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PREVALENCE OF HYPERTENSION AND LINKAGES TO CARE AMONG HEALTHCARE WORKERS: A CASE OF SALLY MUGABE CENTRAL HOSPITAL

BY

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Abstract

Globally, hypertension is one of the leading causes of premature mortality, since only 30 to 50% of the patients are controlled. Uncontrolled high blood pressure can lead to complications such as heart attacks, strokes, kidney disease, diabetes, and peripheral artery disease. The purpose of this study was to measure the prevalence of hypertension and to find out the determinants of linkage to care practices among HCWs screened at SMCH in 2021. An analytic cross-sectional study was conducted using an interviewer-administered questionnaire and physical measurements. Males made up 22% of the participants. At enrolment, 14.9% (n=111) had elevated blood pressure, of which about two thirds (67%) of the known hypertensives had poorly controlled hypertension. Forty-seven participants were referred for further care and about three quarters (72%) were linked to care. Participants with moderate hypertension were 1.4 times more likely to link to care compared to those with mild hypertension [OR= 1.5, 95%CI= (0.36 to 5.9), p-value= 0.599]. Those with severe hypertension were 3.2 times more likely to link to care compared to those with mild hypertension [OR= 3.2, 95%CI= (0.3 to 30.6), p-value= 0.318]. Participants who were older than 50 years were 22 times more likely to link up to care as compared to those who were younger than 30 years [OR= 22.5, 95%CI= (1.5 to 335.4), p-value= 0.024]. Diabetic participants were 3 times more likely to link up to care compared to participants with no medical conditions [OR= 3.7, 95%CI= (0.4 to 33.2), p-value= 1.150]. Participants on medical insurance are 56 times more likely to link to care compared to participants who are not on medical insurance [OR= 56.8, 95%CI= (8.4 to 386.5), p-value= 0.001]. Increasing level of education was associated with an increase in the likelihood of successful linkage. Programs are needed to improve the surveillance systems and implementation of wellness screening programs for early detection of hypertension.

Key words: **Hypertension; Linkage; Medical conditions; Complications, Health workers**

Declaration

I, Fungai Nyarai Kavenga, do hereby 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 Masters' degree.

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Dedication

This study is dedicated to my late father, Mr Sylvester Kavenga and to my beloved mother, Mrs Elizabeth Kavenga. My mother's prayers, unconditional love, encouragement, patience and faith in me have contributed to my successes. My mother is the driver of my energy and will. She indeed is a great inspiration in my life.

List of acronyms and abbreviations

AIDS	Acquired Immuno-Deficiency Syndrome
ASP	Age Standardized prevalence
AUREC	Africa University Research Ethics Committee
BMI	Body Max Index
BRTI	Biomedical Research and Training Institute
COPD	Chronic Obstructive Pulmonary Disease
DBP	Diastolic Blood Pressure
JNC7	Joint National Committee 7
HIV	Human Immunodeficiency Virus
LMIC	Low to Medium Income Countries
NCDs	Non-Communicable Diseases
SBP	Systolic Blood Pressure
SMCH	Sally Mugabe Central Hospital
SSA	Sub Saharan Africa
WHO	World Health Organization

Definitions Used

(i) Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) classification was used for hypertension

(ii) Hypertension is defined as systolic BP level of ≥140 mmHg and/or diastolic BP level of ≥90 mmHg or being previously diagnosed as hypertensive by any health professional. The area falling between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP is defined as "prehypertension".

(iii) Isolated diastolic hypertension (IDH) having a systolic blood pressure ≤ 140 mmHg and diastolic blood pressure ≥ 90 mmHg and isolated systolic hypertension (ISH) having a systolic blood pressure ≥ 140 mmHg and diastolic blood pressure < 90 mmHg will be used to diagnose IDH and ISH, respectively.

(iv) Awareness will be defined as history of hypertension based on diagnosis by a healthcare provider.

(v) Treatment will be defined as taking any medication or other treatment for hypertension in the last two weeks prior to the survey and control was defined as systolic blood pressure < 140mmHgand diastolic pressure < 90 mmHg.

(vi)WHO International BMI classification: BMI < 18.5 was classified as "underweight";BMI > 25 , "overweight"; BMI > 30.00, "Obese"

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Non-Communicable Diseases (NCDs) have historically been considered a problem of high-income countries (HIC) in the past decades, the proportion of morbidity caused by NCDs in low- and middle-income countries (LMIC) is increasing. Once thought of as a disease of the affluent, NCDs have become the largest global burden, and now account for a very large burden of morbidity and mortality in low- and middle-income countries (Kankeu, Saksena, Xu, & Evans, 2013). NCDs caused an estimated 35 million deaths in 2005. The total annual number of deaths from non-communicable diseases will increase to 55 million by 2030 (World Health Organization [WHO], 2014). NCDs such as cardiovascular diseases, diabetes, cancer, Chronic Obstructive Pulmonary Disease (COPD) and mental health disorders cause around two thirds of global death of which 16 million are premature deaths occurring before the age of 70 years (Jaspers et al., 2015).

According to a WHO publication, hypertension and other cardiovascular diseases are among the main chronic diseases in the developed and developing countries consuming an important proportion of their public health budget. The prevalence of hypertension is estimated at 31.5% in developing countries and 28,3% in developed countries (Mills et al., 2016). WHO estimates the prevalence of hypertension in Sub-Saharan Africa to be 46%, making hypertension a major threat to public health (Gebreselassie,Padyab, 2015). Unfortunately, Zimbabwe faces the challenge of high morbidity and mortality from

communicable diseases and increasing prevalence of NCDs (Magodoro, Esterhuizen & Chivese, 2016). Hypertension was ranked first amongst the

NCD outpatient visits recorded in Zimbabwean public hospitals in 2018 (Ministry of Health and Child Care, 2019) Uncontrolled high blood pressure can lead to complications such as heart attacks, strokes, kidney disease, diabetes, and peripheral artery disease. The major risk factors contributing to increase in hypertension are physical inactivity, eating unhealthy diets, smoking, alcohol abuse and non-adherence to medication. Obesity is another important risk factor for hypertension. In a study that was carried out in Zimbabwe in women of childbearing age, the prevalence of overweight and obesity increased substantially from 25.0% in 2005 to 36.6% in 2015 (Mukora-Mutseyekwa, Zeeb, Nengomasha & Adjei, 2019).

Hypertension is a high-burden NCD that is particularly well suited to community-based screening approaches given the ease and speed of sphygmomanometer. However, diagnosis is only the first step in the cascade of care that begins with diagnosis and proceeds to linkage, initiating therapy, retention, and eventual control. With the focus of the international community mainly on the fight against infectious diseases and maternal and child mortality, there has been a neglect on the rising trends of non-communicable diseases such as hypertension.

The epidemiologic transition and double disease burden from chronic infections and NCDs worldwide requires re-engineering of healthcare delivery and occupational health systems. Urbanization has resulted in the westernization of lifestyles in parts of Zimbabwe, mainly urban areas. In urban areas, which is the setting of this study, diets high in refined, starchy carbohydrates are leading to high obesity rates and increased

prevalence of hypertension, diabetes and cardiovascular diseases (Mutowo, Mangwiro, Lorgelly, Owen, & Renzaho, 2015).

This study seeks to explore the prevalence of hypertension in health care workers (HCWs) and the linkages to care following a screening program.

1.2 Background of the study

Hypertension as the iceberg disease is the major public health concern of this era where global population, especially in low and middle-income countries, are facing its escalating burden. The productive age group is the principal victim of the morbid and deceased state due to hypertension. The vital workforce of any nation, the health workers are not spared from the thunder of hypertension. (Ghimire, 2009)

Hypertension remains silent, being generally asymptomatic during its clinical course. As it is hidden beneath an outwardly asymptomatic appearance, the disease does immense harm to the body in the form of 'Target Organ' damage, hence, the WHO has named it the 'Silent Killer' (Rugattu et al., 2015)

Zimbabwe (like most sub-Saharan African countries) faces the dual challenge of communicable and non-communicable diseases, however funds donated to fight HIV/AIDS consistently exceed all other national healthcare expenditure (Magodoro et al., 2016). Many countries at a similar stage of development receive more than 50 percent of their total healthcare budgets from donors. Hypertension and its associated complications accounted for less than 3% of the global health assistance between 2001

and 2008, despite 80% of deaths from cardiovascular disease occurring in low and middle-income countries (Mutowo et al., 2015).

HCWs, just like the general population are at risk of morbidity and mortality from NCDs but are rarely screened for these. Those few hospitals with functional staff clinics face a challenge of low utilisation from the intended beneficiaries, HCWs. In Nigeria prevalence of hypertension is 20.1% among the studied population of healthcare workers (Owolabi, Owolabi, Olorun, & Amole, 2015). In that study, 64.7% of HCWs were aware of their status. While there has been no hypertension study specific for HCWs in Zimbabwe, a study in workers under Bulawayo City Council revealed a hypertension prevalence of 38.4% (Marwiro, 2019). Records from SMCH staff clinic revealed a hypertension prevalence of about 30 % among health workers who attended the clinic for any ailment in 2019.

Linkage to care is a process that connects newly diagnosed individuals to medical care. The process assists individuals who are newly diagnosed or who are not currently accessing care by providing them with short-term, intensive support in engaging with a care provider (Sanga et al., 2018). There is no data on factors affecting linkages to care for hypertension in HCWs. In the general population linkage to care is affected by age, gender, education, occupation, tobacco use, alcohol consumption, family history, and appointment site (Kotwani et al., 2014)

Data on retention of hypertensive patients through all steps in the care cascade in resource limited settings are lacking. A previous study found low utilization of health care services after hypertension screening in Tanzania but did not include a linkage intervention (Bovet et al., 2008). Only 32% follow-up was reported after hypertension

and diabetes screening in Cameroon despite use of a linkage intervention (Gessler et al., 2012).

Hypertension is a high-burden NCD that is particularly well suited to community or workplace screening approaches. Therefore, an estimate of the magnitude of the burden caused by hypertension in healthcare workers in Zimbabwe is required to enable the government and international organizations to work together to reduce risk factors for non-communicable diseases such as hypertension. The aim of this study is to determine trends in hypertension in HCWs and linkages to care.

1.3 Statement of the problem

Hypertension screening and awareness in HCWS is low, resulting in inadequate treatment and management. Unpublished data covering a period between 2015 and 2019 from SMCH staff clinic showed a hypertension prevalence of 30% among HCWs. Of these, about half were not aware of their hypertension status. According to the head of internal medicine department at SMCH, there is an increase in the number of HCWs who are developing hypertension complications such as stroke, heart attacks and renal failure and eventually succumbing to premature deaths because of uncontrolled BP. The main objective of this study is to determine trends in hypertension prevalence in HCWs and linkages to care under Sally Mugabe Central Hospital (SMCH).

1.4 Aim of study

The purpose of this study is to measure the prevalence of hypertension and to find out the determinants of linkage to care practices among HCWs screened at SMCH in 2021.

1.4.1 Specific Objectives

i. To determine the prevalence of hypertension in healthcare workers at SMCH

ii. To establish the proportion of HCWs with previously known hypertension disease that is not controlled

iii. To measure the association between severity of blood pressure recorded during a screening exercise and subsequent linkage to care

iv. To find out the association between presences of other selected comorbidities recorded during a screening exercise and subsequent linkage to care for HTN management

v. To ascertain the association between person-demographic factors and subsequent linkages to care following a screening exercise among HCWs at SCMH

1.5 Justification of the study

The prevalence of hypertension and linkage to care practices in HCWs are unknown within the local context. A clearer understanding of the hypertension burden among HCWs may inform the development of evidence-based prevention strategies. Thus, there is a need to investigate the burden of hypertension in HCWs to formulate health policy

mode.

1.6 Delimitations of the study

The study was be conducted at SMCH. The study population included all HCWs such as doctors, nurses, and ancillary workers, administration, and students in training among other groups.

1.7 Summary

This chapter has outlined the introduction to the study, thus introducing what the study entails. The background of the study was presented together with the statement of the problem. The research objectives and hypothesis were clearly outlined as well. In addition, the justification of the study and delimitation of the study were also presented. Leaving the study without exploring related literature will leave the study handicapped. The next chapter will involve an in-depth focus on the review of related literature.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter will show a review of related literature. Reviewing related literature is done, so as to get a broad understanding of the information that is available in relation to the problem under investigation, in-line with the objectives of the study. This chapter will examine findings from related studies, such that we are able to note similarities and differences in these studies so that we come up with explanations which can inform this study.

