PREPAREDNESS OF PRIMARY HEALTHCARE FACILITIES IN THE MANAGEMENT OF HYPERTENSION IN THARAKA NITHI COUNTY, KENYA

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A Thesis Submitted to the Institute of Postgraduate Studies of Kabarak University in Partial Fulfillment of the Requirements for the Award of the Master of Medicine in Family Medicine Degree

KABARAK UNIVERSITY

NOVEMBER, 2024

DECLARATION

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Kameti Elijah Muthini

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ii

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This thesis entitled "**Preparedness of Primary Healthcare Facilities in Management of Hypertension in Tharaka Nithi County, Kenya"** and written by **Kameti Elijah Muthini** is presented to the Institute of Postgraduate Studies of Kabarak University with our approval as university supervisor. We have reviewed this thesis and recommend it be accepted in partial fulfillment of the requirement for the award of the Degree of Master of Medicine in Family Medicine.

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ABSTRACT

Hypertension is a leading contributor to the global burden of non-communicable disease (NCD). The effective management of hypertension is an urgent need in developing countries, where its prevalence is on the rise. To this end, the preparedness of primary healthcare facilities in Tharaka Nithi County, Kenya, towards managing hypertension was evaluated in the current study. The study aimed to determine the proportion of primary healthcare facilities utilizing hypertension management guidelines, examine the availability of functional equipment for blood pressure measurement in primary healthcare facilities, determine the staffing composition in primary healthcare facilities, and assess the availability of essential medicines for the management of hypertension. The study involved 93 health care facilities which were sampled using a multi-stage sampling technique. Data was collected using the modified World Health Organization (WHO) Service Availability and Readiness Assessment (SARA) questionnaire. The collected data was analyzed using the Statistical Package of Social Sciences (SPSS) version 27 for both descriptive statistics (mean, mode, percentages, and standard deviation) and inferential statistics (Chi- square, ANOVA, and regression). Findings were displayed in the form of tables and graphs. In the study, all ethical considerations were considered. The majority (64.5%, n=60) of health facilities reported unsatisfactory utilization of guidelines in the management of hypertension. Only, 26.9% (n=25) had adequate equipment that were functional and whose efficiency was supervised. Approximately 62.4% (n=58) of the health facilities had satisfactory staffing composition. For essential medicine availability, 73.1% (n=68) had satisfactory availability. Statistically significant differences were also noted in guideline utilization (OR=0.319, C.I, 0.104-0.975; p- value = 0.035), equipment availability(OR=6.650, C.I, 1.377-32.114; p-value = 0.018), staffing composition (OR=4.343, C.I, 1.535-12.289; p-value = 0.006) and availability of essential medicine (OR=3.598, C.I, 1.087-11.911; p-value = 0.036) based on the type of health facilities (dispensary, health centers, and Private medical clinics). The findings suggest a lack of preparedness as evidenced by the numerous barriers towards hypertension diagnosis and management in Tharaka Nithi County primary health facilities. There is an urgent need to develop new strategies, policies, and programs that will promote the preparedness of healthcare facilities for the prevention and control of hypertension. Provision and promotion of hypertension guidelines usage in all primary health care facilities is strongly recommended. Adequate staffing, training of healthcare workers, and the supply of essential medicines for the management of hypertension are key to the improvement of hypertension control

Keywords: *Hypertension, Blood Pressure, Non-Communicable Diseases, Primary Healthcare Facilities, Preparedness*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ESC: European Society of Cardiology

ESH: European Society of Hypertension

DRC: Democratic Republic of Congo

GoK: Government of Kenya

HIV: Human Immunodeficiency Virus

IRB: Institutional Review Board

KHIS   Kenya Health Information System

NACOSTI: National Commission for Science, Technology, and Innovation

NCD: Non-communicable diseases

OR: Odds Ratio

SARA: Service Availability and Readiness Assessment

SCHMT: Sub County Health Management Team

SDGs: Sustainable Development Goals

SSA: Sub Saharan African Countries

SPSS: Statistical Package for Social Sciences

PHC: Primary Health Care

WHO: World Health Organization

OPERATIONAL DEFINITION OF TERMS

Blood Pressure: Force exerted by blood against the walls of arteries as a result of the pumping action of the heart

Hypertension: Persistent increase of systemic blood pressure above 140 mmHg or 90 mmHg diastolic, or both

Hypertension: Persistent increase of systemic blood pressure above 140 mmHg or 90 mmHg diastolic, or both Management of Hypertension: Equipment for blood pressure measurement Maintaining blood pressure levels below those considered for diagnosis of hypertension (140/90 mmHg Instruments used to determine the level of blood pressure

Guideline: Document developed for guiding clinical decisions in diagnosis, management and treatment in the specific area of health care Staffing includes the total and type of clinicians available in a health care facility. The staffing can be in terms of the professional qualifications, total number and staffing categories such as part-time or full-time.

Essential Medicines: Are medicine that satisfies the priority health care needs of the population

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Hypertension is one of the non-communicable diseases that cause millions of deaths globally (WHO, 2022). However, the deaths associated with hypertension could be prevented if hypertensive patients had their blood pressure better controlled. It is stated by Adinan (2019) that less than 30% of hypertensive patients on management have their blood pressure controlled. Hypertension and diabetes mellitus are common chronic diseases rapidly increasing in prevalence (Kirungia2021). Thus, it becomes very critical for health facilities to be more prepared to help mitigate the increasing prevalence of hypertension. Healthcare facilities, whether hospitals, health centers, dispensaries or private medical clinics, are much needed to provide health services at all levels (Ministry of Health 2015). In addition, the healthcare facilities need to be ready to improve the quality of care which will help in minimization of complications associated with hypertension. Hence, the study sought to examine/ evaluate the preparedness of primary healthcare facilities in the management of hypertension within Tharaka Nithi County, Kenya.

1.2 Background to the Study

Non-communicable diseases (NCD) such as hypertension, heart diseases and stroke, diabetes and cancer account for significant deaths in the World (WHO, 2017). An estimated 1.28 billion adults aged 30-79 years worldwide have hypertension, and two-thirds live in low and middle-income countries (WHO, 2022). It is estimated that 46% of adults with hypertension are unaware that they have the condition due to weak primary healthcare facilities and the high cost of medication (World Health Organization, 2022). Hypertension results in more than 8.5 million deaths worldwide each year (Juraev

& Moroz, 2019). The World health organization (WHO) report In Kenya, there are 6402 deaths and 16563 new cases yearly of hypertension (Ministry of Health, 2021). Further, in 2020, Kenya was ranked 96th globally, with the highest number of hypertension deaths. In Tharaka Nithi County, the mortality rate from hypertension cases stands at about 12% (Tharaka-Nithi County, 2022). It is one of the Kenyan counties with higher rates of hypertension cases yearly (Ngai, 2019). In 2020, the County reported 27,136 cases of hypertension while in 2021 hypertension accounted for 55,755 outpatient visits (KHIS 2020 & 2021). Therefore, the study is essential in examining the preparedness of primary healthcare facilities in Tharaka Nithi County in managing hypertension. The findings will inform policymakers on thenecessary interventions to reduce the prevalence of hypertension and improve the quality of primary healthcare services in the County.

None of the reviewed studies above looked at the preparedness of primary healthcare facilities in the management of hypertension in Tharaka Nithi County, Kenya. Considering that this county is one of the leading in hypertension in Kenya, being able to shed light on specific preparedness factors possibly contributing to poorhypertension care will be important for the advancement of this subject in the country. Thus, the lack of information on primary healthcare facilities' preparedness to manage hypertension in Tharaka Nithi County formed the foundation of the current study.

1.3 Purpose of the study

The purpose of the study was to examine the preparedness of primary healthcare facilities in the management of hypertension in Tharaka Nithi County, Kenya. (2010) noted that over 100 million people are pushed into poverty by Non communicable disease (NCD) -related expenditures annually.

Globally, Meiqari (2020) indicate that the management of hypertension in Vietnam is highly affected by the national guidelines for the diagnosis, supervision of the

equipment, supply of medicines and professional qualification of the healthcare providers. In Bangladesh, Kabir (2021) stated that hypertension management guidelines and essential medicines are potent factors influencing the treatment of non-communicable diseases such as hypertension, cancer, cardiovascular accident diseases (stroke) and diabetes. In addition, it is reported by Juraev and Moroz (2019) that the rate of hypertension deaths in Uzbekistan has been above 55 percent due to the weak health care system that is understaffed, under-resourced and also the high cost of medicine.

In Palestine, Albelbeisi (2020) reports that the availability of functional equipment, utilization of hypertension management guidelines and staffing are significant factors defining the management of hypertension in the country. Nevertheless, the availability of functional equipment for blood pressure measurement and access to the essential medicines in the primary healthcare facilities has not been adequate. In Malaysia, Teh (2021) established that poor access to healthcare services has increased the country's risk of hypertension deaths. In some cases, the patients cannot attend the medical checkups as advised by the doctors due to cost-related factors.

In Africa, it is stated by Adinan (2019) that primary health facilities in Tanzania are not fully equipped and prepared to manage the risk of hypertension and associated complications. The deaths associated with hypertension could have been prevented if there had been satisfactory preparedness and adequate health care facilities in the country. Moreover, in Nigeria, it is indicated by Ekenna (2020) that some of the primary healthcare facilities do not have a proper mechanism to ensure that hypertension patients get proper medical attention. Furthermore, some of the hospitals lack adequate supervision of the equipment, professional staff, and satisfactory medication supply. In addition, in Democratic Republic of Congo (DRC), Nkamba (2020) indicate that an effective management mechanism to reduce the risk of deaths related to hypertension

complications has not been achieved. The cost of medication, poor equipment and access to health services have been considered some of the key factors increasing the deaths related to hypertension.

In Kenya, Ngari (2019) reports management of hypertension disease has been aconcern. The rise of cases of hypertension among Kenyans has been due to dilapidated primary healthcare facilities, high cost of treatment and lifestyle associated factors. In addition, a study by Mogaka (2022) show that death from hypertension disease has been on the rise due to poor medical access by patients. The government of Kenya (GoK) incorporated Non communicable disease (NCD) in the Kenya Health Policy 2014-2030 and came up with focused sector-specific interventions such as increased screening, escalated awareness and education about NCDs and rehabilitation to reduce the suffering associated with NCDs (Ministry of Health 2015).

However, the NCDs in Kenya continue to adversely affect the social and economic welfare of many Kenyans while at the same time impinging on the efforts by the GoKto increase economic growth, reduce poverty and attain sustainable development goals (SDGs). Most of the time, management of hypertension becomes difficult as patients may have other concomitant illnesses (Ministry of Health, 2015).

The ministry of health estimates that the death of hypertension patients per year is around 6402, with a reported new case of 16563 yearly (Ministry of Health, 2021). In 2020, Kenya was ranked 96th globally, with the highest number of hypertension deaths making the disease a public health concern to the government. This means that many households in Kenya will continue to spend more and more to fund healthcare needs caused by this disease unless there is satisfactory management of the disease in all levels of healthcare facilities (Ministry of health, 2021).

Tharaka Nithi County is one of the counties in Kenya with high rates of hypertension (Ngai, Moriasi, Nthiga, Mburu, Mpungu& Thika, 2019). The mortality rate from hypertension complications is about 12% (Tharaka-Nithi County, 2022). Thus, the disease is prevalent and remains a crucial morbidity factor and a known cause of mortalities in the County (Kirungia2021). Studies have documented that a low levelof preparedness of health facilities is contributory in increasing hypertension cases. Based on this background, the study sought to examine/evaluate the preparedness of primary healthcare facilities in the management of hypertension in Tharaka Nithi County, Kenya.

1.4 Statement of the Problem

The management of the health establishments gives critical information on the health status of the population and is a prerequisite for socio-economic development (WHO, 2022). The management of healthcare facilities is critical in influencing the prevalence of diseases (Ngari, 2019). Nations all over the World are developing policies and strategies to ensure there is satisfactory management of healthcare services. Hypertension is one of the most silent killer diseases in the World (WHO, 2017). It is estimated that 1.28 billion adults, aged 30-79 years worldwide have hypertension and two-thirds live in low and middle-income countries (WHO, 2022).

1.5 Objectives of the Study

The following were the objectives of this research study:

i. To determine the proportion of primary healthcare facilities utilizing hypertension management guidelines in Tharaka Nithi County, Kenya.

ii. To examine the availability of functional equipment for blood pressure measurement in primary healthcare facilities in Tharaka Nithi County, Kenya.

iii. To determine the staffing composition in primary healthcare facilities in Tharaka Nithi County, Kenya.

iv. To assess the availability of essential medicines for the management of hypertension in primary health care facilities in Tharaka Nithi County, Kenya.

1.6 Research Questions

The following were the research questions for this study;

i. What is the proportion of primary healthcare facilities utilizing hypertension management guidelines in Tharaka Nithi County?

ii. What is the number of primary healthcare facilities with functional equipment for blood pressure measurement in Tharaka Nithi County?

iii. What is the composition of staffing in primary healthcare facilities in Tharaka Nithi County?

iv. What is the percentage of primary healthcare facilities with essential medicines for the management of hypertension in Tharaka Nithi County?

1.7 Research Hypothesis

The following was the hypothesis for this study;

$H0_1$: There is no difference in the utilization of hypertension management guidelines among the 3 primary health facility types in Tharaka Nithi County, Kenya.

$H0_2$: There is no association between primary healthcare facility type and functioning equipment for blood pressure measurement in Tharaka Nithi County, Kenya.

$H0_3$: There is no difference in the composition of staffing among the 3 primary healthcare facility types in Tharaka Nithi County, Kenya

H0$_4$: There is no difference in availability of essential medicines among the 3 primary health facility types in Tharaka Nithi County, Kenya.

1.8 Assumptions of the Study

The study assumed that officers in charge of the health facility will express their honest opinion during the data collection. The study further assumed that the County health management will not victimize the officers by disclosing any information regarding the nature of the preparedness of primary healthcare facilities in the County.In addition, the study assumed it will be able to reach out to the officers and have enough of them respond.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter was presented in sections. The section commences with the literature review. The literature review includes examining the relevant studies based on the current objectives. Under the literature review, the discussion consisted of analyzing management guidelines in primary healthcare facilities, equipment for blood pressure measurement in primary healthcare facilities, staffing in primary healthcare facilities and basic medicines in primary healthcare facilities. The chapter also included the analysis of the theoretical framework, conceptual framework and summary analysis. Each section was be comprehensively analyzed to demonstrate its pertinence in the study.

