calderwood et al., 2024).
The Know-Do Gap	known as the knowledge-action gap was seen when healthcare practitioners struggled to integrate the knowledge gained through an academic or a research environment with real-world clinical practice in mitigating the rise in NCDs (Donohue et al., 2023).

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Health professionals may be assumed to make healthier lifestyle choices and have better health outcomes than others due to greater health literacy, education, and experience with patients. Despite data on how the prevalence of health behaviors compares between health professionals and others, it is unknown how actual health outcomes compare (Helfand & Mukamal, 2013).

WHO (1948) defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Healthy lifestyle has many advantages. A balanced diet lowers the risk of many cardiovascular diseases. Regular exercise helps reduce anxiety and depression, lowers cholesterol level and boosts the immune system. A good mental wellbeing helps cope with daily stress and promotes work productively for individual and community benefit. Avoidance of first- and second-hand smoke protects against many respiratory and cardiovascular diseases (Ahmad et al., 2015).

Hypertension (HTN) is defined as when the pressure in your blood vessels is too high (140/90 mmHg or higher) (Shimizu, 2023). Modifiable risk factors include unhealthy diets (excessive salt consumption, a diet high in saturated fat and trans fats, low intake of fruits and vegetables), physical inactivity, consumption of tobacco and alcohol, and being overweight or obese. Non-modifiable risk factors include a family history of HTN, age over 65 years and co-existing diseases such as diabetes or kidney disease. Lifestyle changes like eating a healthier diet, quitting tobacco and being more active can help lower blood pressure (Shimizu, 2023).

HTN is one of the top 5 causes of NCDs death and disability, with their prevalence and impact projected to increase dramatically in the coming decades (Calderwood et al., 2024). The NCDs are the leading causes of death globally, with most deaths occurring in low- and middle-income countries (Vos et al., 2020)**.** Cardiovascular diseases account for most NCD deaths at 17.9 million people annually (WHO, 2023).

Chronic diseases and multi-morbidity impact the ability of healthcare workers to continue to work, resulting in illness-related absences, requirement of adjustment of work roles, or leading to early retirement (Calderwood et al., 2024). Countries that are affected by economic migration have staff who remain who are generally older and therefore likely to be at higher risk of multi-morbidity increasing the impact of multi-morbidity on human resources for health (Toyin-Thomas et al., 2023). Zimbabwean NCD prevalence estimates are almost 20 years old or restricted to people attending HIV clinics and few on NCD among health care workers (Calderwood et al., 2024).

1.2 Background of the Study

Health workers are the backbone of strong and resilient health systems. Universal health coverage and guaranteed global health security are only possible with adequate investment in the health workforce. Health workforce shortages are increasing the inequities in access to health services, causing preventable illness, disability and death, and threatening public health, economic growth and development (WHO, 2016).

Hypertension is a major cause of premature death worldwide. The WHO African Region has the highest prevalence of hypertension (27%) while the WHO Region of the Americas has the lowest prevalence of hypertension (18%). The number of adults with HTN

increased from 594 million in 1975 to 1.13 billion in 2015, with the increase seen largely in low- and middle-income countries (Shimizu, 2023). This increase was due to mainly a rise in HTN risk factors in low- and middle-income countries populations (Shimizu, 2023).

One of the global targets for non-communicable diseases is to reduce the prevalence of hypertension by 33% between 2010 and 2030. The Know-Do Gap known as the knowledge-action gap was seen when healthcare practitioners struggled to integrate the knowledge gained through an academic or a research environment with real-world clinical practice in mitigating the rise in NCDs (Donohue et al., 2023) An estimated 1.28 billion adults aged 30–79 years worldwide have hypertension, with mostly (two-thirds) living in low- and middle-income countries. It is estimated that 46% of adults with hypertension are unaware that they have the condition. Less than half of adults (42%) with hypertension are diagnosed and treated. Approximately 1 in 5 adults (21%) with hypertension have it under control (Shimizu, 2023).

Cardiovascular diseases are the most frequent causes of non-communicable diseases (NCDs) deaths in sub-Saharan Africa and are responsible for approximately 13% of all deaths in sub-Saharan Africa and 37% of all NCDs deaths. Although ischemic heart disease (IHD) has been identified as the leading cause of Cardiovascular- diseases (CVDs) mortality in sub-Saharan Africa followed by stroke and hypertensive heart disease (Yuyun et al., 2020).

In Zimbabwe, the multi-sectoral National NCD Strategy is still to be developed and its absence makes implementation difficult (Ministry of health and child care of Zimbabwe

[MOHCC], 2021). The STEPs survey in Zimbabwe was undertaken in 2005 and showed that developing countries including Zimbabwe have diabetes and cardiovascular diseases in concert with other non-communicable diseases have not been addressed under specific control programs such as those that exist for several infectious and communicable diseases (MOHCC, 2005).

In the National Health Strategy for Zimbabwe 1997-2007, it was noted that hypertension accounted for more than 40% of total chronic repeat visits to out-patient departments in 2004 and that death from all types of cardiovascular diseases occupied the 4th place in the top 10 causes of hospital mortality among age group five years and above. The strategic document identified cardiovascular conditions as one of the 10 conditions needing priority action. Furthermore, there was emphasis on the education of individuals, families and communities about the risk factors of non-communicable disease (MOHCC, 2005).

The world faces global shortage of health workers and lack of skilled health workers which creates constraints on job creation in the health sector. With the right policies in place, investment in education and job creation in the health sector this will contribute to promoting inclusive economic growth (WHO, 2016).

1.3 Statement of the Problem

Healthcare workforce is the core of any health system and maintaining staff wellbeing is critically important for good population health status, achieving Sustainable Development Goals (SDG) and the ability to combat future pandemics (WHO, 2016). Africa faces a healthcare workforce crisis with a projected shortfall of 6.1 million healthcare workers by 2030. Zimbabwe has experienced a sustained economic crisis that has severely impacted

the health system and resulted in a mass exodus of health workers (MOHCC, 2005). This has led to poor or inadequate service delivery countrywide. Prevalence of hypertension in Zimbabwe is estimated to be between 12.0 – 15.0% (MOHCC, 2005). The infrastructure for identifying and managing NCD is weak, resulting in under diagnosis and under treatment (Calderwood et al., 2024). As a result of a depleted healthcare workforce, Zimbabwe has been added to the WHO health workforce support and safeguards list (Calderwood et al., 2024). Covid19 pandemic lockdown saw the rise in levels of sedentary life style, which predisposed people to cardiovascular diseases among other non-communicable diseases (Karageorghis et al., 2021). In this light, Hippo Valley Sugar Estate being a private company with an established robust health delivery system to ensure sustained sugar production and profit chain also experienced an increase in health care worker's absenteeism related to HTN post Covid19 lockdown. This prompted the research on determining risk factors associated with developing hypertension among health care workers at Hippo Valley Medical Centre.

1.4 Research Objectives

This section provided the research with the direction which was poised to be taken to arrive at as set. These included;

1.4.1 Broad Objective

The aim is to determine factors associated with developing HTN among health care workers in Hippo Valley Sugar Estate from January 2022 to December 2023.

1.4.2 Specific Objectives

- To map the prevalence of HTN among Health care workers in Hippo Valley Estate for the period of January 2022 to December 2023.

- To ascertain if life style factors influence incidence of HTN among health care workers in HVE.
- To determine if changes in physiological factors (BMI and lipid profile) affect incidence of hypertension among health care workers at HVE.
- To determine the socio-demographic and economic factors associated with developing hypertension among health care workers at HVE.

1.5 Research Questions

- What is the prevalence of HTN among Health care workers in Hippo Valley Estate for the period of January 2022 to December 2023?
- Is high BMI or deranged lipid profiles associated with increased blood pressure?
- Do life style risk factors increase incidences of Hypertension among health care workers?
- Do economic factors influence development of HTN among health care workers?
- Do socio-demographic factors increase risk of development of HTN?
- Does the type of health profession and work experience of the health worker influence development of HTN?

1.6 Research Hypothesis

The researcher used the following hypothesis to test for factors associated with HTN among health care workers:

Ho: there are no significant factors associated with HTN

H1: there are significant factors associated with HTN

This research generated characteristics associated with HTN among health care workers and show the morbidity and mortality trend among health care workers in Hippo Valley. It provided empiric evidence on the factors leading to hypertension, thereby assisting in NCD management and treatment program policy makers to identify gaps and resources needed to minimize morbidity and mortality rates related to HTN and in the long run aide in improvement of preventative methods against HTN.

1.7 Significance of the Study

The researcher noted that the study was cantered upon establishing factors associated with the development of HTN and the prevention of the development of HTN. Healthcare workforce forms the core of any health system and maintaining staff wellbeing was critically important for good population health status, achieving Sustainable Development Goals (SDG) and the ability to combat future pandemics (Calderwood, 2024) involve:

A. **Health workers in Hippo Valley Sugar Estate**: this research study was useful in bringing real change to the health workers living with HTN in Hippo Valley, aiding to the decrease of morbidity and mortality associated with development of HTN, and reducing catastrophic costs involved with management of HTN.

B. **Hippo Valley Sugar Estate Health Services**: this research may enable the estate concerned with the management of hypertension to make informed decisions and acquire funding, man power and other resources required to reduce the development of HTN.

1.8 Delimitations of the Study

Research delimitations are by definition boundaries of the research study, based on the researcher's decision of what to include and what to exclude (Theofanidis, 2018). This

helped the researcher addressing non-relevant issues with respect to the research topic and the situation at hand, thereby making the research workable and manageable. Therefore, the researchers considered the following:

a) The scope of this research was delimited to health workers who made up the population group or research participants. The geographical boundary of the research was delimited to Hippo Valley Sugar Estate. The time frame was January 2022 to December 2023. The methodology of the research was an analytical cross-sectional study with both quantitative and qualitative methods. The research focussed on HTN and not the other non-communicable disease.
b) Lipid profile test results for health care workers used was from secondary data captured in the clinical registry during the period of January 2022 and December 2023.

1.9 Limitation of the Study

The researcher noted the following limitations in this research:

i. Some potential participants with valuable information were unwilling to participate in the study due to no financial rewards being offered to the information that they would offer hence the researcher motivated the research participants by indicating how the results would impact the treatment and management of HTN among health care workers and HVE population as a whole.

ii. Some respondents provided biased answers due to their various experiences so as to avoid victimization or stigmatization at work place and society. With this the researcher gave assurance of anonymity, privacy and confidentiality so as to make sure no instrument can be traced to the research participant.

iii. The researcher also noted that due to time and financial constraints of having to do academic and gainful employment work currently and simultaneously, this effectively limited the researchers and to mitigate this limitation, the researcher sticks to a time schedule as planned and use cost effective strategies that lessened the financial pressure and burden of conducting academic research.

iv. The researcher due to financial and time constraints, utilized secondary data for lipid profile test results taken during the period of January 2022 to December 2023.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

The chapter reviewed literature related to factors associated with developing HTN among health care workers and related subjects to identify study design that have been utilized in previous studies and also pick up the gaps in knowledge concerning risk factors and associations. It used the conceptual framework for NCDs because hypertension is in the same category.

2.2 Theoretical Framework

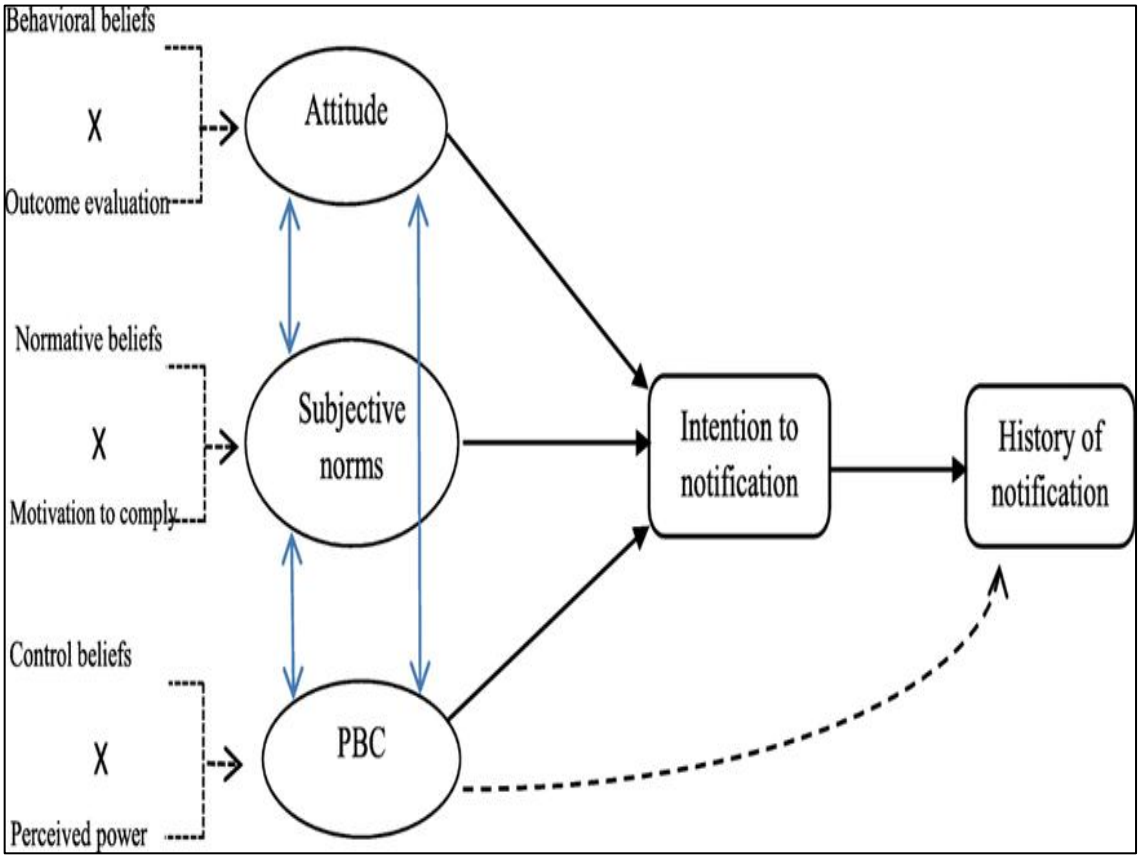

Figure 1 Theory of Planned Behavior

Source: (Ajzen, 1991)

States that intentions are determined by three variables. The first is attitudes, which are an individual's overall evaluation of the behavior. The second is subjective norms, which consist of a person's beliefs about whether significant others think he/she should engage in the behavior. The third measure, the extent to which the individual perceives that the behavior is under their control and is labelled PBC (Ajzen, 1991).

2.3 Conceptual Framework

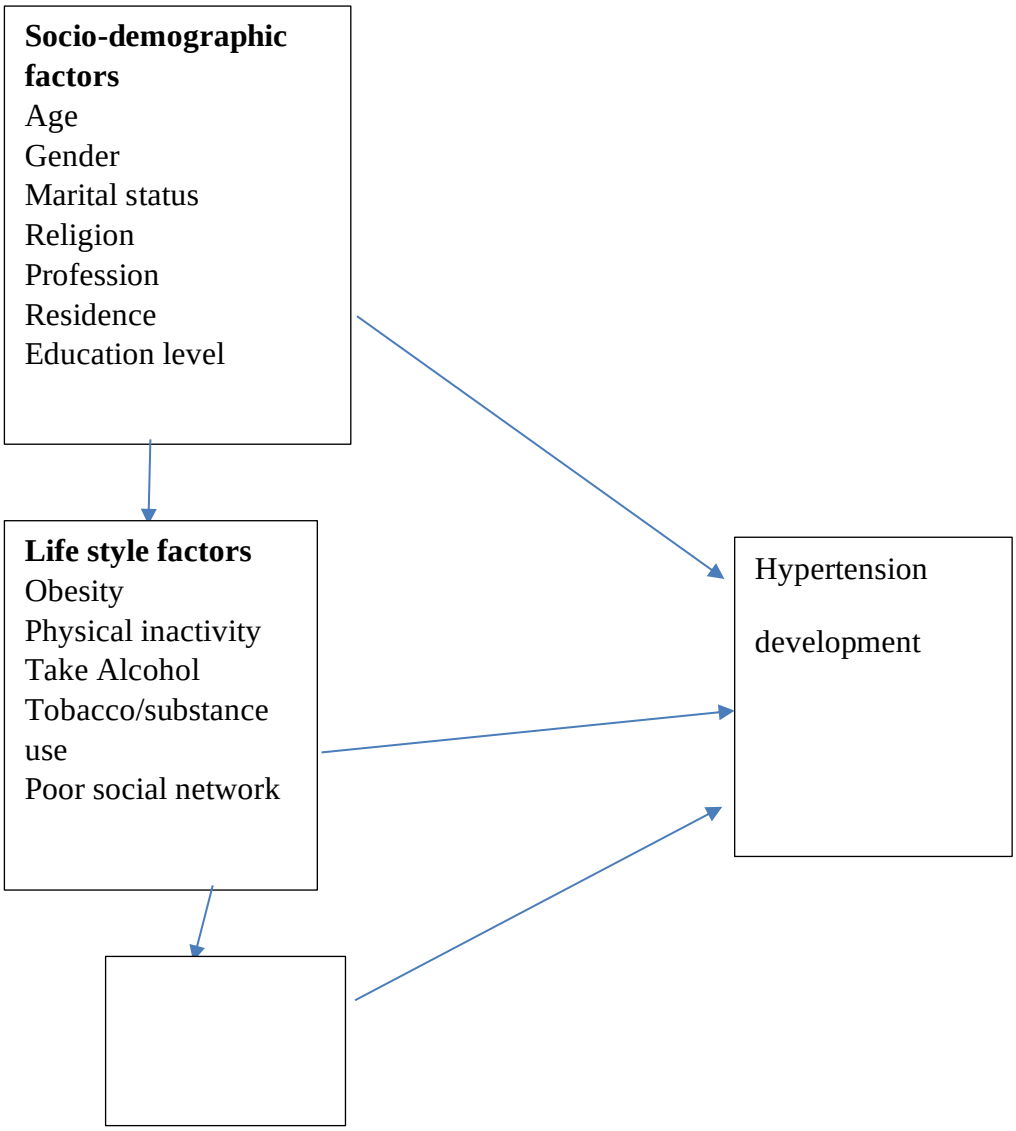

Figure 2 Conceptual framework

Source: *Adapted from the risk factors and outcomes of multi-morbidity Modified from the WHO's Determinants of Health and Their Impacts on Chronic Diseases Conceptual Framework (Eyowas et al., 2021)*

2.4 Significance of Framework to the Study

The NCD are a group of conditions that are not mainly caused by an acute infection and result in long-term health consequences that often create a need for long-term treatment and care (WHO, 2023). They are the leading causes of death globally, with most deaths occurring in low- and middle-income countries (Vos et al., 2020). The four most common NCDs are cardiovascular disease (CVDs) (HTN induced) such as heart attack and stroke, cancers, chronic respiratory disease such as chronic obstructive pulmonary disease and asthma, and diabetes which together account for 82% of all NCD deaths (WHO, 2019).