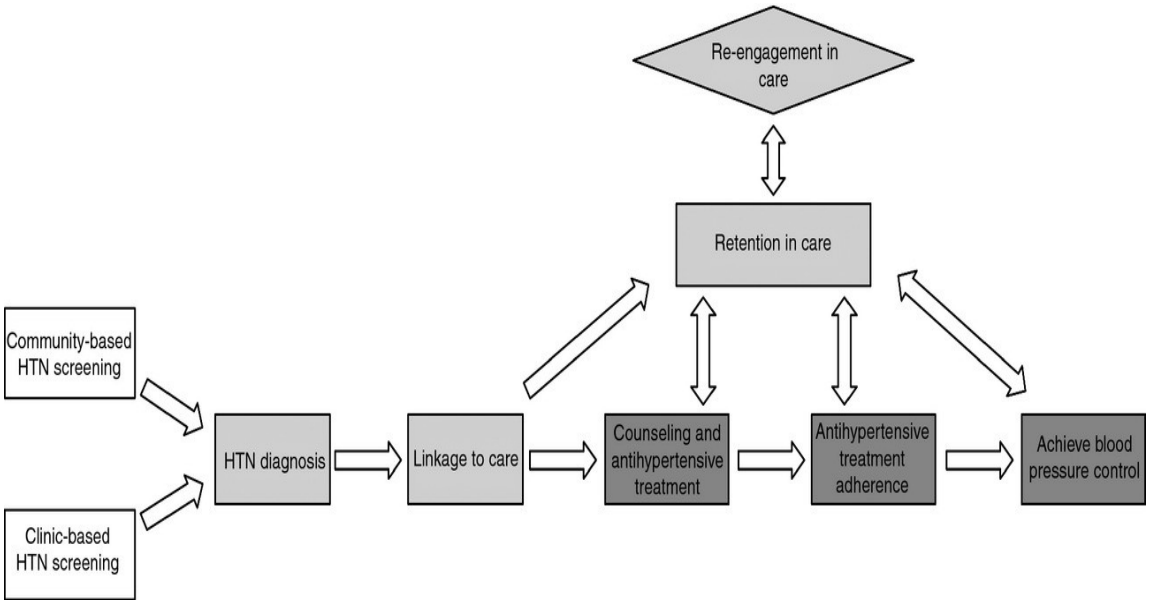

Figure 1. Conceptual framework of hypertension diagnosis and care

A concept map outlining each step involved in the successful treatment of hypertension. This process begins with community or clinic-based hypertension screening initiatives. Once hypertension is diagnosed, the next key steps - linkage, retention, and re-engagement - ensure continued engagement in care

2.2 Diagnosis of hypertension

Hypertension is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), normal blood pressure is a systolic BP < 120 mmHg and diastolic BP < 80 mm Hg. Hypertension is defined as systolic BP level of ≥140 mmHg and/or diastolic BP level ≥ 90 mmHg. The grey area falling between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP is defined as "prehypertension" (Kumar, Shankar & Singhn, 2016). Accurate blood pressure measurement is critical to properly identify and treat individuals with hypertension.

The Canadian Hypertension Education Program identified two significant shortcomings in the current diagnostic process (Cloutier et al., 2015). First, auscultatory measurements performed in routine clinical settings have serious accuracy limitations that are user dependent (Cloutier et al., 2015). Thus, alternatives to auscultatory measurements should be used. Cloutier et al., (2015) further noted that patients with white coat

hypertension must be identified earlier in the process and in a systematic manner rather than on an ad hoc or voluntary basis to reduce hypertension overtreatment.

Hypertension is diagnosed by measuring BP using a sphygmomanometer. In Zimbabwe, two consecutive readings at least 4 hours apart are used for diagnosis after which a medical doctor can commence treatment. However, a single systolic blood pressure (SBP) above 180 mmHg or a diastolic blood pressure (DBP) above 110 mmHg is indication for treatment (Mufunda, Chatora, Nyarango, Chifamba &Sparks, 2006).

2.3 Prevalence of hypertension in the general population

Globally, 26.4% of the adult population in 2000 had hypertension. The estimated total number of adults with hypertension in 2000 was 972 million (Forouzanfar et al., 2017). The number of adults with hypertension in 2025 was predicted to increase by about 60% to a total of 1·56 billion (Forouzanfar et al., 2017) A study by Rodgers, Lawes, & MacMahon, (2000) revealed that increased blood pressure levels are directly responsible for most stroke deaths (more than 50%) and a substantial minority of deaths from coronary heart disease (about 25%) in Eastern Asia. Currently, 80% of deaths due to cardiovascular disease occur in low- and middle-income countries, where the burden of hypertension has increased over the past decade due to population growth, ageing and increase in behavioral risk factors.

A systemic review of 103 full-text articles on hypertension in Africa, which analyzed 43,025 individuals in 15 African countries, revealed that the prevalence of hypertension ranged from 22.3% to 90.0% (Adeloye & Basquill, 2014). WHO (2013) estimates that out of the approximately 650 million people in SSA, between 10 to 20 million may

have hypertension. In a Study in Ghana, of the 219 hypertensive civil servants examined, 104 (47.5%) had evidence of target organ damage. The presence of target organ damage was associated with higher systolic and diastolic blood pressure levels (Addo, Smeeth & Leon, 2009).

The hypertension prevalence for Zimbabwe, estimated by the WHO (2013) was higher at 39% for both genders aged at least 25 years. There is a shortage of national data on hypertension prevalence studies in Zimbabwe, but the Zimbabwe STEPwise survey demonstrated that in 2005, the national hypertension prevalence was 27% (23,2% among males and 29% among females) (Hakim, Mujuru, Rusakaniko, & Gomo, 2005). Mutowo, Mangwiro, Lorgelly, Owen, & Renzaho (2015) looked at four studies with a total of 4829 study participants between 1997 and 2010 across 5 provinces in Zimbabwe. The overall pooled prevalence of hypertension was 30%.

2.4 Prevalence of hypertension in HCWs

In a hypertension prevalence and awareness study among HCWs in Nigeria almost thirty percent (29.9%) of the subjects were health management and support workers, twenty five percent (25.0%) were nurses, a little over twenty four percent (24.1%) were other health workers, almost nine percent (8.6%) were laboratory personnel, almost seven percent (6.8 %) were pharmacy personnel while slightly over five percent (5.6 %) were doctors (Owolabi, Owolabi, OlaOlorun, & Amole, 2015). The prevalence of hypertension was 20.1% in the studied population. In a systemic review of data from six countries by Bosu (2015), sedentary workers such as traders, bank workers, civil

servants, and chiefs were at high risk. Among health care workers, the prevalence ranged from 17.5 to 37.5%. The study further revealed that the prevalence increased with age and was higher among males and workers with higher socio-economic status.

A four-country cross sectional study done by Guwattude et al. (2015) revealed that the overall age-standardized prevalence of hypertension was 25.9 %. Prevalence was highest among nurses with an age-standardized prevalence (ASP) of 25.8 %, followed by schoolteachers (ASP = 23.2 %), peri-urban residents (ASP = 20.5 %) and lowest among rural residents (ASP = 8.7 %). According to that study only 50.0 % of participants with hypertension were aware of their raised blood pressure.

In a hypertension study done in Bulawayo, on Bulawayo City Council employees, the highest prevalence of 38.4% was reported. However, no hypertension prevalence studies have been done in HCWs in Zimbabwe. It remains to be seen if hypertension trends in HCWs follow a similar pattern.

2.5 Linkage to care after screening

Given that hypertension may be asymptomatic, linkage and retention to care and medication adherence are particularly difficult challenges. Moodley (2011) demonstrated that delays in seeking hypertension care have been shown to be associated with increased mortality. Thus, early linkage to hypertension care and successful retention to clinical services are critical components of hypertension management. In a community-based hypertension screening in South Africa carried out by Sudharsanan et al (2020), 14.6% were newly diagnosed with elevated pressure. 26.9% of those sought hypertension care in the following 2 years. The study further revealed that women, those

of older age and those unemployed were more likely to have linked to care. This South African study is supported by another community-based hypertension screening study from Lagos,

Nigeria. This study by Heleen et al., (2018) demonstrated that 59.5% of those who were screened were newly diagnosed with hypertension and 23% of those referred were linked to care.

In another community-based hypertension screening program in Uganda, 83% linked to care within 6 months (Kotwani et al., 2014). Studies of hypertension programs in sub-Saharan Africa have suggested that addressing financial barriers, provider-patient communication, and education may improve linkage, retention, and medication adherence (Magadza et al., 2009). Other studies in Africa suggested that it is rather difficult to improve linkages to care.

A qualitative study by Naanyu et al in western Kenya has revealed that although community members understand that hypertension can cause significant morbidity and mortality, there are few known specific strategies to optimize linkage and retention to hypertension care in this setting. However, there are no studies that demonstrated linkages to care in HCWs undergoing hypertension screening

Several barriers to linkage to care have been cited in many studies. According to a Kenyan study by Naanyu et al., (2016), one of the key barriers noted was the asymptomatic nature of hypertension. Even though people had some knowledge of the causes, treatment, and potential complications of hypertension, they did not consider themselves vulnerable—until the condition produced unbearable symptoms.

Other barriers noted in the same study were health system factors, the most common of which was poor quality of care and poor provider–patient relationship.

2.6 Source of care and referral for hypertension services

Attendance of a health care provider is a first critical step that high-risk individuals must comply with in order to realize maximum benefit from treatment. In addition, utilization of healthcare services should be followed by continued use of such for long-term treatment of hypertension and other non-communicable diseases. In a study in Mazowe district in Zimbabwe, a high proportion of hypertensive patients were being attended to at local clinics (51.4%) as compared to hospitals (43.6%). Smaller proportions were consulting General Practitioners (3.6%) and traditional healers (1.4%) (Mungati et al., 2014).

2.7 Hypertension status awareness

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). According to Pereira, Lunet, Persell (2011), hypertension awareness, treatment, and control rates are low worldwide. In Kenya, hypertension treatment and control rates have been reported at below 15% and 5%, respectively.

Osuala, Abimbola, & Kadiri (2014) carried out a study among urbanized workers in Nigeria and found out that 51.6% of hypertensive subjects were aware of their status. There was a higher awareness of hypertensive status among health workers in this study than the general populace but a significant percentage (35.3%) of health workers were unaware of their hypertensive status. In a Zimbabwean study by Mungati et al., (2014), hypertension awareness in Mazowe district was 75%.

Hypertension, like other non-communicable diseases in SSA is struggling to receive the needed attention it requires as most national programs are structured towards battling infectious diseases. The malaria, tuberculosis and HIV control programs are the leading national health interventions put in place by most African countries.

2.8 Treatment options for hypertension

The efficacy of antihypertensive medicines is well demonstrated and treatment of high-risk individuals has been advocated as a major strategy to control non-communicable diseases in all countries, developing countries included (Staessen, Wang, & Thijs, 2001).. According to researchers Pessel, et al., (2003), hypertension is the most common modifiable risk factor for cardiovascular disease and death and lowering blood pressure with antihypertensive drugs reduces target organ damage and prevents cardiovascular disease outcomes. They noted that a total of 69 drugs in 15 different classes, many of which are also available in single pill combinations, have been approved for the treatment of hypertension in the United States.

Despite this plethora of treatment options, an estimated 10% to 15% of the general hypertensive population has resistant hypertension, defined as uncontrolled blood

pressure on ≥3 antihypertensive drugs of different classes, including a non-potassium-spar. Ataklte, et al., (2014) recorded that 18% of individuals with hypertension were receiving treatment across the studies done in SSA with only 7% having controlled blood pressure. Rural regions have recorded lower treatment coverage as compared to urban areas (Kayima et al., 2013). Hypertension is inadequately diagnosed and managed in many sub-Saharan regions. Factors such as poor access to health services, cost of treatment and poorly resourced health facilities may be attributed to the low level of treatment of hyper tensioning diuretic, at optimal doses, or requiring ≥4 drugs to achieve control (Pessel et, al., 2003).

In a study done in Mazowe district in Zimbabwe by Mungati et al., (2014), 58.6% of all hypertensive patients were on treatment.

2.9 Hypertension Control

With poor control of hypertension among patients the risk of complications is therefore likely to be higher. The poor control of BP in this study may have been worsened by the drug shortages experienced during the study period. A study by Morisky et al. showed that better control of BP was associated with a 57.3% lower risk of mortality among patients on treatment for hypertension through enhancing health educations among patients of treatment. According to Sandoval, Nazzal & Romero (2018), in their study in Chile, blood pressure control of < 140/90 mmHg was achieved in 63.1% of patients. Such a high blood pressure control rate could be attributed to the fact that patients in Chile received better health care in comparison to the Zimbabwean context. Contrary, in

a study in the Southern region of Chile, the urban population showed blood pressure control in 30.7% of 1,838 patients under treatment (Sandoval et al., 2018).