2.2 Literature Review

The analysis in the literature review included a discussion of management guidelines in primary healthcare facilities, equipment for blood pressure measurement in primary healthcare facilities, staffing in primary healthcare facilities and basic medicines in primary healthcare facilities. The review included studies from the global, regional and local perspectives. Looking for studies from different perspectives facilitated a considerable overview of the findings from various scholars.

2.2.1 Hypertension Management Guidelines in Primary Healthcare Facilities

A study was conducted by Yan (2017) to look at hypertension management in rural primary care facilities in Zambia. The data was collected as part of routine patient care from an electronic medical record system and the data analyzed thematically. The study results indicated that management of hypertension in rural primary care facilities in Zambia include considerations of the availability of the equipment for

blood pressure measurement, utilization of hypertension management guidelines, and ensuring satisfactory staffing are available within the health facilities.

Further, World Health Organization (2021) indicates that utilization of hypertension management guidelines in primary healthcare facilities is one key factor in reducing mortality related to hypertension complications. Moreover, the results are consistent with Mbui (2015), who indicated that prescribing patterns of antihypertensive drugs need to be compatible with treatment guidelines. The significance of adherence to the guidelines enables proper prescriptions of the medicines and other factors related to the treatment process.

In addition, the study conducted by Watkins (2018) indicates that hypertension guidelines are widely available internationally and have to be adhered to at all times. The study results agree with Vedanthan (2020), who reports that treatment guidelines for hypertension in Kenya have been incorporated in the treatment guidelines for diagnosis and treatment of common diseases publication from the Ministry of Health. Further, it is stated by Omotayo (2016) that monitoring needs to be carried out and drug treatment initiated if the blood pressure level increases or there is evidence of increased cardiovascular risk.

Another study conducted by Brown (2018) revealed that it becomes critical to initiate drug therapy when the diagnosis of hypertension is made. In some cases, most hypertensive patients require two or more anti-hypertensive drugs to reduce their blood pressure and maintain it within reasonable ranges, as stated in the 2013 European Society of Hypertension (ESH/ESC) guidelines (Mancia,2013). Thus, it becomes significant to have hypertension management guidelines in primary healthcare facilities. This could be key in managing the challenges of the rise of hypertension in the country. However, none

of the reviewed studies had used Tharaka Nithi County as the case study and thus ascertaining this knowledge gap could go along way in helping assess the preparedness within Tharaka Nithi County.

2.2.2 Equipment for Blood Pressure Measurement in Primary Healthcare Facilities

The study was conducted by Al-Hadeethi (2020) showed that the management of hypertension cases in Jordan is highly influenced by the availability of equipment and its functioning. The availability and functioning of the equipment in the hospitals enable a satisfactory screening process. The research showed that the healthcare systems in low-income nations are improperly equipped to deal with the expanding illness burden, which calls for continuous improvement. The study results concur with Meiqari (2020), who stated that strengthening the human and physical infrastructure of primary healthcare settings increased the delivery of hypertension care in Vietnam.

Another study was conducted by Oyekale (2017) on the assessment of primary health care facilities' service readiness in Nigeria. The study results indicated that primary healthcare service delivery depends mainly on healthcare facilities. The effectiveness of delivery of healthcare services requires the availability of adequate infrastructure, diagnostic medical equipment, drugs and well-trained medical personnel. The results are consistent with Musinguzi (2015), who also indicated that healthcare equipment influences the capacity to manage hypertension in Mukono and Buikwe districts in Uganda. Moreover, a study was conducted by Bintabara and Mpondo (2018) showed that lower-level health facilities are significant in influencing the treatment of hypertension cases in the country. In addition, in Democratic Republic of Congo (DRC), Nkamba (2020) indicated that collectively the cost of medication, poor equipment and access to the hospital have been deemed key factors to increasing deaths related to hypertension.

A study conducted in Palestine by Albelbeisi (2020) showed that the availability of functional equipment for blood pressure measurement in primary healthcare facilities and the access to the basic medicines for the management of hypertension in primary health care facilities have not been very adequate. The results concur with Adinan2019), who showed that health facilities in Tanzania are not fully equipped and prepared to manage the risk of hypertension in the country. The deaths related to the complications could have been prevented if satisfactory preparedness and adequate health care facilities were in the country. However, despite having some literature regarding equipment in primary healthcare facilities, none of the studies was focused on Tharaka Nithi County. Thus, further empirical research was needed for policy formulations in Tharaka Nithi County and Kenya in general.

2.2.3 Staffing in Primary Health Care Facilities

A study was conducted by Wagialla and Elnimeiri (2016) on the management of hypertension by primary health care providers in Khartoum, Sudan. The study showed that the majority of the health care providers are not adequately trained on hypertension management. The study concluded that having more trained clinicians is critical in increasing the efficiency in a healthcare facility.

Another study conducted by Abolfotouh (2011) showed that the preparedness to manage the diseases in a country is highly determined by staffing. The availability of clinicians to control hypertension prevalence in primary health care facilities plays a crucial role in ensuring the early detection and management of hypertension. The study results are consistent with Ngari's (2019) results, which reports that the rise of hypertension disease has been due to lack of staffing and communication barriers.

Moreover, it was indicated by Peck (2014) that human resources, equipment unavailability and frequent drug stock outs are vital factors that contribute to the inability of health facilities to be prepared to manage hypertension effectively. In addition, Lulebo (2015) indicated that the availability of health care personnel in primary health care facilities is a crucial determiner of increasing the delivery of the services in the hospitals. Adequate health care personnel can enable patients to seek consultation services when needed.

Satish (2019) conducted a study on hypertension management in a primary care setting in India. The research outcome showed that effective management requires measures beyond treatment protocols. Healthcare providers play a significant role in the treatment of patients. Stock will enable the clinician to administer the most appropriate dose specific to the patient. The study concluded that stock of medication is one of the significant factors that define the preparedness of the healthcare facility.

Further, a study conducted by Husain (2020) showed that the availability and accessibility of pharmaceuticals is an ongoing challenge for health systems. Some hospitals lack enough medicines to manage patients effectively due to low medication stock and lack of adequate facilities to store drugs that are considered delicate and need special storage. In addition, the study shows that the supply of medicines is a significant indicator that determines the effectiveness of hospitals in handling patients.

The study concluded that hypertension disease had become one of India's primary causes of death despite high funding in the health sector. Furthermore, a study conducted by Murphy2015) showed that staffing supervision influences the management of primary health care facilities. Nonetheless, despite having some literature regarding staffing in primary healthcare facilities, none of the studies was focused on Tharaka Nithi County. Hence, further research needed to be conducted for comparisons and inferences.

2.2.3 Essential Medicines for Hypertension Management in Primary Health Care Facilities

A study was conducted by Goit and Yang (2019) to look at the treatment of hypertension. The study showed that the availability of basic medicines in healthcare facilities increases efficiency in managing hypertension. The importance of having the medicine stock is that patients will have a continuous supply. The treatment of hypertension entails both non-pharmacologic and pharmacological methods. Therapy choice depends upon pre-existing conditions of the patients. Thus, sufficient medicine.

In addition, another study conducted by Kithuka (2021) indicates that the rise of the cases of hypertension disease among people in Kenya has been due to dilapidated primary healthcare facilities and the high cost of treatment. In Bangladesh, Kabir (2021) establish that the availability of medicine is critical in determining healthcare quality. In some cases, patients do not attend medical checkups due to cost-related factors and a lack of professionals for the diagnosis. In addition, it is reported by Juraev and Moroz (2019) that the rate of hypertension deaths in Uzbekistan has been above 55 per 100,000 deaths due to the weak health care system and high cost of medicine.

A study was done by Obiebi and Aiwuyo (2021) to examine the cost-effectiveness of drug management of hypertension among patients in selected secondary facilities in Nigeria. The study results indicated that the financial burden of managing hypertension in developing countries had been a problem. The cost of treatment has resulted in some people stopping the medication. In addition, very few people go for checkups due to the high price associated with the diagnosis. The study concluded that the rise in the incidence of hypertension would continue to rise unless an effective healthcare system is developed in those countries. The countries need to invest in health care to ensure quality and efficiency in administering the services.

Likewise, Oyando (2019) looked at the patient costs of hypertension care in public health care facilities in Kenya. The study adopted a cross-sectional research design. The study results indicated that hypertension patients incur both direct and indirect costs in seeking medication. Some of the direct costs include the costs of drugs, transportation fees and consultations, among others. The study concluded that high rates of the use of out-of-pocket money in managing hypertension patients' medication would usher them into poverty. Thus, policymakers needed to develop policies and strategies from the health stakeholders to ensure the affordability and availability of care relating to hypertension.

2.3 Theoretical Framework

The study is hinged on the Donabedian Model of Quality Assessment, which was developed in 1966 by Avedis Donabedian. The model is founded on three elements: structure, process and outcome. The structural aspects are the characteristics of the health facility which provide healthcare, including physical properties such as equipment, medicine, staffing, financial resources and information communication (Lamrini, 2013). The model shows that the quality of the healthcare provider can be enhanced by developing effective management structures, management guidelines, and availability of essential equipment, equipping the health care facilities and ensuring dedicated staffing in the healthcare system (Binder, Torres & Elwell, 2021). The model demonstrates that processes in corporate events by the clients and health workers while providing or receiving healthcare service (Voyce, 2015).

According to the model, the health outcome reflects the development of health care on both individual and community levels (Qu, Shewchuk, Chen & Richards, 2010). The model indicates that the structural domain, treatment processes and health outcomes are equally interlinked (Ghaffari, Jahani, Jafarnejad & Esmaily, 2014). It presumes that

better structures promote better care processes and procedures that bring about effective outcomes. The model shows that management of the health services highly relies on the policies and systems that have been established. The quality in healthcare is enhanced by increasing efficiency through structure and processes (Voyce, 2015).

The model is considered relevant to the current study, which seeks to examine/evaluate the preparedness of primary healthcare facilities in the management of hypertension in Tharaka Nithi County, Kenya. The management of hypertension in the county can be enhanced if there is interlinking between the structure, process and outcome. The model showed that better structures promote better processes of care and better processes of care lead to more effective results and quality in healthcare. The quality of the healthcare provision can be enhanced by developing effective management structures, equipping the healthcare facilities, and ensuring reliable staffing in the healthcare establishment (Binder, Torres & Elwell, 2021). Thus, the model was satisfactory to inform the current study.

2.4 Conceptual Framework

A conceptual framework is a diagrammatical representation that shows the relationship between dependent and independent variables (Creswell, 2014). Figure 1 presents a conceptual framework.