There is a high global burden of hypertension with an estimated 1.13 billion people worldwide reported to have HTN, with most (two-thirds) living in low- and middle-income countries (LMICs) (Adeke et al., 2022). Zimbabwe has an estimated prevalence of HTN at 12.0 to 15.0% nationally (MOHCC, 2005). In Zimbabwe, 36% health workers assessed from 48 health facilities from July 2020 to July 2022 were found to have elevated blood pressure (Calderwood et al., 2024).

They are caused by a combination of modifiable and non-modifiable risk factors, including genetic, metabolic, behavioral and environmental factors (WHO, 2019). This has a major impact on economic livelihoods of individuals, their families and health systems due to their long chronic courses, need for lifelong treatment and follow-up and need for advanced methods for management of complications (Mwangi et al., 2020).

2.5 Factors for Hypertension among Health Care Workers

This section reviewed related literature in terms of similar variables analysed by yester-year scholars, their findings, the methodologies used, the study settings, and the economic environment concerned where the study originated from. The section undertook an

extensive empirical review so as to expose the research gap which gave the current study the motivation to undertake the research. The review looked at local researchers in Zimbabwe pertaining to the research problem, some regional scholars (Southern Africa Development Community) and international researchers as well.

2.5.1 Socio-Demographic Factors

Health care workers in health care systems of low- and middle-income countries are characterized as being exposed to excessive workload, poor staff retention, limited patient health literacy, absent data collection systems, medication and supply shortages, lack of monetary incentives and underfunded health care structures (Kamvura et al., 2022).

Each year, 17 million people die from a NCD before age of 70 years. Of which 86% of these premature deaths (death before age 70years) occurs in low- and middle-income countries (WHO, 2023). There are several socio-demographic determinants of the prevalence of NCDs and their risk factors with the major NCD risk factors been tobacco use, harmful use of alcohol, physical inactivity and unhealthy diets which are modifiable behaviors that are established during adolescence or young adulthood and cause NCDs later in life (Mwangi et al., 2020).

Males are more prone to risky lifestyles associated with tobacco and harmful alcohol use. NCDs have been the leading cause of death in women in the past 3 decades especially in low- and middle-income countries (Idris et al., 2021). Women are vulnerable to NCDs in workplace irrespective of sharing the same environment due to the distinct biological and psychological differences between men and women (Idris et al., 2021). Two out of three deaths in women are due to NCD and the absolute number of NCD deaths in women is similar to men (Mwangi et al., 2020).

Health outcomes are closely related to educational level. Lower levels of education have been found to be related to higher incidence and prevalence of NCDs (Oshio, 2019) Education has been noted to be negatively associated with alcohol and tobacco use (Mwangi et al., 2020).

Determining how NCD prevalence as well as risk factors differ across different gender, wealth quintiles, education level and place of residence provides public policy and health authorities with valuable knowledge on designing and implementing intervention packages and policies to address the NCD (Mwangi et al., 2020).

In an African context, Bosu et at. (2017) carried out an extensive study different from the current in terms of methodology which focused on the prevalence, awareness, and associated risk factors of hypertension in older adults in Africa through a systematic review and meta-analysis protocol. The literature body of knowledge herein exposes that a few studies on hypertension have been done in plantations estates or rural municipalities, let alone in closed community settings. The main focus from their study was on the prevalence of hypertension while the explanatory variables which they analysed included demographic, socio-economic, dietary, lifestyle and behavioural factors.

Bosu et at. (2017)'s study went on to examine effect sizes in bivariate and multivariate analyses which are mostly used statistical methods because they use Odds Ratio/Prevalence ratio, Confidence Interval and Probability Value (P-Value) for estimation. Their study also went on to explore for heterogeneity of the standard errors across the study, and performed a meta-analysis using a random-effects model to present a summary estimate of the prevalence of hypertension (Bosu et al., 2017). The justification of using statistical analysis in medical researches on prevalence was also adopted for the

current study. The estimates of the prevalence, the risk factors and the level of awareness of hypertension by the current study helped in galvanizing efforts at prioritizing the cardiovascular health of older persons in Zimbabwe.

Zeroing in on age and HTN debate, Adeloye and Basquill (2014) carried out an epidemiological study which showed that the pooled prevalence of HTN in Africa in the elderly ranged from two to four times than that in 40 years or younger. Older persons aged 50+ years are more likely than younger adults in urban and rural Africa to have hypertension or to report risk factors for chronic NCDs. This assertion was also echoed by Duda et al., (2011), accordingly the current study expected age to play a significant explanatory role on hypertension due to the fact that most health care workers at the estate are provided accommodation as well as extra allowances by the company on top of the government wages making they comparably better off than their peers in public hospitals. This could potentially result in most of them staying for longer hence aged healthcare workers were expected.

When it comes to age, there are other health issues that come up associated with HTN. In that context, Abegunde and Owoaje (2013) added that older persons in Africa often suffer multi-morbidity, with a majority having hypertension in addition to other health problems such as angina, arthritis, asthma, cataract, chronic obstructive pulmonary disease, depression, diabetes, edentulism, cognitive impairment, obesity and stroke. They also added that NCDs, particularly cardiovascular diseases, are the commonest cause of medical admissions among the elderly in Africa. Zimbabwe's aging population is also not exempted from these problems.

WHO (2005) as cited in Ibrahim and Damasceno (2012), almost three-quarters of people with hypertension (639 million people) live in developing countries with limited health resources and where people have a very low awareness of hypertension and poor blood pressure control:

Table 1 World Prevalence of HTN Mapping (1990-2011)

Prevalence of Hypertension	**Countries**
Very low (<10%)	India(Rural), Nigeria, Sudan, Cameroon(rural)
Low (<20%)	Cameroon(urban), Congo(urban), Ethiopia
Intermediate (20-30%)	China, Turkey, Uganda, Vietnam
High (>30%)	Zimbabwe, Brazil, Mozambique, Tanzania, Ghana, Mexico
Very High (>40%)	Seychelles, Venezuela, Burkina faso

Table 1 shows data from hypertension surveys undertaken after 1990 that defined HTN as blood pressure of 140/90 mm Hg or higher (Ibrahim & Damasceno, 2012). Many of these surveys were regional, multisite, or done in health-care facilities. The short coming of this data although important in our discourse is that they were done without a nationwide representative sample but institutionally. The prevalence of hypertension shown, in most developing and developed countries indicated then that low prevalence of HTN was found in rural settings. More than a decade later the situation could have probably changed or

remained the same. The current study brings in a different angle of analysis where estate workers' socio-economic status ranges from medium to low thus representing a fairly rural setting in Manicaland province whose population is mostly rural and their risk factors do differ.

As such, the underlying risk factors leading to HTN can help to explain why some populations are at a greater risk of developing hypertension than are others. Risk factors can be of genetic, behavioural, or environmental origin or be the result of a medical disorder, (Ibrahim & Damasceno, 2012). They can be reversible, irreversible, or associated with other predisposing disorders. Hypertension is mainly related to environmental and lifestyle factors rather than to genetically defined racial differences, thus categorization of prevalence goes beyond racial strata or ethnic lines.

Of course, some earlier scholars Rutledge and Hogan (2002); Everson-Rose and Lewis, (2005) chose to argue that substantial differences in the prevalence of hypertension between people of African and European origin are greatly reduced after adjustment for socioeconomic status, Genetic predisposition might be per missive rather than determinative. Most later day scholars posit that, with the addition of biosocial factors such as weight gain, high salt intake, psychosocial stress, and excess alcohol consumption necessary to cause disease (Cuevs, Williams & Albert, 2017; Okoro, Edafe & Leader, 2021; Marino, 2022). Genetic factors s argued in some texts seem to play an important part in salt sensitivity, which is common in black people. Single gene mutations promote salt retention through a defect in renal sodium handling (Sanders, 2009). The current study chose to stand with the argument that many more common variants associated with blood pressure remain to be discovered.

In another rural setting, Siego et al. (2017) conducted an unmatched case-control study in rural Burkina Faso using the WHO's STEPS approach. Similar to the current study, the prevalence of HTN and risk factors was not known in population living in rural areas and as such it aimed to identify risk factors associated with hypertension. It also observed socio-demographic, behavioral, psychological and socio-cultural characteristics by running a bivariate, stratified, and logistic regression analysis and calculated odds ratio (OR), adjusted odds ratios (AOR) and 95% confidence interval to identify risk factors. It found out that the main risk factors associated with hypertension were advanced age, family history of HTN, abdominal obesity, intra-family conflicts and absence of physical activity (Siego et al., 2017).

In more recent study on health workers, Mwale et al. (2024) systematic review was therefore conducted to determine the prevalence of hypertension and its associated factors among healthcare workers. Their choice of population was that hypertension affects people from different walks of life, including healthcare workers. Their review exposed that only 21 studies have been published from 1990 to 2023 that provided information on the prevalence of HTN and associated factors among healthcare workers. The studies converged on the premise that the prevalence of hypertension among healthcare workers ranges from 13% to 40%. Several factors have been found to be associated with HTN among healthcare workers, including male gender, being married, increasing age, increasing BMI, smoking, and workplace stress. It also concluded that Healthcare workers are at a high risk of hypertension and pre-HTN and implementing workplace wellness programs and providing regular blood pressure monitoring education can significantly improve their overall health outcomes (Mwale et al., 2024).

In another cross-sectional survey on healthcare workers, Monakali et al. (2018) carried out a study on the prevalence, awareness, control and determinants of HTN among primary health care professional nurses in Eastern Cape, South Africa. Their study used population of 203 healthcare workers who included professional nurses, practicing in PHC clinics, aged 18 years and above. Theirs study established the following associated factors; Age, alcohol use, parity, duration of practice, income and obesity. The prevalence was found to be 52%. Obiebi et al. (2020) also added to the body of knowledge pertaining to a cross-sectional study on the prevalence and correlates of hypertension among 232 healthcare professionals in Nigeria, from a tertiary hospital.

Their study found a prevalence of 36.2% and that being overweight/obese was associated with HTN and Odds Ratio were increasing age. In Nigeria other scholars such as Chinedu-Eleonu, Obasi and Nsonwu (2021) found a significant correlation between HTN and job stress; and Okoro, Edafe and Leader (2021) whose study reinforced that age was associated with HTN also took a keen interest on prevalence of HTN in healthcare workers.

In Thailand, Sirinara (2019) carried out a research to find out whether shift work and types of working patterns in healthcare workers is linked to increased risk of high blood pressure. The aim of their study was to quantify the prevalence of HTN and to determine the effect of shift work and working patterns in healthcare workers of a large tertiary, university-based hospital in Bangkok, Thailand. In that quest it carried out a cross-sectional study using the annual health examination results and occupational health questionnaires of 6,014 healthcare workers.

Shift work or night duty disrupts the body's circadian rhythm and can involve difficulties like insomnia during the sleep phase and or excessive sleepiness during waking hours due to a work schedule that requires working outside of traditional hours. Extended working hours and night shifts, where nutrition and sleep patterns are irregular, may hinder the effective management of chronic conditions in employees, such as hyprttention (Gamboa et al., 2021). In Zimbabwe healthcare workers, firefighters, police officers, military personnel, and drivers are among those who may be subjected to shift work. Working especially between 22:00 at night and 06:00 in the morning has been associated with metabolic syndrome, insulin resistance, and diabetes (Yeom et al., 2017). These adverse effects are particularly observed in individuals who work four or more night shifts per month, and in those with 20 or more years of night shift work.

By using OR, CI and P-value similar to the current study, it found the prevalence of HTN in healthcare workers to be 39.3%. it also exposed that after adjusting for other possible confounders, healthcare workers aged > 50 years had 5.41 fold increased odds of having HTN, in comparison with healthcare workers aged < 30 years (adjusted OR (aOR) = 5.41; 95% CI 4.47 to 6.55). Healthcare workers with obesity (body mass index (BMI) ≥ 30 kg/m2) had 14.34 fold increased odds of having HTN, in comparison with healthcare workers BMI < 18.5 kg/m2 (aOR=14.34; 95% CI 10.16 to 20.22), (Sirinara, 2019).The environmental setting to this study aligns with that of the current study and as such the current study's findings are not expected to deviate that much with Sirinara (2019)'s findings.

In addition, healthcare workers who did shift work, the odds of having HTN increased by 23%, in comparison with healthcare workers with no shift work (aOR = 1.23; 95% CI 1.03

to 1.48). Zimbabwe's health workers especially nurses are not abundantly available and as such some are drafted in long work schedules and are required to rotate for night duty. This further exacerbates their dire situation by putting pressure and demand on them. There were significant associations between hypertension and working patterns including working hours a day, number of night shifts a month, and the rest interval hours a day (Sirinara, 2019).

In essence their results showed that shift workers had heightened risks for HTN compared to the day workers, and the increase of risk was especially marked in workers with higher age, especially higher BMI. No working pattern factors were significantly associated with hypertension.

Kurtul et al. (2020) carried out a cross-sectional study in a university hospital in Turkey. Logistic regression analyses were performed to define the relationship between HTN and socio-demographic and occupational parameters. The prevalence of hypertension was 14.8%, and the logistic regression model revealed a statistically significant correlation between HTN and male gender, age and Body Mass Index (BMI) (Kurtul et al., 2020).

In Saudi Arabia, Baalharith et al. (2020) set out to determine the prevalence of HTN and its related factors among health-care employees in Najran. A cross-sectional survey was done on a sample size of 200 among health care professionals who worked for the Ministry of Health's, Directorate of General Health Affairs. Their study collected data through a self-administered questionnaire. Factors such as BMI, junk food, family history of HTN, smoking status, and physical activity were analysed. The study's findings show that healthcare employees, regardless of their job description, suffer from a high rate of HTN.

The HTN levels were therefore found to be strongly linked to factors such BMI, junk food, family history of HTN, smoking status, and physical activity.

On HTN in the general populace, Kayima et al. (2015) undertook a study to describe the prevalence of pre-hypertension and hypertension among young adults in a peri-urban district of Uganda along with the factors associated with occurrence of hypertension in this population. The results showed that the overall prevalence of hypertension was 15 % (95 % CI 14.2 – 19.6) and 40 % were pre-hypertensive. Among the 553 hypertensive participants, 76 (13.7 %) were aware of their diagnosis and all these participants had initiated therapy with target blood pressure control attained in 20 % of treated subjects. The HTN was significantly associated with the older age-group, male sex and obesity. There was a significantly lower prevalence of HTN among participants with HIV OR 0.6 (95 % CI 0.4–0.8, P = 0.007). Accordingly, there is a high prevalence of high blood pressure in this young peri-urban population of Uganda with sub-optimal diagnosis and control. There is previously undocumented high rate of treatment, a unique finding that may be exploited to drive efforts to control HTN.

Healthcare workers who fight diseases each and every time at hospitals end up developing HTN. In countries such as the Democratic Republic of Congo it is worse since the country has faced a plethora of pandemics such as Ebola in the past five decades for instance. Khonde et al. (2024) carried out a cross-sectional study in Kinshasa's healthcare facilities from among healthcare workers to assess the prevalence of HTN. They were done through a multistage stratified random sampling. Data was collected through a structured questionnaire using a modified WHO STEP-wise approach and Karasek questionnaire.

The variables measured to be associated with hypertension included socio-demographic, occupational, and lifestyle variables.