Geldsetzer et al., (2018) reported data from 1·1 million participants from 44 low-income and middle-income countries. They found that 17·5% of these individuals had hypertension and that, among those with hypertension, 39·2% were aware of their diagnosis, 29·9% had received treatment, and 10·3% had control of their hypertension.

They reported very low hypertension control and highlighted the LMICs achieving control of blood pressure in less than 5% of patients with hypertension. Their findings were supported by findings from Zimbabwe. Blood pressure control among women was 22.6% as compared to 17.9% in men (Mungati et al., 2014)

It is prudent to highlight that the interpretation and comparison of data on hypertension epidemiology are challenging and combining several studies, as has been done by Geldsetzer et al (2018), might not be the best method for cross-country comparisons. There are well known variations in methods of blood pressure measurement, and differences across studies in their definitions of hypertension, including blood pressure cutoffs and how self-reported data are incorporated. Differences might also emanate from variations in local hypertension guidelines. Age demography also makes tracking trends over time and comparing them across countries difficult.

Ataklte et al., (2014) recorded that 18% of individuals with hypertension were receiving treatment across the studies done in SSA with only 7% having controlled blood pressure. Several studies conducted in South Africa, Brazil, Kenya and South Korea, also showed low blood pressure control rates of 45.8%, 45.7%, 34.8% and 32.2% respectively

(Jardim, et al., 2017). These low blood pressure control rates might be comparable to the Zimbabwean context where hypertension patients do not usually adhere to their recommended diets, being physically inactive, consuming alcohol in excess, smoking or not adhering to their medication, as they usually lack comprehensive education about self-care and management of their condition. As noted in the South African study, poverty plays a role in non-adherence to recommended lifestyle modifications in poverty-stricken areas such as Zimbabwe and this worsens uncontrolled blood pressure rates amongst hypertension patients.

2.10 Chronic medical conditions associated with hypertension

Hypertension and obesity are major components of the cardiometabolic syndrome and are both on the rise worldwide, with enormous consequences on global health and the economy (Ataklte et al., 2014). The relationship between hypertension and obesity is multifaceted; the etiology is complex, and it is not well elucidated

Hypertension is often associated clinically with diabetes either as part of insulin resistance syndrome or as a manifestation of renal disease. Elevated syatemic blood pressure accelerates the progression of both microvascular and macrovascular complicationsin diabetes. Hypertension also appears to accelerate vascular and cardiac abnormalities in diabetes.

Treatment of high blood pressure in people with diabetes results in large reductions in death and disability within a short period of time and needs to be a therapeutic priority (Campbell et al., 2009). Achieving acceptable blood pressure levels requires appropriate lifestyle modification, and three or more antihypertensive drugs. Hypertension

management in people with diabetes is one of the few medical treatments estimated to reduce overall health costs. At the end of the day, the cost of treatment is less than the cost of complications prevented. To prevent complications from hypertension and related factors, blood pressure needs to be assessed at all visits and home blood pressure assessment is encouraged.

Management strategies need to include assessment and management of cardiovascular risks including smoking, unhealthy eating, physical inactivity, abdominal obesity, dyslipidemia as well as dysglycemia. Intensive individualized care and lifestyle modification is recommended to prevent and treat hypertension, dyslipidemia, dysglycemia and other vascular risks in people with diabetes.

Hypertension is a common condition, which is increasingly prevalent with age (Franklin et al.,2001). Franklin et al (2001) observed that 50% of those aged >60 years are hypertensive, of which the majority (80%), have isolated systolic hypertension. This is characterized by an increase in systolic blood pressure (SBP) but a normal or reduced diastolic blood pressure (DBP). Although initially considered a benign consequence of ageing, isolated systolic hypertension and a wide pulse pressure are pathological and associated with a considerable increased risk of cardiovascular (CV) disease.

Low socioeconomic status is associated with higher blood pressure, and this association is particularly evident in the level of education. It is therefore important to identify and monitor hypertension and its risk factors to reduce the burden of this disease among the most vulnerable groups in different countries and among different societies

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter gives details of the methods which were be employed in the study. The chapter highlights the type of the study design used, study setting, study population, the sampling method and how the research data were collected and analyzed. The ethical considerations made are also stated in this chapter.

3.2 Study design

The research design that was used is an analytic cross-sectional study. The cases were classified, according to the Eighth Joint National Committee (JNC 8) guidelines which recommend that high blood pressure is 150/90 mm Hg or higher in adults 60 years and older, or 140/90 mm Hg or higher in adults younger than 60 years. In patients with hypertension and diabetes, pharmacologic treatment should be initiated when blood pressure is 140/90 mm Hg or higher, regardless of age.

3.2.1 Definition of hypertension Based on JNC-VII criteria

Normal- Systolic and diastolic < 120/80

Prehypertensive: systolic 120-139 or diastolic 80-89 mm of Hg

Stage-1 hypertensives: systolic 140-159 or diastolic 90-99 mm of Hg

Stage-2 hypertensives: systolic 160 or diastolic 100 mm of Hg

3.3 Study setting

The study setting was Sally Mugabe Central hospital, Harare, Zimbabwe. SMCH is one of the largest public medical centers in Zimbabwe with an inpatient capacity of 1200 beds, general medical and surgical wards, an outpatient wing, an eye center, a children's hospital, a mental health maternity hospital, medical and nursing schools, and staff residences on site. The hospital has a staff compliment of 3200 with eighty percent being nurses. The hospital's staff clinic is manned by 2 doctors, 1 rehabilitation officer, 10 nurses and 3 general hands. This clinic offers wellness services, NCDs screening and general consultations. HCWs who need specialist services are referred to the various specialist clinics that are run within the Outpatients Department.

3.4 Study population

Study population were HCWs, with a deliberately broad scope which included medical and nursing staff but also those working in domestic, administrative, security and other ancillary services. HCWs selected from the various departments underwent hypertension screening at the staff clinic housed within the Outpatients Department.

3.4.1 Inclusion Criteria

The inclusion criteria were healthcare workers, aged 18 – 65 years, who had no medical condition or had any pre-existing medical conditions, signed consent for participation in the research study and were working at SMCH, Harare, during the study period. Subjects

who had no complete measurements of both systolic and diastolic blood pressure results were excluded

3.4.2 Exclusion Criteria

The study excluded hospital's patients and non HCWs. The study also excluded vulnerable groups such as pregnant women. Participants who had no complete measurements of both systolic and diastolic blood pressure results were excluded.

3.5 Sample size and Sampling procedure

3.5.1 Sample size and power

A representative sample size for the study was determined using an estimated prevalence rate of 27% for hypertension which was found in a similar study setting in Zimbabwe by Hakim J, et al, (2005), at a 5% margin of error and 95% confidence level. Based on these assumptions, the minimum sample size for this study was calculated to be 273. Adjusting for a 20% nonresponse rate, the maximum sample size was calculated to be 342, using the formula below:

3.5.2 Sample size determination Formula

$n = Z^2pq/ d^2$

Where,

p = probability of success (prevalence of hypertension- 27%)

q = probability of failure (prevalence of normal blood pressure – 73%)

Z = 1.96 (95% confidence interval)

d = 0.05 or 5% (difference)

The study power being 80% and response rate being 80%

$n = (1.96)^2 (0.27 \times 0.73) / (0.05)^2$

$n = (3.8416 \times 0.1971) / 0.0025 = 0.757179 / 0.0025$

$n = 302.87$

n = 303 people (minimum sample size)

Maximum sample size = minimum sample size/response rate

$= 303/0.8 = 378.59$

=379 people

3.5.3 Sampling procedure

Stratified random sampling method was used to obtain the sample. Study participants were randomly selected from the hospital's main departments, which are maternity, children's hospital, main hospital wing, psychiatric hospital, administration, nursing school and operations.

3.6 Data collection instruments

The researcher used reviewed structured interviewer-administered questionnaire which adopted some components from the WHO Stepwise survey (WHO STEPS 31 Instrument version 3.2). The components adopted from the WHO Stepwise survey were used to collect data on blood pressure measurements.

3.6.1 Validity and Reliability

The data collection tools were first developed in English and then translated to the vernacular language (Shona) and then back translated to English. Comparisons of the

original and back translated versions was made during the process and necessary adjustments will be made accordingly.

3.7 Pretesting of Instruments

The data collection tools were pretested at Mbare Clinic in April 2021. The pre-test also ensured validity and reliability of the data collection tools, as the tools were readjusted according to the constructive feedback and loopholes noted.

3.8 Data Collection Procedure

Data collection was conducted in 3 weeks in April 2021. Research assistants were trained on the data collection procedure and the informed consent process with regards to the issues of privacy and confidentiality. Interviews were used to collect data from the study participants. In the interviews, there was room for probing, since on a face-to-face basis one could ask questions in vernacular language or switch from one language to another depending on the person being interviewed.

3.8.1 Hypertension screening

All eligible HCWs were invited to participate in the hypertension screening program. Each adult responded to an epidemiologic survey ascertaining basic demographics, occupational and medical history, as well as substance use. The blood pressure (BP) measurements were taken using the OMRON digital fully automated blood pressure monitor (OMRON Healthcare, IntelliSense BP785, HEM-7222). After participants had rested in a sitting position for at least ten minutes by qualified nurses, two measurements were taken with an appropriately sized cuff at a one-minute interval on the right arm, with the arm supported at heart level and feet flat on the floor. The Seventh Report of

the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) criteria for the classification of blood pressure was used. Normotensives were classified as systolic blood pressure (SBP) < 120 mmHg and diastolic blood pressure (DBP) < 80 mmHg, prehypertension (SBP 120–129 mmHg or DBP 80–89 mmHg), hypertension stage 1 (SBP 140–159 mmHg or DBP 90–99 mmHg), and hypertension stage 2 (SBP ≥ 160 mmHg or DBP ≥ 100 mmHg).

Persons with high blood pressure underwent two confirmatory measurements one minute apart. The lowest of three measurements was then used to establish a diagnosis of hypertension to minimize over-diagnosis (false positives) using a single blood pressure measure. In addition, height (to the nearest 0.1 cm) and weight (to the nearest kilogram) were measured to calculate body mass index (BMI) for each participant. All HCWs at SMCH who had new diagnosis of hypertension or known hypertension that is not controlled participated in the linkage to care component.

3.8.2 Anthropometric Measurements

All the anthropometric measurements were done by following a standardized technique. Weight was measured by Libra weighing machine having an accuracy of 0.1 kg and height was measured by using a steel anthropometry rod with accuracy of 0.1 cm using standard techniques. BMI was calculated using the following formula: BMI = weight (kg)/ square of height. Based on BMI obtained, the subjects were classified into different categories according to the WHO global classification.

3.8.3 Hypertension linkage intervention

The linkage to care intervention included education and referral appointment to a health facility. Each participant received an individualized counseling session with an experienced nurse which included education about the chronic nature of hypertension, possible complications of untreated disease, need for lifestyle modifications, and potential necessity for lifelong medications. Each session lasted 5–10 minutes and was performed by the same nurse for all participants. Participants were given a referral appointment to the nearest local health center.

3.8.4 Linkage to care

Visits were captured using handwritten logbooks at the local health center and the referral hospital. Participants who did not visit either health facility within 30 days were tracked to determine care status and assess barriers to care. A trained tracker conducted a standardized interview to assess care status and barriers to care.

The tracker was given a list of participants including their pertinent identifiers (name, sex, age, and occupation) and residence information. Since participants provided a cellphone number, the tracker ascertained care status through a phone interview. The phone interview followed a standardized referral form and call log

3.9 Analysis and Organization of Data

Data capturing and cleaning was done using Microsoft Excel and analysis was done using STATA version 12.1 and Statistical Package for Social Science (SPSS) version 24 statistical packages. Data analysis involved use of univariate, bivariate and multivariate analysis to come up with proportions, frequencies, and odds ratios. Information was

secured on a password-protected computer. Data was backed up using a flash drive and an external hard drive which was only accessed by the Principal Investigator (PI), research assistants, biostatistician, and relevant authorities.

3.10 Ethical considerations

The research proposal was submitted to Africa University Research Ethics Committee (AUREC) for ethical clearance and to the Clinical Director for Sally Mugabe Central Hospital for administrative clearance. The researcher obtained informed consent from participants for their voluntary participation in the study. Participants were interviewed and examined in the staff clinic housed within the Outpatient's Department. Privacy and confidentiality were maintained throughout the process.

To maintain anonymity, the questionnaires did not include names of participants instead a code was assigned to each questionnaire. The filled questionnaires and informed consent forms were kept under lock & key at the SMCH research office and research assistants, biostatistician and relevant authorities had access to these tools and data. There were no direct medical or other benefits to study participants because the study was not a treatment study for hypertension. But information gained was used to inform health interventions. There were no physical or psychological risks in this study.