Figure 1

Conceptual Framework

Independent Variables   Dependable Variables

```
┌─────────────────────────────────┐
│ Hypertension Management          │
│ Guidelines                       │
│  • Control precautions           │
│  • National guidelines for       │
│    thediagnosis                  │
│  • National policies for medicines│
└─────────────────────────────────┘

┌─────────────────────────────────┐
│ Equipment for Blood              │
│ PressureMeasurement              │
│  • Supervision of equipment      │
│  • Availability of basic equipment│
│  • Functioning of the equipment  │
└─────────────────────────────────┘                  ┌──────────────────────────┐
                                                      │ Management of            │
┌─────────────────────────────────┐                  │ Hypertension             │
│ Staffing                         │                  │  • Quality of care       │
│  • Professional qualification    │                  │  • Client management     │
│  • Total number of staff         │                  │  • Early diagnosis       │
│  • Staffing categories (part-time or│               └──────────────────────────┘
│    full-time)                    │
└─────────────────────────────────┘

┌─────────────────────────────────┐
│ Availability of Basic Medicines  │
│  • Medicine stocking             │
│  • Storage capacity of medicines │
│  • Source and supply of medicines│
└─────────────────────────────────┘
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Source: Author (2024)

2.5 Summary of Literature Review

The first section in the chapter commenced with a discussion of the literature review. Under the literature review, management guidelines in primary healthcare facilities, equipment for blood pressure measurement in primary healthcare facilities, staffing in primary healthcare facilities and basic medicines in primary healthcare facilities have been discussed. The discussion of the theoretical and conceptual frameworks was

incorporated into the chapter. Based on the literature reviewed, there was insufficient information concerning the preparedness of primary healthcare facilities to manage hypertension in Tharaka Nithi County.

The knowledge gap was presented in the conceptual, contextual and theoretical gaps. The contextual gap from the reviewed literature resulted from some studies conducted outside Tharaka Nithi County and Kenya in general. The preparedness of primary healthcare facilities in managing hypertension varies between countries. Moreover, the conceptual gap was that none of those studies particularly examined the management guidelines in primary healthcare facilities, functional equipment for blood pressure measurement in primary healthcare facilities, staffing in primary healthcare facilities and basic medicines for managing hypertension in primary healthcare facilities in Tharaka Nithi County. Thus, the conducting of the current study was worthy of bridging the knowledge gap.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter included a discussion of the methods used in the study. Particularly, the chapter discussed the research design, location of the study, population, sample size and sampling procedure, study subjects, data collection instrumentation, data collection procedures, data management and analysis and ethical considerations. Each section was critically examined to bring out its relevance to the study.

3.2 Research Design

The study adopted a cross-sectional analytical study design. This design enabled the researcher to examine numerous characteristics at one point without the manipulation of variables (Spector, 2019). In medicine, the cross-sectional study examines the relationship between disease and other variables of interest as they exist in a defined population at a single point in time or over a short period (Downes2016). Thus, the design enabled the researcher to collect data at a single point in time, on utilization of hypertension management guidelines, availability of functional equipment for blood pressure measurement, staffing composition and availability of essential medicines for the management of hypertension in primary health care facilities in Tharaka Nithi County, Kenya.

3.3 Location of Study

The study was conducted in Tharaka Nithi County, Kenya. Tharaka Nithi County is one of the counties with higher rates of hypertension cases (Ngai 2019). The prevalence of hypertension in the County has been growing over the years (Kirungia, 2021). The mortality rate from hypertension cases stands at about 12% (Tharaka-Nithi County,

2022). Tharaka Nithi County is located in the central region of Kenya and boarders Meru County to the North and North East, Kitui County to the East and South East and Embu County to the South and South West. The County covers an area of 2,564.4 km^2 (KNBS, 2019). Moreover, the County has a population of 393,177 people according to the 2019 Kenya Population and Housing Census. The main economic activity is farming where tea, coffee, millet, maize, sorghum, cowpeas and cassava are mainly produced.

3.3 Population of the Study

Population refers to an entire group of objects having common observable characteristics (Cooper & Schindler, 2014). The target population of the study was 142 health facilities offering primary health in Tharaka Nithi County, Kenya.

According to Tharaka-Nithi County (2022), the county is served by 19 health centers, 89 dispensaries and 34 medical clinics, which were the unit of analysis of this study. The primary respondent for the study included the officer in charge of the health facility. The summary of the target population for the study has been presented in Table 1.

Table 1

Target Population

Health Facility	Target Population
Health centers	19
Dispensaries	89
Private Medical clinics	34
Total	142

Source: Tharaka-Nithi County (2022)

3.3.1 Study Inclusion and Exclusion Criteria

The study included primary healthcare facilities and excluded those offering only specialized services like Human Immunodeficiency Virus (HIV), family planning and tertiary health facilities.

3.4 Sample Size Determination

The study sample size was established using Cochran (1963) as cited by Fisher et al. (1998) as shown; $N= (Z^2pq)/d^2$.

Where N= desired sample size,

Z= standard normal deviation which is 1.96

p = was taken as (0.5) since the prevalence of hypertension in the county was not known

q= population without the characteristics being measured which is, q= 1-p.d= measured level of precision which was set at 0.05

Thus,

n= (1.96 x0.5x0.5)/0.05)

n= 384

Since N is the estimated total population below 10,000, finite correction for proportionality was calculated as nf= n/1+ (n)/N,

nf= 384/ (1+384/142) =103

3.5 Sampling Techniques

The facilities were selected from up-to-date sampling frame obtained from the County health facilities data base. The first stage was the stratification of the facilities in three strata (Health Centers, Dispensaries and Private Medical Clinics). The second stage was

simple random selection of the facilities from the strata. The names of facilities were entered in the Excel program, then there was the generation of random numbers between one and maximum number per stratum. Facilities were selected proportionate to the strata until the allocated sample size of each stratum is reached. The 103 health facilities were apportioned as per their total population. The sample size is as illustrated in Table 2.

Table 2

Sample Size Distribution

Health facility	Determination	Sample size
Health centers	19/142*103	14
Dispensaries	89/142*103	64
Private Medical Clinics	34/142*103	25
Total	142	103

3.6 Data Collection Instrumentation

Data was collected using the modified WHO Service Availability and Readiness Assessment (SARA) questionnaire, a type of survey. SARA is a health facility assessment tool designed to assess and monitor the service availability and readiness/preparedness of the health sector to generate evidence to support the planning and managing of a health system (WHO, 2015). The questionnaire was designed in September, 2010 as a tool to help generate reliable and regular information on service delivery. Questions were answered by SARA with a focus on three main areas; Service availability, general service readiness and services specific readiness. The questionnaire was adapted and used to reflect the needs of different regions/ Countries and specificities. More than 127 studies have adapted the questionnaire depending on the area of interest in the health system. For this study, the questionnaire was adapted to look into the

readiness of primary health care facilities to managing hypertension in Tharaka Nithi County, Kenya.

3.7 Data Collection Procedures

First, the researcher sought authority to collect data from the supervisor in charge of the thesis development. Afterwards, the authority was sought from the office of the post-graduate student office. After obtaining research approval from the university to conduct the study, permission was sought from the management of the health facilities through their research ethics committees/office of the director of medical services in the county. As a fulfillment of the mandatory ethical requirements, the researcher obtained a research permit from the National Commission for Science, Technology, and Innovation (NACOSTI). Moreover, an authority letter from Institutional Review Board (IRB) – Kabarak University was obtained. The officer in charge of the health facility helped fill out the questionnaire to selected respondents.

3.8 Data Analysis and Presentation

Data analysis is the process of converting raw data into a readable format that can be interpreted, analyzed and used (Chakravarthy & Jiang, 2009). The collected data was first 'cleaned' to ensure it is error-free. A facility was considered prepared to manage hypertension if it reported at least half of the items listed from each of the four domains (utilization of hypertension management guidelines, availability of functional equipment for blood pressure measurement, staffing composition, availability of basic medicines and management of hypertension). The collected data was analyzed using descriptive and inferential statistics. The descriptive statistics included the mean, standard deviation and frequencies, while inferential statistics included Chi-square, ANOVA and regression analysis. The results were presented in prose form, tables and graphs. A facility was considered prepared for management of hypertension if it reported at least half ($\geq$ 50 %)

of the items listed from each of the domains (Staffing, guideline, basic diagnostic equipment and essential medicines) as identified by WHO SARA questionnaire. The 50% cutoff for each domain was based on the SARA implementation guide recommendations.

3.9 Data Confidentiality and Data Safeguard

Data collected from the participants was kept confidential in accordance with the adherence of ethical considerations by the research. Further, the research participants were assured of confidentiality by filling the researcher's approved consent form that assures them of upholding confidentiality throughout the research process. Noteworthy, data was safeguarded by storing the physical data in a safe cupboard which the researcher anticipates will last for a period of five years. The researcher ensured the safety of the data by scanning the physical copies of filled questionnaires and keeping electronic copies of the filled questionnaires in the researchers Google drive for ease of retrieval in future for reference. The destruction of the questionnaires will be done after 10 years.

3.10 Ethical Considerations

In this research study, the researcher adhered to the ethical research requirements. This study received approval from the Institutional Review Board (IRB) and the National Commission for Science, Technology and Innovation. Written informed consent was obtained from all health workers who participated in the study. The researcher was restricted to using the data collected for the research purposes only. The researcher ensured that the identity of the participants was kept anonymous by using unique identifiers instead of names. The researcher assured respondents that involvement in the study was voluntary and confidentiality of their responses was guaranteed.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Response Rate

The purpose of the study was to determine the preparedness of primary healthcare

facilities in the management of hypertension in Tharaka Nithi County, Kenya. Out of the

calculated sample size of 103 health facilities, 93 were enrolled with a response rate of

90%. The high response rate of 90% reinforces the reliability and comprehensiveness of

the study's data. The distribution based on the type of health facility is shown in Table 3.

Table 3

Distribution per Health Facility

Type of Health Facility	n	N=93	%
Dispensary	58		62.4
Health Centre	12		12.9
Private Medical Clinics	23		24.7

4.2 Hypertension Management Guidelines

The current study showed that dispensaries had the highest representation with 62.4%

(n=58). Notably, all (100%) facilities offered diagnosis of non-communicable diseases.

The majority (62.4%) of the health facilities had national guidelines available while half

(53.4%) only reported that the guidelines were present. The availability of national

guidelines in 62.4% of the facilities is a positive sign, indicating that a majority of the

facilities have access to the resources necessary for standardized care. However, the fact

that only 53.4% of facilities reported the presence of these guidelines points to potential

issues in awareness or acknowledgment of these resources, which may impact their

effective use.

Additionally, most (96.8%) of the health facilities diagnose and manage hypertension patients. A third (32.3%) of the health facilities received a support supervision visit more than two years ago. Treatment of hypertension guided by national policies was done by 60.2% of the health facilities. It's also worth noting that only 19.4% of the health facilities adjusted swiftly based on the guidelines required (Table 4).

The observation that nearly all facilities (96.8%) were diagnosing and managing hypertension, is encouraging and demonstrates a widespread commitment to addressing this critical health issue. Despite this, only 60.2% of the facilities were treating hypertension in alignment with national policies, indicating a disconnect between the availability of guidelines and their practical application in treatment protocols. Additionally, the infrequent supervisory visits, with 32.3% of facilities having last received a visit over two years ago, could be contributing to the inconsistent utilization of guidelines. Regular supervision is crucial for ensuring adherence to national standards, providing feedback, and identifying areas where healthcare providers may need additional support or training. Moreover, it is concerning to note that only 19.4% of health facilities adjusted their practices swiftly in accordance with the required guidelines. This suggests that many facilities may be slow to adopt new protocols or updates to hypertension management, potentially compromising the quality of care provided to patients.