Their study found out a significant prevalence of hypertension among healthcare workers in Kinshasa. This was despite their medical knowledge of the causes and the risks of the disease. What comes out is that maintaining a healthy lifestyle among healthcare workers is fundamental for ensuring the efficiency and productivity of the healthcare system. Due to economic problems facing most African countries, healthcare workers are often forced to do other side jobs to augment incomes amid strained main incomes. This puts pressure on them given the fact that most of their schedules are already overloaded. As such similar to Zimbabwe there is a need for the regulation of multiple job holding (Khonde et al., 2024).

Looking at Community Health Workers (CHW) Oseni et al. (2024)'s study assessed their current role in the management of hypertension and patient satisfaction with the care received. A mixed method study (cross-sectional study and key informant interview) across five states in different geopolitical zones of Nigeria where 381 CHWs were selected for the study using multi-stage random sampling method and 14 patients with hypertension through purposive sampling method for key informant interview (KII) to assess the level of satisfaction with services of CHWs. Chi-square test was used to assess relationship between categorical variables. A $p\text{-value} \leq 0.05$ was considered statistically significant.

Thematic analysis of the text data from the KII was done using Nvivo. Community health workers currently have critical contributions in the management of hypertension in Nigeria. Hypertensive patients generally reported satisfactory experience with CHWs

managing them. The services rendered by CHWs can be improved upon by adequate supervision and training. Community health workers currently have critical contributions in the management of hypertension in Nigeria. Hypertensive patients generally reported satisfactory experience with CHWs managing them. The services rendered by CHWs can be improved upon by adequate supervision and training.

Gunes et al. (2024) in Turkey argued that hypertension is a common public health issue, and its incidence increases parallel to age. It is inevitable that certain occupational conditions may pose risks for high blood pressure or cause difficulties in managing blood pressure. Working under specific circumstances may compromise the safety of individuals with hypertension and potentially others. Therefore, it is crucial to implement activities that enhance awareness of hypertension, to ensure regular periodic examinations, and to establish necessary precautions in the workplace for the health of employees and the public. Given the limited resources offering guidance on hypertension in the context of occupational health, the authors of this paper, who hail from different disciplines, have prepared a set of consensus-based suggestions.

Work stress is a risk factor for the development and control of HTN. Associations have been found between high BP and factors like long working hours, labor-earnings imbalances, and job insecurity. Work stress has been associated with increased mean ambulatory BP measurements at work, at home, and during sleep. Occupations where work stress is prevalent, such as those of directors, professional drivers, jobs with few social interactions, emergency services (police, firefighters, health workers), and shift workers, can have more detrimental effects on employees' health, including HTN. Management of HTN in patients with high occupational stress requires appropriate

measures to minimize work strain. This should include individual coping strategies and lifestyle changes, as well as improvements to the work environment. Offering employee assistance programs or counselling services may be beneficial for those dealing with work-related stress (Jayarajah et al., 2019).

2.5.2 Life style Factors

Alcohol consumption is responsible for about 2.7 million annual deaths and 3.9% of the global burden of disease. Alcohol-attributable disease burden are cancers, chronic liver disease, unintentional injuries, alcohol-related violence, neuropsychiatric conditions and cardiovascular diseases. The role of alcohol consumption in injuries and violence among young adults and in nonfatal neuropsychiatric conditions makes its contribution to the disease burden larger than its contribution to mortality (Ezzati & Riboli, 2013).

International Agency for Research on Cancer (IARC) found that alcoholic beverages are carcinogenic to humans. Acetaldehyde the first breakdown product from ethanol (alcohol) is carcinogenic. Common cancers impacted largely by alcohol are breast and colorectal cancer, in addition to oral cavity, pharynx, larynx, oesophagus and liver cancer (Testino, 2011). Higher consumption of alcohol increases the risk of coronary artery disease and related mortality (Ezzati & Riboli, 2013).

More than 1 billion smokers worldwide live in low- and middle-income countries though prevalence of smoking remains relatively low in sub-Saharan Africa (Ezzati & Riboli, 2013). Tobacco smoking and exposure to second-hand smoke are responsible for about 6.3 million annual deaths worldwide and account for 6.3% of the global burden of disease (cardiovascular disease), mostly in low- and middle-income countries (Ezzati & Riboli, 2013).

Physical inactivity at work is defined in three categories, firstly as work involving mostly sitting or standing with walking for no more than 10 minutes at a time, secondly work that does not involve vigorous activities like heavy lifting for at least 10 minutes at a time and thirdly in term of number of days per week one does vigorous activities as part of one's work (MOHCC, 2005).

Physical inactivity is an established risk factor for premature mortality and several NCD. In 2008, physical inactivity accounted for 6%–10% cases of premature mortality, coronary heart disease, type 2 diabetes, breast cancer and colon cancer globally. Physical inactivity-related healthcare costs associated with these NCD was noted to be high (Katzmarzyk et al., 2012).

Rutledge and Hogan (2002) quantitatively reviewed and critiqued evidence from prospective cohort studies (greater than 1-year follow-up) by assessing associations between psychological factors such anxiety, anger, depression and HTN development. Their study found there is moderate support for psychological factors as predictors of HTN development, with the strongest support for anger, anxiety, and depression variables.

What comes to naught is that, past and present theories regarding mechanisms for this potential relationship center on; (a) cardiovascular reactivity to stress (the current study adopts this assertion) (b) neuro-hormonal models suggesting that psychological characteristics may predispose hypertension development by altering central nervous system control of baroreceptor function, opioid activity, and neurotransmitter levels current study recognizes this medical disposition but could not explore it due to feasibility and practicality of the resources available to the researcher's disposal; and (c) high-risk behavioral dispositions associated with psychological characteristics, including poor diet,

obesity, exercise habits, smoking, and alcohol abuse (the current study explored this assertion) (Rutledge & Hogan, 2002).

Molla (2015) carried out a research meant to provide compressive and up to date evidence on the prevalence and investigate the associated factors of HTN in Ethiopia. The study undertook a quantitative epidemiological systematic literature review by searching different published articles in different data bases. The study found that hypertension was considerably prevalent in Ethiopia. Health promotion strategy tailored to the education on modifiable risk factors and establishment of blood pressure screening in primary health care context would be of immense value both in urban and rural areas. Their study also highlighted the need for implementation of timely and appropriate strategies for prevention and control of HTN (Molla, 2015).

The increasing prevalence of HTN is attributed to population growth, aging and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress. Many factors contribute to the high prevalence rates of HTN including eating food containing too much salt and fat; not eating enough fruits and vegetables; overweight and obesity; harmful use of alcohol; physical inactivity; ageing; genetic factors; psychological stress; socioeconomic determinants and inadequate access to health care (WHO, 2014).

Mozaffarian et al. (2016) as cited by Cuevs, Williams and Albert (2017) highlighted that HTN is an important risk factor for a variety of health conditions, such as cardiovascular disease, stroke, and kidney failure. Nevertheless, this burden is unevenly distributed in society, with Blacks having the highest prevalence of HTN compared to their White counterparts, (Cuevas, Williams, & Albert, 2017). Despite improvements in increasing

the awareness and treatment of hypertension, racial/ethnic differences in HTN persist. Psychosocial factors, such as hostility and job strain, have been found to be associated with higher circulating levels of catecholamines, higher cortisol levels, and increased BP over time (Everson-Rose & Lewis, 2005).

Mutowo et al. (2015) also carried out a meta-analysis on the published studies, using the random-effects model to estimate the pooled prevalence of HTN in Zimbabwe and describe its trend since independence in 1980 using secondary source data. Their study concluded that a high prevalence of HTN in Zimbabwe, with urban areas having higher prevalence than rural areas. The study highlighted that estimating the true prevalence of HTN in Zimbabwe was a challenge due to methodological differences. Therefore, it prescribed that longitudinal national surveys using standardized methodologies are urgently needed in the future to further define the prevalence of HTN and depict trends, (Mutowo et al., 2015).

In Napal, Ghimire et al. (2020) conducted a cross-sectional study aimed at determining the prevalence and factors associated with HTN among health workers of central hospitals. Face to face interviews and a questionnaire were used to gather Information regarding socio-demographic, clinical, behavioral, occupational characteristics and perceived stress. The prevalence of hypertension was 35.31%. Statistically a Binary logistic regression model was used to identify the associated factors of HTN. After controlling potential confounding factors through multivariate analysis, seven factors (increasing age, low educational level, being married, low fruit & vegetable consumption, low physical activity, alcohol use, and increased perceived stress) were found as significant independent predictors of hypertension (Ghimire et al. 2020).

In another sub-Saharan Africa study in Nigeria, Owolabi et al. (2012), went on to determine the prevalence of HTN and related risk factors and to assess the level of awareness of hypertensive status among the health workers. The study used a questionnaire to collect socio-demographic data such as age, sex, marital status, religion, nationality, occupation, educational status, physical activity, family type, history of alcohol consumption or cigarette smoking, history of HTN, family history of HTN, history of diabetes, ethnic group, and level of education (Owolabi et al., 2012). The blood pressure, weight and height were measured and filled into a recording schedule. The prevalence of HTN was found to be 20.1%. Their study found a strong association was found between the prevalence of HTN and increasing age, body mass index, alcohol consumption and duration of employment.

Owolabi et al. (2012), chose to look at having the knowledge whether one had knowledge of having HTN or not. Their research asserted that hypertension is on the increase over the last four decades in Africa; however, the awareness of this condition remains very poor in most parts of Africa. It is on record (WHO, 2023) that HTN is often unnoticed and undiagnosed because it is usually asymptomatic, and as such, many people with hypertension are unaware of their condition. As such, the level of awareness of hypertension varies considerably between countries and regions. In economically developed countries, there were relatively high levels of awareness, with approximately one-half to two thirds of hypertensive aware of their diagnosis (Kearney et al., 2004).

Marino (2022)'s study looked the causes of hypertention. The study exposed that HTN is a long-term medical disorder characterized by chronically excessive blood pressure in the arteries. High blood pressure is another name for it. Symptoms of high blood pressure are

uncommon. Long-term high blood pressure has been associated to stroke, coronary artery disease, heart failure, atrial fibrillation, peripheral arterial disease, vision loss, chronic renal disease, and dementia. There are two types of HTN mentioned in academic texts. Primary HTN refers to the situation when a certain diet and lifestyle are combined, then blood pressure rises with age, increasing the chance of developing hypertensive later in life. Blood pressure is influenced by a variety of elements in the environment. In salt-sensitive people, excessive salt intake raises blood pressure; lack of activity and central obesity can also play a role in some situations. Other factors, such as coffee consumption and vitamin D insufficiency, may play a less apparent influence. Hypertension is exacerbated by insulin resistance, which is frequent in obesity and a component of syndrome X (Marino, 2022).

Marino (2022) further puts secondary hypertension as being caused by a known aetiology. The most prevalent secondary cause of hypertension is kidney dysfunction. Cushing's syndrome, hyperthyroidism, hypothyroidism, acromegaly, Conn's syndrome or hyperaldosteronism, renal artery stenosis, hyperparathyroidism, and pheochromocytoma are all endocrine diseases that can cause hypertension, (Marino, 2022). Obesity, sleep apnea, pregnancy, coarctation of the aorta, excessive eating of liquorice, excessive drinking of alcohol, some prescription drugs, herbal remedies, and stimulants like cocaine and methamphetamine are all causes of secondary hypertension.

Pereira et al. (2021) estimated through a cross-sectional study with 490 health workers in the macro-regional region of Northern Minas Gerais, Brazil. The study estimated the prevalence and factors associated with prehypertension and HTN among health workers who work in high-complexity services for critically-ill and chronic patients. Multinomial

Logistic Regression was used for the multiple analysis. The prevalence of arterial HTN was 21.8% and that of prehypertension was 25.9%. The chances of developing arterial HTN and prehypertension were higher in male professionals, aged ≥40 years, in civil servant workers and those who were obese or overweight. The use of continuous medication and night shift work were associated with hypertension and prehypertension, respectively. The prevalence of arterial hypertension in the group of workers was lower than that of the Brazilian population (Pereirra et al., 2021).

Monakali et al., (2018) points out that there are several factors responsible for the development of the disease. Among them are the behavioral ones, such as an unhealthy diet, obesity, physical inactivity, alcohol and tobacco consumption. However, work-related factors such as stress and shift work/night work have also been implicated in the etiology of HTN. In terms of work specific situations, Magalhaes (2014) posited that the work environment definitely influences the worker's health. Thus, health workers who work in high-complexity services, such as hemodialysis, oncology, emergency department and intensive care units, have daily contact with stressful situations, such as other people's pain, tragedy, and suffering, as well as the fine line between life and death.

How HTN comes in emanates from the nature of the work done when carrying out healthcare duties. This is because they require continuous assistance to patients, compliance with strict rules, routines and regulations, fragmented activity division, hierarchical rigidity and insufficient human resources. Together, these factors generate a high load of exhaustion and physical and emotional stress, increasing the risk of developing HTN (Souza, 2018).

What constitutes the relevance of the current study is on the prevalence of HTN in healthcare workers which has been studied for a few decades and, although, further investigations may be required on the health and working conditions of professionals who work specifically with critically-ill and chronic patients and the association with the disease. What demonstrates the relevance of this study is the need to expand the research on the disease and its factors associated with this group of professionals, aiming to identify the factors, improve health and working conditions and job satisfaction, which may consequently reflect directly on the quality of care provided to the patient?

In the middle-east, Younis et al. (2024) also did another cross-sectional study with multistage stratified random sampling in 10 hospitals and 15 private hospital of the Ministry of Health in Palestine. In contrast to the current study their study used self-administered questionnaire to collect information on socio-demographics, lifestyles, health profiles and health-related risk factors. Factors to measure association included socio-demographics, lifestyles, health profiles and health-related risk factors. The anthropometric parameters were measured, including height, weight, waist circumference (WC), hip circumference (HC), and systolic and diastolic blood pressure. They found out that smoking, coffee intake, physical activity and BMI, were associated with the risk of hypertension. Their findings indicated that effective efforts in maintaining a healthy lifestyle were needed to prevent HTN among healthcare workers.

Baalharith et al. (2020)'s study found out that non-vegetarians made up 78.3 percent of the medical workforce, while non-vegetarians made up 78.7 percent. 45.8% of medical professionals were overweight, and 20% were obese, whereas 23% of non-medical personnel were overweight, and 23.7 percent were obese. 35.8% of medical personnel and

51.7 percent of non-medical employees consume excessive amounts of carbonated beverages, while 43.8 percent of medical workers eat junk food, (Baalharith et al., 2020). Their findings also add that medical professionals had a family history of hypertension in 57.5 percent of cases, while non-medical employees had the same condition in 37.2 percent of instances. Sixty percent of medical employees and 52.5 percent of non-medical workers stated they were overly exposed to stressful situations (Baalharith, 2020).

Their findings matched those of a study conducted by Akinwumi, et al. (2020) on work-related stress perception and hypertension amongst health workers of a mission hospital in south-western Nigeria, which found that the prevalence of hypertension amongst subjects with high job strain is 42.4 percent, which is quite high when compared to the prevalence of HTN amongst subjects with active, passive, and low job strain, which is 15.8 percent (Owolabi et al., 2012).

They further added that workplace stress has is also a risk factor responsible for the development of HTN. Zimbabwe is not an exception pertaining to that assertion; this is often attributed to the high demands at work by superiors or working schedules, poor decision-making abilities, psychological job load, and physical exertion. These variables can contribute to HTN among health care workers.

Gallagher et al. (2006) a cross-sectional online survey was distributed to nurses and midwives via the professional association and Nursing Directors. Questions were taken from published longitudinal health studies for blood pressure, HTN and key socio-demographic and health factors. Working nurses included in this study have advantages in cardiovascular health through a lower prevalence of hypertension than the general population and most demonstrated vigilance in health monitoring by having had a recent

blood pressure check to report. However, just as it is with the general population, older nurses have increased risk of HTN, and this is an important group to treat to reduce the impact on workforce productivity, especially given the potential impact of combined age-related conditions (Gallagher et al., 2006). The study argued that mid-life nurses and smokers diagnosed with HTN are at significant risk of suboptimal treatment with antihypertensive medication and require targeted intervention.

Specifically, on measuring alcohol consumption, Khonde et al., (2024) asserts that alcohol consumption by healthcare workers refers to consumers who could have had consumed alcoholic refreshments within the 30 days preceding the survey. Such consumers could be considered alcohol consumers and should be eligible for inclusion in HTN studies. According to the literature texts on alcohol consumption, refers to the intake of four standard glasses daily for women and six standard glasses daily for men. The net alcohol content of the standard glass is 10 g of ethanol.

The standard glass is the international unit for alcohol and is equivalent to an ordinary bottle of beer (285 ml), a medium-sized glass of wine (120 ml), an aperitif (60 ml), or a small glass of liqueur (30 ml), this is according to WHO STEPS surveillance manual, (2006) as cited in Khonde et al., (2024). Pertaining to smoking Adjobimey (2022) asserts that healthcare worker who was smoking or had smoked cigarettes or any other substance containing nicotine and tar in the last 12 months was considered a smoker.