3.11 Summary

This chapter has outlined the methods and procedures which were employed to implement the study. Amongst other elements, the study instrument to be used, how reliability and validity was ensured in the study and how data was collected for use in the study was clearly described.

CHAPTER 4 DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter will present results of the prevalence of hypertension in HCWs and to find out the determinants of linkage to care practices among HCWs screened. This was an analytic cross-sectional study, which recruited 744 HCWs with an unknown and known hypertension diagnosis. The newly diagnosed hypertensives and those with uncontrolled hypertension received a referral package and were followed up between fourteen- and sixty-days post diagnosis.

Data analysis brought out proportions, frequencies, and odds ratios. Data presentation starts with the demographics which include gender, age, income source, marital status, residence, education level, blood pressure and other chronic conditions. Data presentation for further analysis was based on univariate, bivariate and multivariate analysis (where logistic regression was used to take care of the confounding and effect modification).

4.2 Demographics of the study

The median age was 35 (interquartile range [IQR] 29-42) and the majority (78%, n=582) of the participants were female (Table 1). A wide range of healthcare professions was included, but the most represented were nursing or midwifery (42.5%, n=316), and domestic services (21.3%, n=158). Most participants were married (66.3%, n=493). A majority of HCWs (77.1%, n=540) reported no previous medical conditions; the most reported diagnoses were hypertension (14.4%, n=107) and HIV (7.4%, n=55).

The highest level of education was secondary school O level (42.8%, n=319). Most HCWs are on medical insurance (62.9%, n=468).

Table 1: HCWs demographic characteristics

Variable	N	%
Sex		
Male	164	(22%)
Female	580	(78%)
Marital status		
Married	493	(66.3%)
Single	146	(19.6%)
Other	105	(14.2%)
Roles		
Clinical roles	*427*	*(57.3%)*
Nursing and midwifery	316	(42.5%)
Allied health professionals	51	(6.8%)
Medical	35	(4.7%)
Dental	25	(3.3%)
Non-clinical roles	*317*	*(42.7%)*
Cleaning/domestic services	158	(21.3%)
Security/maintenance/porters/drivers	81	(10.9%)
Administrative	56	(7.5%)
Laboratory	12	(1.6%)
Other	10	(1.4%)
Highest level of education		

Did not complete primary	1	(0.2%)
Primary	4	(0.6%)
Secondary O-Level	319	(42.8%)
Secondary A-Level	90	(12.0%)
Diploma after secondary	220	(29.4%)
University	110	(14.9%)
Medical insurance		
Medical aid	468	(62.9%)
No medical aid	276	(37.1%)
Medical history		
No medical conditions	540	(77.1%)
Hypertension	107	(14.4%)
HIV	55	(7.4%)
Diabetes	15	(2.0%)
Asthma/COPD	13	(1.8%)
Epilepsy	2	(0.3%)
Cardiovascular disease	2	(0.3%)
Renal disease	0	(0.0%)
Previous TB	0	(0.0%)
Malignancy	0	(0.0%)
Psychiatric	0	(0.0%)
Other	10	(1.1%)

4.3 Hypertension screening outcomes

At enrolment, 14.9% (n=111) had elevated blood pressure, that is two separate blood pressure readings above 140/90mmHg, of whom 11.1% (n=83) had a pre-existing diagnosis of hypertension (Table 2). About two thirds (67%) of the known hypertensives had poorly controlled hypertension. Of the total number of HCWs screened, 3.8% (n=28) had a new diagnosis of hypertension (Table 3). This represented a third of those who had elevated blood pressure readings on the day of screening. The proportion with blood pressure reading above 140/90mmHg also increased with age ($p<0.001$), and males were more likely to have uncontrolled blood pressure than females (68.8% vs 60.1%, $p=0.02$).

Table 2: Hypertension screening in HCWs

Variable	Male N= 162 n (%)	Female N =582 n (%)	Total N= 744
Known hypertensives	16 (9.9)	107 (18)	123 (16.5)
poorly controlled	11 (6.8)	72 (12.3)	83 (11.1)
well controlled	5 (4.0)	35 (6.0)	40 (5.4)
New diagnosis	1 (0.3)	27 (4.6)	28 (3.8)

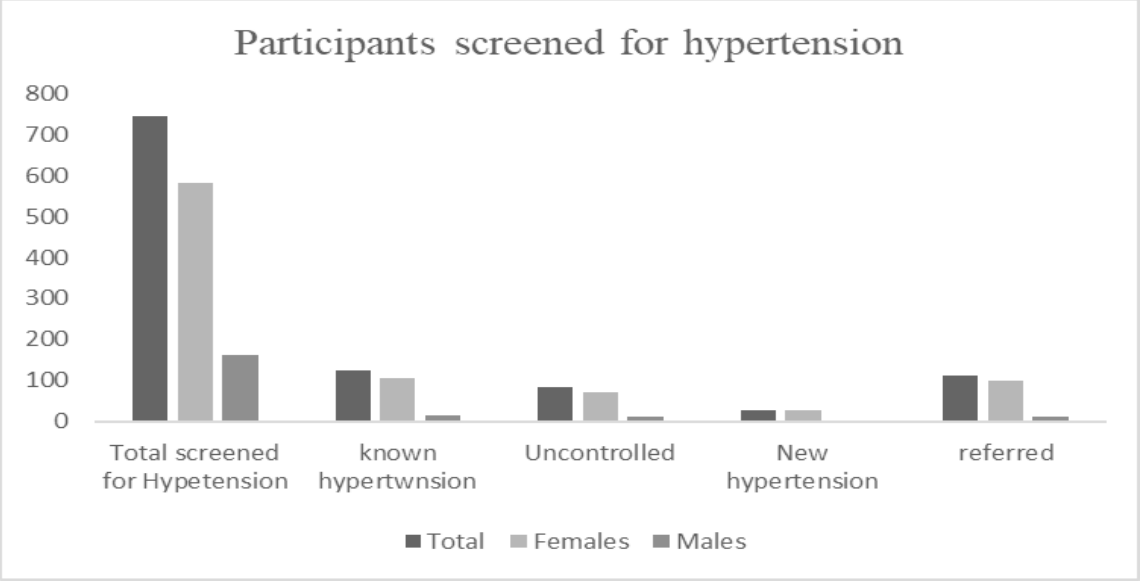

Figure 2: Hypertension screening in HCWs

The upper and lower interquartile values for systolic blood pressure were 165 mmHg and 84mmHg respectively. The upper and lower interquartile values for diastolic blood pressure were 113 mmHg and 53 mmHg respectively.

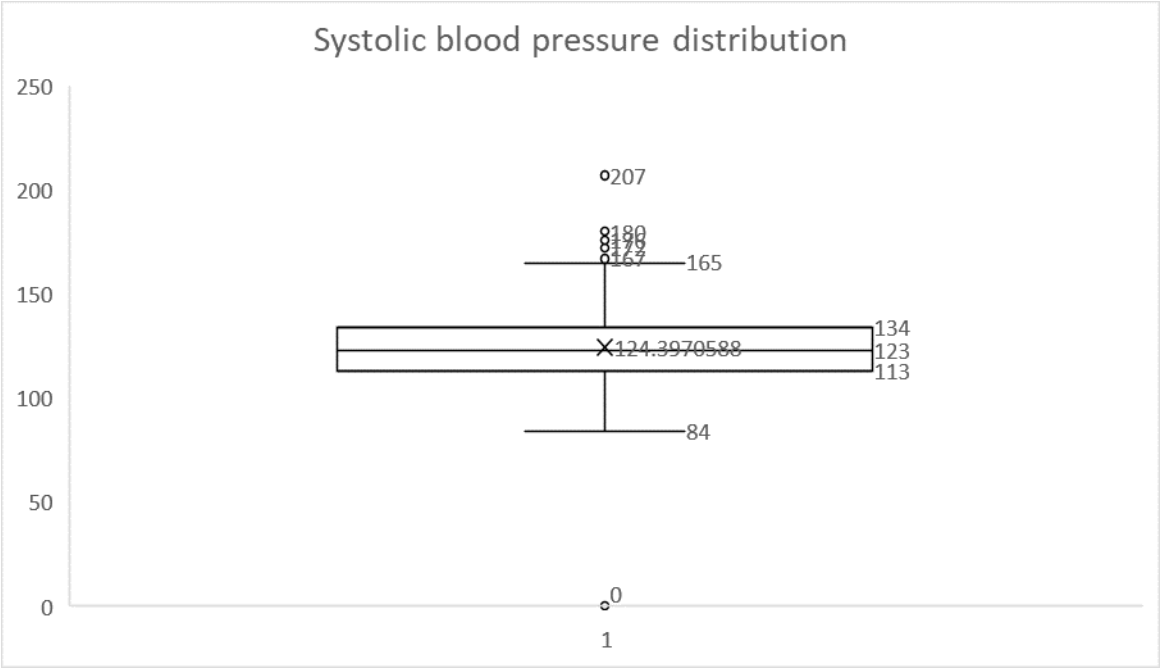

Figure 3: Distribution of systolic blood pressure

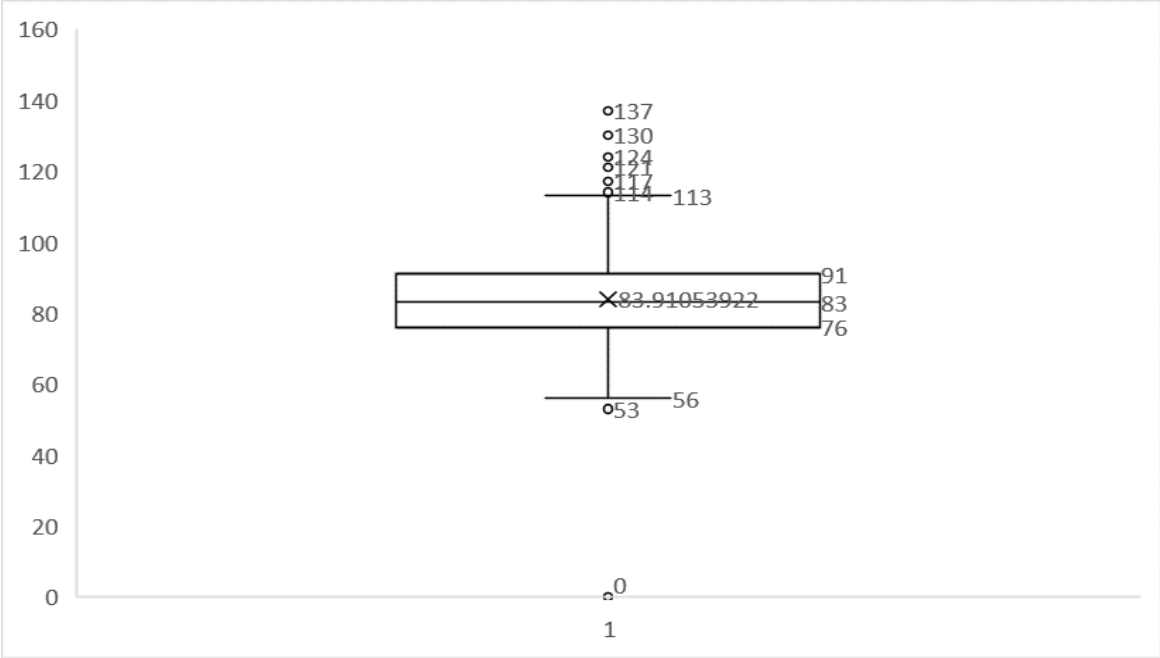

Figure 4: Diastolic blood pressure distribution

4.4 Linkages to care

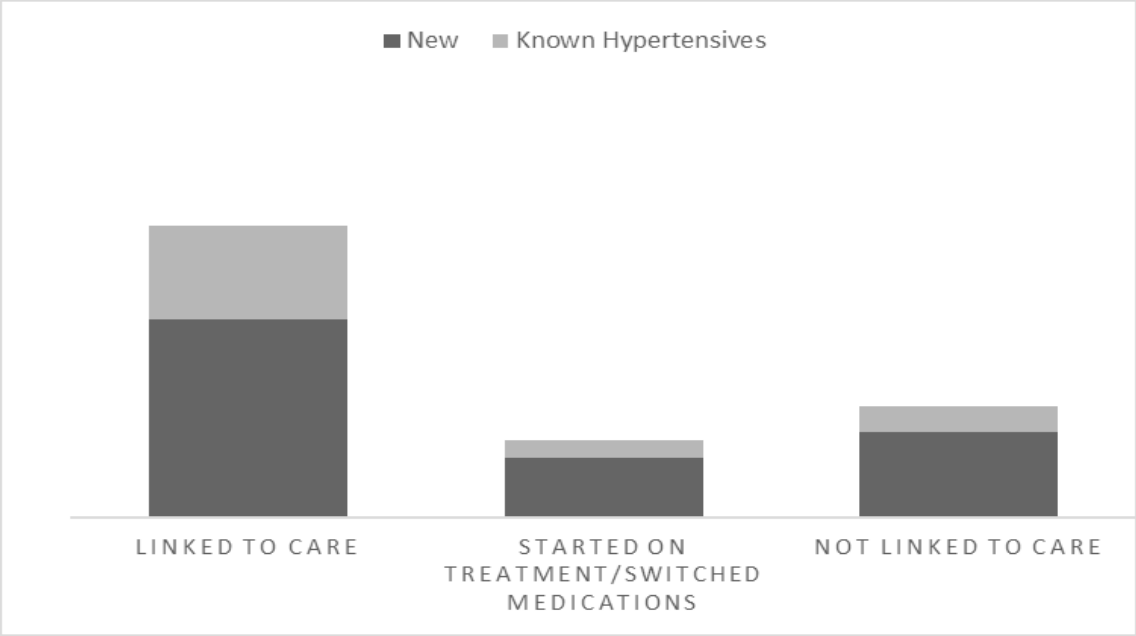

Figure 5: Linkages to care

Participants were referred and followed up over a period of 60 days to ascertain linkage to care. Forty-seven participants were referred for further care and about three quarters (72%) were linked to care. A small proportion of the newly diagnosed hypertensives were started on treatment (18%). About a third (30.4%) of the referred participants with known but poorly controlled hypertensives had their medications switched or were started on new medication. A majority (77%) of those who were not linked to care had a new diagnosis of hypertension at the time of screening.