The guidelines utilization category was based on five indicators, availability of national guidelines, facility diagnoses hypertension, frequency of facility supervisory visits, treatment of hypertension guided by national policies and the facility adjusts swiftly based on the guidelines required. A score of 3 and above out of 5 was satisfactory while a score of less than three out of five was unsatisfactory. A third (34.4%) of the health facilities had a guideline utilization score of two and a mean score

of 2.11. Most (64.5%) of the health facilities scored unsatisfactory in the guideline utilization category (Table 4).

These findings suggest that while the infrastructure for managing hypertension exists, there is a significant need for enhanced supervision, training, and support to ensure that national guidelines are not only available but also actively utilized in clinical practice. The gaps identified in the guideline utilization could lead to variations in the quality of hypertension care across the county, potentially impacting patient outcomes. Addressing these issues through targeted interventions, such as more frequent supervisory visits and additional training for healthcare providers, could improve the consistency and effectiveness of hypertension management in Tharaka Nithi County and beyond.

In agreement with the current study, Lulebo et al. reported that only a few health-care facilities declared having used the guidelines for the management of hypertension (Lulebo et al., 2015). A study conducted in Tanzania reported a slightly lower prevalence (52.9%) of adherence to treatment guidelines by healthcare workers (Adinan et al., 2019). The low guidelines utilization observed in this study could be attributed to lack of awareness of their availability and importance by the health care workers. This is supported by the fact that the study found that only few health workers had been provided with in-job training/ refresher training on hypertension

Table 4

Hypertension Management Guidelines Utilization by Health Facilities

Hypertension management guidelines	N = 93	
	N	%
Category of facility		
Dispensary	58	62.4
Health center	12	12.9
Private Medical Clinic	23	24.7
Facility offers diagnosis of non-communicable disease		
yes	93	100
Availability of national guidelines		
yes	58	62.4
If yes was the guideline reported or seen		-
Observes	27	46.6
Reported	31	53.4
Facility diagnoses and manages hypertension in patients		
yes	90	96.8
Last time the facility received a supervision visit		
Above 2 years	30	32.3
1-2 years	29	31.2
Less than 1 year	9	9.7
Don't know	25	26.9
Treatment of hypertension guided by national policies		
yes	56	60.2
Facility adjusts swiftly based on the guidelines required		
No	75	80.6
Guideline utilization score		
Zero	4	4.3
One	24	25.8
Two	32	34.4
Three	24	25.8
Four	9	9.7
Mean (SD) Guideline utilization score	2.11+1.03	-
Guidelines utilization category		
Unsatisfactory	60	64.5
Satisfactory	33	35.5

Although some facilities reported the availability of guidelines, a number of them reported that they were not using the guidelines. The reason for non-use may be limited resource availability. Standard treatment guidelines can play a vital role in ensuring consistency of care and improving health outcomes (Kataria Golestaneh et al., 2021). Adherence to these guidelines can help reduce the likelihood of costly and preventable mistakes and adverse events (Kredo et al., 2016; Wiedenmayer et al., 2021). Moreover, standard treatment guidelines provide a reference point by which practitioners can review, compare, and improve the quality of care they deliver (Wiedenmayer et al., 2021). Therefore, it is crucial to ensure that the treatment guidelines are readily available and known to healthcare workers in all health provision facilities. Additionally, the high prevalence of not following hypertension guidelines highlights the need for interventions that promote their utilization to prevent, detect, treat, and control hypertension.

Implementation of the policies requires adequate funding for the health facilities. In agreement with the current study, a study conducted in Ghana noted that the national policy and strategy for non-communicable diseases (NCD) have been in place for many years; however, their implementation has been inadequate due to insufficient resources and funding (Laar et al., 2019). The study further reported that the country's current funding priorities were on maternal and newborn health, as well as other infectious diseases. These study findings implied that though Non communicable diseases (NCD) were nationally recognized as a major public health challenge, they were not given enough priority with the necessary funding.

4.2.1 Association between Health Facility Types and Guidelines Utilization

A chi-square test of independence was conducted to establish the association between health facility types and guidelines utilization. The type health facility was found to have a significant association with the guideline's utilization (P = 0.001) (Table 5). This

finding suggests that the type of health facility has a considerable impact on how effectively hypertension management guidelines are utilized.

Table 5

Facility Category and Guidelines Utilization

Facility Category (n)	Unsatisfactory	Satisfactory	χ^2 P-Value
Dispensary (58)	34 (58.6%)	24 (41/3%)	0.001*
Health Centre (12)	3 (33.3%)	9 (66.7%)	
Private Medical Clinics (23)	23 (100.0%)	0 (0%)	

*Significant at p≤0.05

About 19.4%, of the dispensaries scored one and another 19.4% scored three indicating a low and high guideline utilization score respectively, While 19.4%. of the Private Medical Clinics received a score of 'two', Notably, health centers had the lowest guideline utilization scores, with only 6.5% scoring 'three' points. (Figure 2). The significance of this association implies that different types of facilities may vary in their capacity, resources, or training, which in turn affects how consistently they implement the guidelines.

Figure 2

Facility Category and Guideline Utilization

Facility category and guideline utilization score
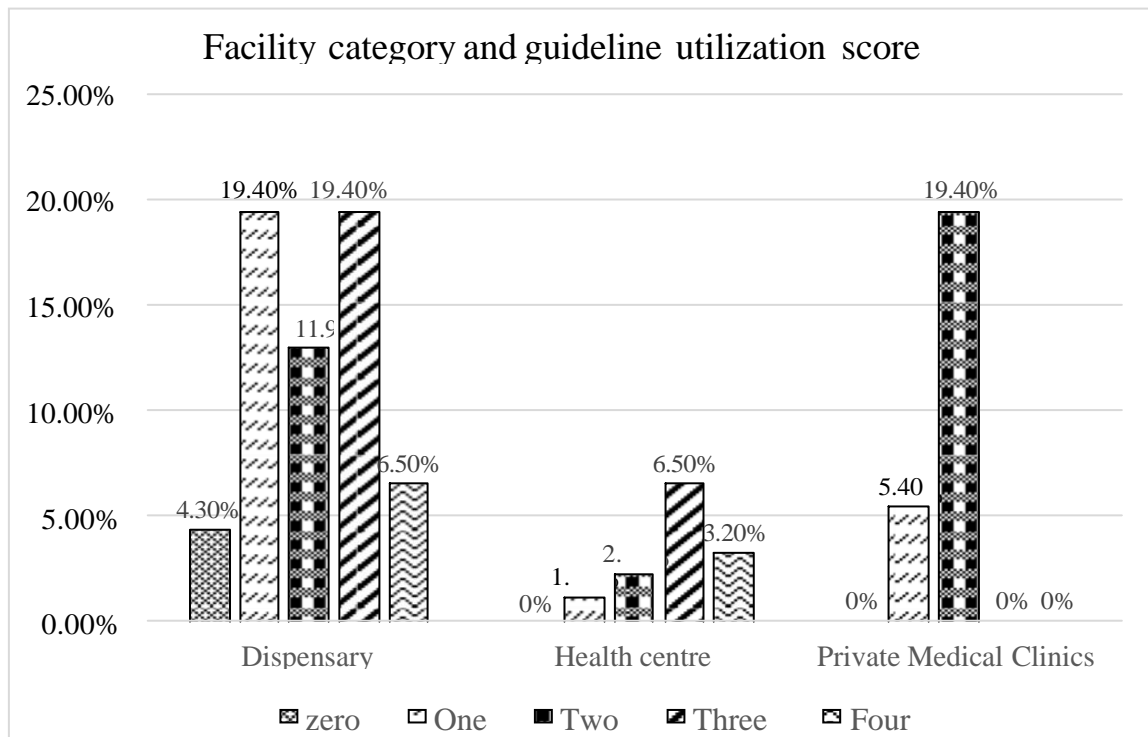
4.2.3 Guideline Utilization Score Based on the type of Facility

An analysis of variance was conducted to establish if the differences in guideline utilization scores between the three types of facilities were significant. The results showed statistically significant differences in the mean guideline utilization scores between the different types of health facilities (F=5.270, P value = 0.007). Health centers had the highest score while private medical clinics had the lowest score (Table 6). This finding indicates that the type of health facility plays a critical role in determining how effectively hypertension management guidelines are utilized.

Health centers emerged as the top performers, with the highest guideline utilization scores. This result is likely due to several factors. Health centers typically have better resources, more staff, and greater access to training and supervision compared to smaller facilities like dispensaries or private medical clinics. These factors may enable health

centers to adhere more closely to national guidelines, ensuring more consistent and effective management of hypertension. On the other hand, private medical clinics had the lowest guideline utilization scores. This could be attributed to various challenges faced by private clinics, such as limited access to updated guidelines, fewer supervisory visits, and possibly lower levels of staff training in the specific protocols mandated by national policies. Private clinics might also have different operational priorities, which could impact their adherence to standardized guidelines. This finding is in agreement with the Tanzania study which reported that 60.0%, 41.7%, and 52.6% of hospitals, health centers, and dispensaries, respectively, reported regular adherence to treatment guidelines (Adinan et al., 2019).

Table 6

Guideline Utilization Score Based on the type of Facility

			Subset for alpha= 0.05	
Facility Category	N	Mean	F	P Value
Dispensary	58	2.07	5.270	0.007*
Health Centre	12	2.92		
Private Medical Clinics	23	1.78		

*Significantatp≤0.05

4.2.4 Association between Health Facilities and Guideline Utilization

A regression analysis was conducted to establish the association between health facilities and guideline utilization. The study results revealed that dispensaries were 0.319 times less likely to have satisfactory guidelines utilization as compared to Private medical clinics. Similarly, health centres were 0.198 times less likely to have satisfactory guidelines utilization as compared to private medical centres (Table 7). This suggests that, despite private clinics having lower mean scores overall, when controlling for other

factors, they are more likely to meet a threshold for satisfactory utilization than dispensaries and health centers.

Several factors could explain this counterintuitive finding. Private medical clinics, while smaller and potentially less resourced, may benefit from a more focused management structure, allowing for quicker adjustments to guidelines and more flexible operations. These clinics might also have more direct oversight or be more responsive to regulatory requirements, leading to a higher likelihood of adhering to the guidelines when evaluated on a binary satisfactory/unsatisfactory basis. This finding highlights a nuanced issue: while private medical clinics may not always score the highest in terms of overall guideline utilization, they may still be better positioned to achieve satisfactory levels of adherence compared to larger, more complex public health facilities. This underscores the need for targeted support and interventions for dispensaries and health centers to ensure that they are not only utilizing the guidelines but doing so effectively and consistently.

Table 7

Association between Health Facilities and Guideline Utilization

Guideline Category[a]	utilization	B	P Value	COR	95% Confidence Interval for COR Lower Bound	Upper Bound
Satisfactory						
	Dispensary	-1.143	.035	0.319	0.104	0.975
	Health care	-1.617	.037	0.198	0.044	0.904
	Private Medical Clinics	0[b]				

a. The reference category is: Satisfactory

b. Baseline category

32

4.2.4 Association Between Health Facility types and availability of National Guidelines

A chi-square test was conducted to establish the association between health facility types and the availability of national guidelines. The health facility category was found to have a significant association with the availability of national guidelines (P = 0.001) (Table 8). This finding suggests that the availability of these essential guidelines varies considerably depending on the type of health facility. The significance of this association highlights that certain types of facilities are more likely to have national guidelines readily available than others. This disparity in availability can have substantial implications for the quality of care provided, particularly in the management of hypertension.

Table 8

Facility Category and Availability of National Guidelines

Facility Category	No	Yes	χ2 P value
Dispensary	29 (31.2%)	29 (31.2%)	0.001*
Health Centre	5 (5.4%)	7 (7.5%)	
Private Medical clinics	1 (1.1%	22 (23.7%)	

*Significant at p≤0.05

Regression analysis was further conducted for parameters that had a significant association in the chi-square test of independence. The regression analysis revealed that dispensaries were 22 times more likely not to have national guidelines as compared to private medical clinics. Moreover, health centres were 15.71 times more likely not to have national guidelines as compared to private medical clinics (Table 8). These findings highlight significant challenges faced by public health facilities, particularly dispensaries and health centers, in accessing and maintaining up-to-date national guidelines.

33

Dispensaries, which are often the most accessible point of care for many patients, appear to be the most disadvantaged, with a much higher likelihood of lacking these essential resources. This lack of access can severely impede the ability of healthcare providers in these settings to deliver standardized and effective care for hypertension, potentially leading to inconsistent treatment practices and poorer health outcomes.

Table 9

Association between Health Facilities and Availability of NationalGuidelines

Availability of guideline	National	B	P value	COR	95% Confidence Interval for COR	
					Lower Bound	Upper Bound
No	Dispensary	3.091	.003	22.000	2.779	74.182
	Health Care	2.755	.019	15.714	1.561	58.211
	Private Medical Clinics	0[b]				

a. The reference category is: yes

b. Baseline category

4.2.5 Association between Health Facilities and Treatment of Hypertension Guided by National Policies

A chi-square test was conducted to establish the association between health facility types and the treatment of hypertension guided by national policies. The health facility category was found to have a significant association with the treatment of hypertension guided by national policies (P = 0.001) (Table 10). This significant association indicates that the type of health facility plays a critical role in determining whether or not national policies are followed in the treatment of hypertension.

This finding suggests that there are considerable differences in adherence to national treatment protocols across different types of health facilities. Some facility types are

more likely to implement these guidelines consistently, while others may struggle due to various factors such as resource limitations, staff training, or management practices.

Table 10

Facility Category and Treatment of Hypertension Guided by National Policies

Facility category (n)	Yes	No	$\chi 2$ P value
Dispensary (58)	29 (50%)	29(50%)	0.001*
Health Centre (12)	6 (50%)	6(50%)	
Private Medical clinics(23)	21 (91.3%)	2 (8.7%)	

*Significant at p≤0.05

A regression analysis was conducted to establish the association between health facilities and the treatment of hypertension guided by national policies. The results showed that dispensaries were 0.095 times less likely to treat hypertension while following guidelines as compared to medical centres. Similarly, health centres were 0.095 times less likely to treat hypertension while following guidelines as compared to Private medical centres (Table 11). These findings highlight a substantial gap in the implementation of standardized hypertension treatment protocols in public health facilities, particularly in dispensaries and health centers. Despite their critical role in providing primary healthcare, these facilities are at a marked disadvantage when it comes to adhering to national guidelines. The lower likelihood of following guidelines in dispensaries may be attributed to several factors, including limited resources, insufficient training, and less frequent supervisory visits.

Similarly, health centers, which are expected to provide a higher level of care than dispensaries, also appear to struggle with guideline adherence. This could be due to similar challenges, such as higher patient volumes, resource constraints, and complex

