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HYPERTENSION KNOWLEDGE AND CONTROL AMONG HIGH BLOOD PRESSURE PATIENTS WHO ATTEND MUTARE CITY CLINICS SEPTEMBER 2022 TO FEBRUARY 2023 IN MANICALAND PROVINCE.

BY

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Abstract

Uncontrolled hypertension can cause complications like renal disease, cerebrovascular accidents, ophthalmic complications, and heart failure. Risks that can be addressed include sedentary lifestyle, too much salt intake, uncontrolled weight, tobacco smoking and excessive alcohol intake. The low socioeconomic status of Mutare city patients, the absence of a General hospital for Mutare patients, absence of resident doctors, shortage of nurses and lack of supported hypertension programs expose clients to poor counselling services or no counselling at all. A cross sectional analytical study was carried out to find the amount of knowledge about hypertension on hypertensive clients who attend Mutare city clinics, to find out if there is any incorrect information circulating in the hypertensive community and to find out if there is an association between hypertension knowledge and good blood pressure control in these clients. The study population are all the hypertensive patients who were diagnosed at least two months prior to the study. A total sample size of 88 participants calculated using Dobson formula was used for this study. The study included all hypertensive clients who were the age of 18 years or above and visited Mutare city clinics for health services during the time of the study Convenience quota sampling was used in this study. Every clinic out of the 8 health facilities that attend outpatients should have supplied 11 hypertensive clients to the study. Data was collected using a structured interviewer administered questionnaire. Independent variables were the demographics of participants, duration of hypertension and patient source of hypertension information. The dependent variables were hypertension knowledge status and blood pressure control. Data collection was conducted over a period starting September 2022 and ending February 2023. 80% of the participants were concluded to have good hypertension knowledge. Those who had at least a discussion with a health worker were more likely to have better knowledge than those who never had a discussion about hypertension with OR=9.3 (CI=1.9-44.7) p=0.005*. Those 50 years and above were less likely to have good knowledge when compared to those below 50 years of age OR=0.2 (CI=0.04-0.99) p=0.049*. Being skilfully employed OR=12.5 (CI=1.3-115.8) p=0.03* was found to be another patient factor associated with good knowledge about hypertension. There are wrong beliefs among high blood pressure clients of hypertensive medication causing diabetes (35%). 32.9% of patients had incorrect information of traditional and herbal medicines being able to cure hypertension. Those with well controlled blood pressure were found to have poorer knowledge compared to those with poorly controlled blood pressures with OR=0.2 (CI=0.05-0.6) p=0.005*. Hypertensive patients that attend Mutare city clinics have good general hypertension knowledge, but they lack some vital knowledge. Factors that affect significantly the amount of knowledge in hypertensive patients are previous discussion with health worker, the type of employment and age below 50 years. There are beliefs about traditional and herbal medicines as cure to hypertension. Those with well controlled blood pressure have poorer knowledge compared to those with poorly controlled blood pressures.

Key Words: hypertension knowledge; low socioeconomic status; Mutare; uncontrolled hypertension; cardiovascular complications

Declaration Page

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

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List of Acronyms and Abbreviations

ABPM	Ambulatory Blood Pressure Monitoring
BP	Blood Pressure
BMI	Body mass index
COVID 19	Corona Virus Disease of 2019
DBP	Diastolic Blood Pressure
HBPM	Home Blood Pressure Monotoring
HCW	Health Care Worker
HPB	High Blood Pressure
HTN	Hypertension
NCD	Non-Communicable Disease
OR	Odds Ratio
RDI	Recommended Daily Intake
SBP	Systolic Blood Pressure
WHO	World Health Organization.

Definition of key terms

Poorly controlled hypertension-Uncontrolled high blood pressure which can lead to complications and damage to different body parts.

Non communicable disease- A diseases that cannot be spread from one person to another.

Cardiovascular illness- A disease involving the heart and the blood circulation system.

Cerebrovascular events- Damage to the brain from interruption of blood supply.

Sedentary lifestyle- A lifestyle where a person often engages in most activities whilst lying down or sitting.

Moderate-intensity aerobic exercise- Working hard enough to raise your heart rate and break a sweat.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

CHAPTER 1 INTRODUCTION

1.1 Introduction

Non-communicable diseases (NCDs) are becoming more visible contributing to the global burden of morbidity and mortality. According to WHO's World Health Statistics (2020), progress in preventing and managing premature death from NCDs has lagged behind improvements in the fight against communicable diseases. Worldwide, an estimated 41 million people passed away from NCDs in 2016, which is 71 percent of all fatalities. Cardiovascular illnesses (17.9 million), cancer (9.0 million), chronic respiratory diseases (3.8 million), and diabetes (1.6 million) made up the majority of those fatalities (WHO 2021).

The new corona virus has made the world realise more that non communicable and communicable diseases are interrelated. The Covid 19 disease has affected more of those with non-communicable conditions including diabetes, hypertension and other cardiovascular conditions. WHO had a fast assessment survey of the COVID-19 pandemic's effects on NCD resources and services in May 2020. Preliminary findings showed people who had diabetes or high blood pressure are two to four times more likely to develop a serious illness from the virus or pass away from it (WHO 2020). The globe currently needs proper control of these non-communicable conditions more than ever.

One of the NCDs hypertension, when uncontrolled can cause complications like renal disease, cerebrovascular accidents, ophthalmic complications and heart failure. Risks that can be addressed include sedentary lifestyle, too much salt intake, uncontrolled weight, tobacco smoking and alcohol. An estimated 1.28 billion adults aged 30-79 years worldwide have hypertension, most (two-thirds) living in low- and middle-income countries. (WHO 2021). According to the WHO, less than half of adults (42%)

with hypertension are diagnosed and treated. In Zimbabwe there is limited data but in the year 2014, 1349 people are recorded to have died of cardiovascular related complications like heart failure, renal failure and diabetes (Government of Zimbabwe, 2014). In a meta-analysis to quantify hypertension burden and policy implications in Zimbabwe, the overall pooled prevalence of hypertension was 30% (Mutsa et al 2015). There is seems to be no previous study quantifying the prevalence of hypertension in Manicaland and Mutare.

Mutare City clinics attend mostly to low socioeconomic patients who do not have medical aid, rely on out-of-pocket user fees. The situation is worsened by the absence of a General hospital for Mutare patents, absence of resident doctors and shortage of nurses. The Ministry does not have a documented policy on management of hypertension patients. All these factors expose patients to rushed care and poor counselling or no counselling at all.

Client hypertension knowledge is essential for proper management of the condition to reduce mortality and morbidity. The researcher has noted some clients who lack necessary hypertension knowledge in the city of Mutare. There seems to be some myths spreading around which makes control of hypertension difficult. The aim of this study is to determine the level of knowledge and misconceptions in hypertensive patients who attend Mutare City September 2022 to February 2023 and the demographic factors that affect the level of hypertension knowledge. The research will be an analytical cross-sectional study meant to find prevalence any association of hypertensive client knowledge to blood pressure control.

1.2 Background To the study

Hypertension is managed from the primary health care level in Zimbabwe around. The Ministry of health does not have a hypertension specific management program or

policy document about hypertension. In Zimbabwe, the overall pooled prevalence of hypertension was 30% (Mutsa et al., 2015). There is poor data collection when it comes to hypertension as there is no set targets and also there is no specific funding for non-communicable diseases or hypertension programs. In the city of Mutare, hypertensive patients are attended at the city 8 primary health facilities, private health facilities and the provincial hospital. Currently city of Mutare does not have a medical doctor and hypertensive patients are attended by a clinical officer and nurses. The city is currently understaffed when it comes to nursing human resource. All these factors expose hypertensive clients to rushed care which gives little or no attention to educating the hypertensive community.

1.3 Problem statement

Mutare City clinics attend mostly to low socioeconomic patients who do not have medical aid, rely on out-of-pocket user fees. The situation is worsened by the absence of a General hospital for Mutare patients, absence of resident doctors and shortage of nurses. With a population of 224450 and 109 nurses, the nurse to population ratio for Mutare city is around 0.5 per 1000 which is not ideal and below the 3 nurses per 1,000 recommended by WHO. It is important to note that unlike non-communicable diseases, maternity and child health conditions that have partners who support technically and financial management of those conditions, there is no partner who supports hypertension programs. All these factors expose patients to rushed care and poor counselling or no counselling at all. The risk factors for hypertension are well documented, and screening, diagnosis and treatment of hypertension have been well researched. Chimberengwa, Naidoo, cooperative inquiry group (2019), determined hypertension knowledge level, attitudes and practices in a disadvantaged rural

community of Zimbabwe. However, this knowledge has not been connected with blood pressure control.

According to the senior nursing officer, patients who need hospital services are referred to Victoria Chitepo provincial hospital. This is not ideal as a provincial hospital is overwhelmed with patients from the province. Patients with non-communicable diseases including hypertensive patients are not a priority compared to other disease conditions which exposes them to lack of attention.

Despite being a major contributor to morbidity and mortality, health care for hypertension is still lagging behind. The Zimbabwean Ministry of Health and Child Care has no documented policy or guidelines regarding hypertension management. This poses a great risk of poor management of hypertensive patients.

Hypertension is the most common outpatient non-HIV chronic disease in the cityof Mutare health facilities. In 2021, 7489 patients were registered as hypertensive patients which is more than twice all other non-HIV chronic diseases combined. This means hypertension is a priority condition.

1.4 Broad Research Objectives

The purpose of this study was to investigate the amount of hypertension knowledge in high blood pressure patients attending Mutare City council clinics, Manicaland province of Zimbabwe and its association to blood pressure control September 2022 to February 2023.

1.4.1 Specific Objectives

The study specifically seek to:

1. Determine the level of hypertension knowledge in hypertensive clients in the city of Mutare who visited the city clinics from September 2022 to February 2023.
2. Determine factors that are affecting level of hypertension knowledge in hypertensive clients in the city of Mutare who visit the city clinics from September 2022 to February 2023.
3. Determine the incorrect information that may be circulating in hypertensive population of Mutare City council clinics, Manicaland province of Zimbabwe during the period September 2022 to February 2023.

5. Determine if there is an association between hypertensive knowledge and blood pressure control among high blood pressure patients in the city of Mutare between September 2022 January and February 2023.

1.5 Research questions

1. What is the amount of hypertension knowledge in high blood pressure patients attending Mutare City council clinics, Manicaland province of Zimbabwe between September 2022 to and February 2023?
2. What are the factors that affect the level of hypertension knowledge in hypertensive clients in the city of Mutare between September 2022 to February 2023.
3. What are the misconceptions circulating in hypertensive population of Mutare city council clinics, Manicaland province of Zimbabwe between September 2022 and February 2023?
4. What is the proportion of the known hypertensive population in Mutare has adequate hypertension knowledge between September 2022 and February 2023?

5. Is there an association between hypertensive knowledge and blood pressure control among high blood pressure patients in the city of Mutare between September 2022 and February 2023?

1.6 Justification

This research aimed to find if the hypertensive patients have information about hypertension in the City of Mutare. The knowledge will give direction to the public health community on what interventions to do to ensure patients get necessary knowledge of this silent killer.

The researcher aimed to find false information in Mutare city hypertensive community. False information usually hinders patient management. The information will be utilised in planning strategies to give correct information to the community.

The information from this study can also be used to show the magnitude of the problem it the city and country at large. The evidence can be used to lobby for hypertension specific public health programs by the city health department and the ministry of health which will go a long way in curbing the effects of this condition.

1.7 Limitations

1. The study may have failed to get a true representation of the hypertensive population since there are defaulters who will not come to the clinics. These are more likely to be affected more by lack of information.

2. The study likely missed clients who have complications as they are usually referred and followed up at the provincial hospital.

3. The study was conducted at a single urban site which may limit the external validity of the findings. These findings may not be applicable to the general population of Zimbabwe.

1.8 Delimitations of the study

The study was limited to individuals who have an established hypertension diagnosis and are already on antihypertensives for at least 2 months. Patients who do not have a patient booklet/card for at least the last 2 months were excluded.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on hypertension and hypertensive patients globally, regionally and locally. Special focus is given to what other studies have reported as potential barriers and enhancers for the hypertensive knowledge among hypertensive patients.

2.2 Definition epidemiology, and clinical features of hypertension

According to WHO, hypertension which is elevated blood pressure is diagnosed when it is measured on two different days, the systolic blood pressure readings on both days is ≥140 mmHg and/or the diastolic blood pressure readings on both days is ≥90 mmHg. According to Kumar and Clarks (2017) hypertension can be classified in to different stages as shown below:

- Stage 1 hypertension – clinic BP ≥140/90 mmHg and daytime average ABPM or HBPM ≥135/85 mmHg.
- Stage 2 hypertension – clinic BP ≥160/100 mmHg and daytime average ABPM or HBPM ≥150/95 mmHg.
- Severe hypertension – clinic systolic BP ≥180 mmHg and/or diastolic BP ≥110 mmHg

High blood pressure (hypertension) is a major cause of premature vascular disease, leading to cerebrovascular events, ischaemic heart disease and peripheral vascular disease (Kumar and Clacks 2017). Blood pressure (BP) is normally distributed in the population and mortality rises with increasing blood pressure. The prevalence of hypertension may be 30–45% of the general population (Kumar and Clacks 2017). The

Zimbabwe STEPwise survey demonstrated that in 2005, the national hypertension prevalence was 23,2% among males and 29% among females (Government of Zimbabwe., WHO., 2005). Locally some studies have looked into the prevalence of hypertension in some settings. The prevalence of hypertension was 38.4% in Bulawayo (Mangwiro, 2012). In Zimbabwe in a meta-analysis to quantify hypertension burden the overall pooled prevalence of hypertension was 30% (Mutsa et al., 2015).