4.5 Severity of hypertension and linkages to care

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) criteria for the classification of blood pressure was used.

Hypertension was classified as mild hypertension (SBP 140–159 mmHg or DBP 90–99 mmHg), moderate hypertension (SBP 160-179 mmHg or DBP 100- 109 mmHg).and severe hypertension (SBP > 180 mmHg or DBP > 110mmHg. About three quarters of the referred patients were successfully linked to care as shown in table 4. Half (50%) of the participants who were linked to care had mild hypertension

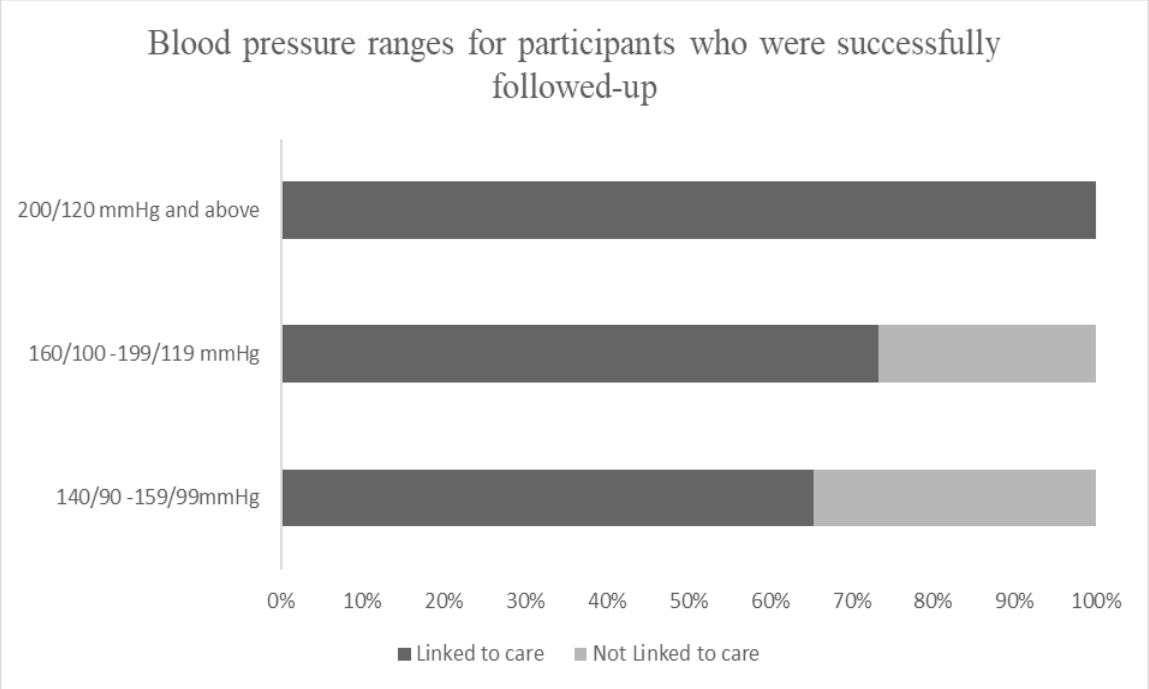

Figure 6: Blood pressure severity for followed up participants

Table 3. Bivariate analysis

		Linked (cases)	Not Linked (controls)	OR (95% CI)	P value
HPT status	New	23	10	0.6 (0.1 - 2.7)	0.536
	Known	11	3		
Medical aid	Yes	31	2	56.8 (8.4 - 386.5)	0.0001
	No	3	11		
Job type	Clinical	26	3	10.8 (2.4 - 49.2)	0.002
	Non-clinical	8	10		

Table 4. Multivariate analysis

Variable		Linked (cases)	Not Linked (controls)	OR (95% CI)	P value
BP reading	Mild	17	9	1	
	Moderate	11	4	1.5 (0.4 - 5.9)	0.599
	Severe	6	1	3.2(0.3 - 30.6)	0.317
Chronic Conditions					
	Diabetes	7	1	3.7(0.4 - 33.2)	1.15
	CDK	4	1	2.1 (0.2 - 20.8)	0.530
	Non	23	12	1	
Level of education					
	O'level	4	8	0.0 (0.0 - 0.6)	0.018

	Diploma	21	4	0.6 (0.1 - 5.9)	0.645
	Degree	9	1	1	
Marital status					
	divorced	1	1	1	
	Single	7	8	0.9 (0.0 - 16.7)	0.929
	Married	26	4	6.5 (0.3 - 126.1)	0.216
Age group					
	< 30 years	1	3	1	
	≥30 to <50	18	8	6.75 (0.6 - 75.2)	0.120
	≥50	15	2	22.5 (1.5 - 335.4)	0.023
	Normal	13	8	1	
BMI	Mild	2	4	0.3077 (0.0 - 2.1)	0.227
	Moderate	4	0	Invalid	
	Severe	15	1	9.2(1.0 - 83.9)	0.049

Participants with moderate hypertension were 1.4 times more likely to link to care compared to those with mild hypertension and it was not statistically significant [OR= 1.5, 95%CI= (0.4 - 5.9), p-value= 0.599]. Almost all the referred participants who had severe hypertension were linked to care (83.3%). Those with severe hypertension were 3.2 times more likely to link to care compared to those with mild hypertension and it was not statistically significant. [OR= 3.2, 95%CI= (0.3 - 30.6), p-value= 0.318].

4.6 Hypertension status and linkages to care

About half (43.4%) of the new newly diagnosed hypertensive participants did not link to care as shown in table 4 above. The newly diagnosed hypertensive participants were 0.6

times likely to link up to care compared to the known hypertensives and this was not statistically significant [OR= 0.6, 95%CI= (0.1 -2.7), p-value= 0.5].

4.7 Chronic medical conditions and linkages to care

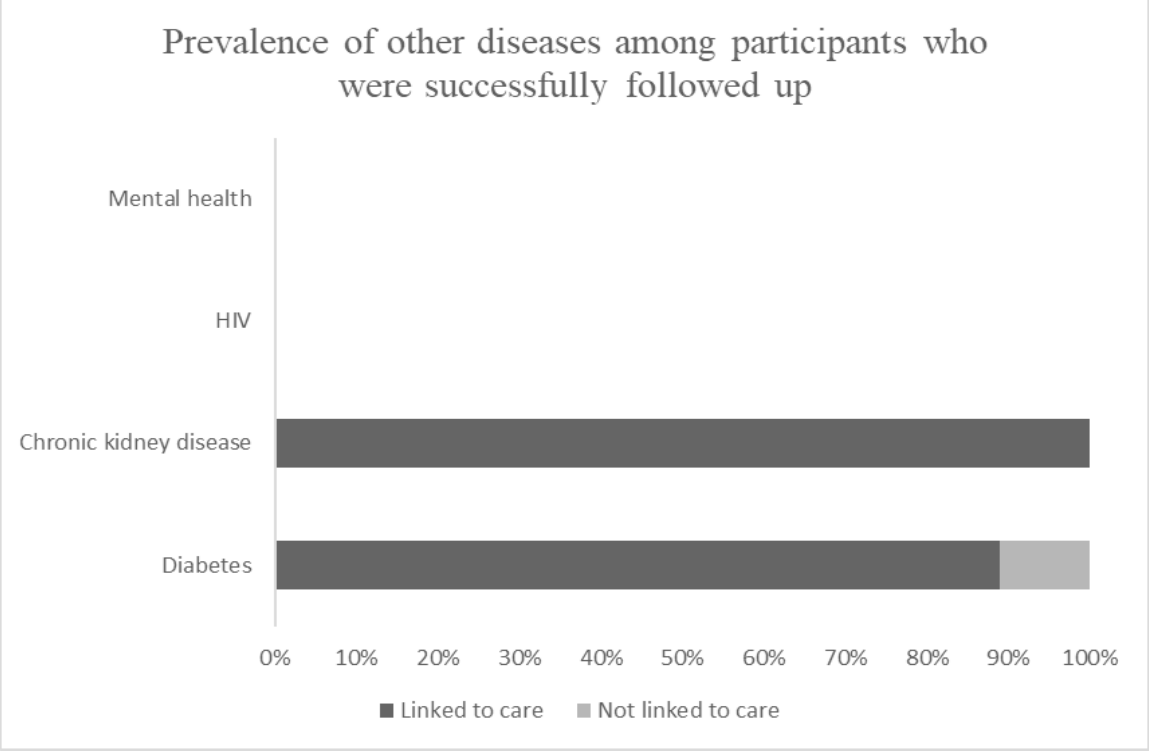

Figure 7: chronic medical conditions in participants successfully followed up

Diabetes, chronic kidney disease, HIV and mental health were the chronic conditions that were tracked in referred participants. There were no participants with underlying mental health or HIV. Almost all the referred participants who had diabetes and chronic kidney disease were successfully linked to care (86% and 75% respectively)

Diabetic participants were 3 times more likely to link up to care compared to participants with no medical conditions**,** and this is not statistically significant [OR= 3.6, 95%CI= (0.4 - 33.2), p-value= 1.150]. Participants with chronic kidney disease were 2 times more likely to link up to care compared to participants with no underlying medical conditions, and this is not statistically significant [OR= 2.0, 95%CI= (0.2 - 20.8), p-value= 0.531]

Participants with severe obesity were 9.2 times more likely to link to care as compared to those with normal BMI, and it is statistically significant.

4.8 Person - demographic factors and linkages to care

Almost all the referred patients who were on medical insurance were linked to care (94%). Participants on medical insurance are 56 times more likely to link to care compared to participants who are not on medical insurance, and this is statistically significant [OR= 56.8, 95%CI= (8.4 - 386.4), p-value= 0.0001].

Participants whose occupation is clinical were more likely to link to care. Clinical participants were 10 times more likely to link to care compared to non-clinical participants and this is statistically significant [OR= 10.8, 95%CI= (2.383 - 49.244), p-value= 0.002].

Increasing level of education was associated with an increase in the likelihood of successful linkage. Compared to those with no formal education, persons with tertiary education or beyond were the most likely to link to care. Those with O level education had a 95% reduced likelihood of linking up to care compared to degree holders and this was statistically significant [OR= 0.1, 95%CI= (0.0 - 0.6), p- value= 0.018]. Diploma level education holders had a 50% reduced likelihood linking up to care compared to degree holders and this was not statistically significant [OR= 0.6, 95%CI= (0.1 - 6.0), p-value= 0.650].

Married participants were 6.5 times more likely to link up to care compared to divorcees and this was not statistically significant [OR= 6.5, 95%CI= (0.3 -126.1), p-value= 0.216].

Single participants had a 12% reduced likelihood of linking up to care compared to divorcees and this was statistically significant [OR= 0.9, 95%CI= (0.0 to 16.7), p-value= 0.929]. Participants aged between 30 and 50 years were 6.8 times likely to link up to care compared with those aged below 30 years and this is not statistically significant [OR= 6.75, 95%CI= (0.6 to 75.2), p-value= 0.121]. Participants who were older than 50 years were 22 times more likely to link up to care as compared to those who were younger than 30 years and this is statistically significant. [OR= 22.5, 95%CI= (1.510 - 335.4), p-value= 0.02].