2.5.3 Economic Factor

High rates of poverty and inequality in the society exacerbate challenges such as living in low-income neighborhoods which are precursors for NCD development. Wealthier residents, especially in urban areas, tend to adopt unhealthy eating habits, as a lifestyle

change as well as availability of unhealthy foods (Mwangi et al., 2020). In low-income countries, overweight and obesity are more common in more socioeconomically affluent groups than in high-income countries were those living in less affluent circumstances are more likely to experience overweight and obesity (Adams, 2020).

In Zimbabwe, Gwini et al. (2024) carried out a study by assessing the frequency of HTN and improving awareness among the population of the sequel of elevated blood pressure (BP). Their study was in response to The May Measurement Month 2021 campaign in Zimbabwe campaign to assess the frequency and awareness of HTN in Zimbabwe. Of the 2094 participants used in Gwini et al. (2024)'s study one-third (37.3%) were found to be over hypertensive, half of hypertensives (49.7%) were aware they had elevated pressure, and less than half (45.0%) of the hypertensive patients were on antihypertensive medications.

In terms of age, increasing age was directly proportional to HTN with a large leap from 9.5 to 27.7% between the 18–29 and 30–39 age groups. Their study exposed that HTN remains a major public health challenge in Zimbabwe. Results from the campaign showed that nearly one in every three adults screened were hypertensive, thus potentially reflecting a major public health concern in Zimbabwe then. The situation is most likely to have worsened given the fact that the health sector has went through quiet a lot since Gwini et al. (2024)'s study was carried out. Zimbabwe's healthcare workers have been flocking into the diaspora since the COVID-19 pandemic, nurses and doctors have been going through industrial action after industrial action until they were arm-twisted by repressive statutes which were designed to stifle their labour rights. Their concerns were

legit; they had earlier raised poor remuneration as well as lack of personal protective equipment to carry out their duties.

A systematic review and meta-analysis of studies on the prevalence of hypertension in Zimbabwe, from April 1980 to December 2013 reveals a high prevalence of 30%. Hypertension prevalence was higher in studies in urban settings compared with studies in mixed settings (urban and rural), indicating the increase of cardiovascular risk factors associated with urbanization and economic progress. The development of national prevention policies and control strategies for HTN are critical to reduce the increasing burden of HTN in Zimbabwe.

The four studies Matenga et al. (1997); Hakim et al. 2005; Marwiro (2012) were conducted across five provinces in Zimbabwe. The studies had a total of 4829 subjects and the enrollment years of the studies ranged from 1997 to 2010. Two studies Matenga et al. (1997); Hakim et al. (2005) conducted in predominately urban areas, had a total sample size of 1077, while the other two studies (Mafunda et al., 2000; Marwiro, 2012), conducted in both urban and rural settings, and had a total sample size of 3752. The four studies did not state age-specific data related to gender, and age was limited to above 25 years old in the four studies.

One peculiar study was carried out in Zimbabwe by Marwiro (2012) on the prevalence and risk factors for hypertension among Bulawayo City Council Employees. Institutional Repository at University of Zimbabwe reported a prevalence which was higher in females than in males and a family history of hypertension which was strongly associated with hypertension in participants in the study.

2.5 Summary

The literature review done in this chapter looked at different to similar research methodologies used as well as various study settings that shaped the literature around the research problem. Some examined prevalence through bivariate and multivariate analysis which used statistical estimates because of Odds Ratio/Prevalence ratio, Confidence Interval and Probability Value (P-Value) such as (Bosu et at., 2017). Earlier scholars such as Rutledge and Hogan (2002); Everson-Rose and Lewis (2005) chose to argue on the substantial differences in prevalence of hypertension between people of African and European origin. Other studies such as, Williams and Albert (2017); Okoro, Edafe and Leader (2021); Marino, (2022) chose to argue along genetic factors explaining prevalence. Some carried out epidemiological studies Adeloye and Basquill (2014) modelling the factors in logistical form. The current study, undertook an analytical cross-sectional study through retrospective secondary data analysis and primary data extraction concerning the physiological risk factors (Body mass index and lipid profile) associated with hypertension among health workers.

Bento et al. (2015) as cited by Rael (2020) there is a positive association between physical activity and systolic blood pressure while no significant relationship between diastolic blood pressure and physical activity was found. Low and moderate physical activity was associated with high blood pressure. Other scholars Owolabi et al. (2012); Baalharith et al. (2020); Ghimire et al. (2020); Gunes et al. (2024) have also used physical activity as one of the factors associated with hypertention. The current study's aim was to assess if there was an association between physical activity (as one of the variables) and hypertention levels among Hippo Valley Estate healthcare workers.

In terms of obesity and HTN, according to Mungreiphy, Kapoor and Sinha (2011) as cited in Rael (2020) the maximum systolic and diastolic pressure was observed in obese individuals while minimum diastolic and systolic pressure was observed in underweight individual (Rael, 2020). The empirical literature review has exposed that some researchers Rutledge and Hogan (2002); Abegunde and Owoaje (2013); Obiebi et al. (2020); Marino (2022) have found that there is a strong positive relationship between obesity and HTN. This study aims to assess if there is an association between obesity / overweight (as one of the variables) and HTN levels among HVE healthcare workers.

On Alcohol, smoking and HTN, the review of literature exposed that researchers converge on the precipice that, HTN and high risk of atrial fibrillation have been associated with increased alcohol consumption. More so, alcohol consumption increase body weight, body fats, BMI and total energy intake, resulting to increase in systolic blood pressure (Rael, 2020). Smoking is the second attribute after alcohol consumption to be associated with HTN. The evidence in Cavagioni and Pierin (2012) as cited by Rael (2020) suggests that among hypertensive patients working as a health professional in Brazil for instance 20.1% were smokers while 47% were alcoholic. Other scholars also came in such as Owolabi et al. (2012); Ezzati and Riboli (2013); Baalharith et al. (2020); Mwale et al. (2024) and weighed on the association between smoking and HTN. The current study aimed at assessing if there is an association between smoking and alcohol consumption (as associate variables) and HTN among Hippo Valley Estate healthcare workers.

In terms of occupational stress related factors, Cuffee et al. (2014) argument stood out as; job insecurity, the nature of job (heavy manual or strainous) or long hours of working per week was associated with elevated diastolic blood pressure. Other scholars like Marwiro

(2012); Kurtul et al. (2020); Khonde et al. (2024); Gunes et al. (2024) argued that work-related out socio-demographic variables such as Work experience; salary grade or Shifts are associated with HTN. The current study's aim was to assess if there is an association between occupations related variables and HTN among Hippo Valley Estate healthcare workers.

In terms of socio-economic factors, Abubakar et al. (2009) as cited in Rael (2020) posited that economic and social factors affect blood pressure. They also found the prevalence of high blood pressure is highest in an urban setting. More so, Miyaki et al. (2013), also juxtaposed some level of education with HTN and it found that education level and household income were significantly associated with salt intake, which is known to influence blood pressure. Other scholars weighed in on developing countries such as Zimbabwe, in Nigeria, Napal or Zimbabwe.

This chapter outlines the conceptual framework for identifying factors associated with developing HTN in existing literature and details on the factors associated with HTN that will aid in addressing study objectives.

CHAPTER 3 METHODOLOGY

3.1 Introduction

Chapter 3 describes the study setting, study population, study period together with sampling technique and sample size that was used for the study. The data collection tools and methods used for data analysis employed for the study are also detailed in this chapter. Ethical considerations are also stated.

3.2 The Research Design

In this study, an analytical cross-sectional study was used with both qualitative and quantitative methods. A retrospective secondary data analysis was also done to address physiological risk factors (Body mass index and lipid profile) associated with hypertension among health workers for the period of January 2022 to December 2023**.** Analytical cross-sectional studies are useful for establishing preliminary evidence for a causal relationship and examining the association between exposure and disease onset for chronic diseases where researchers lack information on time of onset (Alexander, 2015).

3.2.1 Study Site

The study site was Hippo Valley Estate an agricultural based company, located in the south-eastern region of Zimbabwe in Chiredzi town, in Chiredzi district. It was established initially as citrus estate in 1956 providing canned Hippo Valley fruit until the 1970s' when there was the sugar market crash. The estate initiated an irrigation program to water sugar plantations and today it is the major producer of sugar in conjunction with Triangle Sugar Estate.

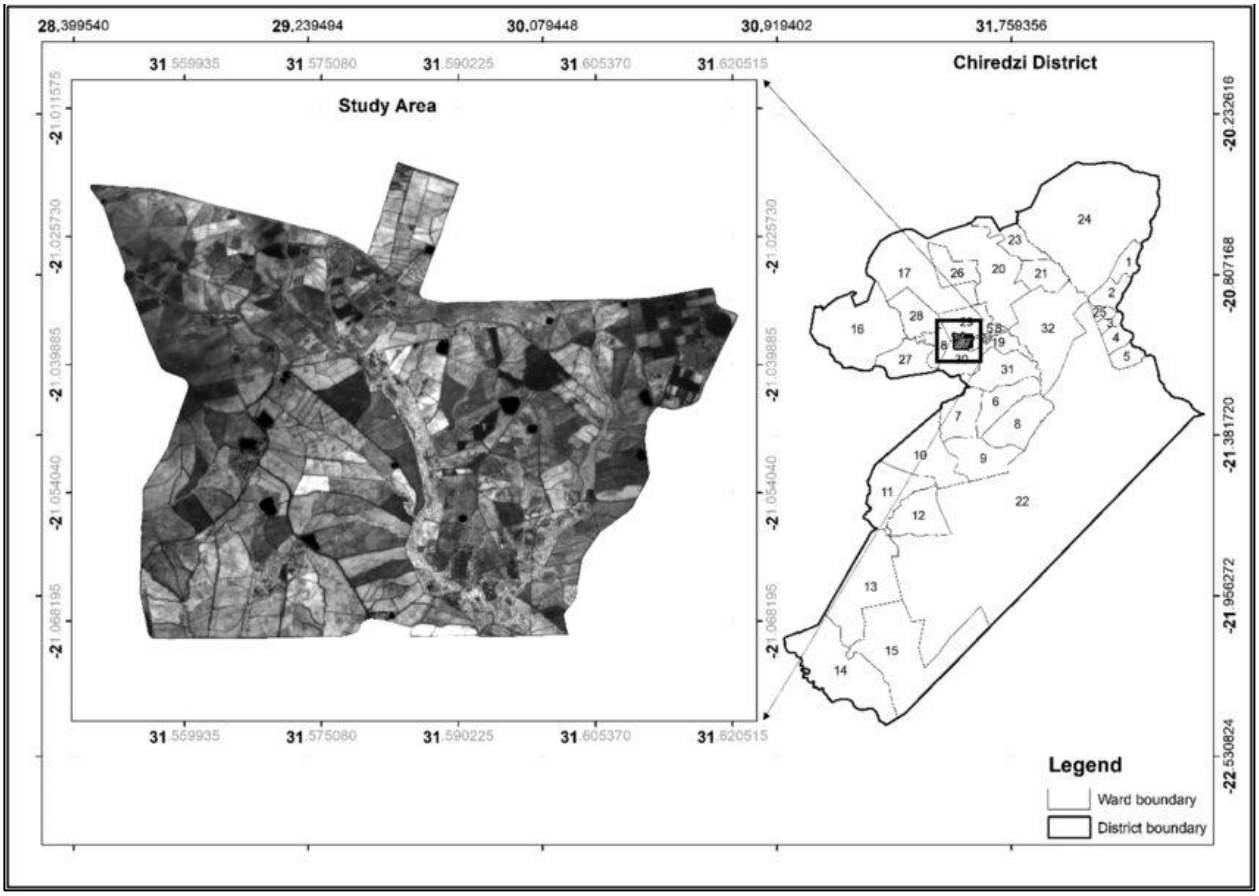

Figure 3 Hippo Valley Estate Map

Source: Pride Mafuratidzea (2023)

3.3 Population and Sampling

The target population was 159 health care workers employed by Hippo Valley Estate. These consist of doctors, matron, nurses, public health department staff, pharmacy staff, laboratory staff, primary health care assistant, community health care worker, nurse aids and hospital orderlies. These are from the Hippo Valley Medical Centre.

3.3.1 Inclusion Criteria

Health workers above the age of 18years and permanently employed by Hippo Valley Estate

3.3.2 Exclusion Criteria

Health workers working as locums (non-permanent worker)

3.3.3 Study Period

The secondary data analysis focused on the period from January 2022 to December 2023.

3.3.4 Sample Size

The sample size was calculated using Epi info version 7.2.6.0. For this study, a sample size of 97 participants (health care workers) was calculated assuming that prevalence proportion of NCD is 20% from the study done on Prevalence of chronic conditions and multimorbidity among healthcare workers in Zimbabwe (Calderwood J C, 2024) given that confidence interval is 95% and level of precision is 1% (design effect). Adjusting sample size for non-response and missing/incomplete records on physiological risk factors by 10%, the minimum sample size required for this study was 107 health care workers.

3.3.5 Sampling Technique

The sampling method used was stratified random sampling method, which involves grouping participants by job status and randomly select participants proportionally relative to the total sample. This sampling technique is used because of participants who brought about relevance of the study. The participants are conveniently selected because of their job status being a health worker. The researcher selected this sampling method to ensure data collected is valid, significant and reliable.

3.4 Data Collection Instruments

The secondary data analysis utilized pre-existing data in the form of wellness clinic register for health-workers to collect lipid profile results, BMI (body mass index) and prevalence of hypertension among healthcare workers for the period of January 2022 to

December 2023. The register records all the chronic illnesses and NCD by department and medication they are on. A questionnaire in Shona and English were used, as it was the most practical data collection tool for this type of studies (Brestoff et al., 2013). This structured interviewer-administered questionnaire was used to collect socio-demographic, life style risk factors and economic risk factors of health care workers that may have predisposed them of developing NCDs. Vital medical data was collected through measurement using an electronic sphygmomanometer.

3.5 Data Collection Procedure

The secondary data was collected on physiological risk factors (BMI, LIPID PROFILE) and prevalence of hypertension among health care workers from January 2022 to December 2023 by utilizing pre-existing data in the form of wellness clinic register and patient book for hypertension for health-workers employed at Hippo Valley Estate. Sociodemographic, life style and economic data will be collected through structured interview questions. Vital medical data such as blood pressure (BP) was collected through measurement using an electronic sphygmomanometer on participants enrolled in the study.

3.5.1 Pretesting Tools

Pretesting of data tools and procedure was done using the wellness registry, structured questionnaire -interview on healthcare workers from non- participating health facility namely Colin Saunders Hospital in Triangle which is also run by same organization, Tongaat Hulett Zimbabwe. This assessed instrument validity and reliability. The pre-test data was also analysed and data collection tools adjusted accordingly in line with feedback received from them.

3.7 Analysis and Organisation of Data

Microsoft excel was used to clean data for errors, missing data fields, duplications, inconsistent data and out of range data. In missing data complete case analysis by variable was employed. STATA version 12 was used to generate frequencies, medians and proportions. Variables were measured against the outcome of interest using bivariate analysis and their 95 % confidence interval was recorded. For qualitative data of the study, data was collected through structured interviewer administered questionnaire and processed and analysed using manual thematic coding.

3.8 Ethical Consideration

Permission to conduct the study and utilize the wellness clinic register for HTN patients under their NCDs Registry was obtained from Senior Medical Officer of HVE. The data upon being received from their wellness clinic was de-identified and kept confidential in a password protected folder and password protected laptop. Ethical approval to conduct study was sort from Africa University Research Ethics Committee. Written informed consent was obtained from participants that participated in the study. This participation was voluntary and participants are free to opt out at any stage of the study. No incentives was given for the study and there are no foreseen risks associated with the study. Vital measurement for blood pressure will be checked using an electronic sphygmomanometer for participants enrolled in the study.

3.8.1 Plan for Dissemination

The findings were presented and sent on email to the Corporate Medical Officer, Senior Medical officers and Public Health Officer for HVE.

3.9 Summary

The chapter describes the study methodology that was utilised by describing study design, study setting, and population under study, sampling technique that were used. Data collection tools, procedures and analysis together with ethical considerations were described that were used for the study.

CHAPTER 4 DATA PRESENTATION, ANALYSIS AND INTEPRETATION

4.1 Introduction

This chapter outlines the presentation, analysis, discussion, and interpretation of data extracted from the field. The chapter addresses the objectives set in chapter 1, from which the research questions were derived. The chapter used Microsoft Excel as well as STATA in aiding the coding, computation and presentation of data. The results generated were further analysed and discussed so as to address the research problem identified. The chapter's results were then generalized on the whole target population of Health care workers at Hippo Valley estate.

4.2 Data Presentation and Analysis

4.2.1 Response rate

Table 2 Questionnaire Response Rate

Description of sample	Target population	Sample	Actual response rate
Hippo Valley Estate health care workers	159	107	107 (100%)

Source: Field data

Table1 of 4.2 shows, that there were 159 healthcare workers who were the targeted population at Hippo Valley Estate. These consisted of doctors, matron, nurses, public health department staff, pharmacy staff, laboratory staff, primary health care assistant, community health care worker, nurse aids and hospital orderlies. The sample which was used was 107 healthcare workers which represented 67% of the target population. The chosen sample (107) of the actual participants reported a 100% response rate. The results

could be inferred on the population given that the sample was a proportionate representation of the target population.