Globally cardiovascular disease accounts for approximately 17 million deaths a year, nearly one third of the total. Of these, complications of hypertension account for 9.4 million deaths worldwide every year. Hypertension is responsible for at least 45% of deaths due to heart disease (WHO 2013). Previously considered a disease of the developed world, hypertension is occurring with increasing frequency in developing countries (Akoko, Fon, & Ngu., 2017). The prevalence of hypertension is highest in the African Region at 46% of adults aged 25 and above, while the lowest prevalence at 35% is found in the Americas (WHO 2013). Not only is hypertension more prevalent in low- and middle-income countries, but there are also more people affected because more people live in those countries than in high-income countries. Further, because of weak health systems, the number of people with hypertension who are undiagnosed, untreated and uncontrolled are also higher in low- and middle-income countries compared to high-income countries (WHO 2013)

Hypertension can be classified by causes in to primary (essential) and secondary hypertension. Primary hypertension is systemic hypertension of unknown cause that results from dysregulation of normal homeostatic control mechanisms of blood pressure in the absence of detectable known secondary causes. This type of hypertension accounts for 95% of cases of hypertension (WHO 2005). Most patients

fall into this category of hypertension and its treatment is usually for a lifetime. Secondary hypertension is a result of an underlying disorder. It accounts for <5% of cases of hypertension (WHO 2005). Examples of medical conditions that can cause high blood pressure are renal conditions, endocrine disorders and acute stress. Individuals may not initiate or adhere to treatment if they are not fully aware of the negative consequences of uncontrolled hypertension (Sudharsanan, Ali, & McConnell 2021)

Increased BP is one of the preventable causes of premature deaths. However, most people do not control their blood pressure optimally (Wolde., Azale., Debalkie Demissie, & Addis, 2022). Client hypertension knowledge is essential for proper management of the condition to reduce mortality and morbidity. The ultimate goal in treatment of the hypertensive patient is to achieve the maximum reduction in the long-term total risk of cardiovascular morbidity and mortality (WHO 2005). This involves a multipronged approach including education of patients about the causes, management and complications of hypertension (Olowe, & Ross, 2017). Treating systolic and diastolic blood pressure to target is associated with a decrease in cardiovascular complications. This includes 35%–40% mean reduction in stroke incidence, 20%–25% mean reduction in myocardial infarction and >50% mean reduction in heart failure (WHO 2005

Lifestyle changes by hypertensive patients is vital in the management of high blood pressure. Kumar and Clacks., (2017) listed the following lifestyle changes in table 1 as recommendation for patients with hypertension.

Table 1 Recommended lifestyle changes for patients with hypertension

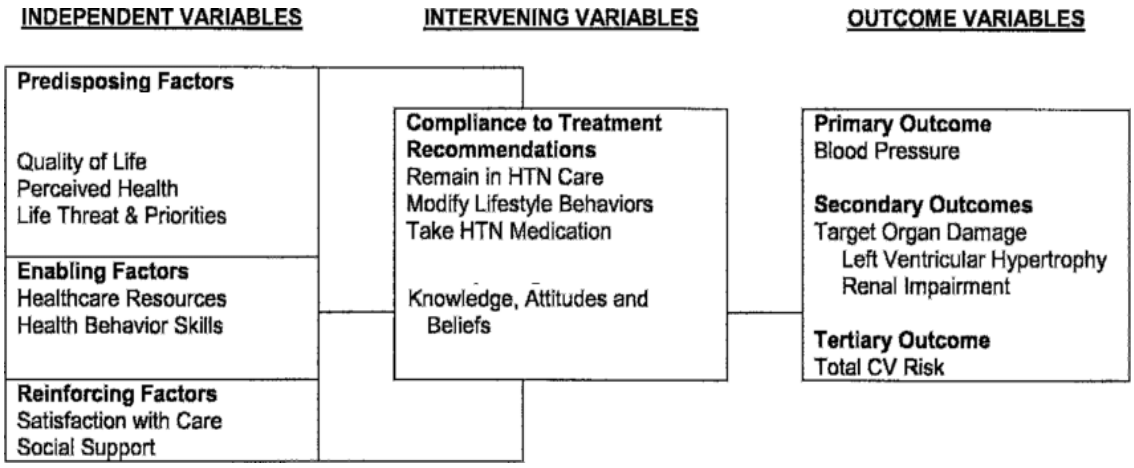
Factors	Comments
Diet	High consumption of vegetables and fruits and low-fat diet
Physical activity	Regular physical exercise (30 min of moderate-intensity aerobic exercise 5–7 days/week)
Alcohol	reduction of alcohol intake (<140 g/week men, <80 g/week women)
Salt intake	reduction of dietary sodium intake (5–6 g/day) and use of low-sodium salt
Smoking	Smoking cessation
Weight reduction	weight reduction (BMI 25 kg/m2, waist circumference <102 cm men, <88 cm women)

Lifestyle modifications decrease blood pressure, enhance antihypertensive drug efficacy and decrease cardiovascular risk (WHO 2005). Complication of hypertension can be prevented or delayed by effective blood pressure control. Individuals may not initiate or adhere to treatment if they are not fully aware of the negative consequences of uncontrolled hypertension (Sudharsanan, Ali, & McConnell, 2021). The higher the pressure in blood vessels the harder the heart has to work in order to pump blood. If left uncontrolled, hypertension can lead to a heart attack, an enlargement of the heart and eventually heart failure (WHO 2013). Other organs that can be damaged by high blood pressure includes the kidneys, retinal damage, the brain and blood vessels (Kumar and Clark 2017). Blood vessels may develop bulges (aneurysms) and weak spots due to high pressure, making them more likely to clog and burst (WHO 2013). Most hypertensive people have no symptoms at all but sometimes hypertension causes symptoms such as headache, shortness of breath, dizziness, chest pain, palpitations of the heart and nose bleeds (WHO 2013).

2.3 Conceptual framework

The World Health Organization developed the Social Determinants of Health conceptual framework that can illustrate the relationship of determinants of health hypertension knowledge and blood pressure control as shown below.

Figure 1: Study conceptual framework



Adopted from Dennison et al., (2007)

The Precede-Proceed Model of health promotion program planning integrates health education, behavioural change and maintenance principles, culturally sensitive strategies, social action, and social learning theory (Dennison, C., Peer, N., Steyn, K., Levitt, N., & Hill, M., 2007). The model emphasizes the relationship between health and social problems, early planning, a comprehensive approach. Pertinent factors and potential barriers to continuous care and blood pressure (BP) control are conceptualized as independent variables and organized as predisposing enabling and reinforcing factors (Dennison et al., 2007). Predisposing factors include attitudes, and beliefs as well as quality of life, perceived health, life threats, and priorities as antecedents to conduct that supply or impact the justification or motive for the behaviour. Enabling variables enable a propensity to convert into behaviour, such as using available health care resources, gaining knowledge on hypertension and learning the proper techniques for managing one's blood pressure. Following a behaviour, reinforcing factors such as social support and satisfaction with care given are necessary for the behaviour to continue (Dennison et al., 2007).

Good blood pressure control in hypertensive patients is a variable that is influenced by the determinants of health as outlined by the conceptual framework. According to the framework above, good blood pressure control is determined by a number of health system structural and social health determinants. Social and socio-demographic characteristics have a huge impact on a health outcome.

Behavioural aspects such as attitudes coupled with knowledge level of an individual also determine good blood pressure control. Structural determinants like policies and health service provision availability also determine good blood pressure control. These structural and social health determinants must be considered when providing services to the hypertensive community. While it is difficult to modify the demographic and behavioural patterns and norms and socioeconomic status of the hypertensive population, increasing their knowledge through educational interventions on treatment, however, can positively influence patients' beliefs about medicines and help control the burden of the disease of HTN and, through it, many of the deaths due to cardiovascular and other related causes. (Nadeem, Mari., Iftikhar, Khatri, Sarwar, & Patel, 2019).

2.4 Significance of the conceptual framework

Good blood pressure control requires adherence, and it is determined by a number of factors that range from knowledge and perceptions, socio-demographic characteristics, structural and social health determinants. Good understanding of the

level of hypertension knowledge allows designing an intervention that improves the control of raised BP through overcoming misperceptions that guide non-compliance behaviour (Wolde et al 2022). While it is difficult to modify the demographic and behavioural patterns and norms and socioeconomic status of the hypertensive population, increasing their knowledge through educational interventions on

treatment, however, can positively influence patients' beliefs about medicines (Nadeem et al 2019).

2.5 Level of hypertensive knowledge in high blood pressure patients

Hypertensive patients with good knowledge are scarce in the developing and developed world (Wolde et al., 2022) Inadequate patient knowledge and awareness about blood pressure (BP) are also potential causes for non-adherence to taking antihypertensive drugs, and consequently, high rates of uncontrolled BP (WHO 2005). Hypertension-related knowledge and practice of patients play an important role in controlling hypertension and in preventing its long-term complications (Malik et al 2014). The knowledge about HTN is vital for patients to be able to evaluate themselves, their BP measurements at home and to comply with their treatment and they can easily be aware of their general status and take precaution promptly (Kilic, Uzunçakmak and Ede, 2016). Participants who took part in an educational intervention that provided them with information about hypertension and its therapy had significant increases in there levels of knowledge significantly modifying in a positive manner ($P < .01$ for concerns about medicines, $P < .01$ for beliefs about the harmful nature of medicines (Magadza, Radloff,, & Srinivas., 2009).

The level of hypertension knowledge has not been so impressive in some previous studies. In a cross-sectional study by Machaalani et al (2022), only 25.15% of HTN patients showed an adequate knowledge level about HTN. In Karachi Pakistan, the level of hypertension knowledge in hypertensive patients was concluded generally low (Almas et al 2012). In Cameroon of the 221 participants in the study, 31 (14.1%) had adequate knowledge of hypertension. 118 (53.4%) had average knowledge, while 72 (32.6%) had poor knowledge of hypertension (Akoko et al., 2016). Out of the 385 patients in Quetta, Pakistan, 146 (37.9 %) were within the poor knowledge range, 236

(61.3 %) moderate and only 3 patients (0.8 %) showed adequate general knowledge about hypertension (Saleem., & Hassali., & Shafie., & Awad., & Bashir., 2011). Bilal et al., (2015), found that the awareness level of cardiac hypertensive patients in general is inadequate. The patients were not informed about recently recommended guidelines, cut off values of SBP and association of their SBP levels with cardiovascular disease.

In South African Kwazulu Natal observational, descriptive and cross-sectional study, most hypertensive patients achieved a moderate knowledge-level score (Olowe, & Ross, 2017). Similar findings were seen by Kilic, Uzunçakmak and Ede, (2016) in Turkey a developed country. They found that approximately one-third of patients with HT had a poor level of knowledge about HT and very few numbers of patients (6.6%) had adequate level knowledge. Of the total of 385 urban dwellers, 55.3% (213) of them had a low level of, 17.9% (69) had a moderate level of knowledge whereas 26.8% (103) had a high level of knowledge about hypertension (Wolde et al., 2022). The knowledge about hypertension is the first step for any hypertensive patient to have well controlled blood pressures. Poorly informed patients are not aware of what is required of them and how to achieve these requirements. It is encouraging that in some settings it has been shown patients had good results about hypertension knowledge. 69.9% of patients had adequate knowledge about hypertension in Northern Sri Lanka at a tertiary care institution.

In Zimbabwe, in a study of Knowledge, attitudes and practices related to hypertension among residents of a disadvantaged rural community in Gwanda, 64,4% of the subjects were classified as having good knowledge which is better than other studies (Chimberengwa, Naidoo, cooperative inquiry group 2019). In Karachi Pakistan, when classified in two groups on 50% cut-off knowledge scale, 94.6%of the participants had high knowledge and only 5.4% had low knowledge (Nadeem et al., 2019). These

studies are an indication that it is possible for hypertensive patients to be knowledgeable about the condition..Hypertensive patients may lack critical knowledge about specific areas about Hypertension. These can be the diagnostic criteria or definition, necessary lifestyle modifications and possible complications of hypertension. In Chennai India, hypertensive patients lacked knowledge about complications of uncontrolled hypertension. Only less than half of hypertensive individuals in the study reported heart problems as a main consequence of uncontrolled hypertension and less than one third linked hypertension to stroke (Sudharsanan, Ali, & McConnell, 2021).