CHAPTER 5 DISCUSSION

5.1 Introduction

The global burden of hypertension and other non-communicable diseases is substantial and increasing, especially in LMICs. However, insufficient data exist regarding effective health care delivery practices in these settings, especially among HCWs. Each step in the implementation pathway, from screening through to linkage and retention to care, can benefit from evidence-based approaches. The purpose of this study was to measure the prevalence of hypertension and to find the determinants of linkage to care practices among HCWs screened at SMCH in 2021. This chapter includes a discussion of major findings of this study as related to the literature on adult HTN patients. The chapter concludes by stating limitations of the study, further research areas, a summary, and recommendations.

5.2 Demographic characteristics of HCWs

The median age was 35 years and most of the participants were female. The mean age for the participants in this study was 47 years and this compares well to what was found in other 64 studies which supported that, older participants were diagnosed with HTN (Riegel et al., 2019; Obirikorang et al., 2018; Choi et al., 2003; Jaddou et al., 2011). Contrary, literature has it that other studies found lower mean ages (Khayyat et al., 2017; Tibebu et al., 2017). The studies which reveal much lower mean ages, might have shown so because, their population comprised of younger individuals and is comparable to this study which included more younger participants.

There were more females than males in this study, 78% vs. 22%. This mirrors the staffing levels at the institution where 70% are females. On the other hand, could have been so because in the Zimbabwean context, women are known to have better health seeking behavior as compared to men, which might have been the reason why this study sample had more women who were readily available for screening at SMCH. Other studies in SSA have also reported higher hypertension screening in women than men. Factors such as women having better health seeking behaviors demonstrated in some studies and getting access to blood pressure measurement during contact with a health institution whilst pregnant may be possible explanations for higher detection among women (Addo et al., 2007). This compares well with a study in Brazil, where 64% were women (Riegel et al., 2019). A study which was conducted in Chile in four government subsidized primary care centers in the Metropolitan region of Santiago, similarly, revealed that 65.2% were women and men were 34.8% (Sandoval et al., 2018).

However, contrary to this study, studies conducted in Jordan and Ethiopia found that, 56% and 52% of the participants were male respectively (Alhalaiqa et al., 2017; Tibebu et al., 2017). The difference presented by these studies with more male participants, might have been due to regional differences, were in other regions men might have been empowered to have better health seeking behaviors.

In this study most of the clinical staff were nurses or midwives. Most non-clinical staff were domestic workers.

This is contrary to a hypertension prevalence study that was carried out in Nigeria in which almost thirty percent (29.9%) of the subjects were health management and support workers, twenty five percent (25.0%) were nurses, a little over twenty four

percent (24.1%) were other health workers, almost nine percent (8.6%) were laboratory personnel, almost seven percent (6.8 %) were pharmacy personnel while slightly over five percent (5.6 %) were doctors (Owolabi, Owolabi, OlaOlorun, & Amole, 2015

5.3 Hypertension screening and diagnosis

In this study the prevalence of hypertension was 14.9%. Our findings of HTN prevalence were lower compared to those of a cross sectional study conducted in 2013 in all six provinces of Lebanon and including a sample of 1697 participants, which reported a crude prevalence of 36.9% for HTN and 30% for pre-HTN while the control rate was 54% (Noubani, Nasreddine, Sibai, Tamim& Isma'eel, 2018). Both studies utilized similar methodologies, specifically the definitions of BP, which was based on BP measurements and not on self-report only. In this study, prevalence of hypertension was 17.5%: 48.1% among teaching medical doctors, 13.6% in the group of other medical doctors, 14.9% in the nurse's group and 18.8% in the assistant nurse group (Konin et al.,2011)

The low BP control found in this study compares well to findings from several studies conducted in South Africa, Brazil, Kenya and South Korea, which also showed low BP control rates of 45.8%, 45.7%, 34.8% and 32.2% respectively (Jardim, et al., 2017; 63 Riegel, et al., 2019; Kimani et al., 2019).

Such low BP control rates might have been since HTN patients are less likely to adhere to their recommended lifestyles because adhering to these BP lowering interventions has no foreseeable benefit to them, as their condition is asymptomatic.

Comparing the findings of our study with similar studies in the other countries, Zimbabwe had the lower prevalence of HTN when compared to Palestine (27.6%), Egypt (26.3%), and Turkey. (Naobani et al., 2018). This study revealed better control rates of the disease compared to the rates reported from Palestine (9.5%), Egypt (8%), and Turkey (8.1%), respectively (Naobani et al.,2018). On the other hand, comparing the results with the West, this study had lower prevalence of HTN than the developed countries such as the USA (29%) (Nwankwo, Yoon, & Burt, 2013) and Canada (20%) (Padwal, Bienek, McAlister, Campbell, 2016). Yet the control rate in Lebanon is comparable to the same countries, USA (63%) and Canada (66%)

The variability across countries is multifactorial and could have occurred because of differences in the study designs and methodologies, time frames, geographic variations, lifestyle habits, and socioeconomic differences in addition to medical access and quality of care (Tailakh et al., 2014)

Among the hypertensive subjects in this study, 84.7% of them were previously aware of their hypertensive status. Awareness of blood pressure status is higher than what was found in the general populace. A study carried out among urbanized workers in Nigeria found that 51.6% of hypertensive subjects were aware of their status (Owolabi et al., 2015).

There is a higher awareness of hypertensive status among health workers in this study than the general populace but a significant percentage (19%) of health workers were unaware of their hypertensive status, this demonstrates the asymptomatic course of the disease and as such routine systematic screening is very important even among health care workers

This study was carried out in an urban set- up. Reports have shown that urban populations consistently have higher prevalence of hypertension than their rural counterparts in almost all studies that covered both area (Addo, Smeeth, & Leon 2007). This observation has been suggested to be linked with increased levels of obesity, salt, and fat intake from increased consumption of processed foods and engaging in jobs with minimal physical activity and smoking. The comparison in hypertension burden between urban and rural HCWs did not come out in this study as only urban HCWs participated.

In this study females exhibited a higher prevalence of hypertension than their male counterparts. We assume this may be due to the higher prevalence of obesity among women, a risk factor for hypertension (Mukora-Mutseyekwa et al., 2019). The STEPwise survey of 2005 also found a higher prevalence of hypertension in women (Mungati et al., 2012). A hypertension study in India on HCWs revealed a higher burden of hypertension among females (Singh, Shankar, & Singh, 2017). This gender disparity in hypertension prevalence is unusual as studies have demonstrated that men are at a higher risk of hypertension due to behavioral risk factors like smoking, alcohol consumption, or physical activity (Singh et al., 2017).

However there has been no consistence in the sex difference as shown by a study done in Mozambique where men had a higher prevalence of hypertension than women (Damasceno et al., 2009)

Age was found to be an important risk factor for hypertension. As the age was advancing so did the prevalence of hypertension among both males and females. Similar findings were reported by other studies also where advancing age was positively related to hypertension (Tabrizi et al., 2016). This is biologically plausible as the age-related

arteriosclerosis of blood vessels compromises flexibility of blood vessels causing the heart to increase the force of myocardial contraction thereby raising BP.

5.4 Linkage to care

We screened 711 adults during a screening exercise at SMCH and found that 72% of adults with elevated hypertension successfully linked to care within 60 days. This is in keeping with a community-based hypertension screening study that was done in SSA by Kowani et al., (2014). This good linkage output from this study is in contrast with a Cameroonian study in which 32% follow-up was reported after hypertension and diabetes screening despite the use of a linkage intervention. This study provided the first sound estimate of the efficacy of a linkage to care intervention following a facility-based hypertension screening in HCWs in Zimbabwe. Our multi-disease screening approach also showed that efforts to scale up NCDS screening and linkage at the community level can be successfully leveraged to identify and link persons with other NCDs such as diabetes, CKD, and mental health issues.

Within the context of a chronic care cascade for hypertension, this study illustrated the critical first steps of diagnosis and linkage-to-care. These data can inform targeted interventions to prevent loss of patients after facility-based screening

Poorly controlled hypertension is associated with significant morbidity and mortality. In this study only 18% of the newly diagnosed hypertensives were started on treatment. This finding is in keeping with a study by Ataklte, et al., (2014) who recorded that 18% of individuals with hypertension were receiving treatment across the studies done in SSA. In contrast to this, a Zimbabwean study done in Mazowe district by Mungati et al.,

(2014) demonstrated that 58.6% of all hypertensive patients were on treatment. The low treatment coverage in HCWs that was demonstrated in this urban set up study is in contrast with many studies that showed that low rates of treatment and management of HTN were obtained in the rural areas of the low to middle income countries, which was mainly due to difficulties in the accessibility to healthcare.

Tracking subjects who did not link allowed us to identify important barriers to care faced by HCWs. Transportation expenses and inconvenience were prominent issues, which is consistent with the socioeconomic challenges in Zimbabwe. These challenges were also noted by Goudge et al., (2009). Feeling healthy or lack of symptoms was another common reason for failure to link. This has been reported previously in the HIV linkage to care literature as well by Govindasamy et al., (2011) Improving patient education surrounding asymptomatic nature of hypertension seems essential to effectively link patients to care.

Fear of being reprimanded by fellow HCWs was also a barrier to care and has been described as a barrier to retention in care for other diseases (Ware et al., 2013). Sensitization efforts to promote treatment alliances and decrease 'bad HCW patient' labelling by HCWs is needed in this country.

5.5 Hypertension status and linkages to care

Persons with known hypertensive status were likely to link up to care compared to newly diagnosed participants. This finding is like findings in a Sub-Saharan study by Addo, Smeeth & Leon, (2007). Although there was a high percentage of diagnosed

hypertensive participants that were on treatment, the majority had blood pressure that was not well controlled. This means that the majority were still at risk of developing complications of hypertension despite being on treatment, the primary goal of hypertension is to reduce the incidences of hypertension related diseases and deaths. According to World Health Organization, the risk of cardiovascular disease doubles for each increment of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg

5.6 Severity of hypertension and linkages to care

Severity of hypertension was a significant predictor of linkage to care. Linkage to care was directly related to severity of hypertension. Almost all the HCWs who had severe hypertension were linked to care. This finding is in keeping with another study by Dijkstra, Niemeijer, Cleophas (2008) that looked at compliance to medications and severity of hypertension. Patients who perceived their hypertension as severe were more likely to link to care and adhere to medications.

5.7 Chronic medical conditions and linkages to care

Comorbidities are additional conditions or diseases co-existing with a primary condition or disease. According to research conducted by Li, Wang, Liu, Lee, Chan, Griffiths & Chen (2016), in China the comorbidity prevalence rate was 47.4% and proportions of those who reported to have no comorbidity or one and ≥2 additional chronic conditions besides HTN were 52.6%, 29.1% and 18.3%, respectively.

Diabetes was found to be the most prevalent chronic condition in the referred participants followed by CKD. Similarly, in a study in Saudi, which involved 204 HTN patients, 71.6% had diabetes and 45.6% had hyper-lipidemia (Khayyat, et al., 2017).

Existence of underlying conditions was a predictor of linkage to care. Participants with diabetes were more likely to link compared to those with CKD or no chronic condition. These persons are perhaps already at an increased risk for complications related to hypertension, such as heart disease and stroke. It is likely that a community-based approach could be successful in reaching out to these high-risk groups. Family history also increased likelihood of linkage to care. Receiving encouragement or perhaps sharing the cost of a journey with a family member may contribute to this finding.

Obesity can result in serious health complications that are potentially life threatening, including hypertension, type II diabetes mellitus, increased risk for coronary disease, increased unexplained heart failure, hyperlipidemia, infertility, higher prevalence of cancers. The relationship between obesity and hypertension is well established both in children and adults. The mechanisms through which obesity directly causes hypertension are still under research. Activation of the sympathetic nervous system has been considered to play a role in the pathogenesis of obesity-related hypertension.

In this study obesity increased the likelihood of linkage to care. Those with diabetes and CKD were more likely to link to care compared to those with no medical conditions. Those with other chronic medical conditions are likely to be obese. According to a study by Mutseyekwa et al (2019), age showed a marked and continuous increase in the trend of the prevalence of overweight. Age was also found to influence linkage to care. This could explain the association of obesity and linkage to care.

5.8 Person - demographic factors and linkages to care

Persons with little or no formal education had lower probability of linking to care than those with secondary or tertiary education. This finding emphasizes the need for increasing awareness and health literacy surrounding hypertension, perhaps through public health initiatives. I speculate that it could be due to the reason that higher education imparts better knowledge and information about hypertension and subsequently improve access to hypertension care. It was significant in this study that higher education levels have been noted to amount to better understanding of health-related issues and better health outcomes. According to Pandit et al., (2008) lower education attainment and more limited literacy are important predictors of poorer hypertension knowledge and linkage to care. My study finding emphasizes the need for increasing awareness and health literacy surrounding hypertension, perhaps through public health initiatives such as the HCWs wellness program.