operational demands that make it difficult to consistently implement national treatment protocols. On the other hand, private medical centers, which are less likely to experience these challenges, may benefit from more streamlined operations, better resource allocation, and closer regulatory oversight. These factors likely contribute to their higher adherence to national guidelines, ensuring more standardized and effective treatment for hypertension.

Table 11

Association between Health Facilities and Treatment of Hypertension Guided by National Policies

| | | | | | 95% Confidence Interval for COR | |
| | | | | | Lower | Upper |
Treatment of hypertension guided by national policies[a]	National	B	P value	COR	Bound	Bound
Yes	Dispensary	-2.351	.003	0.095	0.020	0.444
	Health Care Medical Clinics	-2.351	.012	0.095	0.015	0.599

a. The reference category is: No

b. Baseline category

4.2.6 Association between Health Facilities and Adjusting Swiftly Based on Guidelines Required

A chi-square test was conducted to establish the association between health facilities and adjusting swiftly based on guidelines required. The health facility category was found to have a significant association with adjusting swiftly based on guidelines required (P = 0.001) (Table 12). This finding suggests that some health facilities are more agile in implementing changes in guidelines, which is crucial for maintaining high standards of

care, particularly in the management of chronic conditions like hypertension. The ability to swiftly adjust to new guidelines ensures that patients receive the most current and effective treatments, which is essential for improving health outcomes.

Given the significant association, it is likely that private medical centers, with their more streamlined operations and possibly better access to resources, are more capable of making quick adjustments when guidelines are updated. These facilities might have more direct management structures, allowing for faster dissemination and implementation of new practices. Additionally, private centers might be more motivated to stay current with guidelines due to competitive pressures or regulatory requirements.

In contrast, public health facilities like dispensaries and health centers might face more challenges in this regard. Bureaucratic processes, limited resources, and high patient volumes could slow down the adoption of new guidelines in these settings. Dispensaries, often dealing with limited staff and resources, may struggle the most with rapidly adjusting to changes, potentially leading to inconsistencies in care. The significant association found in this study highlights the importance of strengthening the capacity of all health facilities to adapt quickly to updated guidelines.

Table 12

Facility Category and Adjusting Swiftly Based on Guidelines Required

Facility Category (n)	Yes	No	χ^2 P value
Dispensary(58)	1(1.72%)	57(98.28%)	0.001*
Health Centre(12)	0 (0%)	12 (100%)	
Private Medical Clinics (23)	17(73.91%)	6 (26.09%)	

*Significant at p≤0.05

A regression analysis was conducted to establish the association between health facilities and facilities adjusting swiftly based on the guidelines required. The results revealed that dispensaries were 0.006 times less likely to adjust swiftly based on guidelines as compared to private medical centres. Similarly, health centres were 0.072 times less likely to adjust swiftly based on guidelines as compared to private medical centres (Table 13). The markedly lower likelihood of dispensaries and health centers to adjust swiftly suggests several underlying issues. Dispensaries, often located in more rural and resource-constrained settings, likely face significant barriers such as limited staffing, inadequate training opportunities, and slower communication channels with central health authorities.

These challenges can delay the implementation of updated guidelines, potentially leading to outdated practices and suboptimal patient care. Similarly, although health centers are generally better equipped than dispensaries, they still face considerable challenges in making rapid adjustments. Their lower likelihood of adjusting swiftly compared to private medical centers could be due to bureaucratic processes, higher patient loads, or logistical challenges that slow down the adoption of new practices.

Table 13

Association between Health Facility Types and Adjusting Swiftly Based on Guidelines Required

Facility adjusts swiftly based on guidelines required[a]		B	P value	COR	95% Confidence Interval for COR	
					Lower Bound	Upper Bound
Yes						
	Dispensary	-5.085	.001	0.006	0.001	0.055
	Health Care	-22.815	.001	0.072	0.034	0.082
	Private Medical Clinics	-5.085	.001	0.006	0.001	0.055

a. The Reference Category is : No

b. Baseline Category

4.3 Availability of Blood Pressure Measurement Equipment

The effective delivery of healthcare services requires the availability of adequate infrastructure, diagnostic medical equipment, drugs, and well-trained medical personnel. Additionally, the quality of services rendered at healthcare facilities can be properly gauged from the availability of medical equipment (Oyekale, 2017). In the present study, the majority of primary health facilities were well- equipped with basic equipment for the diagnosis and monitoring of hypertension with all (100%) of the health facilities having blood pressure measurement equipment (Table 14).

Furthermore, in the majority (96.8%) of the facilities, the equipment was functioning appropriately. Contrary to these findings, a previous study by Besigye et al., (2021) reported that some healthcare providers brought their own blood pressure machines to the facilities or tried to repair broken ones due to the lack of basic equipment. Lack of basic equipment for diagnosis and management of blood pressure can negatively impact

the quality of care provided by healthcare providers. The shortage of blood pressure machines is a major contributor to the hypertension-relevant equipment shortage that has been documented in other studies in low-resource settings (Musinguzi et al., 2015; Yan et al., 2017). This shortage, in turn, leads to low levels of awareness and a low proportion of patients being screened for hypertension within health facilities (Besigye et al., 2021).

Table 14

Blood Pressure Measurement Equipment

Blood Pressure Measurement Equipment	N=93	
	N	%
Availability of equipment for BP measurements		
Yes	93	100
Equipment functioning appropriately		
Yes	90	96.8
Equipment efficient supervision		
No	90	96.8
Supervision for equipment functionality		
Never	69	74.2
Rarely	24	25.8
Type of BP apparatus		
Digital	90	96.8
Manual	3	3.2
Equipment Score		
Two	4	4.3
Three	64	68.8
Four	25	26.9
Equipment category 2		
Unsatisfactorily	68	73.1
Satisfactorily	25	26.9

Although basic equipment was observed to be available in this study, the support supervision of the equipment's efficiency was inadequate: in most (96.8%) of the facilities, the equipment had no efficient support supervision from the Sub County health management team (SCHMT). Additionally, supervision for equipment functionality was never done in most (74.2%) of the health facilities. In a study conducted in Uganda, Nanono et al., (2023) reported that only 69% of health facilities included in the study had functional blood pressure measuring devices. This finding demonstrates that the mere presence of equipment in a facility does not necessarily mean that the healthcare providers have access to them as some of the machines could be out of service.

Current findings further show that digital blood pressure machine was the most commonly used by majority (96.8%) of the facilities (Table 14). While these machines are convenient and easy to use, studies have shown that they may not be as accurate as traditional mercury devices (Suokhrie et al., 2013). Specifically, digital BP machines have been reported to underestimate blood pressure levels, potentially leading to misclassification of hypertension (Heinemann et al., 2008). Additionally, it is worth considering that digital devices require recurrent expenditures on batteries or cells, which may be a significant consideration in resource-limited settings. Therefore, while caution should be exercised when using digital BP machines, it would not be prudent to discourage their use altogether (Besigye et al., 2021). These concerns notwithstanding, increased use of digital BP machines has been shown to reduce the incidence of white coat hypertension. By striking a balance between the benefits and limitations of this technology, healthcare providers can ensure that patients receive the best possible care.

In this study, about three-quarters (68.8%) of the health facilities had an equipment score of three with an equipment score mean of 3.23. Most (73.1%) of the health facilities were unsatisfactory in terms of the equipment (Table 13). Consistent with current

findings, in a study by Bukenya et al., (2017), only 22% of health facilities reported that they possessed sufficient equipment to provide services that can meet the needs of patients. The availability of equipment and supplies is a critical component of quality primary care (PHCPI, 2022). it is thus crucial to maintain these health facilities' equipment to ensure the continuity of quality services, and this can be achieved through regular monitoring.

4.3.1 Association between Facilities and Blood Pressure Measurements Equipment

A chi-square test was conducted to establish the association between health facilities and the blood pressure measurements equipment score category. The health facility category was found to have a significant association with the blood pressure measurements equipment score category (P = 0.001) (Table 15). This significant association indicates that the availability and quality of blood pressure measurement equipment vary significantly across different types of health facilities in Tharaka Nithi County.

Table 15

Health Facility and Blood Pressure Equipment Score

Facility Category(n)	Unsatisfactory	Satisfactory	χ^2 P value
Dispensary (58)	57 (98.28%)	1 (1.72%)	0.001*
Health Centre (12)	7 (58.33%)	5 (41.67%)	
Private Medical Clinics (23)	4 (17.39%)	19 (82.61%)	

*Significant at p≤0.05

Dispensary had an equipment score of 'three' accounting for (57%). Private Medical clinics had an equipment score of 'four' (20.4%) while health centres performed dismally with only seven health centres scoring an equipment score of 'three' (Figure 3). Thus, the current study findings show that private medical clinics had a

higher availability of diagnostic equipment as compared to health centers and dispensaries. One possible explanation for this observed difference could be the lack of a clear formula for allocating funds between these facilities, which may lead to inefficiencies and inequities in the distribution of medicines and equipment.

The better performance of private medical clinics in this regard can be attributed to better resource allocation, more frequent updates or replacements of equipment, and potentially greater emphasis on maintaining high standards to remain competitive in the healthcare market. These findings are consistent with those reported by other studies conducted on the matter (Bintabara & Mpondo, 2018; Jacobs et al., 2016; Oyekale, 2017; Peck et al., 2014). The lower scores in health centers are concerning, especially given that these facilities are expected to provide a higher level of care than dispensaries and often serve as referral points for more complex cases. The lack of adequate equipment in health centers could compromise the accuracy of hypertension diagnosis and monitoring, leading to suboptimal management of the condition. Overall, the lack of sufficient equipment in health facilities continues to be a major concern, thus highlighting the need for improved funding and better resource allocation mechanisms.

Figure 3

Facility Category and Equipment Score
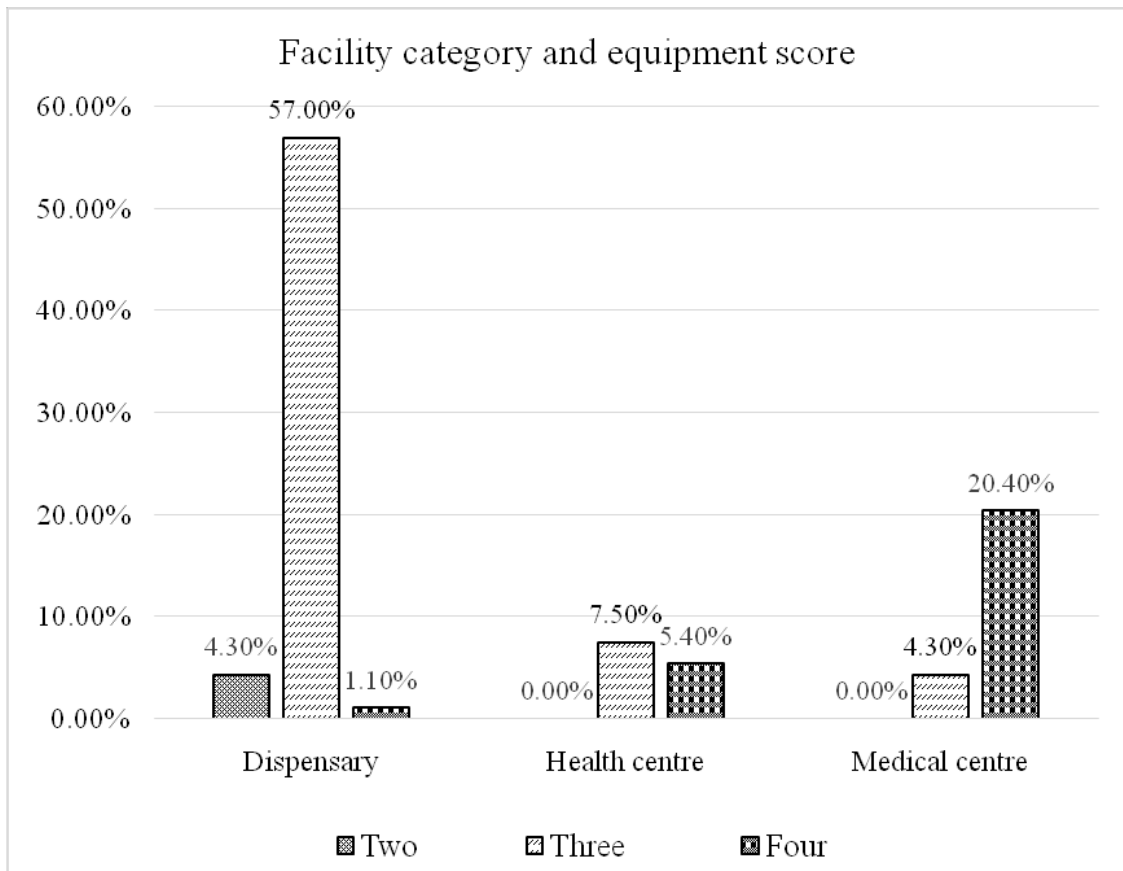
4.3.2 Equipment Score Based on the Type of Facility

An analysis of variance was conducted to establish the differences in equipment scores based on the type of facility. The results showed that statistically significant differences were observed in the mean equipment score based on the type of health facility. Private medical centres had the highest score while dispensaries had the lowest score (F=53.647, P value < 0.001) (Table 16). This finding underscores a substantial disparity in the availability and quality of diagnostic equipment, particularly for blood pressure measurement, among the various facility types in Tharaka Nithi County. The significant differences in equipment scores among facility types emphasize the need for targeted interventions to enhance the diagnostic capabilities of lower-tier public health facilities.

44

Table 16

Equipment Score Based on the Type of Facility (ANOVA)

			Subset for alpha = 0.05	
Facility category	N	Mean	F	P value
Dispensary	58	2.95	53.647	0.001*
Health Centre	12	3.42		
Private Medical Clinics	23	3.83		

*Significant at p≤0.05

4.3.3 Association between Health Facility Types and Equipment Category

A regression analysis was conducted to establish the association between health facilities and equipment category. The result showed that dispensaries were 7.750 times more likely to have unsatisfactory equipment as compared to Private medical centres. Likewise, health centres were 6.650 times more likely to have unsatisfactory equipment as compared to private medical centres (Table 17). These findings highlight the significant resource disparities between private and public health facilities, with private centers being much better equipped to provide accurate and effective hypertension management. The higher likelihood of unsatisfactory equipment in dispensaries and health centers underscores the challenges faced by public health facilities in maintaining and updating essential diagnostic tools.

The possible reason could be that these facilities often operate under resource constraints, leading to inadequate equipment that can compromise the quality of care. Additionally, the higher patient load in public health facilities can strain resources, making it difficult to keep equipment in optimal condition. Furthermore, the need to stay competitive in the healthcare market may drive private facilities to ensure they are well-equipped with the latest and most reliable diagnostic tools.

45

Table 17

Association between Health Facilities and Equipment Category

Equipment Category 2[a]		B	P value	COR	95% Confidence Interval for COR	
					Lower Bound	Upper Bound
Yes						
	Dispensary	1.601	.001	7.750	2.480	37.888
	Health Care	1.895	.018	6.650	1.377	32.114
	Private Medical Clinics	0[b]				

a. The reference category is: Satisfactory

b. Baseline category

4.4 Staffing Composition in Selected Health Facilities

The results show that 96.8% of the health facilities did not have a medical doctor. While 98.9% of the health facilities had at least one nursing officer with 12.9% having over 3 nursing officers, almost three-quarters (74.2%) of the health facilities had at least one pharmaceutical officer. Moreover, in 23.7% of the facilities, there was no clinical officer.