It is necessary for hypertensive individuals to know high blood pressures may be asymptomatic. Patients may not take necessary measures or may default medications with the illusion that their blood pressures are well controlled because they are asymptomatic. In Venezuela, more than 80% of participants believed that hypertension shows symptoms in most people (Lugo-Mata et al., 2017). Similarly, Nadeem et al (2019) found an overwhelming majority (80.9%) people in the study affirmed that being symptomless denotes normal blood pressure. High blood pressures are usually asymptomatic in the majority of individual. Malik et al., (2014) found that only 33.3% of hypertension-controlled, and 29.1% of uncontrolled group patients knew that even a person with high BP might not feel any symptoms.

Defining hypertension and being aware of possible complications by hypertensive individuals has had different results in studies. The majority of primary care patients in Venezuela correctly identified blood pressure numbers that are considered as normal (86.17%) (Lugo-Mata et al 2017). Bilal et al., (2015) found only 8% of cardiac patients were aware about the correct definition of HTN and majority of the patients (82%) did

not know anything about this term. In Shanghai China in a cross-sectional survey, participants at risk for hypertension were not familiar with the diagnostic criteria for hypertension, the Recommended Daily Intake (RDI) of salt, or that heart failure was a complication of hypertension. (Gong et al 2020). In contrast a large number of participants considered salt intake as the risk factor to be associated with high BP (Bilal et al 2015). One-fourth of the participants in this China study did not know that smoking and low physical activity were related to high BP (gong et al 2020) Bilal et al., (2015) noted ninety percent of cardiovascular patients knew that lowering
BP would improve a person's health and that they could lower their uncontrolled BP by adjusting their lifestyle. Similarly, in South Africa participants scored high around questions relating to lifestyle modification and all participants knew that poor hypertension control could lead to life-threatening complications (Olowe, & Ross, 2017). Instead in this South African study they noted patients lacked information about their medications. Over 95% of participants did not know the names of their antihypertensive medication (Olowe, & Ross, 2017).

In Khartoum state Sudan, participants were most knowledgeable on the importance of reducing salt intake in managing hypertension (93.8%), A high percentage of participants (71.4%) answered correctly that regular exercise can help lower blood pressure. However, more than half of the respondents answered incorrectly to whether alcohol consumption affected blood pressure (Abdalla 2021). Lugo-Mata (2017) had a quarter of the respondents believing that they could stop treatment if blood pressure figures were controlled, and 19.15% believed that treatment could be discontinued if they felt better. In contrast almost 60% of respondents said that hypertension is a lifelong disease in Uzbekistan (Malik et al., 2014). Since hypertension is mostly a chronic asymptomatic condition, patients may not feel any physical symptoms from

it, and without knowing the need to take drugs regularly for a long time, they may forget to take their medicine or feel that there is no need to take them (Malik et al 2014).

2.6 Source of hypertension knowledge in high blood pressure patients

The source of hypertension knowledge is important as it determines whether hypertensive patients will get correct information or not. Studies have shown that some patients are getting information from professional health care providers. Goverwa et al (2012) found that most of their hypertension educated subjects (78.4%) had received the education from medical doctors. It is important to note that only approximately one-third of the study population noted that they got education about HT (Goverwa et al 2012). In Gwanda Zimbabwe Chimberengwa, Naidoo, & cooperative inquiry group (2019) found out that 56 % of patients said they received hypertension knowledge from local clinic nurses 11.5% from village health workers, only 18.1% had received the knowledge from public hospital doctors. In Turkey, most of the educated subjects (78.4%) got this education from medical doctors, 4.3% of them from nurses and 3.3% of them from both medical doctors and nurses (Kilic, Uzunçakmak and Ede, 2016).

The duration and number of counselling sessions can also affect the amount of knowledge a patient will have. Patients at a referral cardiovascular hospital in Khartoum State either perceived they were never counselled by a medical doctor or most of those who thought they were counselled the perceived duration was less than 5 minutes which is not adequate (Abdalla 2021). Patients may also receive information from other sources like non health professionals and traditional medicine practitioners. This is associated with wrong knowledge or poor correct knowledge in hypertension patients as seen by Chimberengwa, P. T., Naidoo, M., & cooperative inquiry group (2019).

2.7 Duration of hypertension diagnosis and hypertension knowledge

The time duration from hypertension diagnosis may be a factor in the amount of hypertension knowledge one has. The possible explanation for this might be due to patients with a longer duration of treatment having a better chance to hear different information and get advice from health professionals. Also, to attend different health education sessions more about their disease than patients with recent years of diagnosis (Wolde et al., 2022). Patients with a lower duration of hypertension 6 to 11 months since HTN onset (p-value = 0.015) recorded the lowest mean knowledge score in Lebanon (Machaalani et al 2022). Similarly, the odds of having a high level of knowledge among those who were in longer duration of treatment were (relative to moderate and low level of knowledge) 2 times higher as compared with patients with less than two years duration of treatment in Ethiopia (Wolde et al., 2022). In a study at a hospital in Khartoum state, the duration of consultation was found to be associated with participants' level of knowledge ($p = 0.039$) (Abdalla,.2021)

Kilic, Uzunçakmak and Ede, (2016) had different results from a developed country where HT duration did not show any statistical correlation between score of the HTN knowledge. The time since diagnosis in hypertensive patients was not associated with a higher level of knowledge about HTN ($p > 0.05$) in Venezuela (Lugo-Mata et al 2017). Similarly, Olowe & Ross (2017) found no statistically significant association between duration of hypertension with regard to knowledge.

2.8 Demographic factors and hypertension knowledge

Most studies have not shown any gender differences in hypertensive knowledge. Gong et al (2020) found no difference between males and females regarding knowledge of hypertension. Similar results were seen by Melnikov, Itzhaki., & Koton, (2018) on stroke knowledge. Lugo-Mata et al (2017) found the same result, no relationship was

found between sex and level of hypertension knowledge. Even in a developed country Turkey, there was no significant differences in respect to gender (Kilic, Uzunçakmak and Ede, 2016). Nadeem et al., (2019) findings are consistent with the above studies as no significant difference was observed in the median knowledge score between the groups of gender. In contrast to the above studies, Akoko et al., (2016) found male sex positively affecting knowledge of hypertension significantly.

Different results have been seen in regard to marital status and hypertension knowledge. Machaalani et al (2022) found the highest mean knowledge score of HTN was significantly associated with the marital status of the patients, with the highest score among divorced patients (9.8 ± 1.317 over 12) and the lowest among widows. Kilic, Uzunçakmak and Ede, (2016) found no differences with marital statusMachaalani et al (2022) found an inverse correlation between increased age and knowledge about HTN. Similar findings were seen by Kilic, Uzunçakmak and Ede, (2016) with age clusters subjects aged 70 years and above had lower knowledge levels. Akoko et al., (2016) found similar results with age less than 63 years associated with good knowledge.

In China Shangai younger community participants had better knowledge (gong et al 2020). These results can be attributed to younger patients being able to understand health information better than older patients. It is interesting to note that in Israel, participants younger than 45 years showed the lowest levels of stroke knowledge and the highest stroke knowledge was found in the 45 to 64 years age group (Melnikov, Itzhaki, & Koton, (2018). Similaririly Lugo-Mata et al., (2017) found the group under 30 years showed a lower level of knowledge than the rest. The higher the age, the higher the knowledge about the disease in Venezuela. A possible reason might be older patients have had longer duration of hypertension and longer exposure to hypertension

knowledge. Nadeem et al (2019) did not find any age differences in the groups for knowledge of hypertension in Pakistan,

2.8.1 Education status and hypertension knowledge

One may expect education level to affect the level of knowledge positively as educated individuals understand more. Literate individuals have better information exposure about hypertension through different ways including reading of Information, Education and Communication (IEC) materials prepared to patients with hypertension and this enhances their chance of obtaining adequate knowledge about hypertension (Wolde et al., 2019). Findings from Gwanda Zimbabwe study, those who attained tertiary education and secondary education were 7.52 (95%CI:2.76–20.46) and 3.68 (95%CI;1.61–8.41) more likely to have better knowledge than those who had no formal education respectively (Chimberengwa, Naidoo., & cooperative inquiry group 2019). Similarly, Kilic, Uzunçakmak and Ede, (2016) and Akoko et al., (2016). in their study where the level of knowledge was correlated significantly with educational status. Educational level markedly influenced knowledge of hypertension as a risk factor of stroke in stroke patients. It steadily increased from 54% in patients without a basic school education to 89% of patients with a college degree (Samal., Greisenegger., Auff., Lang., & Lalouschek. 2007). Eduacted patients are more likely to have better health literacy hence may grasp health education better. This has significant implications for control of hypertension in this population; educational materials must be delivered in a form that can be understood by those with lower literacy levels (Olowe, & Ross, 2017).

The average knowledge score of subjects without formal education was significantly lower than that of subjects with primary school and above graduate (Kilic, Uzunçakmak and Ede, 2016). Almost the same findings were also noted where

knowledge about HTN increased with education in Lebanon study (Machaalani et al 2022) and community participants with higher educational level had better hypertension knowledge in Shangai China (Gong et al 2020). Same findings were found in South African study where an association was found between a higher level of education and better hypertension knowledge (Olowe, & Ross, 2017). Interestingly formal education did not show any relation with high knowledge scores in Pakistan hypertensive patients (Almas et al 2012). The authors suggested that specific knowledge about disease is needed and just education alone may not suffice(Almas et al 2012). A similar finding was seen by Lugo-Mata et al., (2017) as no relationship was found between educational level or professional status and the knowledge about hypertension.

2.9 Level of knowledge and hypertension control

Many people with hypertension both in developing and developed countries have no adequate control of their blood pressure (BP) (Malik et al., 2014). Knowledge of patients about their disease is a key factor for better compliance (Wolde et al 2022). Knowledge about hypertension and its control influences blood pressure control in patients with hypertension (Samal., Greisenegger., Auff., Lang., & Lalouschek. 2007). The association of the amount of hypertension knowledge and hypertension control has been documented in some studies. In Turkey, although not statistically significant, the proportion of subjects with controlled hypertension was higher (75%) among subjects with adequate level of HT knowledge compared to the ones with moderate and poor levels who had 69.4% and 63.2% respectively (Kilic, Uzunçakmak and Ede, 2016). Similarly, Wang et al (2003) concluded patients' knowledge on hypertension control was significantly related to the rate on hypertension control. Malik et al., (2014) found that patients' knowledge levels were significantly associated with BP

control status. Compared to those with an inadequate knowledge level, the OR of controlled hypertension was 2.9 (95% CI 1.3–6.5) for the adequate level and 5.4 (95% CI 1.7–16.2) for a good knowledge level. Hypertension control may be difficult in low knowledge patients as they are more likely to default medications because they lack information necessary for control of the disease.

In Pakistan there was an association found between knowledge of hypertension and good hypertension control (Almas et al 2012). In a hospital in Uzbekistan, more patients from the BP controlled group knew the normal DBP level, as compared with patients from the uncontrolled BP group (90.2% vs 75.3%, OR=2.9, 95% CI 1.0–8.0) (Malik et al., 2014). In the same study subjects who considered that hypertension patients should take drugs for a long time, were most likely to have controlled BP (OR=5.5, 95% CI 2.6–11.6) (Malik et al 2014). A meta-analysis in China had consistent results which showed that, after health education for patients with hypertension, SBP and DBP is substantially lowered; the effect was statistically significant ($P < 0.001$.

Intentional nonadherence to antihypertensive medication that stems from incomplete knowledge of HBP treatment was seen prevalent among middle-aged Korean Americans with HBP (Kim et al 2007). This was also seen in India where over one quarter (28% (95% CI 25% to 31%)) of diagnosed individuals reported not taking daily treatment and the majority of individuals who discontinued medications said they did so because their BP had returned to normal and thus did not require further treatment. (Sudharsanan., Ali, & McConnell, 2021). Knowledge regarding BP medications was strongly associated with daily medication use in this India study (Sudharsanan,, Ali, , & McConnell, 2021). Association between compliance to treatment and knowledge on hypertension was statistically significant in Cameroon (p\0.001) (Akoko et al 2016).

Some studies have found different results with no association of hypertension knowledge and good blood pressure control. Nadeem et al (2019) saw no significant difference in the median knowledge score between groups of different blood pressure control status. There was no association found between knowledge of hypertension and good hypertension control by Olowe, & Ross, (2017). These findings might imply that managing blood pressure involves more than just knowledge. Knowledge must be utilized. to implement preventive measures to control blood pressure.

2.10 Incorrect information about hypertension

Myths about hypertension have been described in literature. Myths affect management of hypertension negatively. In Lebanon most patients believed traditional medicine and garlic treat hypertension which is not true and some patients believed they can get addicted from anti hypertensives (Machaalani et al 2022). Malik et al., (2014) found the same reason of patients fearing addiction as a cause of defaulting hypertensive medication. Belief in herbal remedies to manage hypertension was seen in 50.7% of hypertensive low socioeconomic status patients in Gwanda Zimbabwe (Chimberengwa, Naidoo, & cooperative inquiry group 2019). In the same study, 14.5% patients agree to using African medicines to manage hypertension and believed traditional medicines to control your blood pressure.