4.2.2 Socio-Demographic Characteristics of Study Population

This section presented the socio-demographic variables analysed in the study in line with the research problem. These included gender, marital status, age group, occupation, work experience and salary grade.

4.3.1 Gender

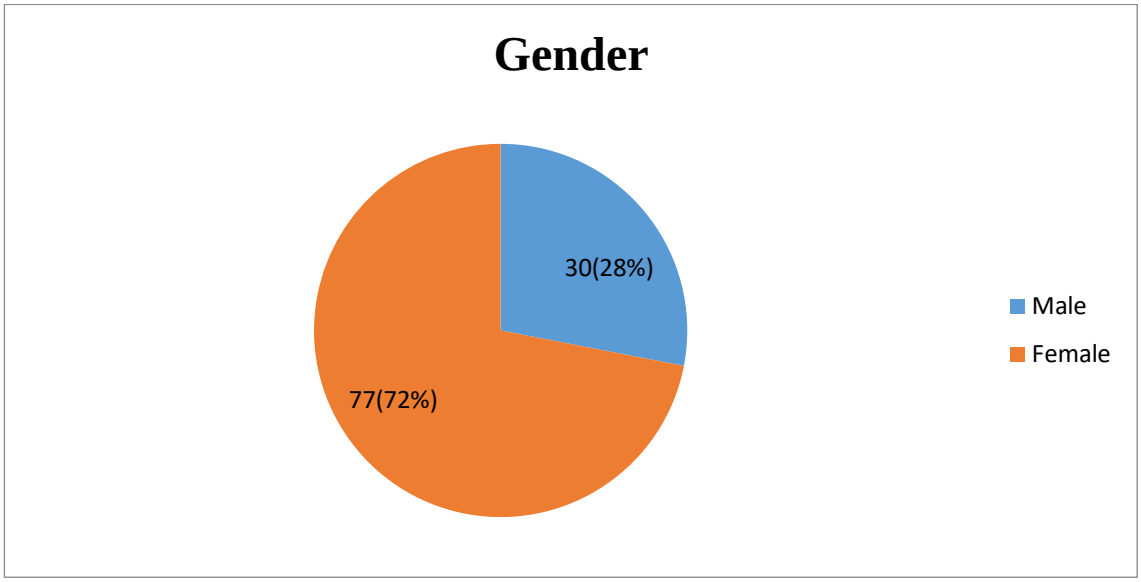

Figure 4 Percentage Representation by Gender

Source: Researcher's computation from raw data

Gender constituent was a valid demographic variable to be included such a study mainly because of what the Zimbabwean community revers of the health sector as being more of sector for women. This is reflected by the gender representation of females 77(72%) and men 33(28%), thus warrants an investigation so as to find out if hypertension affects women as much as men. Evidence from Mwangi et al., (2020) and Idris et al., (2021) reinforces and comes to similar assertion that, women are more vulnerable to NCDs in

workplace irrespective of sharing the same environment due to the distinct biological and psychological differences between men and women. More so, if earlier finding the previous scholars converge on the fact that two out of three deaths in women in the health sector are due to NCD and the absolute number of NCD deaths in women is similar to men, then the analysis of this current study along gender lines in terms of determining how NCD prevalence as well as risk factors differ across different gender among other socio-demographic variables was valid.

4.2.3 Age

Table 3 Tabulation of Frequency of Age by Group

Variable (Age Groups in years)	Overall (n=107)	Women (n=77)	Men (n=30)
18 -29	2(1.9%)	2(2.6%)	0(0%)
30-39	24(22.4%)	16(20.8%)	8(26.7%)
40-49	39(36.4%)	28(36.4%)	11(36.7%)
>50	42(39.3%)	31(40.3%)	11(36.7%)

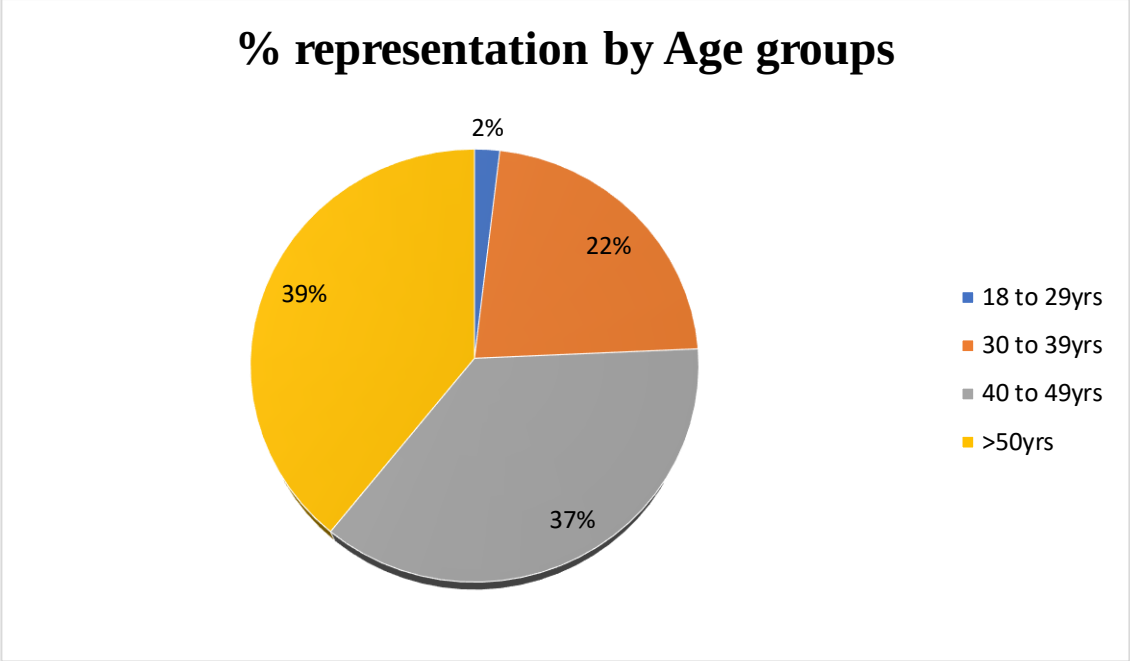

Figure 5 Percentage Frequency Representation by Age Groups

Source: Researcher's computation from raw data

Figure 5 above shows distribution of respondents by age groups. The majority 42(39.3%) of respondents fell within the 50+ age group, followed by the 40 to 49 years age group 39(36.4%), then the 30 to 39 years age group 24(22.4%) and lastly the 18 to 29 years age group 2(1.9%). The inclusion of this variable in the analysis of the prevalence of hypertension in Zimbabwe is re-enforced by the submission of The World Health Organization (2023) that each year, 17 million people die from a NCD before age of 70 years.

4.2.4 Marital Status

Table 4 Tabulation of Frequency of Responses by Marital Status

Variable (Marital status)	Overall (n=107)	Women (n=77)	Men (n=30)
single	17(15.9%)	17(22.1%)	0(0%)
Married	72(67.3%)	44(57.1%)	28(93.3%)
Divorced	9(8.4%)	9(11.7%)	0(0%)
Widowed	9(8.4%)	7(9.1%)	2(6.7%)

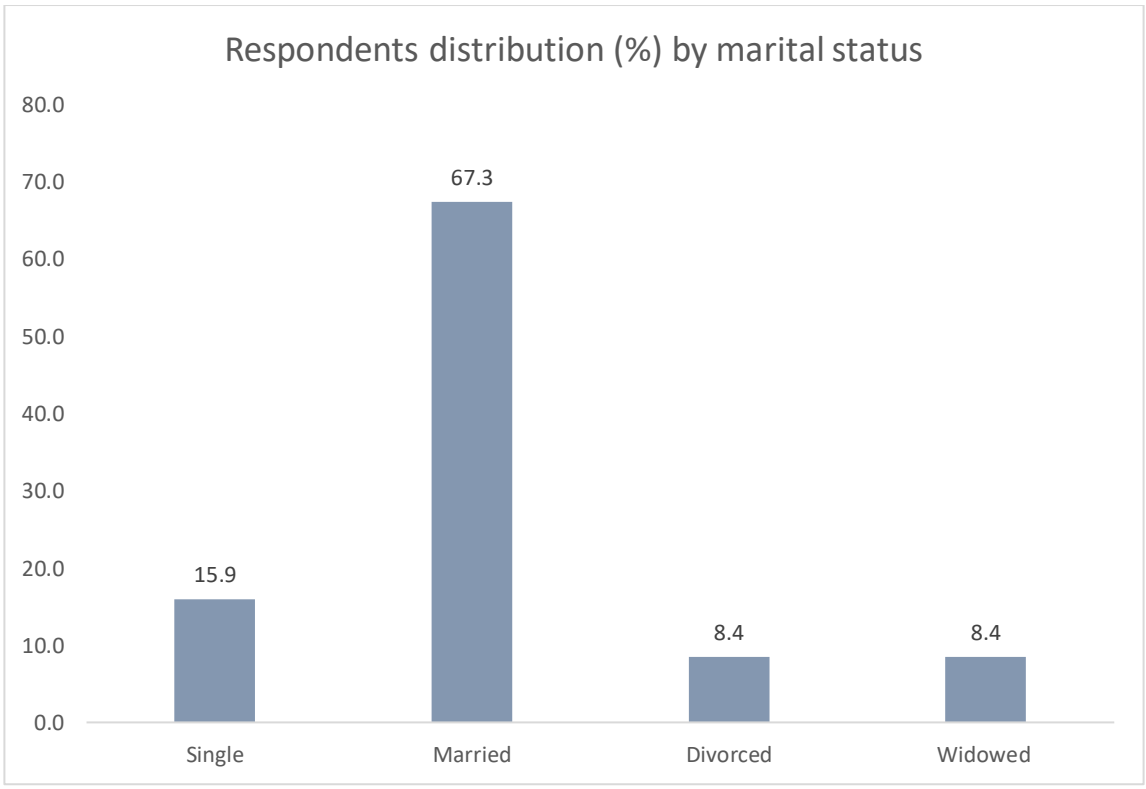

Figure 6 Respondents distribution (%) by Marital Status

Source: Researcher's computation from raw data

Figure 6 above shows distribution of respondents by marital status. The majority (67.3%) of respondents are married, followed by singles (15.9%), while divorced and widowed participants were at 8.4% each. The Zimbabwean economy has been in dire straits in the last three decades and the Zimbabwean health sector has not been spared. This is evidenced by mass exodus of health personnel into the diaspora citing poor working conditions and failure to take care of families exacerbated by poor remuneration and high cost of living. Those who are married as expected have greater responsibilities. Those who are divorced and widowed are also expected to have pronounced hardships due to reduced income as well as emotional vacuums, which may result in health workers being susceptible to hypertension. Adams (2020) reinforces with the assertion that, those living in less affluent circumstances are more likely to experience overweight, obesity or being under-weight (malnourished) due to economic situation which has an indirect effect on marital status in Zimbabwe.

4.2.5 Occupation

Table 5 Tabulation of Frequency of Responses by Occupation

Variable (Occupation)	Overall (n=107)	Women (n=77)	Men (n=30)
Doctor	4(3.7%)	2(2.6%)	2(6.7%)
Nurse	9(8.4%)	8(10.4%)	1(3.3%)
Public Health department	22(20.6%)	8(10.4%)	14(46.7%)
Matron	1(0.9%)	1(1.3%)	0(0%)
Pharmacy staff	5(4.7%)	3(3.9%)	2(6.7%)
Lab staff	2(1.9%)	1(1.3%)	1(3.3%0
PHCA	22(20.6%)	20(26.0%)	2(6.7%)
Community Health Workers	20(18.7%) 14(13.1%)	18(23.4%) 12(15.6%)	2(6.7%) 2(6.7%)
Office orderly Medical admin	8(7.5%)	2(2.6%)	6(20.0%)

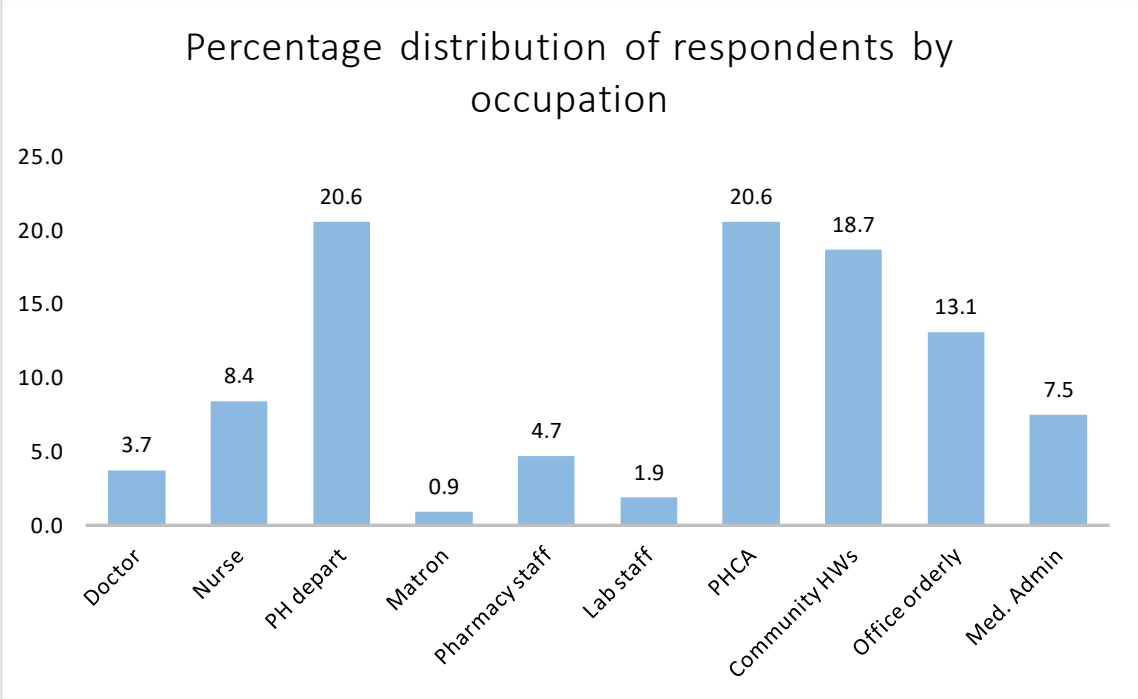

Figure 7 Percentage Distribution of Respondents by Occupation

Source: Researcher's computation from raw data

Figure 7 above shows distribution of respondents by occupational status. The top three occupational streams that had the majority of respondents are from PH department (20.6%), PHCAs (20.6%) and Community Health workers (18.7%). Occupational streams with the least respondents were Matron (0.9%) lab staff (1.9%) and Doctors (3.7%). The results above show that all healthcare workers were represented. This inclusivity by designation enriched the study's findings in that it represented everyone from the estate's health care facility.

4.2.6 Work Experience

Table 6 Tabulation of Frequency of Responses by Work Experience

Variable (Work experience)	Overall (n=107)	Women (n=77)	Men (n=30)
1 to 5yrs	18(16.8%)	13(16.9%)	5(16.7%)
6 to 10yrs	16(15.0%)	15(19.5%)	1(3.3%)
11 to 15yrs	30(28.0%)	23(29.9%)	7(23.3%)
16 to 20yrs	14(13.1%)	7(9.1%)	7(23.3%)
>20yrs	29(27.1%)	19(24.7%)	10(33.3%)

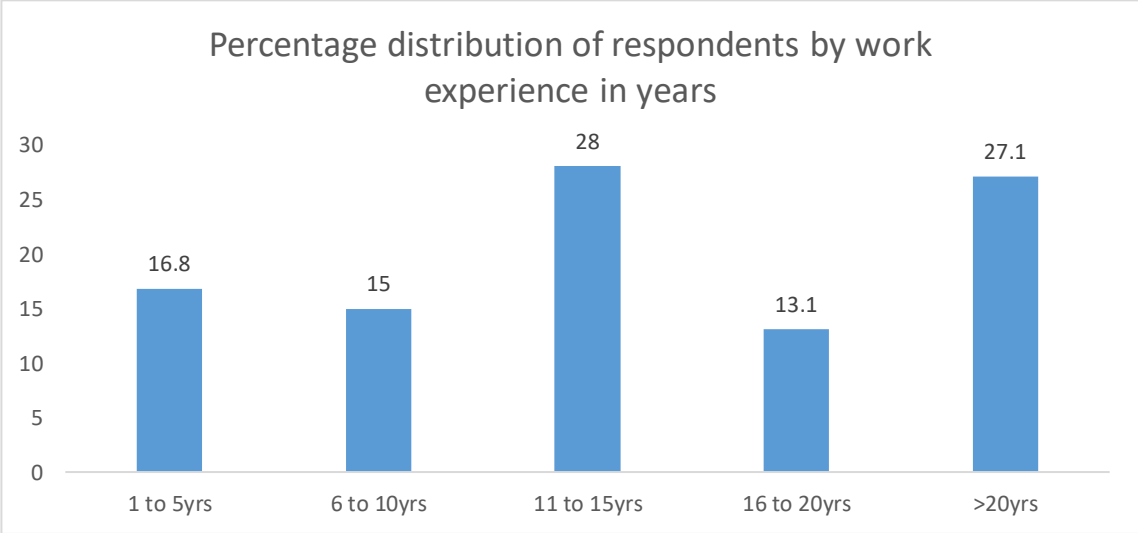

Figure 8 Percentage Distribution of Respondents by Work Experience in Years

Source: Researcher's computation from raw data

Figure 8 above shows distribution of respondents by work experience in years. The majority (28%) of respondents had a work experience of 11 to 15 years followed by

respondents with more than 20 years of work experience (27.1%). Respondents with 1 to 5 years, 6 to 10 years and 16 to 20 years work experience had a percentage distribution of 16.8%, 15.0% and 13.1%, respectively.