About 60.2% of Health facilities had a score of 'four'. However, only 2.2% had a staff number score of 'five'. The mean score of staff number score in the health facilities was 3.53. Notably, most (97.8%) of the staff number score category was unsatisfactory (Table 18). while some facilities have sufficient staff, the majority do not meet the optimal staffing levels necessary for effective healthcare delivery. The fact that 97.8% of the staff number score category was deemed unsatisfactory highlights a widespread deficiency in healthcare staffing across the county's facilities. These staffing inadequacies likely contribute to the overall limited capacity of these facilities to effectively manage chronic conditions like hypertension.

Table 18

Staffing Composition in Selected Health Facilities

Staffing composition in selected Health facilities		N=93	
		N	%
Number of medical doctors			
None		90	96.8
One		2	2.2
Two		1	1.0
Number of nursing officers			
None		1	1.1
1-3		80	86.0
4-10		12	12.9
Number of clinical officers			
None		22	23.7
1-5		66	70.9
6-10		5	5.4
Number of pharmacists			
None		24	25.8
One		60	64.5
Two		8	8.6
Three		1	1.1
Laboratory staff			
Laboratory officer		13	14.0
Laboratory technician		80	86.0
Staff number score			
Two		11	11.8
Three		24	25.8
Four		56	60.2
Five		2	2.2
Mean (SD) Staff number score	3.53±0.73		
Staff number category full 5cadres			
Unsatisfactory		91	97.8
Satisfactory		2	2.2
Staff number category above 3 cadres			
Unsatisfactory		33	37.6
Satisfactory		58	62.4
Majority of staffing in the health facility			
Full time		92	98.9
Part time		1	1.1
Received training in the last two years			
Yes		15	16.1
No		78	83.9
Health providers familiar with local dialect			
Yes		47	50.5
No		46	49.5
Staffing score			
One		17	18.3
Two		38	40.9
Three		33	35.5
Four		5	5.4
Mean (SD) Staffing score	2.28#0.82		
Unsatisfactorily		55	59.1
Satisfactorily		38	40.9

The majority (98.9%) of the staff in the health facilities were full-time staff. Most (83.9%) of the staff in the health facilities had not received refresher training in the management of hypertension in the last two years (Table 18). Half (50.5%) of the staff in the health facilities were familiar with the local dialect. About 40.9% of the facilities had a staffing score of 'two' with a mean score of 2.28. The health facilities had 59.1% with unsatisfactory staffing category (Table 18). The findings highlights the shortage of key personnel who are crucial for patient diagnosis and treatment planning. The management of non-communicable diseases poses a challenge for Sub-Saharan African (SSA) countries due to the lack of adequately trained health workforce and appropriate skills mix (Anderson & Chu, 2007; Kengne et al., 2009). Current findings corroborate this position, as only 16.1% (n=15) of health workers had received in-job training (refresher training) for hypertension and other cardiovascular diseases' diagnosis and management (Table 18). A similar study conducted in Congo found that only a small percentage of nurses had received training on cardiovascular diseases or their risk factors, while a majority of them had already received training on infectious diseases (Lulebo et al., 2015).

Another study conducted by Oyekale (2017) in Nigeria reported that health facilities providing hypertension services often had a shortage of trained healthcare workers and those present may not adhere to treatment guidelines, which could further exacerbate the situation. These findings underscore the urgent need for heightened efforts to strengthen healthcare systems, particularly in resource-constrained settings. Other studies have also pointed out that inadequate staffing composition and delays in receiving refresher training were common barriers in hypertension management (Nanono et al., 2023;Yan et al., 2017). On the other hand, a study conducted in Tanzania reported that 52.9% of facilities had healthcare workers trained on hypertension management within two years preceding the survey (Adinan et al., 2019).

The need for healthcare workers to have access to regular and up-to-date training on key health issues across the world cannot be overemphasized. For instance, cardiovascular disease is a leading cause of death worldwide, and an essential aspect of preventing it is the identification and management of cardiovascular risk factors. Healthcare workers play a crucial role in this process by providing patients with the necessary guidance and support to make healthy lifestyle choices. However, it's imperative that healthcare workers themselves have adequate and current knowledge of cardiovascular (hypertension) health to provide the best possible care to their patients.

Previous studies have indicated that some healthcare providers may provide inappropriate guidance to patients on lifestyle changes and other risk factors due to a lack of adequate knowledge (Mungati et al., 2014; Powell-Wiley et al., 2012). As depicted by these findings, in sub-Saharan African (SSA) countries, a shortage of adequately trained health workers for managing non-communicable diseases is a prevalent challenge (Kengne et al., 2009).

Current findings also reveal lack of adequate staff number as a major challenge in all the primary health facilities. Apart from the lack of knowledge, one major challenge faced by primary health facilities, is the shortage of staff and imbalanced skill mix which constitute significant barriers to providing high-quality healthcare services to patients. In agreement with the current study, a recent study conducted in Ghana found that the lack of high-caliber personnel in primary health facilities was a significant problem that needed to be addressed (Laar et al., 2019). Adequate and balanced skills representation can assure the best possible care and management of hypertension and its risk factors.

4.4.1 Staff Number Score based on the Type of Facility

An analysis of variance was conducted to establish the differences in staff number scores based on the type of facility. The results showed that significant differences were observed in the number of staff based on the health facility. Private Medical facilities had the highest number while dispensaries had the lowest number (F=16.285, P value = 0.001) (Table 19).

Table 19

Staff Number Score Based on the Type of Facility (ANOVA)

			Subset for alpha = 0.05	
Facility category	N	Mean	F	P Value
Dispensary	58	3.25	16.285	0.001
Health Centre	12	3.83		
Private Medical Clinic	23	4.09		

* Significant at p≤0.05

4.4.2 Staff Score Based on the Type of Facility

An analysis of variance was conducted to establish the differences in staff scores based on the type of facility. The results showed that significant differences were observed in the mean staffing score based on the type of health facility. Private Medical clinics had the highest score while health centres had the lowest score (F=7.804, P value = 0.001) (Table 20). These findings suggests that private facilities are better staffed, likely due to more flexible funding, competitive salaries, and the ability to attract and retain qualified personnel. In contrast, the lower staffing levels observed in dispensaries reflect the resource constraints typical of public health facilities, particularly in rural or underserved areas. Dispensaries, often the first point of contact for many patients, are struggling with insufficient staff, which can lead to longer wait times, overburdened healthcare workers, and potentially lower quality of care. The significant differences in staff numbers based

50

on facility type underscore the need for targeted interventions to improve staffing in public health facilities, ensuring that all patients have access to adequate and timely healthcare services, regardless of the facility they attend.

Table 20

Staff Score Based on the type of facility (ANOVA)

			Subset for alpha = 0.05	
Facility category	N	Mean	F	P Value
Dispensary	58	2.12	7.804	0.001[*]
Health Centre	12	2.00		
Private Medical Clinic	23	2.83		

* Significant at p≤0.05

4.4.3 Association between Health Facility Category and Staffing Score Category

A chi-square test was conducted to establish the association between the health facility category and the staffing score category. The health facility category was found to have a significant association with the staffing score category (P = 0.002) (Table 21). This finding underscores that the differences in staffing levels across various types of health facilities in Tharaka Nithi County are not random but are significantly influenced by the category of the health facility.

Table 21

Facility Category and Staffing Score

Facility category(n)	Unsatisfactory	Satisfactory	χ2 P value
Dispensary (58)	38 (65.52%)	20 (34.48%)	0.002*
Health Centre (12)	10 (83.33%)	2 (16.67%)	
Private Medical Clinics (23)	7 (30.43%)	16 (69.57%)	

*Significant at p≤0.05

Almost a quarter of the dispensaries (24.7%) had a staffing score of two. While about 14% of the private medical clinics had a staffing score of three with 8.6% of the health centres having a staffing score of two (Figure 4).

Figure 4

Facility Category and Staffing Score
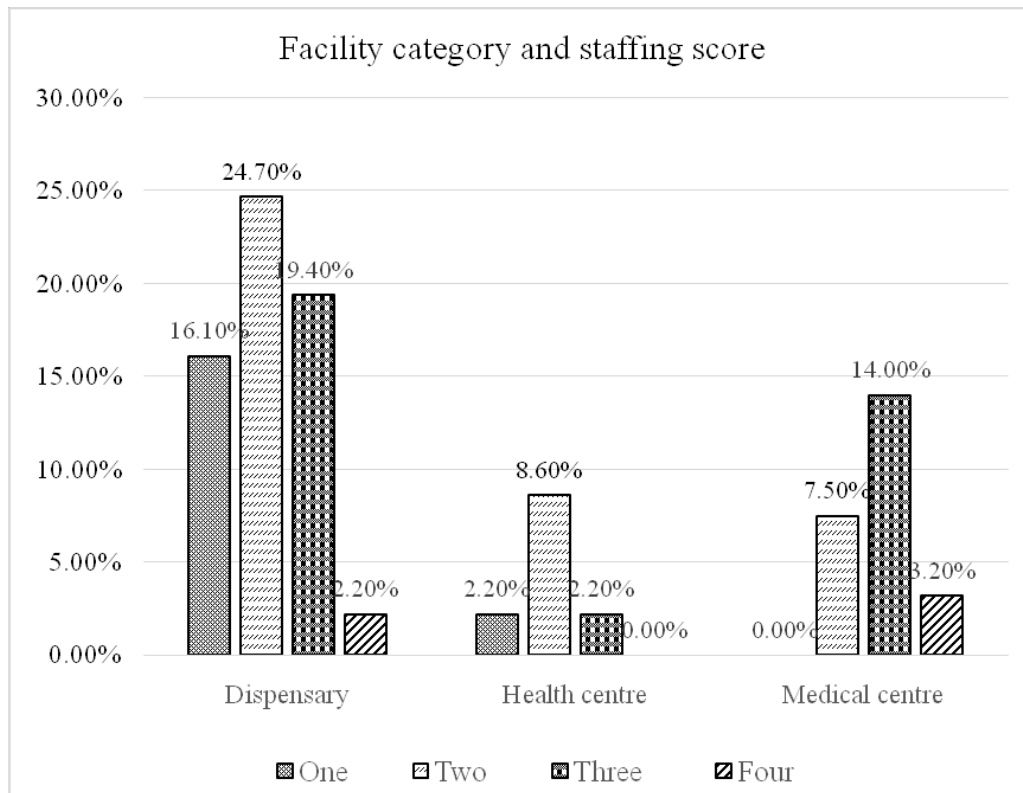
4.4.4 Association between Health Facilities and Staffing Score Category

A regression analysis was conducted to investigate the association between health facilities and the staffing score category. The result showed that dispensaries were 4.343 times more likely to have unsatisfactory staffing as compared to Private medical clinics. Similarly, health centres were 11.429 times more likely to have unsatisfactory staffing as compared to Private medical clinics (Table 21). This indicates that dispensaries, which often serve as the first point of contact for many patients in rural areas, are significantly under-resourced in terms of personnel. This shortage can severely impact the quality of care, particularly in managing chronic conditions like hypertension, where continuous

monitoring and patient education are essential.

 Similarly, the results show that health centers were 11.429 times more likely to have unsatisfactory staffing compared to private medical clinics. This finding suggests that even larger public health facilities, which are expected to offer a broader range of services, struggle with severe staffing shortages. The high likelihood of unsatisfactory staffing in health centers and dispensaries highlights a critical gap in the public healthcare system. These facilities are likely overburdened, which can lead to long wait times, reduced patient care quality, and increased strain on the existing staff.

Table 22

Association between Health Facility Type and Staffing Score Category

Staffing score category[a]		B	P value	COR	95% Confidence Interval for COR	
					Lower Bound	Upper Bound
Unsatisfactorily						
	Dispensary	1.469	.006	4.343	1.535	12.289
	Health Care	2.436	.007	11.429	1.968	66.355
	Private Medical Clinics	0[b]				

a. The reference category is: Satisfactory

b. Baseline category

Of note, universal access to qualified, skilled, motivated, and equitably distributed health workers is critical for achieving national health sector goals and sustainable development goals, particularly Goal 3 of attaining good health and well-being (Ahmat et al., 2022; WHO, 2015; WHO, 2016). However, there remains a shortfall of health workers, which is projected to reach 10 million by 2030, especially in Africa and rural and remote areas (Boniol et al., 2022; WHO, 2021).

This shortage limits the functionality of health systems and the achievement of set goals at global, national, and sub-national levels (Okoroafor et al., 2023; WHO, 2021).

4.5 Availability of Essential Medicine

Essential medicines are crucial in meeting the population's most pressing healthcare needs, and they should always be available in sufficient quantities and dosage forms within health facilities (Tefera et al., 2022). Current findings show hypertensive drugs were available in three-quarters (65.6%) of the health facilities (Table 23) while Thiazide was available in 51.6% of their health facilities (N=61). While this indicates that a majority of the facilities have access to these critical medications, it also highlights that a significant proportion, nearly one-third, lack sufficient supplies. This shortfall could lead to inadequate management of hypertension, which is concerning given the long-term health risks associated with untreated or poorly managed high blood pressure.

Additionally, the availability of Thiazide, a commonly prescribed diuretic for hypertension, was reported in only 51.6% of the health facilities. This suggests that even among facilities that stock hypertensive medications, not all essential drug classes are consistently available. The inconsistent availability of Thiazide and other antihypertensive drugs could compromise the effectiveness of hypertension management protocols, as healthcare providers might be forced to prescribe less optimal treatments or adjust regimens based on available drugs rather than the best clinical evidence. These gaps in medication availability underscore the need for improved supply chain management and resource allocation to ensure that all health facilities, particularly those in underserved areas, can provide the full spectrum of essential medicines needed to manage hypertension effectively.

Table 23

Availability of Essential Medicine

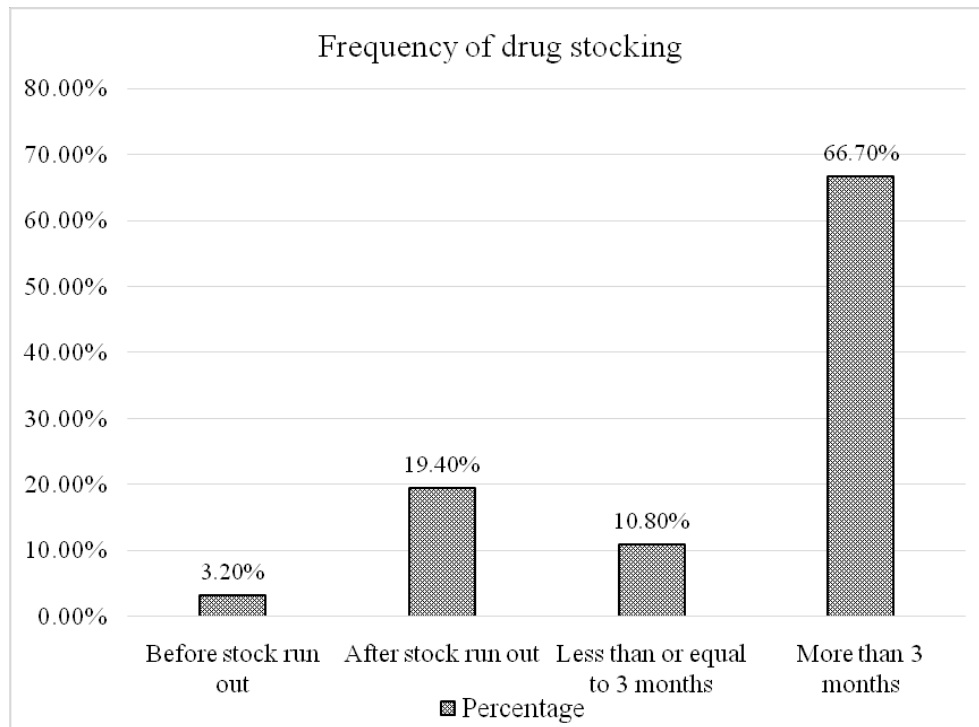| Availability of essential medicine	N=93	
	N	%
Availability of hypertension drugs		
Yes	61	65.6
For those available Thiazide availability		
Yes	48	51.6
For those available Calcium channel blockers availability		
Yes	43	46.2
For those available ACE availability		
Yes	34	36.5
Regular stock-taking of hypertension drugs in the facility		
Yes	93	100.0
Essential medicine score		
Two	25	26.9
Three	60	64.5
Four	8	8.6
Essential medicine score		
Unsatisfactorily	25	26.9
Satisfactorily	68	73.1

About 46.2% of facilities with hypertensive drugs had calcium channel blockers. Additionally, for those available, 36.5% had Angiotensin-converting enzyme. Notably, all (100%) health facilities were doing regular stock-taking of hypertension drugs in the facility. However, the time taken before stocking dispensaries and health centres were longer compared to private medical clinics. The essential medicine score among the health facilities was 'three' points accounting for 64.5% with a mean score of 2.82. Of note is that the essential medicine score category was satisfactory among 73.1% of the health facilities (Table 23).Three-quarters (66.7%) of the health facilities had a frequency of drug stocking after more than three months this was more in dispensaries,

and health centers compared to private medical clinics. Private medical Clinics had their stocks replenished within 72 hours of stockouts. Notably, 19.4% of the facilities were stocked after running out of the available stock within one month (Figure 5). This study revealed that the availability of essential medicines was below the WHO recommendation of 100%. Additionally, the availability was also below the minimum requirement of WHO, which is set at 80% (Prinja et al., 2015). These findings point to the need for a concerted effort to improve the availability of essential medicines within health facilities to ensure that patients have access to treatment.