Malik et al., (2014) found patients who could default hypertension treatment because they had switched to traditional medicine. In India, the primary reason that individuals reported for not taking daily medications was that their BP had gone back to normal (Sudharsanan, Ali, & McConnell, 2021). Nadeem et al., (2019) similarly found 46.6% individuals who thought they must take their medication only when they feel ill, regardless of their BP measurement. This is wrong information as normal blood

pressure is a result of taking antihypertensives. If one stops taking the medications the blood pressure will be elevated again.

2.11 Chapter summary

This chapter presents a literature review on knowledge about hypertension in hypertensive patients, factors that affect this knowledge and the association of knowledge about hypertension and blood pressure control. Factors that have been seen to affect the amount of hypertension knowledge includes demographic factors, the source of hypertension information and the duration one has been under care for high blood pressure.

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter outlines the research design, study setting, study population, sampling criteria and methods, data collection methods, data analysis plan and ethical considerations.

3.2 The Research Design

A cross sectional analytical study was carried out to find the amount of knowledge about hypertension on hypertensive clients who attend Mutare city clinics and to find out if there is an association between hypertension knowledge and good blood pressure control in these clients. The research design was chosen for as it determines association between variables. This design is suitable as it is cheap and less time consuming. Quantitative and qualitative methods were used in data collection.

3.3 Study setting

This study was carried out in Mutare City Council clinics, Manicaland, Zimbabwe. About 260km from the country capital, Harare. According to the Health Information department Mutare city the city has an estimated 224450 people in 2022. Mutare City has 9 health institutions, one is currently being used as an isolation hospital for infectious diseases whilst the rest are primary health facilities.

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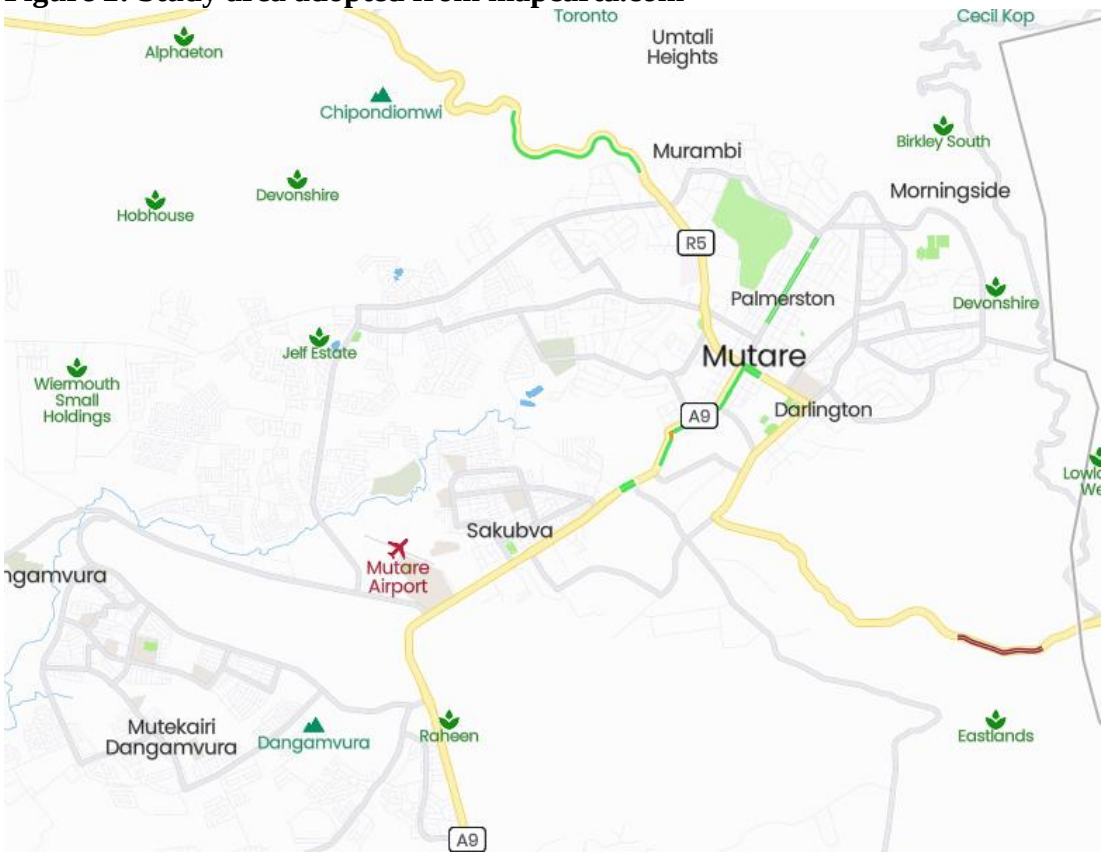
Figure 2: Study area adopted from mapcarta.com



3.4 Study population

The study population are all the hypertensive patients who were diagnosed at least two months prior to the clinic visit at Mutare city clinics for consultations, drug resupplies or other health services.

3.4.1 Inclusion Criteria

All hypertensive clients who were the age of 18 years or above and visited Mutare city clinics for health services during the time of the study. Hypertensive clients in this study means all those who had antihypertensive medications prescribed for them by a health worker at least 2 months prior to the day of the interview.

3.4.2 Exclusion Criteria

All hypertensive clients who were diagnosed less than 2 months prior were excluded. All women with pregnant induced hypertension were also excluded. Furthermore, any hypertensive patient who was unwilling to participate or incapacitated to give consent was excluded from the study.

3.5 Sample size

The sample size was calculated using Dobson's formula as the proportion we want is a qualitative variable. :

S=Z^2* (p) * (1-p)/c2

Z = 1.96 (for 95% confidence level)

p = 0.645

c = margin of error (10%)

With a good hypertension knowledge rate of 0.645% in hypertension patients as seen the study by Chimberengwa, Naidoo, & cooperative inquiry group (2019) 1.96^2*0.644*0.355/0.1^2= 88 participants

3.6 Sampling Procedure

Convenience quota sampling was used in this study. Every clinic out of the 8 clinics should have supplied 11 hypertensive clients. The days to visit the clinics were chosen randomly between September 2022 to February 2023. Repeated visits were done to aim to gets 11 participants from each clinic. Every hypertensive client who visited the clinic on the day of study and was willing will be enrolled into the study was enrolled.

3.7 Data collection instruments

The investigator used a structured interviewer administered questionnaire (Appendix 1) to collect information on demography, knowledge on hypertension awareness, treatment and control, and other relevant information adopted and modified from a

study by Chimberengwa, Naidoo, & cooperative inquiry group (2019). A shona translated questionnaire (Appendix 2) was used for all shona speaking participants.

3.7.1 Dependent variable

The dependant variables are hypertension knowledge status and blood pressure control. These variables are measured by the score on knowledge questions and assessment of the last 3 blood pressure readings in the patient booklet.

3.7.2 Independent variables

The demographic characteristics of the hypertensive patients, duration of hypertension and their source of information, were the independent variables. This included the age, education level, religion and marital status of the health workers.

3.8 Pretesting of Instruments

10 questionnaires were used as a pre-test and responses were analysed for any need of alterations. Questionnaires were be pretested on hypertensive clients at Hauna Hospital Honde valley.

3.9 Data collection procedure

An MPH student who is proficient in history taking will collected data from participants using his history taking skills to get necessary information. A written informed consent was obtained from every participant who would have volunteered to participate in the study. Following a written informed consent, participants were interviewed in a private and confidential space using an interviewer-administered structured questionnaire to collect quantitative data. The place of interview was at the clinic. Standard protocols for COVID 19 prevention will be observed. Interviewer was at least one metre apart from the participant and masks were appropriately worn all the time.

3.10 Data analysis and organisation

In this analysis, Microsoft excel was used for capturing, cleaning and tabulation of all the data collected using the questionnaires.

Independent variables were the demographics of participants, duration of hypertension and patient source of hypertension information.

The dependent variables were hypertension knowledge status and blood pressure control. Dependent variables will be measured by the score on knowledge questions and at least 2 of last 3 blood pressure readings in their booklet within the last 6 months are in the normal range according to WHO standards respectively. Those who have less than 2 blood pressure reading within the last 6 months were classified as poorly controlled.

The questionnaire had ten knowledge questions on hypertension and scoring of six or more points by a respondent was considered good knowledge while five or less points was poor knowledge. Frequencies and proportions were calculated for respondents' demographic profiles, lifestyle related factors, beliefs and knowledge on hypertension treatment and control. Logistics regression analysis was done and odds ratio used to assess the relationship of variables. Confidence interval was used to test the statistical significance with $P<0.05$. To conduct analysis, questions were coded, scored, aggregated into points and clustered on knowledge, perceptions and blood pressure control. Microsoft excel was used for analysis of quantitative data.

3.11 Dissemination of results

Study findings will be shared with Africa University, City Health executive, City Health workers and Ministry of Health and Child Care staff, the rest of the community and the general public locally, nationally and regionally.

3.12 Ethical considerations

The investigator obtained ethical approval from the Ethics Committee of Africa University (AUREC) (Appendix 5). The permission to collect data was sought from the city health directorate (Appendix 6). A written informed consent (Appendix 4) will was obtained from all participants using the local language. All the participants were assured that they can withdraw from the process whenever they want with no consequences to them. Privacy and confidentiality was maintained throughout the study process. Measures to ensure confidentiality included telling clients that no information was to be shared to other people and privacy will be maintained, no names were used on the questionnaires, coding was done using numbers. Furthermore, collected data was be kept in a safe and locked cupboard.

3.13 Summary

Chapter 3 provided the study methodology, outlining the design, setting, population, sampling method, data collecting, and analysis, as well as the ethical principles that were followed during the study. This was a descriptive cross-sectional analytical and descriptive study in Mutare City health department. Hypertension patients voluntarily participated. A pretested questionnaire was used for data collection. Data analysis was done using Microsoft excel and all ethical considerations were be observed.

CHAPTER 4: DATA PRESENTATION

4.1 Introduction

Data collection was conducted over a period starting September 2022 and ending February 2023. 88 hypertensive people participated in this study. The study managed to get only 4 patients during the data collection period at Fern valley clinic. This is less than the required number of participants for the clinic and was due to very low number of patients attending the health facility despite 5 repeated days. To compensate the numbers more patients were obtained from 3 high volume sites which are Chikanga, Sakubva and City clinic. Only 3 patients denied giving a consent to participate. The mean age of the participants was 56.1 (Q1-Q3; 44.5–66.5) years.

4.2 Socio-demographic characteristics of study participant

A total of 88 participants hypertensive people participated in this study. Table 2 shows the sociodemographic data for hypertensive patients who were enrolled into the study. The study sample consisted of 61 (69.3%) females and 27 (30.7%) male and the respondents were predominantly Christians 65 (73.8%). About 28 participants which is thirty one percent attended primary level or below (Table2)

The majority of the participants were married 56 (63%) and the next common marital status was being widowed 20 (22.7%). 18 (20%) of the participants were not employed 26 (29.5%) are skilfully employed and 44 (50%) are unskilfully employed. 37 (42%) of the participants earned less than $100 per month, 24 (27.2%) participants earned above $100 but less than $300 and 26 (29.5%) of the participants earned more than $30

Table 2: Socio-demographic characteristics of study population (N=88)

Characteristic	Variables	Frequency, n (%)
Gender	Female	61 (69.3)
	Male	27 (30.7)
Age intervals	30-50 years	54 (61.4)
	51-90 years	34(38.6)
Marital status	Married	56 (63.6)
	Divorced	9 (10.2
	Widowed	20 (22.7)
	Single	3 (3.4)
Religion	Apostolic	19 (21.6)
	Christianity	65 (73.8)
	Other	4 (4.5)
Level of education	Primary	28 (31.8)
	Secondary	31 (35.2)
	Tertiary	29 (32.9)
Job description	Skilled	26 (29.5)
	Unskilled	44 (50)
	Unemployed	18 (20)
Monthly income (US$)	<100	37 (42)
	100–300	24 (27.2)
	>300	26 (29.5)
	Not declared	1 (1.1)

Frequency: percentage of participants who identified the particular cause or complication

4.3 Prevalence of hypertension knowledge in hypertensive clients

Table 3 shows the respondents' beliefs on HT treatment and control among Respondents. 69.3% had something positive about anti hypertension treatment. Majority of these positive responses said the treatment works to lower blood pressure, is useful and necessary. 34.1 % had something negative to say about anti hypertension treatment. The responses included complaints about side effects, expenses and difficulties to get the tablets and being dependent on the treatment for life. 32.9 % believed in herbs and traditional medicines. The local clinic nurse was primarily the source of knowledge on hypertension for 88.6% of the respondents while others has sources like the private pharmacist and private doctor (7.9%).

Various reasons why some people default anti hypertensives were given and we categorised them into 12 different reasons. The most common reason given (35.2%)

as a cause of defaulting treatment was fear of ‘side effects’ of anti-hypertensives. The side effects speculated mostly are diabetes and cancer. The second most common reason cited by respondents was financial constraints (23.8%). Other reasons given were fear of dying from the medications, the fact that treatment is lifetime, denial, finding of traditional treatment, lack of knowledge, fear of addiction and religious reasons.