4.2.7 Salary Grade

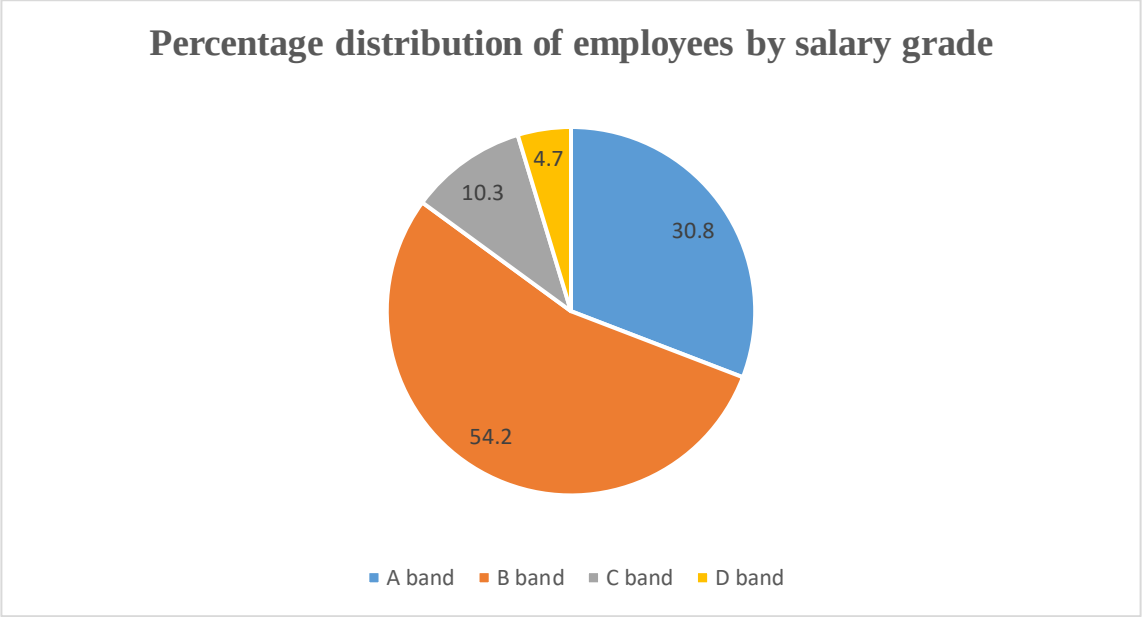

Figure 9 Percentage Distribution of Respondents by Salary Grade

Source: Researcher's computation from raw data

Figure 9 above shows distribution of respondents by salary grade. The majority (54.2%) of respondents fell within the B band, followed by the A band (30.8%), then C band (10.3%) and lastly D band (4.7%).

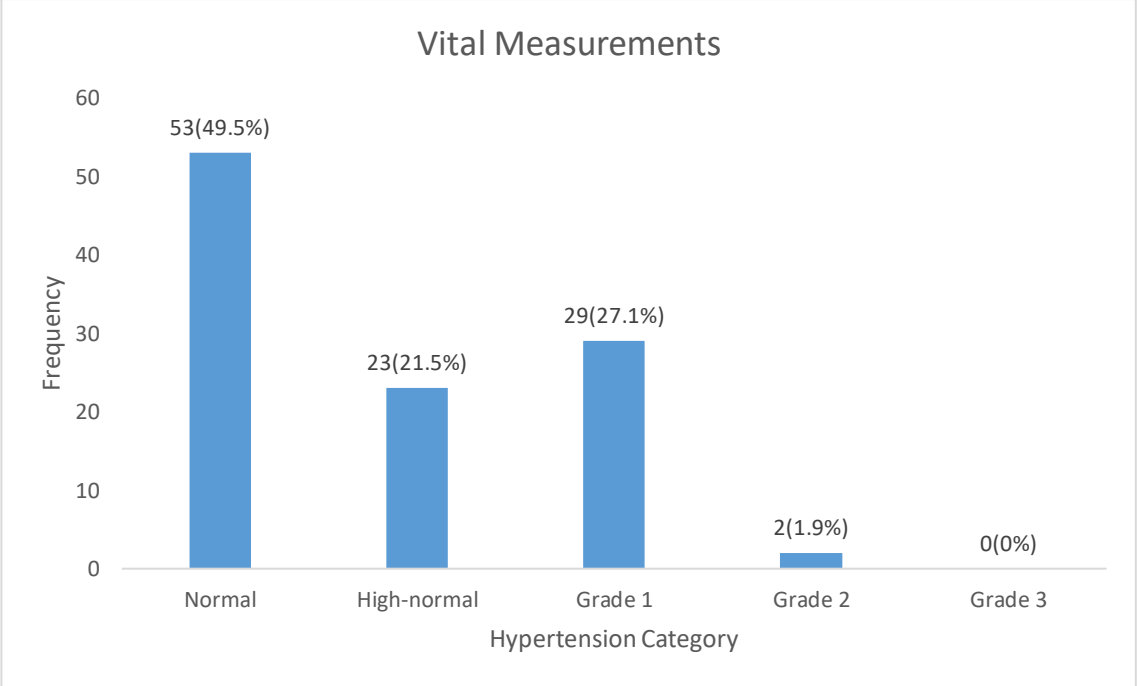

Figure 10 Percentage Distribution of Respondents by Vital Measurements

Majority of participants had normal vital measurement of <130/80 on either HTN medication or not on medication followed by grade 1 HTN (systolic 140-159/ diastolic 0f 90-99). None had grade 3 HTN of 180/110 or isolated HTN.

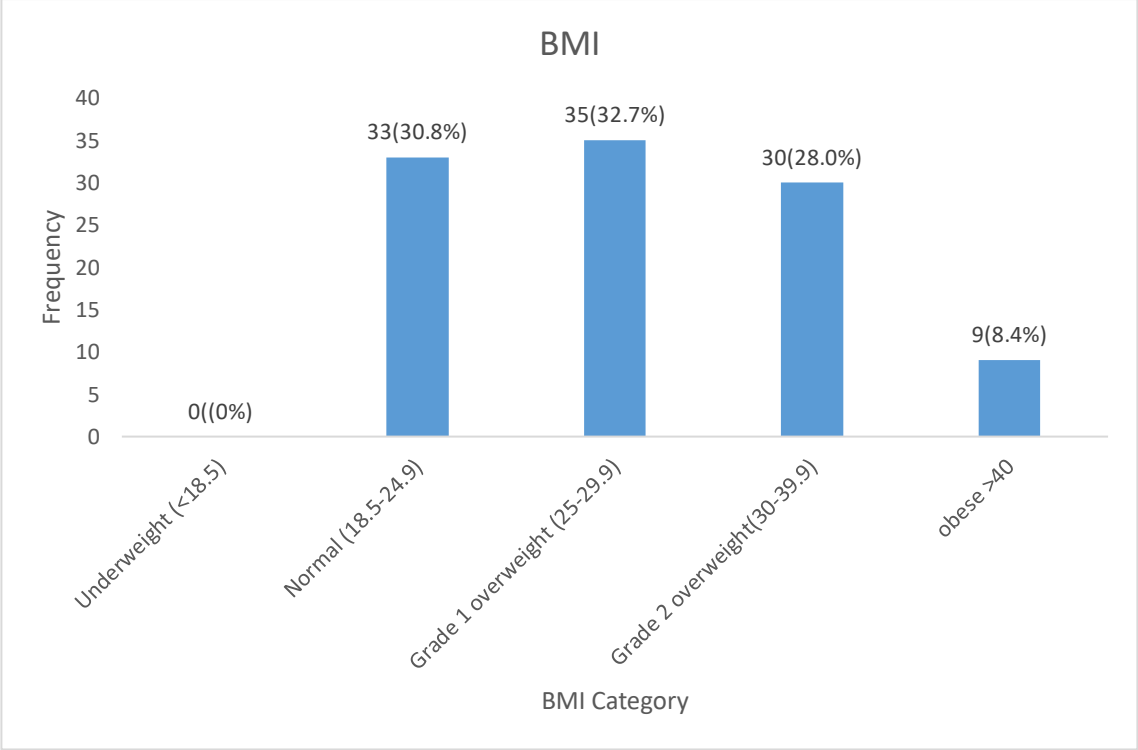

Figure 11 Percentage Distribution of Respondents

Figure 11 shows that most participants had BMI grade 1 overweight (25-29.9) 32.7% followed by normal weight (18.5-24.9)30.8%, non were underweight (<18.5) and few were obese (>40)

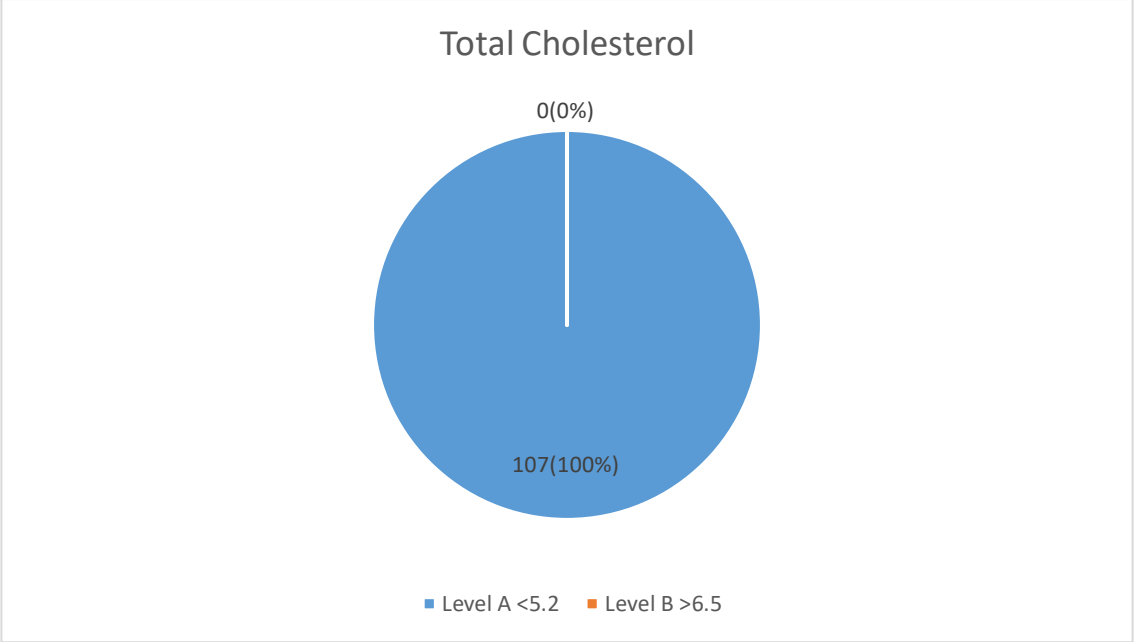

Figure 12 Percentage Distribution of Respondents

All participants (107) had total cholesterol level A <5.2 (100%) and none had total cholesterol >6.5

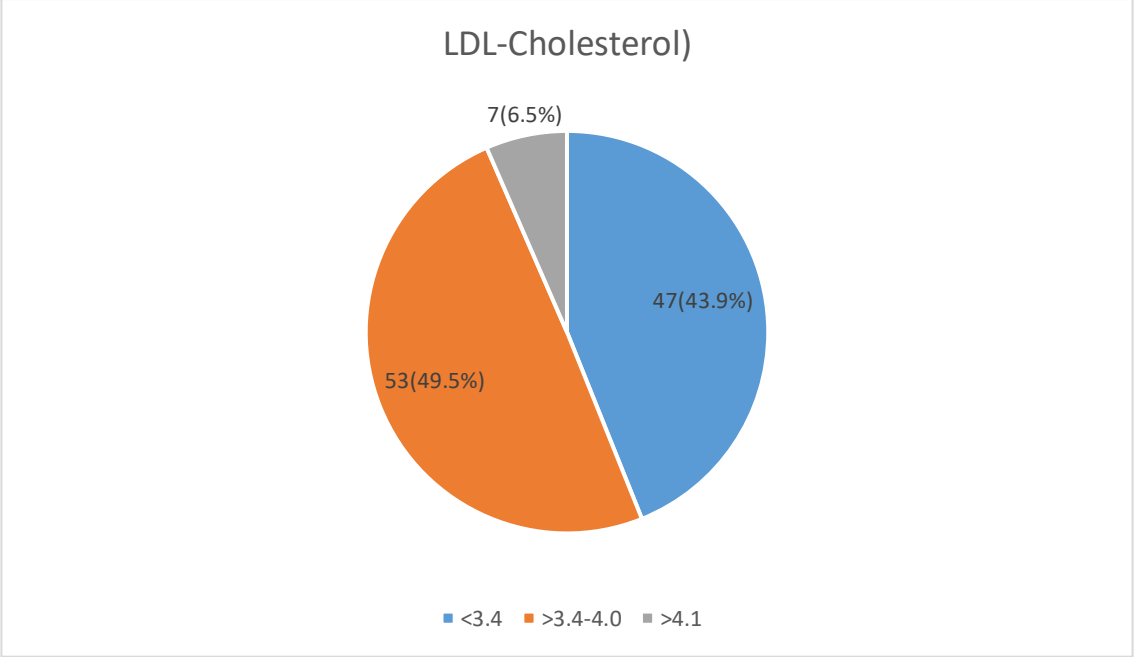

Figure 13 Percentage Distribution of Respondents

Most of participants had LDL (>3.4-4.0) 53(49.5%) followed by LDL (<3.4) 47(43.9%) few had high LDL of 7(6.5%)

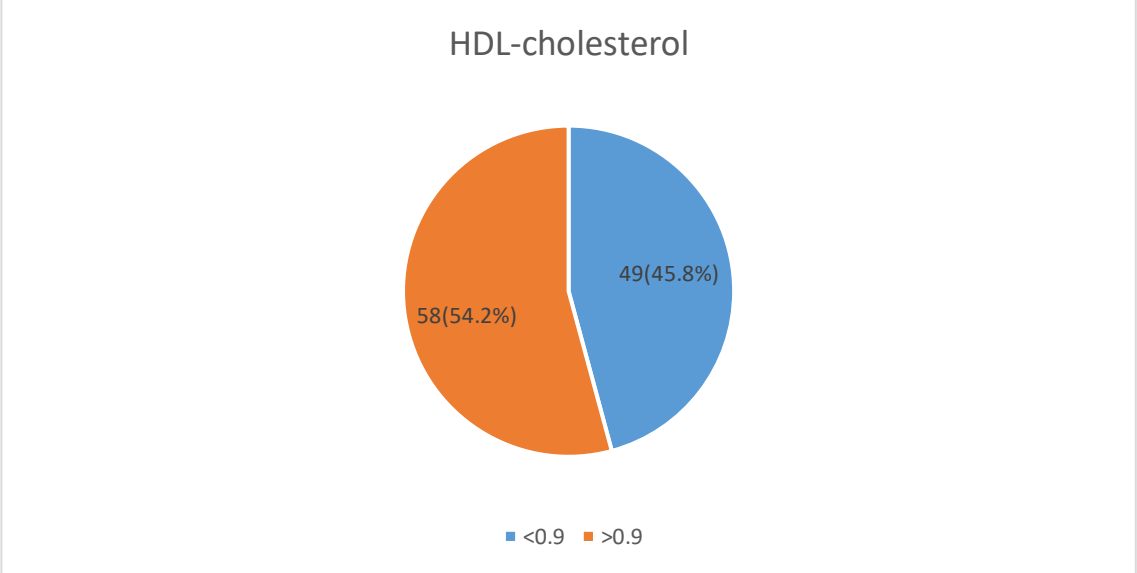

Figure 14 Percentage Distribution of Respondents

Most of the participants had HDL (>0.9) 58(54.2%) and few had HDL (<0.9) 49(45.8%)

4.3 Discussion and Interpretation

4.3.1 Life Style Factors and Incidence of HTN among Health Care Workers

This section used prevalence ratio (PR), confidence interval (CI) and tested significance of Probability value (P-value at 5%). Prevalence ration herein was used so as to interpret the number of times greater the risk of disease or conditions is for exposed individuals compared to unexposed individuals. The rule of thumb used in qualifying prevalence ratio is that when PR = 1 it means that exposure is not associated with the disease. If PR > 1 it means positive association. Then if PR <1 it means there is a negative association. After estimating prevalence ratio, CI was interpreted so as to determine the reliability of the prevalence ratio.