It is concerning that only 3.2% of the facilities reported restocking the drugs before the stock runs out, according to recommendation: majority of the facilities indicated restocking the drugs after a period of three months, irrespective of the needs with the most affected being dispensaries and health centers. This implies a significant challenge in ensuring continual availability of essential medicine for hypertension management. According to Steele et al. (2019), instances of stock-out of essential medicines at the community level pose a significant challenge to achieving universal health coverage and promoting equitable improvement of health outcomes. It has been observed that such occurrences can lead to inadequate access to life-saving drugs and treatments, particularly in resource-limited settings.

Figure 5

Frequency of Drug Stocking

Current findings showed on the availability of essential drugs compares with those comparable of a study conducted in India, which reported a 60% availability of anti-hypertensive drugs (Prinja et al., 2015). However, our study recorded a slightly higher availability of essential drugs compared to a study conducted in Ethiopia, which reported a 55.65% availability (Tadesse et al., 2021).

Furthermore, our findings revealed that the availability of essential drugs in our study was much lower than what was reported in a study conducted in North- west Ethiopia, which reported availability of 80% and 93.3% for a general hospital and health center, respectively. On the other hand, the availability of essential medicines in our study was higher compared to the findings of a study conducted in Gondar, which reported availability of 79.17% (Woldeyohanins et al., 2020). The differences in the availability of essential drugs in these studies could be attributed to various factors such as differences in the period of study and the health policies of the respective countries.

The study findings are consistent with data from other developing countries. For instance, a study conducted in Zambia revealed that primary health facilities faced several challenges in hypertension management, including drug stock-outs, lack of equipment, and difficulty in getting patients to return for follow-up visits (Yan et al., 2017). Similarly, another study conducted in Uganda indicated that about half of the health facilities involved in the study lacked appropriate anti-hypertensive drugs (Musinguzi et al., 2015). These findings highlight the need for urgent measures to address the gaps in hypertension management in primary health facilities in developing countries. Furthermore, other studies have documented stock-outs of essential medicines as a major challenge in the provision of healthcare services (Mazigo et al., 2021; Olutuase et al., 2022; Okoroafor et al., 2023) and which hegatively impacts the utilization of health services by patients (Elias et al., 2018; Vedanthan et al., 2016).

Current findings are further corroborated by those of the study conducted by Rathish et al. in 2017. According to their report, more than 33% of the world's population and 50% of people living in the poorest countries of Africa and Asia lack access to essential medicines.

These studies highlight the urgent need for effective interventions to ensure consistent supply of essential medicines in primary health facilities. The World Health Organization (WHO) has estimated that health interventions based on the delivery of essential medicines could prevent over 10 million deaths each year (WHO, 2017). Thus, ensuring access to essential medicines is a key factor in improving health outcomes, especially in low-income countries. For instance, developing an essential medicines policy can help countries rationalize the purchase and distribution of medicines, thereby reducing the overall expenditures in public and private health systems, improving their accessibility, and enhancing their rational use (Guo et al., 2017).

4.5.1 Association between the Health Facility Category and Essential Medicine Category

A chi-square test was conducted to establish the association between the health facility category and the essential medicine category. The health facility category was found to have a significant association with the essential medicine category (P = 0.001) (Table 24). This significant association likely reflects disparities in resource allocation, procurement processes, and overall management practices between different types of health facilities.

Table 24

Facility Category and Essential Medicine Category

Facility category	Unsatisfactory	Satisfactory	χ^2 P value
Dispensary	25 (26.9%)	33 (35.5%)	0.001*
Health centre	0 (0%)	12 (12.9%)	
Private Medical Clinics	0 (0%)	23 (24.7%)	

*Significant at p≤0.05

About 31.3% of the dispensaries had an essential medicine score of 'three' while 21.5% of private medical centres had an essential medicine score of 'three'. However, only 11.8% of the health centres had an essential medicine score of 'three' (Figure 6).

Figure 6

Facility Category and Essential Medicine Score

Facility category and essential medicine score
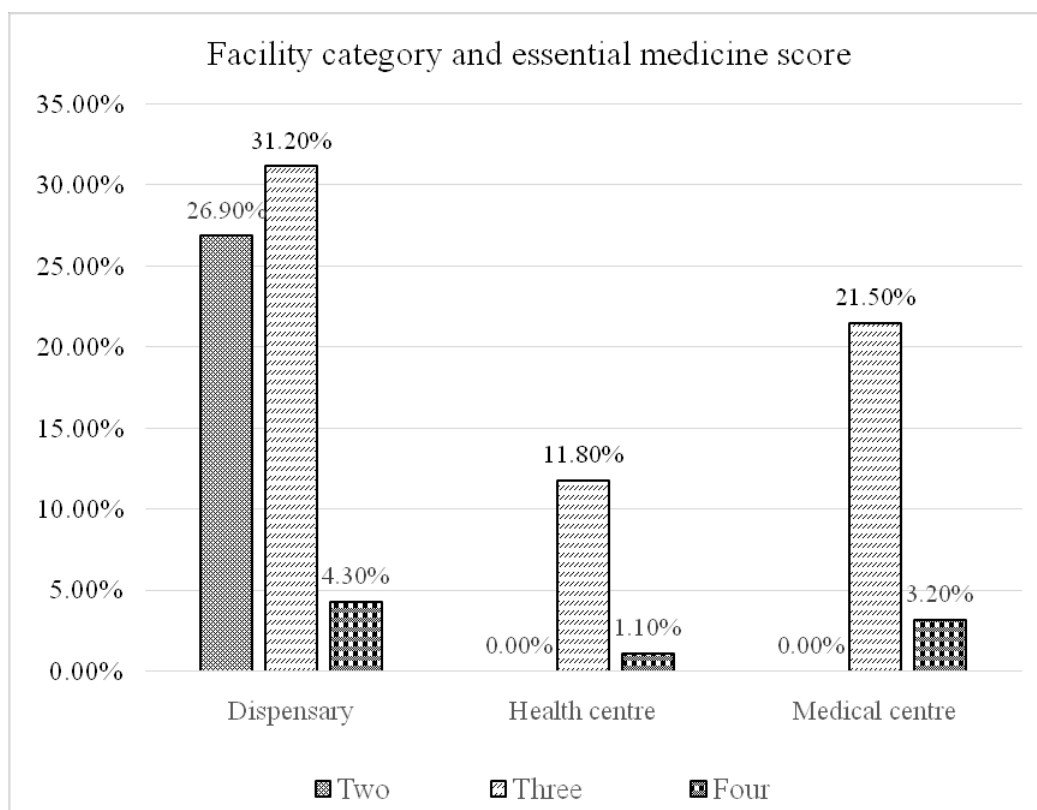
4.5.2 Essential Medicine Score Based on the type of Facility

An analysis of variance (ANOVA) was conducted to establish the differences in essential medicine scores based on the type of facility. The results showed that significant differences were observed in the mean essential medicine score based on the type of health facility. Private Medical clinics had the highest mean score while dispensaries had the lowest mean score (F=8.975, P value < 0.001) (Table 25). These findings suggest that private medical clinics could be better funded and more efficiently managed, and are likely to have a more consistent supply of essential medicines compared to public facilities like dispensaries and health centers.

Table 25

Essential Medicine Score Based on the type of Facility (ANOVA)

Facility category	N	Mean	F	P Value
			Subset for alpha = 0.05	
Dispensary	58	2.64	8.975	0.001[*]
Health Centre	12	3.08		
Private Medical Clinic	23	3.13		

[*]Significant at p≤ 0.05

The current study further observed that private medical centres were more likely to have essential medicines available compared to health centers and dispensaries. This could be attributed to the fact that private medical centres are driven by profits and receive higher allocation and supervision than public healthcare facilities (Anthony, et al 2022). Additionally, public facilities may face challenges such as limited budgets, bureaucratic delays, and supply chain issues, leading to sporadic or insufficient availability of critical medications.

Lack of essential medicines in primary health facilities, particularly dispensaries and health centers, is a common problem in low- and middle-income countries. According to Kefale and Shebo (2019), stock outs of essential medicines in the health facilities often force patients to use more expensive alternatives, which can be a financial burden for them. This could partly be due to inefficient drug inventory systems.

4.5.3 Association between Health Facilities and Essential Medicine Category

A regression analysis was conducted to establish the association between health facilities and the essential medicine category. The result showed that dispensaries were 3.598 times more likely to have unsatisfactory essential medicine as compared to Private medical clinics (Table 26). The lower performance observed in dispensaries highlights the ongoing challenges faced by public health facilities in ensuring adequate drug

supplies, further emphasizing the need for policy interventions and resource allocation strategies that address these inequities and ensure all health facilities, particularly those serving vulnerable populations, have the necessary resources to provide comprehensive care.

Table 26

Association between Health Facilities and Essential Medicine Category

Essential medicine category[a]		B	P value	COR	95% Confidence Interval for COR	
					Lower Bound	Upper Bound
Unsatisfactorily						
	Dispensary	1.281	.036	3.598	1.087	11.911
	Health Care	-.840	.477	0.432	0.043	4.366
	Private Medical Clinics	0[b]				

a. The reference category is: Satisfactorily

b. Baseline category

The availability of essential medicines has been identified as the most important aspect of quality healthcare services by consumers, and a shortage of medicines is a major cause of underutilization of government health services (Force, 2009). Therefore, it is crucial to ensure the continual availability of essential medicines to provide patients with value-added services, leading to improved health outcomes (Mikkelsen-Lopez et al., 2011). Notably, an effective healthcare system should ensure equitable access to essential medicines, vaccines, and healthcare technologies that are of guaranteed quality, safety, efficacy, and cost-effectiveness profile. This is particularly important for low-income countries, where access to essential medicines is of great concern (Awle, 2016).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Findings

The findings of the study revealed that the dispensary had the highest representation among the health facilities surveyed. It is noteworthy that all the health facilities examined provided diagnosis and treatment for hypertension. The study also found that the majority of the health facilities had access to and used national guidelines in their practice but adherence was not good. Additionally, it was observed that most of the health facilities were equipped to diagnose and manage hypertension patients. However, it was concerning to note that a significant number of health facilities had not received a support supervision visit in over two years which is a management surveillance requirement. Despite this, most of the health facilities adhered to national policies for the treatment of hypertension. Nevertheless, the study revealed a limited number of health facilities that promptly adjusted their practices based on the required guidelines. The guideline utilization score for a third of the health facilities was two, with a mean score of 2.11. Furthermore, it was found that most of the health facilities scored unsatisfactorily in the guideline's utilization.

The health facility category was found to have a significant association with the guidelines utilization. Furthermore, the results showed that statistically significant differences were observed in the mean guideline score based on the type of health facility. Health centers had the highest score while private medical centers had the lowest score. Results revealed that dispensaries were 22 times more likely not to have national guidelines as compared to private medical centres. Moreover, health centres were 15.71 times more likely not to have national guidelines as compared to private medical centres. Additionally, the results showed that dispensaries were 0.095 times less

likely to treat hypertension while following guidelines as compared to private medical centres. Similarly, health centres were 0.095 times less likely to treat hypertension while following guidelines as compared to private medical centres.Further, the results revealed that dispensaries were 0.006 times less likely to adjust swiftly based on guidelines as compared to private medical centres. Similarly, health centres were 0.072 times less likely to adjust swiftly based on guidelines as compared to medical centres. Notably, the study results revealed that dispensaries were 0.319 times less likely to have satisfactory guidelines utilization as compared to private medical centres. Similarly, health centres were 0.198 times less likely to have satisfactory guidelines utilization as compared to private medical centres.

All of the health facilities were found to have blood pressure measurement equipment. Notably, the majority of the equipment was functioning appropriately. However, most of the equipment had no efficient support supervision. Additionally, supervision for equipment functionality was never done in most of the health facilities and digital blood pressure machine was the most common. About three-quarters of the health facilities had an equipment score of three with an equipment score mean of 3.23. Most of the health facilities were unsatisfactory in terms of the equipment. The health facility category was found to have a significant association with the blood pressure measurements equipment score category. Further, the results showed that statistically significant differences were observed in the mean equipment score based on the type of health facility. Private medical clinics had the highest score while dispensaries had the lowest score. Moreover, the result showed that dispensaries were 7.750 times more likely to have unsatisfactory equipment as compared to private medical centres. Likewise, health centres were 6.650 times more likely to have unsatisfactory equipment as compared to private medical centres.

The current study found that the number of medical doctors was low. Most of the health facilities had no medical doctors. However, most of the health facilities had between one to three nursing officers. Moreover, almost three-quarters of the health facilities had one pharmaceutical officer. Laboratory technicians were the majority among the laboratory staff. The mean score of staff number score in the health facilities was 3.53. Notably, most of the staff number score category was unsatisfactory. Furthermore, the majority of the staff in the health facilities were full- time staff. Of note, most of the staff in the health facilities had not received refresher training in the last two years. Half of the staff in the health facilities were familiar with the local dialect. The health facilities had 59.1% with unsatisfactory staffing category.

The health facility category was found to have a significant association with the staff number category. Furthermore, the results showed that significant differences were observed in the number of staff based on the health facility. Medical private centres had the highest number while dispensaries had the lowest number. Moreover, the results showed that significant differences were observed in the mean staffing score based on the type of health facility. Notably, private medical centers had the highest score while health centers had the lowest score. The health facility category was also found to have a significant association with the staffing score category. Further, the result showed that dispensaries were 4.343 times more likely to have unsatisfactory staffing as compared to private medical clinics. Similarly, health centres were 11.429 times more likely to have unsatisfactory staffing as compared to private medical clinics.

Almost three-quarters of the health facilities had availability of hypertension drugs.Of those available, most had Thiazide and calcium channel blockers available in their health facilities. Additionally, of those available, half had Angiotensin-converting enzymes in their health facilities. Notably, all health facilities were doing regular stock-taking of

65

hypertension drugs in the facility. Three-quarters of the health facilities had a frequency of drug stocking after more than three months. The essential medicine score among the health facilities was three points with a mean score of 2.82. Of note is that the essential medicine score category was satisfactory among most of the health facilities.