Table 3: Stratified prevalence of hypertension knowledge in hypertensive clients (N=88)

Belief category	Yes	No	Frequency n% (Yes)
Had positive sentiments and belief in effectiveness blood pressure pills to manage hypertension	61	27	69.3
Had negative comments about hypertension tablets	30	58	34.1
Belief in herbal/traditional remedies to manage hypertension.	29	59	32.9
Do believe in herbal/traditional medicines	28	60	31.8
Have not used herbs before	31	57	35.2
Can use traditional medicines to control high blood pressure if offered.	44	44	50
Source of knowledge on HBP			
Local clinic nurse	78	10	88.6
Village health worker	0	88	0
Public hospital	0	88	0
Private doctor	3	85	3.4
Other eg internet, pharmacist	7	81	7.9
Reasons why patients default HBP medication.			
Side effects of diabetes	31	57	35.2
Financial constraints	21	67	23.8
Denial	3	85	3.4
Fear of death	9	79	10.2
Because medication is lifetime	14	74	15.9
They have found traditional substitution	6	82	6.8
They are healed	3	85	3.4
Lack of knowledge	4	84	4.5
Religious reasons	2	86	2.2
Advice from peers	6	82	6.8
I don't know	15	73	17.0
Current control of blood pressure.			
Blood pressure tablets	75	13	85.2
Traditional medicines, remedies/ herbs	7	81	8.0
Nothing	6	82	6.8

HBP: High blood pressure

4.4 Prevalence of Good versus Bad Knowledge on HBP

A total of 66 cases (80%) of participants had good knowledge when assessed with the knowledge questions (figure 4). All participants answered correctly the questions about

symptoms of high blood pressure and what can cause hypertension. 80% of the participants cited stress as a possible cause of hypertension. There is no participant who gave medical conditions and aging as causes of high blood pressure. Table 4 shows the proportions of participants who mentioned different causes of hypertension. 86 (97.7%) participants answered that they would visit a health worker if they need more knowledge about hypertension.

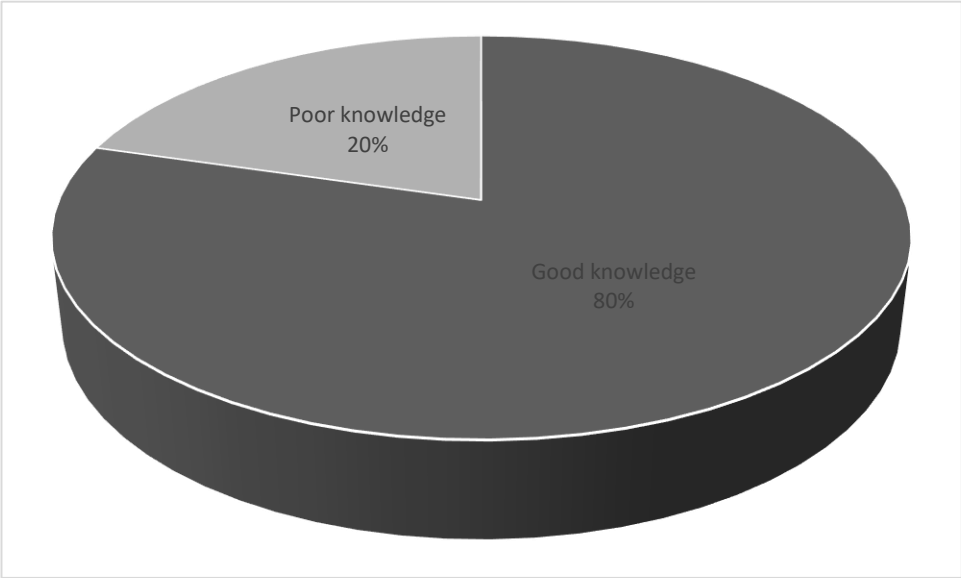


Figure 3: Prevalence of Good versus Bad Knowledge on HBP

The question that had the least number of participants 4 (4.5%) who answered correctly was the question about defining high blood pressure. The most common known complications of hypertension among participants were stroke and death (Table 4). Other complications that were mentioned were loss of eyesight, heart failure and collapsing. Kidney disease was not mentioned by any participant.

When asked about what causes hypertension, stress was the most popular response given (90.9% of participants). No participant mentioned medical conditions and aging as causes of hypertension.

Table 4: Knowledge on selected questions on Hypertension (N=88)

Knowledge Variables	**Number who answered correctly (%)**	**Number who answered incorrectly (%)**
If you need more knowledge on high blood pressure, where would you go?	84 (95,5)	4 (4.5)
How do you define high blood pressure?	4 (4.5)	84 (95.5)
Any one cause of high blood pressure?	88 (100)	0
Any symptom/s of elevated blood pressure you know?	88 (100)	0
Can one have high blood pressure with no symptoms?	64 (72.7)	24 (27.2)
How will you continuously know your blood pressure is poorly/ well controlled?	50 (56.8)	38 (43.2)
What can happen if high blood pressure remains untreated?	82 (93.2)	6 (6.8)
What are risk factor of developing high blood pressure?	60 (68.1)	28 (31.8)
Beside high blood pressure tablets, how else can you prevent/control hypertension?	43 (48.9)	45 (51.1)
What should one do when blood pressure is normal whilst taking anti-hypertensive	81 (92.0)	7 (8.0)

Table 5: Participants knowledge on causes and complication of hypertension (N=88)

Variables	Knowledge	No	Yes	Frequency (n %)
Causes	Stress	8	80	80 (90.9)
	Diet	85	3	3 (3.4)
	Hereditary	81	7	7 (8.0)
	medical conditions	88	0	0
	Age	88	0	0
Complications	Death	43	45	45 (51.1)
	Stroke	30	58	58 (65.9)
	Collapsing	85	3	3 (3.4)
	heart disease	79	9	9 (10.2)
	kidney disease	88	0	0

Frequency: percentage of participants who identified the particular cause or complication

4.4 Hypertension control

The majority of the participants 61 (69.3%) had poorly controlled average blood pressures as shown if figure.5

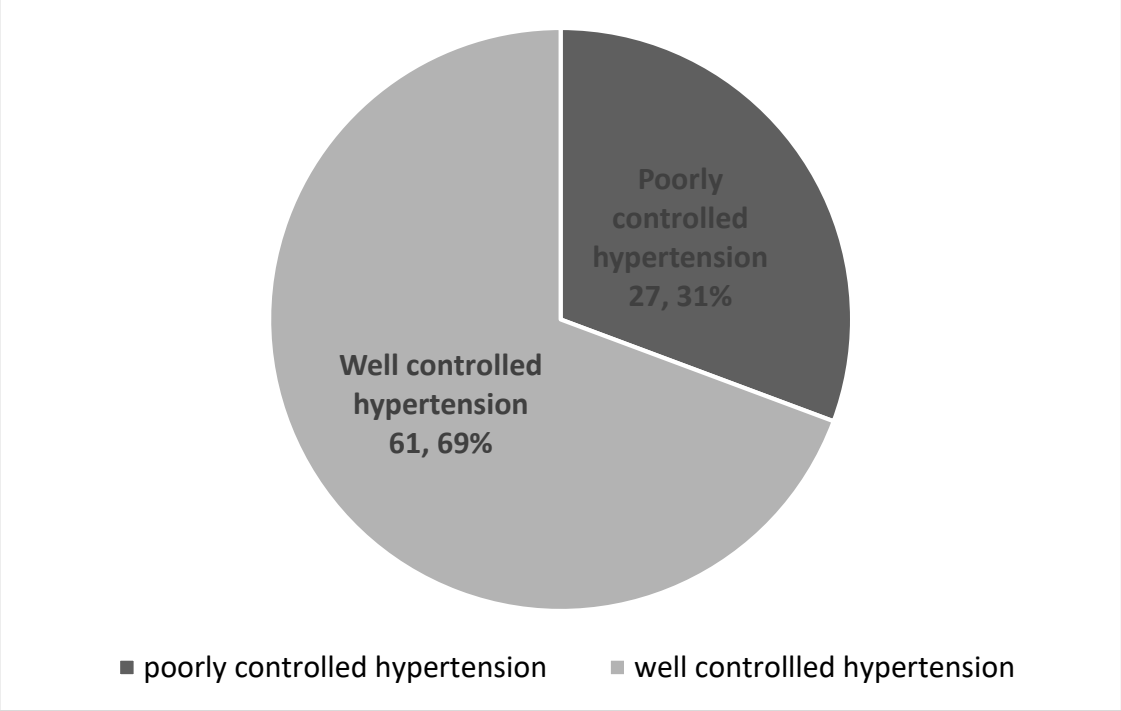


Figure 5: Hypertension control among participants

4.5 Regression analysis on factors affecting Hypertension knowledge.

Table 5 shows a logistic regression analysis of factors affecting knowledge on hypertension. Data was re-coded such that those who had scored below six points out of ten had poor knowledge and scoring six or more out of ten had good knowledge. These was no statistically significant association of gender, education, religion and duration of hypertension treatment with good hypertension knowledge. Those who are 51 years and above were significantly less likely to be knowledgeable compared to the 30-50 years age group odds ratio 0.21 (95%CI 0.04-0.99) p value 0.049. Those that had skilled employment were 12.5 times (95%CI;1.3-115.8) more likely to have better knowledge than those who had no employment at all and this was statistically significant with p value 0.03. Although not statistically significant those who had unskilled employment were 2.6 / (95%CI; 0.7-9.4) more likely to have better knowledge. Those who had a previous discussion about hypertension with a health worker were 9.3 (95%CI 1.9-44.7) times more likely to have good hypertension knowledge than those who had not discussed with a health worker at all. With regards to beliefs in herbal and traditional medicines use, those who said they will accept herbal medicines if offered were 66% (OR 0.3 (95% CI 0.1-1.2)) less likely to have good knowledge compared to those who did not believe in herbs. Those who were using hypertensive medicines had no statistically significant difference in knowledge status compared to those who were using traditional medicines to control hypertension. Those who had their hypertension controlled were significantly less likely to have good knowledge when compared to those with poorly controlled hypertension odds ratio 0.2 (95% CI 0.05-0.6) p value 0.005. Participants who had at least a discussion with a health worker were 9.31 times (95% CI 1.94-44.7, P value 0.005) likely to have good knowledge compared to those who have not had a discussion with a health worker.

Table 5 Regression analysis for socio-demographic factors (N=88)

Factor	**Hypertension knowledge**		**OR (95% CI)**	**P Value**
	Good n=74	Poor n=14		
Gender				
Female	48	13	0.14 / (0.02-1.2)	0.07
Male	26	1	ref	
Age				
30-50	33	2	ref	
51-90	41	12	0.21 (0.04-0.99)	0.049
Religion				
Apostolic	16	3	ref	
Christianity	55	10	1.03 / (0.25-4.20) /	0.97
Level of education				
Tertiary	27	2	4.5 / (0.9-24.0) /	0.08
Secondary	26	5	1.73 (0.5-6.3) /	0.40
Primary	21	7	ref	
Employment				
none	12	6	ref	
skilled	25	1	12.5 / (1.3-115.8) /	0.03
unskilled	37	7	2.64 / (0.7-9.4) / 0.1	

Ref = Reference against which other categories were measured against

Table 6: Regression analysis of various factors versus knowledge of Hypertension N=88)

Factor	**Hypertension knowledge**		**OR (95% CI)**	**P Value**
	Good n=74	Poor n=14		
Duration of hypertension diagnosis				
<1 year	14	2	ref	
≥1 year <5years	28	6	0.7 / (0.1-3.7) /	0.64
≥5 years	32	6	0.8 / (0.1-4.3) /	0.76
Hypertension control				
Poor	56	5	ref	
Good	18	9	0.2 / (0.05-0.6) /	0.005
Perceptions				
Can use traditional medicines if offered				
Yes	40	4	ref	
No	34	10	0.3 / (0.1-1.2) /	0.09
Previous discussion about hypertension				
Had no discussion with a health worker	29	12	ref	
Had a discussion with a health worker	45	2	9.3/ (1.9-44.7)	/0.005
Current treatment in use for hypertension				
Hypertension medications	64	12	1.1 / (0.2-5.5) /	0.94
Other traditional remedies or none	10	2	ref	

Ref = Reference against which other categories were measured against

CHAPTER 5 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter will discuss the findings of the study on hypertension knowledge and control among high blood pressure patients who attend Mutare City clinics September 2022 and February 2023 in Manicaland Province. We will also give recommendations that can assist the city to achieve better treatment of hypertensive patients and ultimately better health outcomes.