Medical insurance cover was directly related to linkage to care. This reflects the barrier to care due to costs related to hypertension care. This study finding is like findings by Mungati et al., (2012) in their study in Mazowe in which a free consultation was associated with linkage to care and better HTN control. Lower educational attainment and more limited literacy were found to be significant predictors of poorer linkage to hypertension care and control. This is similar to findings by Leng, Jin,Li, Chen& Jin (2015). Subjects who are from broken homes had the poorest linkages to care when compared to the others. This could be due to psychosocial and moral support received by those who are married. This is in keeping with findings by Owalabi et el., (2015) in their hypertension study in HCWs in Nigeria.

5.9 Limitations of the study

The study has several limitations. Being a facility-based study, selection bias is another limitation due to the small cohort of participants enrolled in the study and the female overrepresentations. Use of a random sampling on HCWs who were available, might have led to the inclusion of more participants who were more likely to have hypertension problems. So, this might have affected the representativeness of the study. Also, the

sample was taken only from urban based HCWs which limits the generalizability of the results to the rest of HCWs in the country. The study did not take note of the duration in which patients were diagnosed of HTN or when they started their medication, since patients diagnosed of HTN for longer periods were mostly controlled and they seemed more adherent to the recommended lifestyle behaviors, as the participants were more experienced and knowledgeable on their condition. Although this study was facility-based, limitations include loss of eligible subjects due to unintended operational deficiencies. Specifically, a temporal delay between receiving a diagnosis of hypertension and obtaining the linkage intervention may have confused some participants and led them to leave the linkage process prematurely.

5.10 Study Conclusions

From the results of this study, it can be concluded that the prevalence of hypertension is very high in HCWs. This makes HCWs vulnerable to several chronic diseases and other unbearable health consequences. Specifically, men are at more risk of being hypertensive than women. Increasing age is proved to be an independent risk factor for

hypertension. Programs are needed to improve the surveillance systems and implementation of wellness screening programs for early detection of hypertension is also needed. As the awareness of the hypertension status among hypertensive cases was very poor, raising the awareness of hypertension is also the need of the hour. Interventions like weight management, increased physical activity, increased fruits and vegetables consumption, and reduction in tobacco and alcohol use are required and recommended

5.11 Implications of findings to practice

The findings of this study show serious public health implications because a considerable number of HCWs persistently have uncontrolled BP and this will result in increase in the number of patients who develop complications or die eventually, yet this is preventable. This in-turn would increase the burden on the already struggling health care system, particularly the human resources for health component. Morbidity from hypertension reduce productivity and alter quality of life. There is also an associated increase in poverty when parents die leaving their children to fend for themselves.

Health literacy is critical to the design of educational tools to improve knowledge acquisition. Our results can also advise the development and establishment of national interventions by the public health sectors to achieve better awareness, primary prevention, and better control of the disease. The development of a national awareness campaign for hypertension can serve in increasing the detection of the disease, educating HCWs and the community on factors impacting their BP level, and promoting the importance of following healthy lifestyle habits (healthy diet) and medication adherence

5.12 Recommendations

Considering the high rate of hypertension unawareness (high prevalence of undiagnosed hypertension) the Director of Clinical Services should set up a program for health education and promotion of awareness and treatment of hypertension. This could be implemented in the form of campaigns at the hospital educating HCWs on hypertension, the importance of screening for hypertension and the association between hypertension with cardiovascular complications. High risk groups such as people with family history of hypertension, females and aged forty years and above should be encouraged to have more regular blood pressure checks. Posters which encourage losing weight and physical activities such as using stairs instead of elevator may also be used to convey the information. Another recommendation is setting up a surveillance system for risk factors of hypertension which will be used to monitor and evaluate health education and promotion activities. Analysis of pre-employment information and periodic medical examination can be used as a system to monitor the prevalence of hypertension and risk factors. A proper system for referral of employees who have raised blood pressure during routine staff clinic health delivery need to be put in place such that all patients with raised blood pressure during medical examination will be referred for evaluation and subsequent treatment if needed. In view of the poor linkages associated with no medical insurance cover, the hospital management must put a measure in place to ensure all HCWS are on medical insurance.

Communication and dissemination

The research results were communicated and disseminated to the key stakeholders of Sally Mugabe Central Hospital, and to the Africa University Community. The research findings will be disseminated at the Annual Medical Research Day in 2022. In addition, the

research results will be sent for publication in an identified journal, as well as being kept in the Africa University Research Database and library

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APPENDIX 1. Clinical questionnaire

Q00	Has consent been obtained? *If consent declined , then do not proceed with the questionnaire*	Yes□No □
Q0a	Study number	□□□□
Q01	Date form completed (dd/mm/yyyy)	□□/□□□/20□□
Q02	Sex	Male□Female□
Q03	Age, years, at last birthday	□□
Q04	Employer	City health service□ Government health services (excluding city health) □ Private health facility (hospitals or clinics) □ NGO□ Other□ Specify:_____
Q05	What is your role at Sally Mugabe Central Hospital	Nurse□ Midwife□ Community health care worker□ Security □ Administration/Clerk/IT□ Nurse Aide□ Laboratory Tech□ Radiographer□ Doctor□ Cleaner□ Porter□ Service/maintenance team□ Student nurse/midwife□ Student doctor□ Police/army□ Other□

		Specify----------
Q06	How long have you been working in your current job/role?	_____Years _____Months
Q07	What is the highest level of education you have achieved	Did not complete primary/no school Primary Secondary 0 level Secondary A level Diploma after secondary University
Q08	Do you have any known medical conditions?	Yes No
Q09	If yes, please tick all that applies	Diabetes Hypertension Epilepsy HIV Cardiovascular disease/past stroke Renal disease Asthma/COPD **Past** TB Past or present malignancy Don't want to answer Mental Health Other Specify----------
Q10	What medication do you take regularly (excluding short course antibiotics and Cotrim)	ART Oral anti diabetics Insulin Antihypertensives Heart medication (excluding antihypertensives) Oral steroids

		Inhalers □ Antiepileptic meds □ Oral contraceptive/implant □ Treatment for TB □ INH prophylaxis □ Other □ Specify----------
Q11	Do you smoke cigarettes? If yes, how many per day	Yes□No □ _____per day
Q12	Have you ever had a blood pressure check	Don't want to answer□Yes□No □
Q12a	If yes, what was the result of the check	Normal• Elevated□ Don't want to answer□
Q12b	If elevated, are you taking blood pressure lowering drugs	Don't want to answer□Yes□No □
Q12c	Has your health worker advised that your blood pressure is under control	□Yes □No □Do not know
Q13	Do you have medical aid cover?	yes□ No□
Q14	CIMAS PSMAS First Mutual Alliance Health BONVIE	Yes□ No□ Yes□ No□ Yes□ No□ Yes□ No□ Yes □No□ Specify----------

	OTHER	
Q15	Sats (%)	□□□
Q16	Temp °C)	□□,□ Not done□
Q17	Weight(kg)	□□□,□ Not done□
Q18	Height(cm)	□□□ Not done□
Q18a	Body mass index	□□□
Q19	BP (mmHg) – systolic	□□□ Not done□
Q20	BP (mmHg) – diastolic	□□□ Not done□
Q24	Referred for	HTN□ Other□ Specify_____
Q25	Referred to	Staff clinic □ Physician clinic□ Private practitioner□ Other□ Specify_____

APPENDIX 2: Referral form

Referring investigator: Fungai Kavenga

Contact Details: + 263 772 211 748

Please receive (Client First name and

Surname):_____

Date of birth: □□/□□/□□□□ (dd/mm/yyyy)

Age: □□

Referred: Yes □ No □ Refused □

Date referred: □□/□□/□□□□ (dd/mm/yyyy)

Referred for:

HTN□ Other □

Referred to:

Staff Clinic □ Physician clinic□ Private Practitioner □

Comments_____

_____

_____

_____

_____

APPENDIX 3. **Referral follow up form**

R01	ID	**Study ID**	□□□□□
R02		**Reason for referral**	HTN (new diagnosis) □ HTN (previously diagnosed) □ Other□

	Reason		

PARTICIPANT NOTIFICATION

……
……

R 03	DATE	Date Participant referred	□□/□□□/21□□
R 04	DATE	Date successful or final contact (attempt) (dd/mm/yyyy)	□□/□□□/21□□
R 06	Success	Successful attempt	Yes□ No (despite a minimum of 3 attempts) □ Number not working□
R 07	Outcome	Have you accessed care for hypertension	Yes □ No □
R 08	Reason for not linking	Why have you not linked to care?	
R 09	Future linkage	Are you planning to link to care in the future?	Yes □ No □
Hypertension linkage			
R 10	Date reported for treatment/care	(dd/mm/yyyy)	□□/□□□/21□□
R 11	Institution	Health institution linked	……..……
R 12	Repeat BP measurement	Was your blood pressure measured	Yes□ No□
R 13	BP	What was the blood	BP……..

		pressure reading?	
R 14	Treatment	Were you started on treatment?	Yes□ No□ I am already on treatment □
R 15	Change of treatment	If already on treatment was the treatment changed	Yes□ No□
R 16	Review	Next appointment date provided.	Yes□ No□
Comments			

APPENDIX 4: **Call log**

Study Number	**Phone number**	**Call 1** **Day 21**	**Call 2** **Day 30**	**Call 3** **Day 60**	**outcome**

Outcome Key 1. Linked to care

2. Not linked

3. Lost to follow up

APPENDIX 5.1: Informed Consent form - English

AFRICA UNIVERSITY
A United Methodist-Related Institution

INFORMATION SHEET AND INFORMED CONSENT FORM – STUDY PARTICIPANTS

TITLE OF THE STUDY:

The prevalence of hypertension among healthcare workers and linkages to care: A case of Sally Mugabe

Central Hospital, Zimbabwe

PRINCIPAL INVESTIGATOR: Fungai Nyarai Kavenga

PHONE NUMBERS: +263 772 211 748, +263 020 60075

WHAT YOU SHOULD KNOW ABOUT THIS RESEARCH STUDY:

- We give you this consent so that you may read about the purpose, risks, and benefits of this research study.
- The main goal of research studies is to gain knowledge that may help current and future generations.
- We cannot promise that this research will benefit you.
- You have the right to refuse to take part or agree to take part now and change during the process

- Participation is voluntary, whatever you decide, it will not affect you in any way
- Please review this consent form carefully. Ask any related questions before you make a decision.

INVITATION

You are being asked to participate in a research study to investigate prevalence of hypertension among healthcare workers and linkages to care. I need participants to be part of this study which is part of the fulfilment of a Master's degree in Public Health, so please read all the information and then…YOU DECIDE! It is important that you take your time and read all the information. If there is anything you do not understand, you are free to ask. There is no problem if you do not want to participate. Your participation will only involve answering question as they are presented in the study questionnaire. The interview is expected not to exceed 30 minutes.

WHAT SHOULD YOU KNOW ABOUT THE STUDY?

Purpose

The purpose of this study is to measure the prevalence of hypertension and to measure the association between blood pressure reading and linkage to care in healthcare workers at Sally Mugabe Central Hospital for a period covering December 2020 and March 2021

Importance

The prevalence of hypertension in HCWs is unknown. It is necessary to carry out this study, due to the observed increase in the number of HCWs who are developing hypertension complications such as stroke, heart attacks and renal failure and eventually succumbing to premature deaths because of uncontrolled BP. Thus, there is a need to investigate the burden of hypertension in HCWs to formulate models for workplace health programs aiming to improve cardiovascular health

YOUR PARTICIPATION IS VOLUNTARY

We hope that you will agree to take part in this study. However, you do not have to take part in this study if you don't want to. If you decide that you do not want to participate in this study, that decision will not affect your daily life, your relationship with the researcher or regular health care in any way. If you decide that you want to take part now but then change your mind later, you may withdraw from the study at any time without having to give a reason.

PROCEDURES AND DURATION

All healthcare workers under the employment of Sally Mugabe Central Hospital are eligible to participate in the study. Those who are eligible to participate must be willing and able to give written informed consent to take part in this study. You have been asked to take part in the study because you meet the conditions above. If you are willing to participate, you will be asked various questions about yourself and blood pressure measurements. A minimum of 379 people will be asked to answer questions asked from

a questionnaire, which is interviewer administered. This process will take about 20 to 30 minutes to complete. The study will be conducted from March to April 2021 Information may be given to regulatory authorities should they wish to see it for their regulatory duties. The body regulating this study is Africa University Research Ethics Committee (AUREC).