Table 7 Life Style Factors, Economic factors and Incidence of HTN

Exposure	Prevalence in exposed	Prevalence unexposed	Prevalence ratio	CI		p-value
Gender (Females)	0.27	0.33	0.82	0.44	1.53	0.53
Above 40 years of age	0.31	0.23	1.34	0.62	2.90	0.44
Being overweight to obese	0.26	0.34	0.77	0.42	1.40	0.4
Smoking	0.55	0.23	2.4	1.38	4.16	0.004
Alcohol consumption	0.52	0.30	1.73	1.03	2.90	0.06
History of hypertension in family	0.44	0.19	2.36	1.25	4.44	0.005
Physically active 3 to 5 days a week	0.24	0.32	0.76	0.41	1.42	0.40
Physically active 1 to 2 days a week	0.14	0.30	0.48	0.08	3.00	0.38
No Exercise in a week	0.24	0.32	0.77	0.40	1.46	0.41
Vigorous activity	0.34	0.36	0.95	0.56	1.61	0.86
Physical activity	0.45	0.19	2.44	1.23	4.81	0.004
Tryglyc	0.34	0.43	0.79	0.32	1.94	0.63
low HDL	0.46	0.25	1.82	1.04	3.19	0.03
on diet exercise	0.24	0.35	0.67	0.37	1.20	0.19
Not taking BP medication	0.14	0.34	0.41	0.19	0.85	0.01

Source: STATA generated results from field data

4.3.2 Sociodemographic factors and prevalence of HTN

4.3.2.1 Gender-hypertension

As shown in Table 7 the prevalence of hypertension among females was 27% while males were 33%. The prevalence ratio of 0.82 or 82% can be interpreted as follows: among the sampled participants, females were observed to be 0.82 times as likely to be hypertensive as males. A p-value of 0.53 shows that the results may have occurred by chance and that the evidence is statistically weak. Simply put this implies that gender is statistically insignificant in explaining association with the likelihood of having hypertension. This is because its p-value was more than 0.005 and it can be concluded that we are confident that the interval 0.44 to 1.53 contains the population mean gender of females with hypertension.

4.3.2.2 Age-hypertension

As shown in Table 7, the prevalence of HTN in sampled participants that are above 40 years of age was 0.31 or 31% while those below 40 years of age had a prevalence of 0.23 or 23%. Amongst the sampled participants, people who are above 40 years of age were found to be 1.34 times as likely to be hypertensive as those that are below 40 years of age. The corresponding p-value shows a weak association thus requiring further studies on the two variables. A p-value of 0.44 shows that the results may have occurred by chance and that the evidence is statistically weak. In other words, this implies that age is statistically insignificant in explaining association or the likelihood of having hypertension. This is because its p-value is more than 0.005 and it can be concluded that we are confident that the interval 0.62 to 2.90 contains the population mean age of those above 40 years with hypertension.

4.3.2.3 History of hypertension in the family-hypertension

Prevalance of HTN in sampled participants with a history of HTN in the family was 0.44 or 44% while those without a history of HTN had a prevalence of 0.19 or 19%. A prevalence ratio of 2.36 shows that amongst the sampled participants, current smokers were found to be 2.36 times as likely to be hypertensive as non-smokers (CI 1.25 – 4.44). The corresponding p-value shows strong evidence on the association. In other words, this implies that history of hypertension in the family was statistically significant in explaining association or the likelihood of having hypertension. This is because its p-value was less than 0.005 and it can be concluded that we are confident that the interval 1.25 to 4.44 contains the population mean in sampled participants with a history of hypertension in their family with hypertension.

4.3.3 Life Style Factors, Risk Factors and Prevalence of HTN

4.3.3.1 Obesity-hypertension

As shown in Table 7, the prevalence of hypertention in sampled participants that are overweight to obese was 0.26 or 26% while those not overweight had a prevalence of 0.34 or 34%. Amongst the sampled participants, people who are overweight to obese were found to be 0.77 times as likely to be hypertensive as those that are not overweight. The corresponding p-value shows a weak association thus requiring further studies on the two variables. Simply put this implies that the prevalence of hypertention in sampled participants that are overweight to obese was statistically insignificant in explaining association or the likelihood of it resulting in having hypertension. This is because its p-value was more 0.005 and it can be concluded that we are confident that the interval 0.42 to 1.40 contains the population mean in sampled participants that are overweight to obese with hypertension.

4.3.3.2 Smoking-hypertention

As shown in Table 7, the prevalance of hypertention in sampled participants that are current smokers was 0.55 or 55% while non-smokers had a prevalence of 0.23 or 23%. A prevalence ratio of 2.4 shows that amongst the sampled participants, current smokers were found to be 2.4 times as likely to be hypertensive as non-smokers (CI 1.38 – 4.16). Simply put this implies that the prevalance of hypertention in sampled participants that are that are current smokers was statistically significant in explaining association or the likelihood of it resulting in having hypertension. This is because its p-value was more 0.005 and it can be concluded that we are confident that the interval 1.38 to 4.16 contains the population mean in sampled participants that are current smokers with hypertension. This finding concurs with the assertions by Mwangi et al., (2020) pertaining to tobacco use, which their study argued that this is a modifiable behavior that are established during adolescence or young adulthood and cause NCDs later in life.

4.3.3.3 Alcohol consumption-hypertension

As shown in Table 7, the prevalence of hypertention in sampled participants that reported alcohol consumption was 0.52 or 52% while those that reported not consuming alcohol had a prevalence of 0.3 or 30%. A prevalence ratio of 1.73 shows that amongst the sampled participants, participants that reported alcohol consumption were found to be 1.73 times as likely to be hypertensive than those that did not report alcohol consumption (CI 1.03 – 2.9). The corresponding p-value shows borderline statistical significance, probably requiring further studies. Simply put this implies that the prevalence of hypertention in sampled participants that that reported alcohol consumption was statistically insignificant in explaining association or the likelihood of it resulting in having hypertension. This is

because its p-value was more 0.005 and it can be concluded that we are confident that the interval 1.03 to 2.9 contains the population mean in sampled participants that that reported alcohol consumption with hypertension. This finding echoes similar sentiments to those aired by Idris et al., (2021) that risky lifestyles associated with harmful alcohol use has been the leading cause of death in men and women in the past 3 decades especially in low- and middle-income countries.

4.3.3.4 Physical Activity-hypertension

As shown in Table 7, prevalence of HTN in sampled participants that reported having physical activity was 0.45 or 45% while those that reported not having physical activity had a prevalence of 0.19 or 19%. A prevalence ratio of 2.44 (CI 1.23 – 4.81) shows that amongst the sampled participants, those that reported having physical activity were found to be 2.44 times as likely to be hypertensive than those that did not report having physical activity. The corresponding p-value of 0.004 shows strong evidence on the association. In other words, this implies that the prevalence of hypertention in sampled participants that that reported having physical activity was statistically significant in explaining association or the likelihood of it resulting in having hypertension. This is because its p-value was less than 0.005 and it can be concluded that we are confident that the interval 1.23 to 4.81 contains the population mean in sampled participants that reported having physical activity with hypertension.

4.3.3.5 Low HDL – Hypertension

As shown in Table 7, prevalence of hypertention in sampled participants that had low HDL was 0.46 or 46% while those that reported not having physical activity had a prevalence of 0.25 or 25%. A prevalence ratio of 1.82 (CI 1.04 – 3.19) shows that amongst

the sampled participants, those that had low HDL cholesterol were found to be 1.82 times as likely to be hypertensive than those that did not have low HDL cholesterol. The corresponding p-value of 0.03 shows strong evidence on the association. . In other words, this implies that the prevalence of hypertension in sampled participants that had low HDL was statistically significant in explaining association or the likelihood of it resulting in having hypertension. This is because its p-value was less than 0.005 and it can be concluded that we are confident that the interval 1.04 to 3.19 contains the population mean in sampled participants that had low HDL with hypertension.

4.4 Summary

The chapter presented, analysed, discussed, and interpreted the data extracted from Hippo Valley estate. The chapter addressed the objectives which were set in chapter 1, from which the research questions were derived. Microsoft Excel as well as STATA was used in the coding, computation and presentation of data. The study found out that, smoking, History of hypertension in family, physical activity, Low HDL and not taking BP medication were found to be significant variables as factors explaining association with hypertension on HVE healthcare workers. The next chapter discusses the results, draws the conclusion and makes recommendations based from the findings.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines the study's limitations to the study, a summary, implication to practice and recommendations. It will also outline the procedure that the researcher disseminated the results to the participants as well as the action that could be taken in response to the study's findings.

5.2 Discussion

The study's main aim was to determine risk factors associated with developing HTN among health care workers at Hippo Valley Medical Centre. Hippo Valley Sugar Estate is a private company with an established robust health delivery system to ensure sustained sugar production and profit chain. It experienced an increase in health care workers absenteeism related to hypertension post Covid19 lockdown.

The research undertook to map the prevalence of hypertension among Health care workers at HVE. It also sought out to ascertain if life style factors influenced the incidence of hypertension among health care workers. In addition, it also determined if changes in physiological factors (BMI and lipid profile) affect incidence of HTN among health care workers at Hippo Valley Estate. Lastly the study went on to determine whether socio-demographic and economic factors associated with developing HTN among health care workers at HVE.

The variables that were analysed included Gender, Age (above 40 years of age, being overweight to obese, Smoking, alcohol consumption, History of hypertension in family, exercising 3 to 5 days a week, exercising 1 to 2 days a week, no exercise in a week, vigorous activity, physical activity, Tryglyc, low HDL, on diet exercise and not taking BP

medication. There were other socio-demographic variables that were discussed and juxtaposed with the likelihood of causing hypertension. These variables included: age, marital status, occupation, work experience, work experience and salary grade.

The major findings coming from the study include:

a) The study had 77 female and 30 male Health care workers as participants in the study working at Hippo Valley Estate. The study also found that there was no association between ages of those above 40 years with the prevalence of hypertension among healthcare workers. There was also 31% prevalence rate of hypertension of those above 40 years of age and 23% of those below.
b) The study found out that there was a 27% chance of prevalence of hypertension in females and 33% in males. Females were observed to be 82% times as likely to be hypertensive as males.
c) There was no association between gender and HTN.
d) The study also found that the prevalence of HTN on those with a history of hypertension in the family was 44% while those without a history of HTN was 19%.
e) There was association between History of HTN in the family and HTN.
f) The study found that the prevalence of hypertension in those that are overweight to obese was 26% while those not overweight had a prevalence of 34%.
g) There was no association between obesity and hypertension.
h) The study found the prevalence of hypertension in current smokers to be 55% while non-smokers to be 23%.
i) There was association between current smokers and hypertension.

j) The study also found the prevalance of hypertention by those who reported alcohol consumption to be 52% while those that reported none consumption to be 30%.

k) There was no association between alcohol consumption and hypertention.

l) The study also found the prevalance of hypertention in those that reported having physical activity to be 45% while those that reported not having physical activity to be 19%.

m) There was association between physical activity and hypertention.

n) The study also found prevalance of hypertention to those that had low HDL to be 46% while those that reported not having physical activity to be 25%.

o) There was association between low HDL and hypertention.

Therefore, in essence the results above equip the researcher with evidence to reject the null hypothesis there are no significant factors associated with hypertension. The study found out that, smoking, History of hypertension in family, physical activity, Low HDL and not taking BP medication were found to be significant variables as factors explaining association with hypertension on HVE healthcare workers.

5.3 Conclusions

This section marks the closure of the current study. The gist of the research was anchored on determining risk factors associated with developing hypertension among health care workers at Hippo Valley Medical Centre. The study selected 107 Health workers as participants who were permanently employed by HVE. The study reviewed quiet a number of scholars whose area of focus was similar to that of the current study. These scholars included among many; Kamvura et al. (2022); Mwangi et al. (2020); Idris et al.

(2021) as well as working papers and journals from the WHO and Ministry of Health and Child Care of Zimbabwe. The review of various literature enabled the researcher to map out the prevalence of HTN among Health care workers at a global level, Africa and at HVE. Theory of planned behavior, by Ajzen (1991) informed the study by bringing together attitudes, subjective norms and perceived behavior under control related with the prevalence or likelihood of one suffering from hypertension. The adopted research methodology was an analytical cross-sectional study which used both qualitative and quantitative methods through a structured interviewer-administered questionnaire as well as secondary data sources. The major 'take-home' coming from the study is that there is need introduce stress reduction issues at work that may result in smoking, History of hypertension in family, reduce physical activity at work that demand workers to stand for long hours and last but not least there is a need also for employers to be in the know of employee's health history such as those on BP medication.

5.4 Implications

The parent Ministry of Health as well as the private healthcare employers to address socio-demographic factors, life style factors and economic factors so as to reduce the likelihood of employees developing HTN. The study's findings provide an insight on which areas of focus need worker-related policies to be focused on such reduction in smoking, discovery of the individual history of HTN in the family, reduction in physical activity by introducing shifts and breaks and also allowing employees taking BP medication to be allowed to do so at work.

In terms of policy, the health system may also consider adopting a team-based approach by enabling understanding of regulatory body policies affecting health care professionals

and service delivery in the Zimbabwe. The Health care policy guidelines and regulatory support could be tailor-made with respect to the redistribution of individual work duties, this may be modified to facilitate team-based care. For example, responsibilities among health care professionals, including prescription rights, may be decentralized to other professional health care workers. The responsibility of prescribing medication in practice could be possibly shift pressure from a physician to a nurse or other health care worker. Legally expanding the cadre of health care workers who can prescribe or renew antihypertensive medication can free up time for both patients and physicians.

5.5 Recommendations

Based on the study's finding the study recommends the following;

RECOMMENDATION	**DIRECTED TO**	**EXPECTED IMPLEMENTATION & FEED-BACK TIME LINE**
There is a need for preventive health care intervention to focus more on those above 40 years of age who are more susceptible to hypertension during that age category	Ministry of Health personnel: Nurses, Policy makers and Community health workers.	The project expects such policy implementation would take 2-3 months to realise change.

On gender-hypertension relationship there is a need for the creation of personalised work-related interventions so as to reduce hypertension in workers. There is a need for gender empowerment through work-based policies since females are 82% times more likely to be hypertensive than males.	Ministry of Health and Ministry of Gender and women development, Ministry of youth and economic empowerment	The preject expects policy formulation and inter-ministerial debate and policy formulation to take 3 – 6 months and tabulation of the policy and probably be debated in parliamentary.
Employers should create a work- based health register so as to be in the know pertaining to employee's history of hypertension in the family.	Ministry of Health and Public Service Commission (PSC)	In a month policy pronunciations can be made and communicated across medical centres and feed-back expected in a month
It also recommends that, responsible employers could introduce healthier menus in the work cafeteria or	Ministry of health and PSC	1-2 months to implement

canteens so as to reduce the chances of weight gain by employees coupled by periodic education by professional nutritionists and dieticians. This will reduce obesity and align attitudes of employees towards healthier lifestyles.		
The study also recommends that employers need to introduce a strict non-smoking policy at work places and designated smoking areas.	Ministry of Health and PSC	Projects expect 2 months for that policy to be implemented.
The study also recommends that there is a need to include Alcohol Anonymous (AA) grouping if there are employees suffering from alcohol abuse leading to	Ministry of health; departments responsible for workers metal health, government psychologists, counsellors.	3-4 months of policy debate and implementation

hypertension and stress related illnesses. This could be coupled by periodic testing by breathalyser and tax them as a deterrent to alcohol abuse.		
Employers need to introduce flexible working plans as well as duty rosters so as to reduce work which may demand workers to stand/sit for longer hours without being active	Ministry of Health and PSC	1 month for successful implementation and another month for feedback
Creation of staff shower area at work to promote use of bicycles to use when coming to work.	Ministry of Health, Ministry of Finance and PSC	4-6 months of debate and application for financing.

Introduction of incentives or monthly recognition of health care workers on monthly calendars for those reducing their BMI effectively.	Ministry of health, Ministry of Finance and PSC	4-6 months of debate and application for financing

5.6 Suggestion for Further Research

The study needs to incorporate rural argument into the fold because healthcare workers employed in towns or by corporates earn relatively higher and live better lives than those in real settlements and as such factors associated with hypertension may be different.

The researcher informed the participants that the study's findings would be sent to the Corporate Medical Officer, Senior Medical officers and Public Health Officer for Hippo Valley Estate. The researcher left contact details for the concerned participants to use in requesting the results.

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APPENDICES

APPENDIX 1: Informed Consent Form (ENGLISH)

My name is Tracey Farisai Makuchete a final year Master of Public Health student at Africa University. I am carrying out a research on factors associated with developing hypertension among health care workers in Hippo Valley Sugar Estate, Chiredzi district for a period of January 2022 to December 2023**.** I am kindly asking you to participate in

this study as you are a key informant by responding to my questionnaire face to face interview.

Purpose of the study

The purpose of the study is to determine the host and exposure factors associated with Hypertension and review the wellness program registry for hypertension among health care workers. The study is for academic purposes, but information from this study will assist Hippo Valley Estate to note gaps if any and design effective programs that respond to the health care-worker needs.

Procedure and durations

The eligible participants for the study are health care workers that are employed permanently by Hippo Valley Estate. You may have been purposively selected as a possible participant because you meet the stated selection criteria. About 107 participants will be enrolled in this study. If you If you decide to participate, you will be asked to undergo a face to face interview while completing this questionnaire. The interview will take about 30 minutes.