5.2 Discussion

The study was conducted using both quantitative and qualitative methods. The study participants were all above the age of 30 which tally with what is already known that hypertension mostly come when people are aging. 69.3% of participants were female which may reflect better health seeking behaviour of women compared to men (Table 2). Similarly, Chimberengwa, Naidoo, & cooperative inquiry group (2019) found more women (64.5%). About 2 thirds (63.6%) of the participants were married, 22. 8 were widowed followed by 10.2% who were divorced. Only a minority 3.4% of the participants were never married. This study was conducted in a disadvantaged urban community where formal education is low and about a third of the participants (31.8%) were not educated beyond primary school and only about a third reached tertiary level education (table 2). Educational attainment was not significantly associated with good knowledge on hypertension. In contrast Chimberengwa, Naidoo, cooperative inquiry group (2019) found educational attainment directly proportional to knowledge on hypertension in a rural community. Although education background affects understanding and seeking health knowledge, other factors may be affecting the knowledge levels of hypertensive population. Half (50%) of the participants were unskilled workers and 29.5% of the participants had skilled employment (Table 2). In

our study employment status was strongly associated with good hypertension knowledge. This may be due to better exposure to information when one is gainfully employed. Our study participants mainly belong to the poor socioeconomic group as the majority (69.2%) of the participants earned less than US$ 300 per month income (Table 2).

The knowledge status of participants in this study was good as 80% were considered had good knowledge (Figure 3). This is similar and better to Gwanda study were 64,4% of the subjects were classified as having good knowledge (Chimberengwa, Naidoo, cooperative inquiry group 2019). When compared to Gwanda study participants our participants may have had better hypertension knowledge because they are mostly from a city and also they were better educated 60% secondary educated and above (Table 2) compared to 48.9% in Gwanda (Chimberengwa, Naidoo, cooperative inquiry group 2019). Our findings can also be related to what was seen in Karachi Pakistan, 94.6% of the participants had high knowledge and only 5.4% had low knowledge (Nadeem et al., 2019). In contrast to our study other studies have found poor hypertension knowledge in high blood pressure patients. Machaalani et al (2022), had only 25.15% of HTN patients with adequate knowledge, Almas et al (2012), concluded HPT knowledge generally low and Saleem., et al (2011) had only (0.8 %) with adequate general knowledge about hypertension.

It is necessary to discuss the nature of the responses that we had on specific knowledge questions as these may give insight on the kind of knowledge the participants had and the kind of information that may be lacking. When assessed on individual questions most participants (95.5%) failed to give cut off points for high blood pressure. This is similar to Shanghai China survey where participants at were not familiar with the diagnostic criteria for hypertension (Gong et al 2020) and also findings by Bilal et al.,

(2015. In contrast the majority of primary care patients in Venezuela correctly identified blood pressure numbers that are considered as normal (86.17%) (Lugo-Mata et al 2017). Knowledge about levels of high blood pressure is necessary for good management of hypertension. The knowledge about HTN is vital for patients to be able to evaluate themselves, their BP measurements at home and to comply with their treatment and they can easily be aware of their general status and take precaution promptly (Kilic, Uzunçakmak and Ede, 2016).

The other question that had poor performance was about lifestyle modifications. More than half (51.1%) of the participants in this study could not give any other way of assisting controlling high blood pressure besides the tablets. Gong et al, (2020) had similar results. Participants did not know that smoking and low physical activity were related to high blood pressure. In contrast a large number of participants considered salt intake as the risk factor to be associated with high BP (Bilal et al 2015) and in Khartoum, participants were knowledgeable on the importance of reducing salt intake in managing hypertension (93.8%), a high percentage of participants (71.4%) answered correctly that regular exercise can help lower blood pressure. (Abdalla 2021). Possible explanation on why the Khartoum participants had better knowledge on this aspect might be the fact that these were cardiology hospital clients who had been exposed to specialised care as compared to our setting. Lifestyle changes by hypertensive patients is vital in the management of high blood pressure. Kumar and Clacks., (2017).

When asked about the causes of hypertension and complications of uncontrolled high blood pressure most patients knew only stress (90.9%) and stroke (65.9%) plus death (51.1%) respectively (Table 4). No participant mentioned it being unknown, medical conditions and aging as causes of hypertension or renal disease as a complication and

a very few participants talked about heart disease. Similar lack in some knowledge was reported by Sudharsanan, Ali, & McConnell, (2021), where only less than half of hypertensive individuals in the study reported heart problems as a main consequence of uncontrolled hypertension. Unlike our study, Sudharsanan, Ali, & McConnell, (2021), found less than one third of the participants who linked hypertension to stroke. Although most participants scored on these questions, the lack in some knowledge is not desirable as participants cannot link the complications, they are not aware to poor hypertension control.

When it comes to beliefs and attitudes only about 2 thirds 69.3 % (Table 3) had positive sentiments and beliefs in effectiveness blood pressure pills to manage hypertension. Chimberengwa, Naidoo, & cooperative inquiry group (2019) had much better results as 93.8% 0f the participants believed in antihypertension medicines. Our study had a high level of incorrect beliefs and knowledge. About a third of the participants 34.1 % had negative comments about hypertension tablets, about a third 32.9% believed herbal/traditional remedies can manage hypertension and of the participants can use traditional medicines to control high blood pressure if offered (Table 3). Chimberengwa, Naidoo, & cooperate inquiry group (2019), had only 8.8% and 3% of participants using traditional herbs and prayer as high blood pressure treatment.

In this study participants gave reasons that are not necessarily true or good reasons why patients default HBP medications. Most prominent incorrect information were side effects of diabetes 35.2%, fear of death 10.2%, medication being for lifetime 15.9%, finding traditional substitution 6.8%, being healed 3.4% and religious reasons 2.2%. These reasons and incorrect information affect patients compliance to hypertension medications. One may not take anti hypertensives because they fear to be die from taking the medication.

The source of hypertension knowledge is important as it determines whether hypertensive patients will get correct information or not and also the quality of information that they will get. 88.6% of our participants get hypertension knowledge from local clinic nurses and only 3.4% had their knowledge from a private doctor and no participant had received their knowledge from a village health worker (Table 3). Chimberengwa, Naidoo, & cooperative inquiry group (2019) had a slightly similar picture where 56 % of patients had received hypertension knowledge from local clinic nurses 11.5% from village health workers, only 18.1% had received the knowledge from doctors. This is different from what was found in Lupane where most of their hypertension educated subjects (78.4%) had received the education from medical doctors (Goverwa et al 2012). This is likely because the study was done in the outpatient's department of a district hospital. In Turkey, most of the educated subjects (78.4%) got this education from medical doctors, 4.3% of them from nurses and 3.3% of them from both medical doctors and nurses (Kilic, Uzunçakmak and Ede, 2016). It maybe desirable for every hypertension patient to have a discussion with a doctor but in our setting that may be difficult. It then becomes necessary for nurses to be capacitated with necessary information and kills to counsel hypertensive clients.

In this study there was no statistically significant differences in the level of knowledge when different gender and religions were compared. This is in keep with most studies as they have not shown any gender differences in hypertensive knowledge. Gong et al (2020) found no difference between males and females regarding knowledge of hypertension. Similarily Melnikov, Itzhaki., & Koton, (2018) and Lugo-Mata et al (2017) found the same result, no relationship was found between sex and level of hypertension knowledge employment status. In contrast to our study, Akoko et al., (2016) found male sex positively affecting knowledge of hypertension significantly.

In this study we found older age to be associated with lower levels of knowledge significantly. Those 50 years and above were less likely to have good knowledge when compared to those below 50 years of age (odd ratio 0.21, P value 0.049) (Table 5). This is in keep with Machaalani et al (2022) who found an inverse correlation between increased age and knowledge about HTN and Kilic, Uzunçakmak and Ede, (2016). Akoko et al., (2016) found similar results with age less than 63 years associated with good knowledge. These results can be attributed to younger patients being able to understand health information better than older patients. Interestingly in Israel, participants younger than 45 years showed the lowest levels of stroke (Melnikov, tzhaki, & Koton, (2018). Lugo-Mata et al., (2017) found the higher the age, the higher the knowledge about the disease in Venezuela. Nadeem et al (2019) did not find any age differences in the groups for knowledge of hypertension in Pakistan. From our findings it is critical to pay more attention on elderly hypertensive patients so that they get better understanding of the condition.

Although statistically insignificant, those with tertiary and secondary educational attainment were 4.5 and 1.73 more likely to have better hypertension knowledge. was directly proportional to knowledge. This tally so well with what was seen in previous studies. In Gwanda, those who attained tertiary education and secondary education were more likely to have better knowledge than those who had lower education level (Chimberengwa, Naidoo, & cooperative inquiry group 2019). Similarly, Kilic, Uzunçakmak and Ede, (2016) and Akoko et al., (2016) the level of knowledge was correlated significantly with educational status. The reasons behind higher education being associated with better knowledge may be better understanding that comes with education and better economic status that is associated with education which brings better exposure to knowledge resources and other determinants of health.

Those who had at least a discussion with a health worker were 9.3 (p value 0.005) times more likely to have better knowledge than those who never had a discussion about hypertension with a health worker (Table 6). This means dedication by health workers to give at least a counselling session will go a long way. There must be adequate counselling time, unrushed sessions for better outcomes. In Khartoum State most of those who thought they were counselled the perceived duration was less than 5 minutes which is not adequate (Abdall a 2021).

In this study there was no statistically difference in the level of knowledge when participants with different durations of hypertension treatment were compared for less than one year compared to one year or more to five years and more than five years respectively. This entails us that there are no changes in the amount of knowledge as Mutare city patients are having longer durations of treatment. Kilic, Uzunçakmak and Ede, (2016) had similar results where HT duration did not show any statistical correlation between score of the HTN knowledge. Lugo-Mata et al (2017) and Olowe & Ross (2017) also found no statistically significant association between duration of hypertension with regard to knowledge. This is unlike the findings in Ethiopia, the odds of having a high level of knowledge among those who were in longer duration of treatment were (relative to moderate and low level of knowledge) 2 times higher as compared with patients with less than two years duration of treatment (Wolde et al., 2022). Patients with a lower duration of hypertension since HTN onset were also found to have the lowest mean knowledge score in Lebanon (Machaalani et al 2022). The longer duration of treatment is supposed to be a plus factor where patients have received more sessions of counselling. This may suggest patients are just coming to collect medicines from health facilities with no health information given to them.

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It is interesting to note that in this study the odds of those with well controlled blood pressure to have good knowledge was less than those with poorly controlled blood pressures odds ratio 0.2 (P value 0.005) (Table 6). Knowledge about hypertension and its control is expected to influence blood pressure control. This is opposite Wang et al (2003) and Malik et al., (2014) findings where patients' knowledge on hypertension control was significantly related to the rate on hypertension control. Our findings might suggest that managing blood pressure involves more than just knowledge. There are studies that have at least found no association of hypertension knowledge and good blood pressure control. Nadeem et al (2019) saw no significant difference in the median knowledge score between groups of different blood pressure control status. Similarly, there was no association found between knowledge of hypertension and good hypertension control by Olowe, & Ross, (2017).

5.3 Conclusion

The study revealed that hypertensive patients that attend Mutare city clinics have good general hypertension knowledge, but they lack some vital knowledge which is necessary for proper control of high blood pressure. Demographic and health system factors that affect significantly the amount of knowledge in hypertensive patients are previous discussion with health worker, the type of employment and age below 50 years. There is beliefs in traditional and herbal medicines as cure to hypertension. A significant proportion of the hypertensive population believe that hypertensive medicines can cause serious side effects like addiction and death. Those with well controlled blood pressure were found to have poorer knowledge compared to those with poorly controlled blood pressures.

5.4 Recommendations

From the findings of the study several recommendations have been drawn in order to improve the amount of hypertension knowledge among hypertensive clients in Mutare city council health centres:

Recommendation	Time frame	Responsible person/entity
Need to draft policies and guidelines for hypertension management	1 year	MOHCC
Ensure every hypertensive client receives at least one counselling session annually	3 Months	Senior nursing officer Mutare City
Use of mass media campaigns, technological applications like sms and WhatsApp	1 month	HPO and Director health Mutare city
Health department to put measures to retain and increase the number of health workers	2 months	Director Health
Address other factors that may affect adherence like scrapping medicine and user fees for hypertension patients	2 Months	Director Health
Use of Specific messages to address false information circulating	1 month	HPO

HPO: Health Promotions officer

MOHCC: Ministry of Health and Childcare

1. There is a need for national policies and guidelines which address the management of hypertension. This must include prevention, treatment and rehabilitation and should be distributed to reach all stakeholders. Ideas can be borrowed from the HIV/OI/ART program which has matured over time.
2. Mutare city health department must ensure every hypertensive client receives at least one counselling session annually so that patients remain well informed.
3. Consider making use of mass media campaigns, technological applications like sms, WhatsApp and even tele counselling to patients to feed them regularly

with necessary information. Particular attention should be given to messages against incorrect in formation.

4. It is recommended that the city health department put measures to retain and increase the number of health workers who are necessary for counselling hypertensive patients. This is to avoid overwhelmed health care providers who end up not giving health information well.
5. There is need to address other factors that may affect blood pressure control to ensure that patients are able to utilise the information they receive. This may include scrapping medicine fees and home deliveries of medicines to patients who don't afford to travel to clinic.
6. Specific messages to address false information circulating in the hypertensive community must be formulated. The messages will be targeting incorrect information like BP medicines cause addiction, death and diabetes to ensure clients have accurate information.
7. The council should make sure that user fees are scrapped for hypertensive patients. The board of directors to consider scraping off some of the user fees required to allow patients to come frequently and interact with the health system.