RISKS AND DISCOMFORTS

- There is no any harm anticipated during your participation in this study.
- Participation will require your time which can be an inconvenience to you, however it is expected not to exceed 30 minutes.
- There will be a follow up call a week after screening and this will take 1 minute.

BENEFITS AND/OR COMPENSATION

You are not likely to benefit immediately by taking part in this study. You will not be paid to participate in this research study. As stated earlier, results from the research study may benefit the general population in the prevention and control of hypertension

CONFIDENTIALITY

Information that is obtained in the study that can be identified with the participant will not be disclosed without your permission. Names and any other identification will not be asked for and your contribution will only be identified using a unique 3-digit code.

OFFER TO ANSWER QUESTIONS

Before you agree to participate in this study, please ask any questions on any aspect of this study that may be unclear to you. You may take as much time as necessary to think it over. For any other questions that you may have about this study now or in future, please contact the study Principal Investigator Fungai Nyarai Kavenga +263 772 211 748, Land line +263 20 60075.

CONSENT FORM / 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.

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

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 ----------

YOU WILL BE OFFERED A COPY OF THIS CONSENT FORM TO KEEP

APPENDIX 5.2: Shona Informed Consent Form

MUSORO WETSVAKURUDZO: ***PREVALENCE OF HYPERTENSION IN HEALTHCARE WORKERS AND LINKAGES TO CARE***

Mutsvakurudzi: Fungai Nyarai Kavenga

Nhamba dzenhare: 0772211748

Chinzvimbo: Final Year MPH Student (Africa University)

ZVAMUNGADA KUZIVA PAMUSORO PETSVAKURUDZO

- Tinokupai gwaro iri retendarano kuti muverenge nezvechinangwa, njodzi uye zvakanakira tsvakurudzo ino.
- Chinangwa chetsvakurudzo ndechekutsvaga ruzivo runogona kuzobatsira veruzhinji munguva inotevera.
- Hatikupii chivimbiso chekuti tsvakurudzo iyi ichakubatsirai.
- Makasununguka kuramba kana kubvuma kupinda mutsavkurudzo izvozvi uye kuzoshandura mafungiro enyu kumberi

- Kupinda mutsvakurudzo isarudzo yakasununguka, hamumanikidzwi.
- Verengai gwaro retenderano iri zvakanaka. Mubvunze kana pane zvimwe zvamungada kuziva zvinechekuita netsvakurudzo ino musati maita sarudzo.

KUKOKWA

Munokokwa kuti mupinde mutsvakurudzo yekuongorora zvinechekuita nechirwere che hypertension kana kuti BP muvashandi vepachipatara che Sally Mugabe Central Hospital.Ndinoda vanhu vanopinda mutsvakurudzo iyi, saka ndokumbirwa kuti muverenge ruzivo rwose mobva MASARUDZA ZVAMUNODA KUITA. Munokurudzirwa kuti muverenge ruzivo urwu rwose, muwane nguva yose yamungada yekuti muverenge mugobvunza chero mibvunzo ipi zvayo yamunayo. Kana pane chero chipi zvacho chamusinganzwisisi, makasununguka kubvunza. Hazvina dambudziko kana musingadi kupinda mutsvakurudzo iyi. Kana mukaszrudza kupinda mutsvakurudzo, munenge muchizokumbirwa kupindura mibvunzo sekupiwa kwayakaitwa mugwaro remibvunzo yetsvakurudzo. Hurukuro iyi inotarisirwa kusapfuura maminitsi makuni matatu *(30 minutes)*.

ZVAMUNGADA KUZIVA MAUSORO PETSVAKURUDZO

Chinangwa

Chinangwa chetsvakurudzo ndechekuongorora kuwanda kwechirwere che hypertension muvashandi uye kuti vanobatwa vane chirwere ichi vanorapwa sei kuzvipatara.

Kukosha kwetsvakurudzo

Kuwanda kwechirwere che BP kuvashandi vemuzvipatara hakuzikanwi. Zvakakosha kuti izvi zvitvsakiridzwe nekuti huwandu hwevashandi vemuzvipatara vari kuita

dambudziko nechirwere cheBP vari kuwanda. Matambudziko aya anosanganisira stroke, ma heart attack ne renal failure. Saka zvikazikanwa kuti dambudziko reBP rakakura sei panogona kugadzirwa maprogram ekuti utano hwevashandi huchengetedzwe.

MUNOPINDA MUTSVAKURUDZO NEKUZVIDIRA

Tinovimba kuti muchasarudza kutora danho mutsvakurudzo ino. Zvisinei, musatora danho iri kana musina kusungunuka. Kana masarudza kusatora danho mutsvakurudzo ino, sarudzo yenyu haikanganise kurarama kwenyu kwamazuva ose, kurapwa kwenyu kana hukama hwenyu nevatsvakurudzi. Kana masarudza kutora danho mutsvakurudzo ino panguva ino, mukazofunga kushandura pfungwa pamberi apo, munotenderwa henyu kubuda mutsvakurudzo ino pamunenge madira kunyangwe musina kupa chikonzero.

CHII CHICHAITWA UYE ZVICHATORA NGUVA YAKAREBA ZVAKADII?

Kana muchinge masarudza kupinda mutsvakurudzo, muchabvunzwa mibvunzo inechekuita nezvechirwere cheBP pamwe nekutariswa BP.Ndinotarisira kuti izvi hazvitori nguva inodarika maminitsi makumi matatu *(30 minutes)*.

NJODZI NEKUSAGADZIKANA

- Hapana njodzi inotarisirwa kuti mungasangana nayo mutsvakurudzo ino
- Kupinda kwenyu mutsvakurudzo kunozotora chikamu chenguva yenyu zvinova zvinogona kukanganisa hurongwa hwenyu asi handitarisiri kuti zvinopfuura maminitsi makumi matatu *(30 minutes)*.

ZVAMUNGAWANA KANA MURIPO WAMUNGAWANA

Hapana chamunotarisirwa kuwana nekuda kwekuti mapinda mutsvakurudzo. Hapana muripo wamuchapiwa kana mapinda mutsvakurudzo. Sezvambotaurwa, zvichabuda mutsvakurudzo zvinogona kuzobatsira veruzhinji marringe nekudzivirirwa uye kurapwa kechirwere che Baraziya.

KUCHENGETEDZEKA

Ruzivo ruchawanika mutsvakurudzo zvinonongedzera kunemi semunhu haruzobudiswi pasina mvumo yenyu. Tsvakurudzo ino haizotori zita renyu kana zvimwe zvinokunongedzai semunhu asi kuti tichakuzivai kuburikidza nerupawo rwema namba matatu.

MUKANA WEKUPINDURA MIBVUNZO

Musati masarudza kutora danho mutsvakurudzo ino, munokurudzirwa kubvunza kana paine zvamusiri kunzwisisa maererano netsvakurudzo ino. Munokomekedzwa kuti mutore nguva yamunoda kufunga nezvekutora danho mutsvakurudzo ino. Kana mukazoita mimwe mibvunzo panguva ino kana inotevera pamusoro petsvakurudzo ino, batai mutsvakurudzi anonzi Fungai Nyarai Kavenga panhare dzinoti +263 772 211 748, kana kuti +263 020 20 60075.

GWARO REKUPA MVUMO

Kana masarudza kupinda mutsvakurudzo, munokumbirwa kuti muise runyoro rwenyu pazasi pakatarwa sechiratidzo chekuti maverenga gwaro ramapiwa mukabvuma kupinda mutsvakurudzo.

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

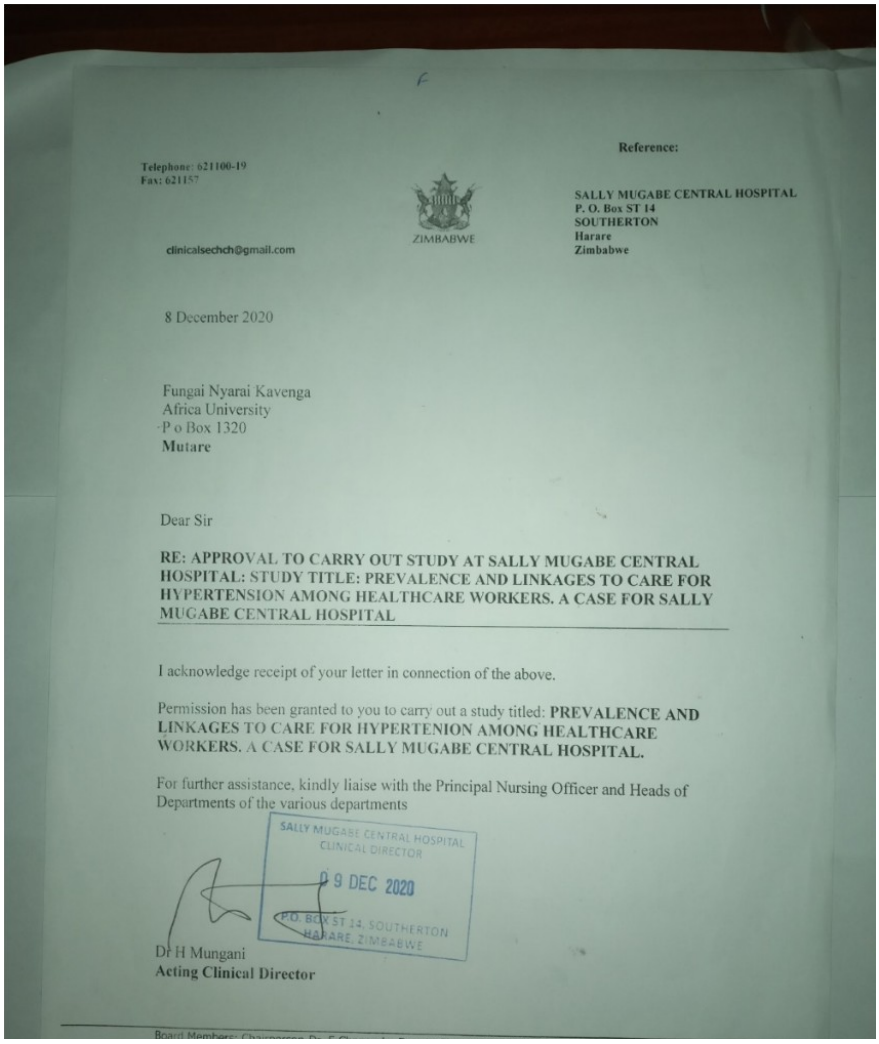
Zita rearikupinda mutsvakurudzo Zuva

Sainecha yeari kupinda mutsvakurudzo

Kana mune mibvunzo inechekuita netsvakurudzo ino kana gwaro retsvakurudzo isiri yamapindurwa nemutsvakurudzi, kusanganisira mibvunzo inechekuita nekodzero dzenyu semunhu apinda mutsvakurudzo, uye kana mufinga kuti hamuna kubatwa zvakana uye munoda kutaura nemumwe asiri mutsvakurudzi, sunungukai kubata ve Africa University research Ethics Committee panhare dznoti (020) 60075 kanakuti 60026 *extension* 1156; *email:* aurec@africau.edu

Zita remutsvakurudzi _____

Appendix 6: Sally Mugabe Central Hospital Approval



Telephone: 621100-19
Fax: 621157

clinicalsechch@gmail.com

ZIMBABWE

Reference:

SALLY MUGABE CENTRAL HOSPITAL
P. O. Box ST 14
SOUTHERTON
Harare
Zimbabwe

8 December 2020

Fungai Nyarai Kavenga
Africa University
P o Box 1320
Mutare

Dear Sir

RE: APPROVAL TO CARRY OUT STUDY AT SALLY MUGABE CENTRAL HOSPITAL: STUDY TITLE: PREVALENCE AND LINKAGES TO CARE FOR HYPERTENSION AMONG HEALTHCARE WORKERS. A CASE FOR SALLY MUGABE CENTRAL HOSPITAL

I acknowledge receipt of your letter in connection of the above.

Permission has been granted to you to carry out a study titled: **PREVALENCE AND LINKAGES TO CARE FOR HYPERTENION AMONG HEALTHCARE WORKERS. A CASE FOR SALLY MUGABE CENTRAL HOSPITAL.**

For further assistance, kindly liaise with the Principal Nursing Officer and Heads of Departments of the various departments

SALLY MUGABE CENTRAL HOSPITAL
CLINICAL DIRECTOR
09 DEC 2020
P.O. BOX ST 14, SOUTHERTON
HARARE, ZIMBABWE

Dr H Mungani
Acting Clinical Director

Board Members: Chairperson, Dr. S. Ch...