Risks and discomforts

The risks of participating in this study are minimal. It is possible that you may feel uncomfortable with some of the questions I will ask you or when blood pressure is being taken. You can choose to skip or to discontinue the interview if you feel uncomfortable. If vital measurements done for blood pressure are seen to be elevated during assessment

patient will be sent to the Wellness department of Hippo Valley Estate for further evaluation and management with patient consent.

Benefits

There are no direct benefits to you for participating in this study. I am hoping that findings from this study will be used to improve wellness program for healthcare workers at Hippo Valley Estate.

Confidentiality

If you participate in the study you will be assigned a participant identity to be used on the questionnaire as no personal details will appear on the questionnaire. Any information that is obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. All study records will be kept in secure, locked filing cabinets, separate from any information that identifies you personally like this consent form. Your name will not be used in any reports or publications that may arise from this study. Under some circumstances, the Africa University ethical council may need to review records for compliance audits only.

Voluntary participation

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect your future relationship with Hippo Valley Estate. If you chose to

participate, you are free to withdraw your consent and to discontinue participation without penalty at any time.

Questions

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you.

Authorisation

If you have decided to participate in this study, please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

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Name of Research Participant (please print) **Date**

Signature of Research Participant or legally authorised representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University **Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email aurec@africau.edu. Name of Researcher: Tracey** Farisai Makuchete

APPENDIX 2: Questionnaire (ENGLISH)

Data collection for this study will be done in 2 parts, part 1 being a questionnaire and part 2 being a secondary data checklist for physiological risk factors of hypertension.

PART 1: QUESTIONNAIRE

Questionnaire Number | | Date:

……

SECTION A: Socio-Demographic Characteristics

QUESTION	**RESPONSE** Tick applicable.
1. age group	18-29 years old [ ] 30-39 years old [ ] 40-49 years old [ ] 50 years old & above [ ]
2. Sex:	Male [ ] Female [ ]
3. Marital Status	Married [ ] Single [ ] Divorced [ ] Widowed [ ]

4. profession of health worker	Doctor [ ] Nurse [ ] Public Health department staff [ ] Matron [ ] Pharmacy Staff [ ] Laboratory staff [ ] Medical center administrative staff [ ] Primary Health Care Assistant [ ] Community Health care worker [ ] Hospital orderly [ ]
5. work Experience	1-5 years [ ] 6-10 years [ ] 11-15 years [ ] 16-20 years [ ] 21 or more years [ ]
6. have you been diagnosed with hypertension	Yes [ ] No [ ]

7. if yes to question 6 are you on medication	Yes [ ] No [ ] Not applicable [ ]
8. if no to question 7 are on diet and exercise control	Yes [ ] No [ ] Not applicable [ ]
9. do you have a positive family history of hypertension	Yes [ ] No [ ]

Section B: Vital Measurements

	BP category	Systolic Bp (mmHg)	Dyastolic Bp(mmHg)	Tick were applicable
10. Blood pressure (Ministry of health and child care, 2005)	Optimal Normal High-Normal Grade 1 Hypertension Grade2 Hypertension Grade3 Hypertension Isolated-systolic Hypertension	<120 <130 130-139 140-159 160-179 >180 >140	<80 <80 85-89 90-99 100-109 >110 >90	

SECTION C: Behavioral risk factors

	YES	NO
11. Do you smoke		
12. insufficient physical activity: (Ministry of Health and Child Care of Zimbabwe, 2005) -work involving sitting/ standing with walking no more than 10 minutes		
13. work that involves vigorous activities such as heavy lifting patient or machinery at work, walking and standing for more than 10 minutes		
14. number of days per week one does vigorous activities as part of work 1-2 days a. days		
15. Do you take alcohol		

SECTION D: ECONOMIC RISK FACTOR

	GRADE
16. Salary grade	A [ ] B [ ] C [ ] D [ ] E [ ] F [ ]

PART 2: SECONDARY DATA CHECKLIST FOR PHYSIOLOGICAL RISK FACTORS

17. Lipid Profile (Ministry of health and child care, 2005)	**Total Cholesterol**	**levels in mmol/l**	
	Level A Hypercholestolaemia	< 5.2	[ ]
	Level B Hypercholestrolaemia	> 6.5	[ ]
	Low HDL Cholesterol	**<0.9**	**[ ]**
		>0.9	**[ ]**
	LDL Cholesterol		
	High LDL-Cholesterol	>4.1	[ ]
	Borderline High-risk LDL-Cholesterol	>3.4-4.0	[ ]
	LDL	<3.4	
	Triglycerides		
	High triglycerides	>4.5	[ ]
	Borderline triglyceride	2.3-4.4	[ ]

	Trigycerides < 2.3
18. Body Mass Index (BMI) (Ministry of health and child care, 2005)	Underweight (<18.5) [ ] Normal (18.5-24.9) [ ] Overweight grade 1 (25.0-29.9) [ ] Overweight grade 2 (30.0-39.9) [ ] obese > 40.0) [ ]

APPENDIX 3: Informed Consent Form (SHONA)

Zita rangu ndinonzi Tracey Farisai Makuchete ndiri mugore rekupedzisira reMaster of Public Health ndichidzidza paAfrica University. Ndiri kuita tsvakiridzo pamusoro pezvikonzero zvine chekuita nekukwira kweBP pakati pevashandi vezvehutano muHippo Valley Sugar Estate, mudunhu reChiredzi kubva muna Ndira 2022 kusvika Zvita 2023. Ndinokukumbirai kuti mupinde muchidzidzo ichi sezvo muri mutauri akakosha, uye nekupindura kubvunzurudzo yangu takatarisana muhofisi pasinganzwike nevanhu.

Chinangwa chechidzidzo

Chinangwa chechidzidzo ichi ndechekuona zvinoratidzira zvine chekuita neHypertension uye kuongorora chirongwa chehutano hwekunyoresa kwehypertension pakati pevashandi vehutano. Chidzidzo ichi ndechezvinangwa zvedzidzo, asi ruzivo rwechidzidzo chino ruchabatsira Hippo Valley Estate kuona mikaha kana iripo uye kugadzira zvirongwa zvinoshanda zvinoenderana nezvinodiwa nevashandi vehutano.

Maitiro uye kureba kwechidzidzo

Vanokodzera kupinda muongororo iyi vashandi vezvehutano vanoshandira zvachose muHippo Valley Estate. Iwe unogona kunge wakasarudzwa zvine chinangwa semugari wemu Hippo Valley Estate uye unosangana nezvataurwa zvekusarudza maitiro. Vatori vechikamu vanosvika 107 vachanyoreswa muchidzidzo ichi. Kana iwe ukafunga kutora chikamu ichi, uchakumbirwa kubvunzurudzwa chiso nechiso paunenge uchizadzikisa gwaro remibvunzo iri. Hurukuro yacho inotora anenge maminitsi makumi matatu.

Njodzi uye kusagadzikana

Ngozi dzekutora chikamu muchidzidzo ichi ishoma. Zvinokwanisika kuti unganzwa usina kugadzikana nemimwe yemibvunzo yandichakubvunza kana kuti paurikutorwa blood pressure. Iwe unogona kusarudza kusvetuka kana kurega kubvunzurudza kana uchinzwa kusagadzikana. Kana zviyero zvakakosha zvakaitwa zveBP zvikaonekwa zvakakwira panguva yekuongororwa murwere achatumirwa kuWellness department reHippo Valley Estate kuti aongororwe zvakare kana aching atipa mvumo yake..

Benefits

Hapana mabhenefiti akananga kwauri nekutora chikamu muchidzidzo ichi. Ndine tarisiro yekuti zvakabuda muongororo iyi zvichashandiswa kuvandudza chirongwa cheutano hwevashandi vehutano paHippo Valley Estate.

Kuvanzika

Kana ukapinda muchidzidzo ichi uchapihwa zita renumba richashandiswa pagwaro remibvunzo sezvo pasina humbowo hwako huchabuda pagwaro remibvunzo. Ruzivo rwupi zvarwo ruchawanikwa maererano nechidzidzo chino rwunogona kuzivikanwa kwauri rucharamba rwakavandika uye ruchaziviswa chete nemvumo yako. Marekodhi ese ezvidzidzo achachengetwa akachengetedzeka, akakiyirwa makabati ekufaira, akaparadzana kubva kune chero ruzivo rwunokuzivisa iwe pachako sewekuda fomu remvumo iri. Zita rako harizoshandiswa mune chero mishumo kana zvinyorwa zvingangobuda muchidzidzo chino. Mune mamwe mamiriro ezvinhu, Africa University ethical council ingangoda kuongorora marekodhi ekutevedzwa kwekuongorora chete.

Kuzvipira kuita chidzidzo ichi

Kupinda muchidzidzo ichi kuzvidira. Kana ukasarudza kusapinda muchidzidzo ichi, sarudzo yako haikanganisi hukama hwako neHippo Valley Estate. Kana ukasarudza kutora chikamu, wakasununguka kubvisa mvumo yako uye kurega kutora chikamu pasina mutongo chero nguva.

Mibvunzo

Musati masaina fomu iri, ndapota bvunzai mibvunzo ine chekuita nechidzidzo chino yamusina kujeka nayo.

Mvumo

Kana wafunga kutora chikamu muchidzidzo chino ndapota isaiyi fomu iri panzvimbo yakapihwa pazasi sechiratidzo chekuti waverenga nekunzwisisa ruzivo rwakapihwa pamusoro uye wabvuma kutora chikamu.

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Zita reMutsvakiridzo (ndapota printa) Date

---------- ----------

Siginicha yeMutsvakiridzo Mumiriri kana mumiriri akatenderwa zviri pamutemo

Kana uine mibvunzo ine chekuita nechidzidzo ichi kana fomu remvumo kupfuura iyo yakapindurwa nemutsvakurudzi kusanganisira mibvunzo pamusoro petsvakurudzo, kodzero dzako semupindi wetsvagurudzo, kana uchiona sekuti hauna kubatwa zvakanaka

uye uchida kutaura nemumwe munhu asiri muongorori, ndapota inzwa wakasununguka kubata Africa University Research Ethics Committee parunhare (020) 60075 kana 60026 yekuwedzera 1156 email aurec@africau.edu

Zita remutsvakurudzi :Tracey Farisai Makuchete

APPENDIX 4: Questionnaire (SHONA)

Kuunganidzwa kwedata pachidzidzo ichi kuchaitwa muzvikamu zviviri, chikamu 1 chiri gwaro remibvunzo uye chikamu chechipiri chiri chechipiri chekuongorora data yezve physiological ngozi zvinhu zvehypertension.

CHIKAMU 1: MIBVUNZO

Mubvunzo Wenhamba  Date:

……

<u>CHIKAMU A: Mamiriro eMagariro evanhu</u>

MIBVUNZO	**MHINDURO** (Tick applicable)
i. Zera	Makore 18-29 [ ] Makore 30-39 [ ] Makore 40-49 [ ] 50 makore kana kupfuura [ ]
ii. Uri murume kana mukadzi here?	Murume [ ] Mukadzi [ ]
iii. Marital Status	Vakaroorana [ ] Single [ ] Vakarambana [ ] Akafirwa [ ]

iv. basa revashandi vehutano	Chiremba [ ] Mukoti [ ] Vashandi vebazi rePublic Health [ ] Vashandi vePharmacy [ ] Vashandi ve laboratori [ ] Vashandi veRadiology [ ] Primary Health Care Assistance [ ] Community Health care worker [ ] Hospital orderly [
v. wagara makore magani pabasa	Makore 1-5 [ ] Makore 6-10 [ ] Makore 11-15 [ ] Makore 16-20 [ ] Makore 21 kana kupfuura [ ]
vi. Wakabatwa chirwere chehypertension here?	Ehe [ ] Kwete [ ]
vii. Kana mhinduro yako iri ehe pamubvunzo 6, uri pamushonga here?	Ehe [ ] kwete [ ]
viii. Kana mhinduro yako iri kwete pamubvunzo 7 uri kudya zvineutanho here kana kudzora muviri?	Ehe [ ] Kwete [ ]

ix. Mumhuri menyu mune vane chirwere chehypertension here?	Ehe [ ] Kwete [ ]

Chikamu B: Zviyero Zvinokosha

	Bp category	Systolic Bp (mmHg)	Dyastolic Bp(mmHg)	Tick were applicable
1. Blood pressure (Ministry of health and child care, 2005)	Optimal Normal High-Normal Grade 1 Hypertension Grade2 Hypertension Grade3 Hypertension Isolated-systolic Hypertension	<120 <130 130-139 140-159 160-179 >180 >140	<80 <80 85-89 90-99 100-109 >110 >90	

CHIKAMU C: Maitiro ane ngozi

	EHE	KWETE
x. unoputa fodya here?		
xi. Unomwa doro here?		

xii. kusakwana kwekushandisa muviri (Ministry of Health and Child Care of Zimbabwe, 2005) Basa rinotarisira kugara kana kumira ne kufamba kwenguva isinga pfuuri maminetsi makumi -basa rinosanganisa kunyanyo takura varwere kana kusumudza zvinorema kwenguva inopfuura maminetsi makumi -mazuva pavhiki aunoita basa rinorema, pabasa pako	**Ehe**	**kwete**

CHIKAMU D: ECONOMIC RISK FACTOR

	Giredhi
xiii. Giredhi remuhoro rako chii?	A [ ] B [ ] C [ ] D [ ] E [ ] F [ ]

CHIKAMU CHECHIPIRI: SECONDARY DATA CHECKLIST FOR PHYSIOLOGICAL RISK FACTORS

1. Lipid Profile (Ministry of health and child care, 2005)	.**Total Cholesterol**	**levels in mmol/l**	
	Level A Hypercholestolaemia	< 5.2	[ ]
	Level B Hypercholestrolaemia	> 6.5	[ ]
	Low HDL Cholesterol	**<0.9**	**[ ]**
		>0.9	**[ ]**
	LDL Cholesterol		
	High LDL-Cholesterol	>4.1	[ ]

	Borderline High-risk LDL-Cholesterol >3.4-4.0 [ ] LDL <3.4 **Triglycerides** High triglycerides >4.1 [ ] Borderline triglyceride 3.4-4.0 [ ]
2. Body Mass Index (BMI) (Ministry of health and child care, 2005)	Underweight (<18.5) [ ] Normal (18.5-24.9) [ ] Overweight grade 1 (25.0-29.9) [ ] Overweight grade 2 (30.0-39.9) [ ] obese > 40.0) [ ]

APPENDIX 5 : Request Letter for Carrying Out Study

Dr C Charera

Senior Medical Officer

Tongaat Hurlett Zimbabwe

Hippo Valley Estate

Chiredzi

03 April 2024

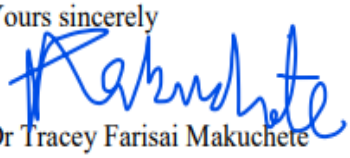
Dear Sir

REF: REQUEST TO CARRYOUT RESEARCH FOR HYPERTENSION AMONG HEALTH CARE WORKERS AT HIPPO VALLEY SUGAR ESTATE, CHIREDZI DISTRICT, ZIMBABWE

My name is Dr Tracey Farisai Makuchete am an MPH student at Africa University and currently on attachment under Tongaat Hurlett Zimbabwe and in partial fulfilment of the requirements for the Degree of Masters of Public Health I am expected to do a research for my dissertation.

I am kindly requesting permission to do research on Hypertension among health care workers at Hippo Valley Sugar Estate

Yours sincerely



Dr Tracey Farisai Makuchete

Medical Officer

APPENDIX 6: Acceptance Letter to Carry out Study

Hippo Valley Estates Limited

Dr Tracey Farisai Makuchete
Medical officer
10 Devos Avenue
Kingsdale
Bulawayo

4 April 2024

REF: ACCEPTANCE LETTER TO CARRYOUT RESEARCH FOR HYPERTENSION AMONG HEALTH CARE WORKERS AT HIPPO VALLEY SUGAR ESTATE, CHIREDZI DISTRICT, ZIMBABWE

Dear Dr Tracey F Makuchete

It is my pleasure to accept your request to carry out the above-mentioned research as partial fulfilment of the requirements of your Degree in Masters of Public Health under Africa University Zimbabwe.

Yours sincerely

Dr C Charera
Acting Senior Medical Officer
Tongaat Hullet Zimbabwe Hippo Valley Estates

APPENDIX 7: Supervisor Authorization Letter for AUREC Submission

AFRICA UNIVERSITY
(A United Methodist-Related Institution)

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL RESOURCES

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11 April 2024

To The AUREC Secretariat

Dear Madam

Re: Permission to Submit to AUREC for Tracey Makuchete

Programme: Masters in Public Health

This letter serves to confirm that the above-mentioned student has satisfied all the requirements of the faculty in developing the dissertation proposal and is ready for assessment.

Your facilitation for review of the proposal is greatly appreciated.

Thank you

Fadzai Mutseyekwa

Student's Supervisor

APPENDIX 8: Budget

ITEM	UNIT COST	QUANTITY	TOTAL COST (USD)
AIRTIME	$100		$100
fuel	$200		$200
Data tools (pens, pencil, rubber bond paper)	$50		$50
Lunch	$50		$50
Printing and photocopying	$50		$50
TOTAL			**$450**