5.5 Suggestions for further study

Further research needs to be done to determine why knowledge on hypertension does not translate into good blood pressure control. Bigger studies using mixed methods to triangulate data is likely to provide more information on how good blood pressure control can be achieved. Further studies on other factors that may contribute to good blood pressure control should be done.

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APPENDICES

APPENDIX: 1 Questionnaire

Questionnaire number: …….		**Date**: ……	
Socio-demographic Data			
No	**Question**	**Options**	**Code**
1	How old are you	Number of completed years …….	
2	Gender (observe)	Male	1
		Female	2
3	Marital status	Single	1
		Married	2
		Divorced	3
		Widowed	4
		Other (specify)…..	77
4	What is your religion?	Christianity	1
		African tradition	2
		Apostolic (specify) ….	4
		Other (specify) ….	77
5	Does your religion permit you to seek modern medical assistance?	Yes	1
		No	2
6	What is your highest educational level?	None	1
		Primary	2
		Secondary	3
		Tertiary	4
7	What is your occupation?	Job…….	

8	Job description	Skilled	1
		Unskilled	2
9	Family monthly income in US$	<100	1
		100-300	2
		>300	3
10	How long have you been with a hypertension diagnosis?	<1 year	
		≥1 year<5 years	
		≥5 years	
Perceptions			
11	What is your comment on the use of antihypertensive medicines/tablets on lowering blood pressure		
12	What is your comment on the use of traditional remedies used to treat hypertension (high blood pressure)?		
13	Would you use traditional medicines to control your blood pressure?	Yes	1
		No	2
14	Who has discussed with you about blood pressure treatment and control	Local clinic nurse	1
		Village health worker	2
		Relatives/Neighbours	3
		Other(specify)	77

		…….....	
15	In your own opinion, why do people not like taking/ default blood pressure treatment?		
16	How do you currently control your blood pressure?		
		Blood pressure tablets	1
		Traditional medicines	2
		Other (state).	
Knowledge on Hypertension Awareness, Treatment and Control			
17	If you need more knowledge on high blood pressure (hypertension) where would you get it?		
		Relatives/ Neighbours	1
		Workmates	2
		Health workers	3
		Other specify …….	77
18	How would you define high blood pressure?		
		Mentioned above 139/89 or 140/90 and above	1
		Incorrect or does not know	2
19	What causes high blood pressure (hypertension)?	Unknown, Drugs Old age, Stress, pain, medical conditions or any response that is true	1

		Any response that is not true	77
20	What are the signs and symptoms of high blood pressure?	Asymptomatic, headache Palpitations, Poor vision Dizziness, Any other correct symptom	1
		Does not know	2
21	Can one have high blood pressure (hypertension) without any signs and symptoms?	Yes	1
		No	2
22	How will continuously know your blood pressure is normal or raised?	By regular blood pressure checking	
		Any other response that is not appropriate	
23	What can happen if blood pressure remains untreated?	Mentioned any one of the following: stroke, Heart failure, Kidney failure, Loss of sight, Death or any other complication of hypertension	1
		Don't know or any response that is incorrect	99
24	What are the risk factors of developing high blood pressure?	Mentioned any risk factor which can be Physical inactivity, Hereditary, Smoking, Obesity, High fat intake, High salt	1

		intake, consumption of excess alcohol	
		Don't know	99
25	Besides anti hypertension medication, how else can you prevent/ control hypertension? …….. …… …… …….. ……	Mentioned any of the following or any other reasonable factor: Minimize salt intake, Reduce fatty foods, Avoid excess alcohol, Avoid smoking, Regular exercise,	1
		Don't know	99
26	What should one do when blood pressure is normal whilst taking anti hypertensives	Continue taking medications	1
		Continue taking medications	2
Blood pressure control			
27	Last 3 documented blood pressure readings (The interviewer must request for the clinic booklet and look for blood pressure readings. The blood pressure readings must be from different days.)	Reading 1	
		Reading 2	
		Reading 3	

Appendix 2 Shona Questionnaire

Introduction

Questionnaire number: ……. **Date**: …….

Socio-demographic Data			
No	**Question**	**Options**	**Code**
1	Mune makore mangani	Number of completed years …….	
2	Gender (observe)	Male	1
		Female	2
3	Makaroora, kuroorwa, kusiyana nemuchato kana kuti hamusati mapinda muwanano.	Single	1
		Married	2
		Divorced	3
		Widowed	4
		Other (specify)…..	77
4	Murivechitendero chipi?	Christianity	1
		African tradition	2
		Apostolic (specify) ….	4
		Other (specify) ….	77
5	Chitendero chenyu chinobvumidza kuenda kuchipatara here?	Yes	1
		No	2
6	Makadzidza kusvika papi?	None	1
		Primary	2
		Secondary	3
		Tertiary	4
7	Munoita basa rei remaoko?	Job…….	
8	Basa renyu rinoda zvidzidzo here kanakuti kwete	Skilled	1
		Unskilled	2
9		<100	1

	Pamwedzi munowana mari yakawanda sei pamwedzi $US?	100-300	2
		>300	3
10	Mava nenguva yakadii muchirapwa blood pressure yakakwira?	<1 year	
		≥1 year<5 years	
		≥5 years	
	Maonero pane zveblood pressure		
11	Munotii nemapritsi eBp pakudzikisa Bp?		
12	Munotii nemaherbs kana mishonga yechivanhu pakudzikisa Bp		
13	Mungashandisa here mishonga yechivanhu kurapa Bp?	Yes	1
		No	2
14	Ndivanani vakambotaura nemi nezveBp yakakwira?		
		Mukoti wepaclinic	1
		Mushandi weutano wemunharaunda	2
		Hama neshamwari	3
		Vamwewo……	4
15	Pamaonero enyu. Sei vanhu vachirega kunwa mushonga we Bp yakakwira?		
16	Murikurapa Bp yakakwira nei parizvino?		
		Blood pressure tablets	
		Traditional medicines	
		Other……..	

Knowledge on Hypertension Awareness, Treatment and Control			
17	Kana mukada rumwe ruzivo rwezveBp yakakwira mungaruwanepi		
		Hama neshamwari	1
		Vandinoshanda navo	2
		Vashandi vezveutano	3
		Vamwewo …….	77
18	Chii chinonzi blood pressure yakakwira?		
		Vataura BP inopfuura 139/89 kana kuti 140/90 zvichikwira.	1
		Vataura zvisiriizvo	2
19	Chii chinokonzeresa kukwira kweBP?	Hazviziikanwe, mishonga kukura, kufungisisa, marwadzo, humwe hurwere hwakasiyana siyana	1
		Vapindura zvisiri zvechokwadi	77
20	Zvii zvinonzwikwa nevane blood pressure yakakwira	Kushaya zvavanonzwa, kutemwa nemusoro Kurohwa nehana, kusaona zvakanaka Dzungu kana zvimwewo zvechokwadi	1

		Havazive or vataura zvisiri izvo	2
21	Blood pressure yakakwira inogona kuvapo munhu asina zvaanonzwa pamuviri wake here?	Hongu	1
		Kwete	2
22	Mungagara muchiziva kuti blood pressure yakanaka or yakakwira nguva nenguva sei?	Nekugara ndichitariswa BP	1
		Vapindura zvisiri izvo	2
23	Chii chinogona kuitika kana BP ikagara yakakwira?	Kana vataura zvinotevera : kustroka, Chirwere chemoyo, kuita dambudziko reKidney, kusaona, kufa kana zvimwe zvose zvino kwanisa kuitika	1
		Kana vasingazive kana kuti vataura zvisiriizvo	99
24	Zvii zvinoita kuti munhu ave panjonzi yakawedzerwa yekuita BP yakakura?	Kana vataura zvimwe zvezvinotevera: Kugara munhu asinga shande kana kuexerciser, zvirimuropa remhuri, kuputa fodya, kusimba kwakapfurikidza, chikafu chakawanda mafuta sauti, kunwa doro rakawanda.	1
		Kana vasingazive kana kuti vataura zvisiri izvo	99

24	Kunze kwemushonga munokwanisa kudzivirira nekudzikisa BP nekuita sei? …….. …… ……. …….. …….	Kana vataura zviotevera kudzikisa munyu muchikafu, kuisa mafuta mashoma muchikafu, kudzikisa doro ratinonwa, kusaputa fodya, kugara tichiita exercise,	1
		Kana vasingazive	99
26	Chii chinofanira kuitwa kana BP yakanaka panguva yatirikutora mushonga we BP	Kuramba tichitora mushanga	1
		Kuchiregedza kutora mushonga	2
Blood pressure control			
27	Last 3 documented blood pressure readings (The interviewer must request for the clinic booklet and look for blood pressure readings. The blood pressure readings must be from different days.)	Reading 1	
		Reading 2	
		Reading 3	

APPENDIX 3: Consent Form

Title of the study: : Hypertension knowledge and control among high blood pressure patients who attend Mutare city clinics in Manicaland Province

Good morning/ afternoon. I am Tafadzwa Mushamba, a student at Africa University. I am conducting a study seeking to determine the amount of knowledge about high blood pressure in high blood pressure patients in Mutare City clinics. This form gives you information about the study and will be used to document your willingness to take part should you choose to do so.

Purpose of the study

The purpose of this study is to find the amount of knowledge about hypertension in high blood pressure patientsa and explore factors associated with poor hypertension knowledge in Mutare City clinics. The study is for academic purposes only. Also, information from this study will assist relevant line ministries e.g. City Health Department and Ministry of Health and Child Care at large to design effective preventive programs for hypertension patients and the population at large.

Procedures and Duration

The eligible participants for this study are high blood pressure patients. You have been selected as a possible participant because you meet the stated selection criteria. About 88 participants will be enrolled in this study. If you decide to participate, you will be asked to answer a structured questionnaire. It will take about 20 minutes for you to finish answering the questions.

Benefits, Risks and Discomforts

There are no direct benefits to you for participating in this study. I am hoping that findings from this study will be used to improve hypertension management. The risks of participating in this study are minimal. It is possible that you may feel

uncomfortable with some of the questions I will ask you. You can choose to skip or to discontinue the interview if you feel uncomfortable.

Confidentiality

If you participate in this study, your personal details will not appear on the questionnaire. Any information that is obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. You will be assigned a study participant identity number which will be used to identify the questionnaire. All study records will be kept in secure, locked filing cabinets, separate from any information that identifies you personally like this consent form. Your name will not be used in any reports or publications that may arise from this study. Your details may be released to authorized individuals if required by the law. Under some circumstances, the University or Medical Research Council of Zimbabwe may need to review records for compliance audits only.

Additional Costs

There will be no additional costs to you because of your participation in this study except those related to the time taken while participating in this study.

Voluntary Participation

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect your future regular health care services and employment status in any way**.** If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty.

Authorization

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over. Your

signature indicates that you have read and understood the information provided above, have had all your questions answered, and have decided to participate.

_____ _____

Signature/fingerprint of Participant or legally authorized representative Time

_____

Relationship to the Participant

_____ _____ _____

Name of participant Obtaining Consent Signature Date

For any queries, contact information

College of Health, Agriculture and Natural Sciences, Africa University
Research Supervisor: Dr Maibouge T.M.Salissou
Field Supervisor: Mrs Muyambuki 0776 330 383
Researcher: Tafadzwa Mushamba
Email: mushambat@africau.edu
Mobile: +263 782477737

APPENDIX 4: Shona Consent Form

Zita retsvakurudzo: Hypertension knowledge and control among high blood pressure patients who attend Mutare city clinics in Manicaland Province

Mangwanani/ masikati. Ini ndinoitwa Tafadzwa Mushamba, mudzidzi wepaAfrica University. Ndirikuita tsvakurudzo yekutsvaga ruzivo rwezveBP ruri muvanhu vanorapwa BP mumaclinic eMutare City. Fomu rino richakupai zvetsvakurudzo iyi uyezve richashanda kuratidza kuti mapinda mutsvakurudzo iyi nokuda kwenyu.

Chinangwa chetsvakurudzo

Chinangwa chetsvakurudzo ino kutsvaga ruzivo rwezve BP ruri muvanhu vanorapwa BP nekutsvaga zvikonzero zvingaita vanhu vasava neruzivo rwakakwana mumaclinic eMutare city. Tsvakurudzo ino ndeyekuitira dzidzo chete. Zvichawanikwa mutsvakurudzo zvichabatsirawo vebazi rezveutano muZimbabwe, nevezveutano maMutare kuti vakwanise kugadzira zvirongwa zvinobatsira vane dambudziko reBP nevamwe vose.

Zvichaitwa nenguva ichashandiswa

Vanhu vachasarudzwa vanhu vane BP inorapwa. Imi masarudzwa kuti mupinde mutsvakurudzo nekuti munoenderana nezvirikutariswa. Vanhu makumi masere nevasere vachasarudzwa. Kana masarudza kuti munoda kuti mupindewo mutsvakurudzo muchakumbirwa kuti mupindure mibvunzo. Zvichatora maminitsi enyu makumi maviri enguva kuti mupindure mibvunzo.

Zvamuchawana, Njodzi ingavapo, neZvingasakufadzai

Hapana zvamuchawana sedunga munhu patsvakurudzo ino. Ndinovimba zvichabuda mutsvakurudzo zvichaita kuti kurapwa kweBP yakakwira kuwedzere kunaka. Njodzi mutsvakurudzo ino ishoma shoma. Zvinogona kuitika kuti munogona kusafarira

mimwe mibvunzo ingabvunzwa. Munokwanisa kusarudza kusapindura mibvunzo isingakuitirei kana kusarudza kubuda musarudzo kana mukaona zvisingakuitirei.

Kuvanzika kwezvichawanikwa mutsvakurudzo

Kana mapinda musarudzo zita renyu hariwanikwe pabepa remibvunzo. Ruzivo rwezvenu ruchawanikwa patsvakurudzo ino ruchange rwakavanzwa uye runobuditswa kana imi matendera chete. Zvinoshandiswa mutsvakurudzo ino zvichange zvakachengetedzwa zvichivharirwa. Zita renyu hariiswe pane zvichanyorwa zvetsvakurudzo. Zvinechekuita nemi zvinogona kupihwa kune vanobvumirwa nemutemo kana zvadiwa pamutemo. Dzimwe nguva chikoro cheUniversity kana bazi rezvetsvakurudzo dzezveutano vangangoda kutarisa zvakawanikwa kuitira.

Mutengo kwamuri

Hapana mutengo kana muripo uchave kwamuri kunze kwenguva yamuchadyirwa pakutaura nemi.

Kupinda nesarudzo yenyu

Kupinda mutsvakurudzo iyi hakumanikidzwe. Kana mukasarudza kuti hamudi kuoinda mutsvakurudzo iyi, hazvina chazvichakanganisa pane zvinhu zvose pakurapwa kana kushanda kwenyu. Kana masarudza kupinda munokwanisa kusarudza kut hamuchada chero nguva pasina kurangwa kunovepo.

Kubvumidza

Musati masaina bapa rino bvunzai mubvunzo wamungada pane zvamusina kunzwisisa. Munokwanisa kutora nguva yamunoda kana muchida kumbofunga. Kusaina kunoratidza kuti maverenga mukanzwisisa zvataurwa uye mibvunzo yenyu yese yapindurwa mukasarudza kupinda mutsvakurudzo.

Signature/fingerprint yenyu/yemumiri Nguva

_____

Ukama wemumiriri

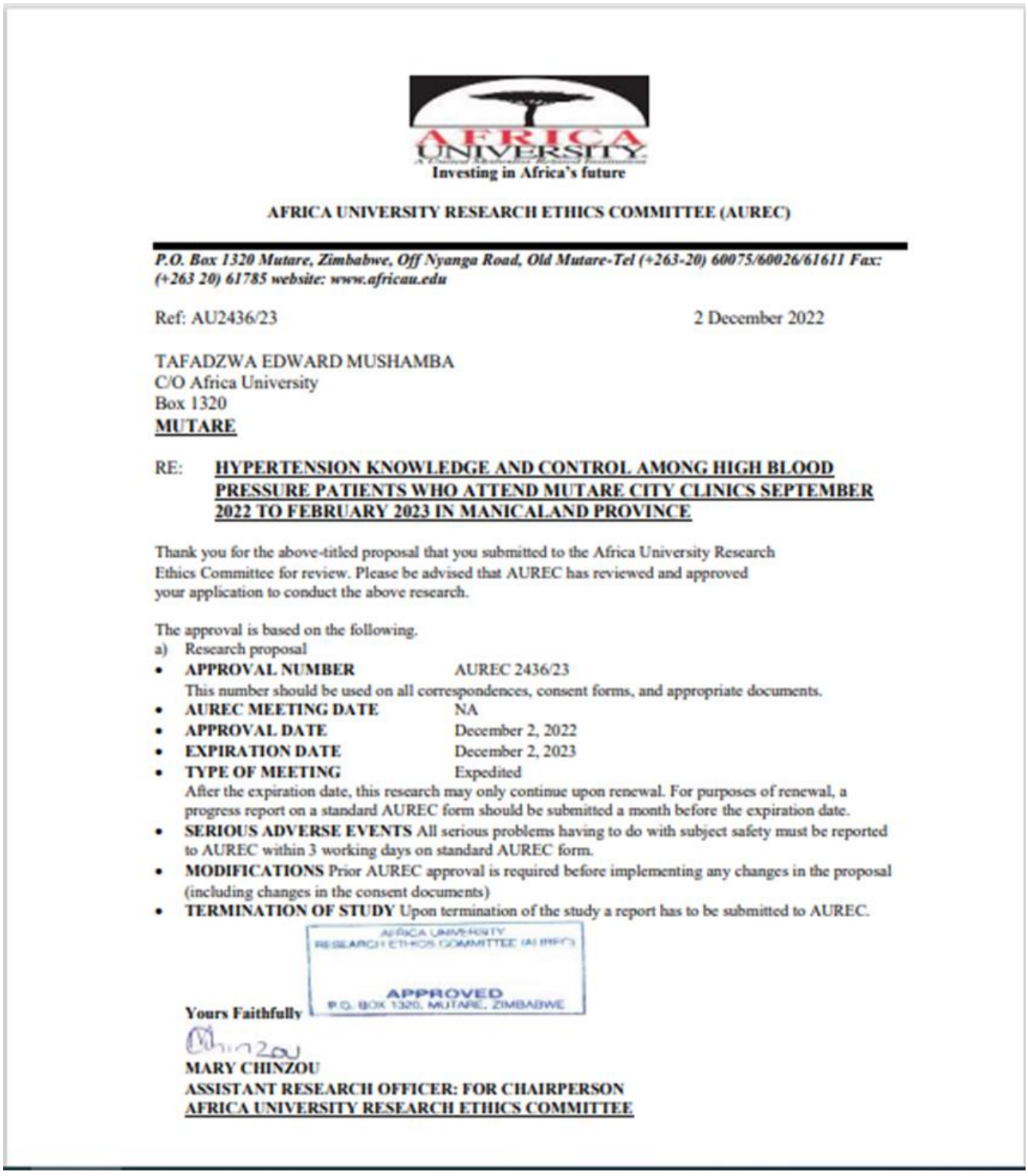
_____

Zita revachapinda mumubvunzo

Kana paine zvamusina kunzwisisa batai vanoteera

College of Health, Agriculture and Natural Sciences, Africa University
Research Supervisor: Dr Maibouge T.M.Salissou
Field Supervisor: Mrs Muyambuki 0776 330 383
Researcher: Tafadzwa Mushamba
Email: mushambat@africau.edu
Mobile: +263 782477737

Appendix 5: AUREC Approval letter



AFRICA UNIVERSITY
Investing in Africa's future

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU2436/23 2 December 2022

TAFADZWA EDWARD MUSHAMBA
C/O Africa University
Box 1320
MUTARE

RE: **HYPERTENSION KNOWLEDGE AND CONTROL AMONG HIGH BLOOD PRESSURE PATIENTS WHO ATTEND MUTARE CITY CLINICS SEPTEMBER 2022 TO FEBRUARY 2023 IN MANICALAND PROVINCE**

Thank you for the above-titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.

a) Research proposal

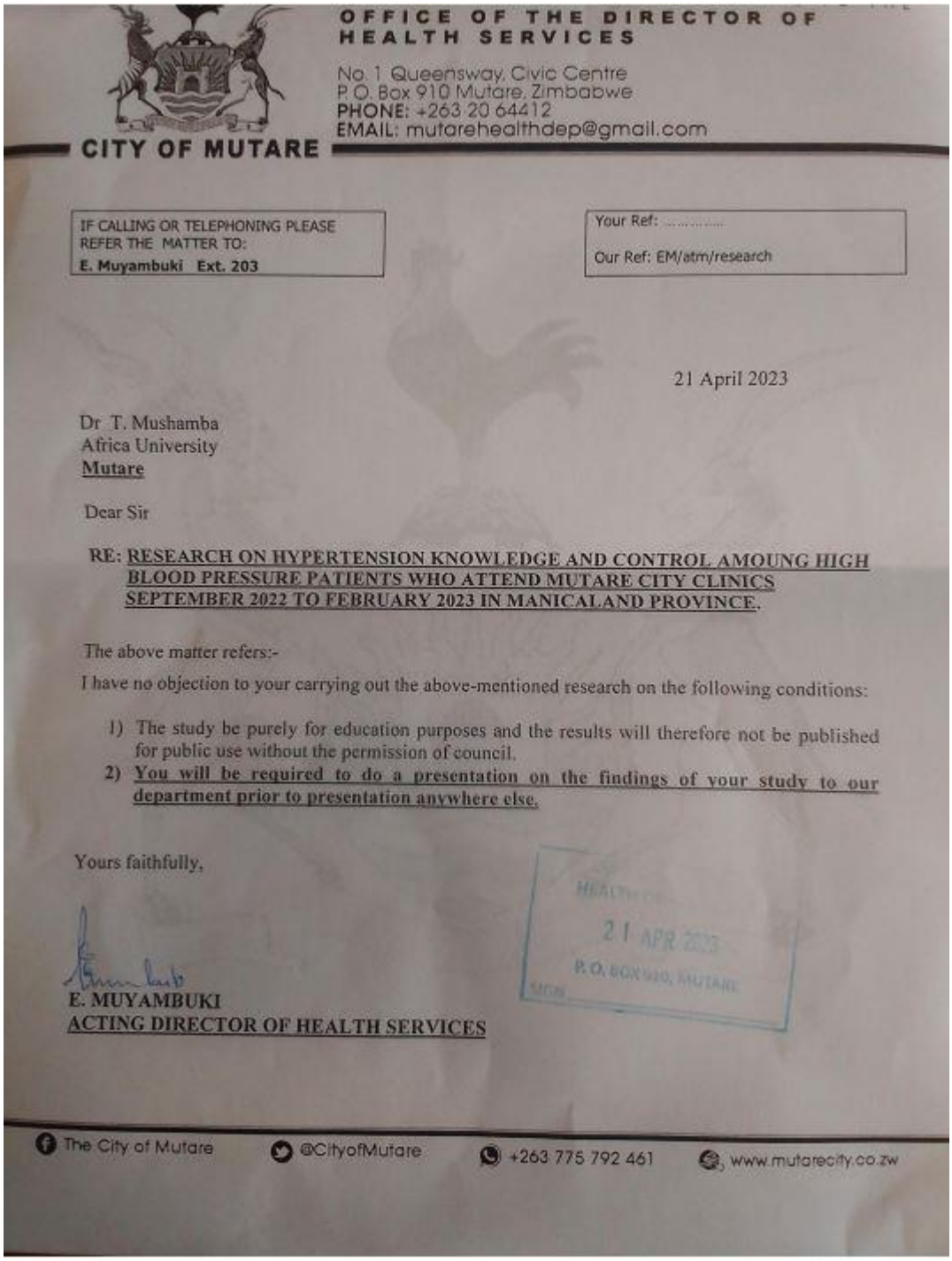
- **APPROVAL NUMBER** AUREC 2436/23
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE** NA
- **APPROVAL DATE** December 2, 2022
- **EXPIRATION DATE** December 2, 2023
- **TYPE OF MEETING** Expedited
  After the expiration date, this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before the expiration date.
- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC) APPROVED P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE

Appendix 6: Director City Health Approval letter



OFFICE OF THE DIRECTOR OF HEALTH SERVICES

No. 1 Queensway, Civic Centre
P. O. Box 910 Mutare, Zimbabwe
PHONE: +263 20 64412
EMAIL: mutarehealthdep@gmail.com

CITY OF MUTARE

IF CALLING OR TELEPHONING PLEASE REFER THE MATTER TO:
E. Muyambuki Ext. 203

Your Ref: .....
Our Ref: EM/atm/research

21 April 2023

Dr T. Mushamba
Africa University
Mutare

Dear Sir

RE: RESEARCH ON HYPERTENSION KNOWLEDGE AND CONTROL AMOUNG HIGH BLOOD PRESSURE PATIENTS WHO ATTEND MUTARE CITY CLINICS SEPTEMBER 2022 TO FEBRUARY 2023 IN MANICALAND PROVINCE.

The above matter refers:-

I have no objection to your carrying out the above-mentioned research on the following conditions:

1) The study be purely for education purposes and the results will therefore not be published for public use without the permission of council.
2) You will be required to do a presentation on the findings of your study to our department prior to presentation anywhere else.

Yours faithfully,

21 APR 2023
P.O. BOX 910, MUTARE

E. MUYAMBUKI
ACTING DIRECTOR OF HEALTH SERVICES

The City of Mutare @CityofMutare +263 775 792 461 www.mutarecity.co.zw