The health facility category was found to have a significant association with the essential medicine category. Further, the results showed that significant differences were observed in the mean essential medicine score based on the type of health facility. Private Medical centers had the highest score while dispensaries had the lowest score to establish the association between health facilities and the essential medicine category. Notably, the result showed that dispensaries were 3.598 times more likely to have unsatisfactory essential medicine as compared to private medical centres.

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significant differences were observed in the mean staffing score based on the type of health facility. Notably, private medical centers had the highest score while health centers had the lowest score. The health facility category was also found to have a significant association with the staffing score category. Further, the result showed that dispensaries were 4.343 times more likely to have unsatisfactory staffing as compared to private medical clinics. Similarly, health centres were 11.429 times more likely to have unsatisfactory staffing as compared to private medical clinics.

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5.2 Conclusions

The study concludes that there is a high prevalence of lack of hypertension guideline usage. Additionally, the study concluded that there was unsatisfactory equipment for

hypertension management provision among primary Health Care Facilities in Tharaka Nithi County, Kenya. Inadequate staffing composition and skill mix, lack of refresher training, and lack of essential medicines for hypertension management were also common challenges reported by the health facilities. The study findings revealed considerable gaps and a lack of preparedness in the management of hypertensive patients at primary healthcare facilities in the County. This study's findings suggest that numerous barriers stand in the way of hypertension diagnosis and management in Tharaka Nithi County primary health facilities. These results support an urgent need to develop new strategies, policies, and programs that will promote the preparedness of healthcare facilities for the prevention, detection, treatment and control of hypertension.

5.3 Recommendations for the Study

The results of the study indicate that there is a critical need for healthcare workers to receive comprehensive refresher training and adequate resources to effectively manage hypertension in their patients. This will lead to a significant improvement in the quality of care provided to individuals with high blood pressure. In addition, it is important to increase public awareness of hypertension and promote better hypertension control measures. This can be achieved through health education campaigns and outreach programs aimed at promoting healthy lifestyle choices and encouraging regular blood pressure monitoring. Overall, a concerted effort is required to address the growing burden of hypertension and its related complications in our communities.

5.3.1 Recommendation for Policy

The findings of this study reveal a pressing need for the development of new and innovative strategies, policies, and programs that will effectively promote the preparedness of healthcare facilities in the prevention and control of hypertension. To achieve this goal, appropriate guidelines must be provided in all primary health

facilities, improve on support supervision, and healthcare workers should be trained on how to use them, as well as be encouraged to adhere to them.

Investing in the provision of essential equipment and medicine supplies is also essential to ensure that healthcare facilities are well-equipped to provide the necessary care to patients with hypertension. Additionally, there is a need to improve the availability, performance and good skill mix of human resources, including healthcare professionals, to ensure that they are adequately trained and equipped to provide quality services and care to patients. To improve the quality of care, effective implementation of existing policies and the strengthening of the health system through adequate budgetary allocations are also strongly recommended. Investing in research and development to identify new and more effective prevention and control strategies for hypertension is also crucial.

5.3.2 Recommendation for Further Research

It is crucial to have a coordinated and sustained approach towards regular assessments of population health facilities to ensure preparedness for managing hypertension. These assessments can provide valuable trend data that can inform the development and updating of policies, programs, and interventions aimed at addressing hypertension. Additionally, it is imperative to conduct further research to explore other underlying drivers of the variation reported among primary health facilities in terms of their readiness to manage hypertension outside health system structure. This research can help us gain a better understanding of the preparedness of health facilities for hypertension management, which can be crucial in improving health outcomes for hypertensive patients across different clinical contexts.

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APPENDICES

Appendix I: Cover Letter

Dear Respondent,

I am conducting a study entitled, "**Preparedness of Primary Healthcare Facilitiesin the Management of Hypertension in Tharaka Nithi County, Kenya**." I would like to request that you spend some of your time completing this questionnaire to the best of your knowledge. Your information is of high value and will guarantee the success of this study. To maintain anonymity, I request that you do not write your names on the questionnaire. Thank you in advance for your willingness to participate in the study and co-operation.

Yours Sincerely

Elijah Muthini Kameti.

Title of the project:	Preparedness of Primary Healthcare Facilities in Management of Hypertension in Tharaka Nithi County, Kenya
Name of the researcher:	Elijah Muthini Kameti
Institutional Name	Kabarak University

1. Introduction and Purpose of the study

This study will be conducted in the primary healthcare facilities in Tharaka Nithi County, Kenya and it will evaluate the facilities preparedness to manage hypertension.

2. Description of the research

In this study, the participant will be provided with a questionnaire. Every section has questions, and the participants are allowed to answer them in the simplest way possible. No coercion when answering the questions.

3. Subject participation

In this study 103 health facilities are expected to participate as they possess the vital information needed and it will involve visits during the distribution of the questionnaires and collection of the questionnaire. The facility in charge will guide in filling of the questionnaire.

4. Potential risks and discomfort

No known risk and discomfort but in case any issues arise the matter can be reported to the nearest police station or the administration of the Kabarak University school of post-graduate studies. I understand that if I inform the researcher that myself or someone else is at risk of harm they may have to report this to the relevant authorities they will discuss this with me first but may be required to report with or without my permission.

5. Potential benefit

No direct benefit to the participants who participate in this research study besides the general benefit that will accrue to the health facilities, society, future researchers and government among others.

6. Confidentiality

The participants' responses taken from this study will be coded to protect the participant's name and no name or any other identifying information of the participant will be used while discussing or reporting data.

7. Voluntary participation and authorization

The decision to participate in this study is purely voluntary and no coercions or coaching before the day of research.

8. Withdrawal from the study

If the participant decides to participate in this study and feels the need to withdraw from participation at any time, he/she can do so without any penalty.

9. Cost

There is no cost in participating in this study or payment except for the benefit that comes with the research findings. I voluntarily agree to participate in this research program

- o   Yes
- o   No

I confirm that I have read and understood the information provided on this form and give my consent to take part in this research.

Participant's Name:		Date:
Participant's signature:		
Research's Name:	Elijah Muthini Kameti	**Date:**
Research's signature		

Appendix III: Questionnaire

The questionnaire includes statements regarding the preparedness of primary healthcare facilities in the management of hypertension in Tharaka Nithi County, Kenya.

Kindly respond accordingly by ticking (6) or writing short answers.

Part A: Hypertension Management Guidelines

1. Does the facility offer diagnosis or management of non-communicable diseasessuch as hypertension?

i. Yes [ ]

Confirmation from morbidity record { }

Not confirmed from morbidity record {}

      ii. No [   ]

2. Do you have the national guidelines for the diagnosis and management of hypertension patients in this facility?

      i. Yes, Observed   [ ]

      ii. Yes, Reported not seen   [   ]

      iii. No   [ ]

3. Do health providers in this facility diagnose and manage hypertension in patients

      i. Yes, { }

      ii. No [ ]

4. When was the last time this facility received a supervision visit from the officers in the County Department of Health

This month……………….

In the last 3 months……………

More than 3 months ago ………………..

Don't Know……………………………

Part B: Equipment For Blood Pressure Measurement

1. Does the health facility have equipment for blood pressure measurement?

i. Yes, Observed   [ ]

ii. Yes, Not observed [ ]

iii. No   [ ]

2. Does the equipment for blood pressure measurement, if available, function appropriately?

i. Yes, Observed [ ]

ii. Yes, Not observed [ ]

iii. No [ ]

3. Does the health official supervise the efficiency of the equipment for blood pressure measurement?

i. Yes[ ]

ii. No [ ]

4. When last did the facility receive a supervision visit from the higher levels to ascertain the functionality of the equipment?

This month …………………………..

In the last 3 months …………………..

More than 3 months ago………………

Don't know……………………………

5. Is the blood pressure apparatus in the health facility digital or manual?

i. Digital [ ]

ii. Manual [ ]

iii. None {   }

Part C: Staffing

1. How many staff with each of the following qualifications is currently assigned to the facility?

  i. Medical doctors …………………..

 ii. Nursing officers …………………..

iii. Clinical officers ……………………..

iv. Pharmacy Officer…………………..

Others ………………...…………

2. Which is the majority staffing category in this health facility?

      i.   Full time [   ]

      ii.   Part time [   ]

3. Have you or any provider(s) received any refresher training in hypertension diagnosis and management in the last 2 years?

      i.   Yes [   ]

          How long ago…............. ....?

      ii.   No [   ]

   2. Are the health providers in this facility familiar with the locality and locallanguage or dialect?

      i.   Yes [ ]

      ii.   No [ ]

Part D: Availability of Essential Medicines For Hypertension

1. Does the facility have hypertension management drugs today?

   i. Yes, Observed [ ]

   ii. Yes, Not observed [ ]

   iii. No [ ]

2. Which anti-hypertensive are available?

   i. Thiazide …………………….

   ii. Calcium channel blockers…………..

   iii. ACE inhibitors ……………………….

iv. Others ……………………………….

3. Is there regular stock-taking of the hypertension drugs in the health facility

   i. Yes[   ]

   ii. No [   ]

4. How frequent do the stocks get replenished? Within a month................................

More than 1 month..............................

More than 3 months.....................................

5. Does the facility have a database management system to allow storage and retrieval of prescriptions?

   i. Yes, Observed[]

ii. Yes, Not observed {   }

iii. No [   ]

Part E: Management of Hypertension

1. The service availability to the hypertension patients is 24/7

    i. Yes [ ]

    ii. No [ ]

2. The health facility advocates for treatment follow-up services
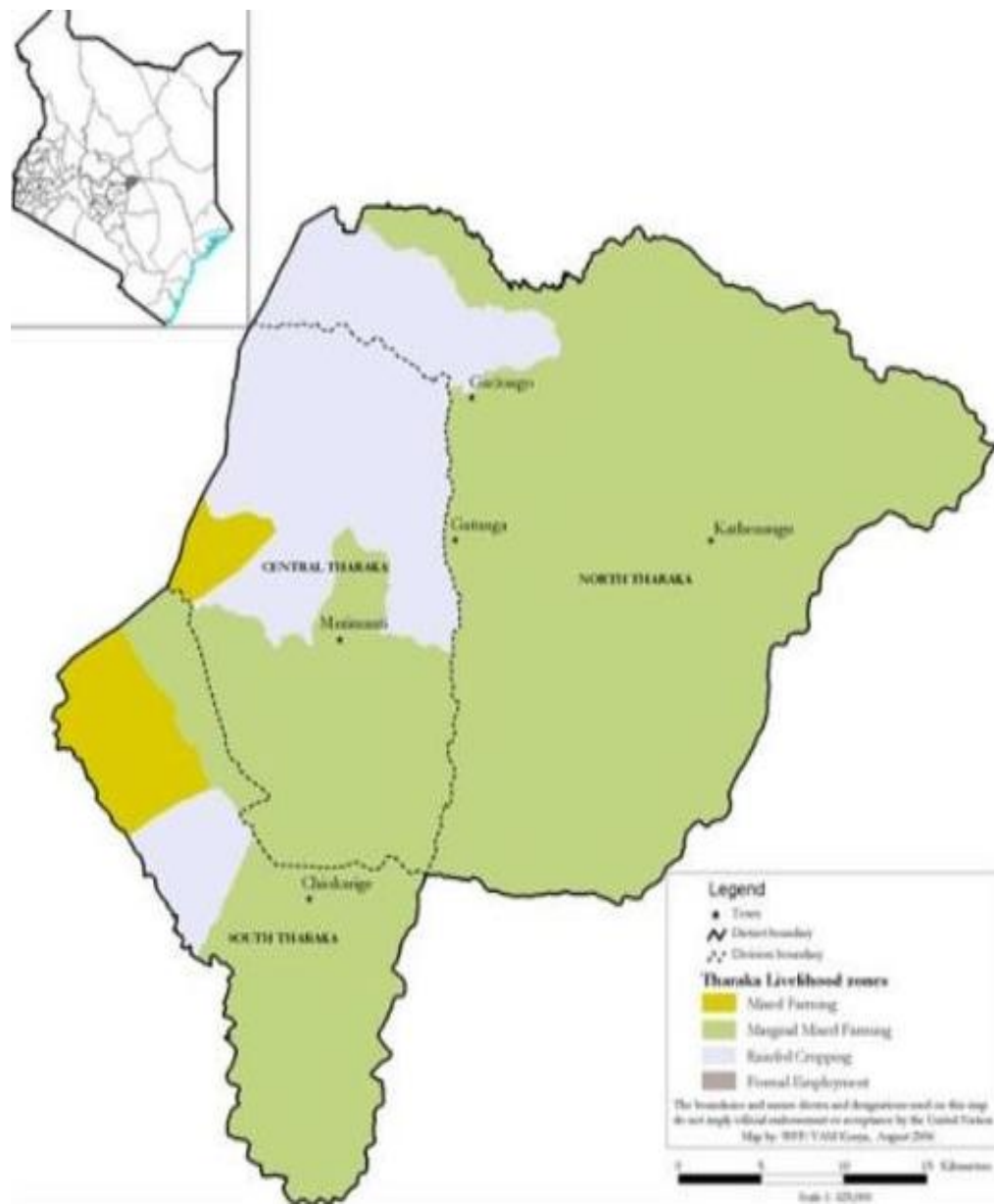   for persons withhypertension

    i. Yes, Follow up schedule observed[ ]

    ii. Yes, Follow up schedule not observed {   }

    iii. No [ ]

Source: *Modified Service Availability and Readiness Assessment (SARA)*
Questionnaire

86

Appendix IV: Map of Tharaka Nithi County, Kenya

Appendix V: KUREC Approval Letter

KABARAK UNIVERSITY RESEARCH ETHICS COMMITTEE

Private Bag - 20157
KABARAK, KENYA
Email: kurec@kabarak.ac.ke

Tel: 254-51-343234/5
Fax: 254-051-343520
www.kabarak.ac.ke

OUR REF: KABU01/KUREC/001/03/06/23

Date: 13th June, 2023

Elijah Kameti,
Reg. No: GMMF/M/2689/09/18
Kabarak University,

Dear Elijah,

RE: PREPAREDNESS OF PRIMARY HEALTHCARE FACILITIES IN MANAGEMENT OF HYPERTENSION IN THARAKA NITHI COUNTY, KENYA

This is to inform you that *KUREC* has reviewed and approved your above research proposal. Your application approval number is *KUREC-030623*. The approval period is *13/06/2023 – 13/06/ 2024.*

This approval is subject to compliance with the following requirements:

i. All researchers shall obtain an introduction letter to NACOSTI from the relevant head of institutions (Institute of postgraduate, School dean or Directorate of research)

ii. The researcher shall further obtain a RESEARCH PERMIT from NACOSTI before commencement of data collection & submit a copy of the permit to KUREC.

iii. Only approved documents including (informed consents, study instruments, MTA Material Transfer Agreement) will be used

iv. All changes including (amendments, deviations, and violations) are submitted for review and approval by *KUREC*.

v. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to *KUREC* within 72 hours of notification;

vi. Any changes, anticipated or otherwise that may increase the risk(s) or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to *KUREC* within 72 hours;

vii. Clearance for export of biological specimens must be obtained from relevant institutions and submit a copy of the permit to KUREC;

viii. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal and;

ix. Submission of an executive summary report within 90 days upon completion of the study to *KUREC*

Sincerely,

Prof. Jackson Kinetu PhD.
KUREC-Chairman

Cc   Vice Chancellor
      DVC-Academic & Research
      Registrar-Academic & Research
      Director-Research Innovation & Outreach
      Institute of Post Graduate Studies

As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord
(1 Peter 3:15)
Kabarak University is ISO 9001:2015 Certified

Appendix VI: NACOSTI Research Permit

NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

REPUBLIC OF KENYA

Ref No: 480564

Date of Issue: 25/July/2023

RESEARCH LICENSE

This is to Certify that Dr.. Elijah Muthini Kameti of Kabarak University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Tharaka-Nithi on the topic: PREPAREDNESS OF PRIMARY HEALTHCARE FACILITIES IN MANAGEMENT OF HYPERTENSION IN THARAKA NITHI COUNTY, KENYA for the period ending : 25/July/2024.

License No: NACOSTI/P/23/27491

480564

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

89

Appendix VII: County Research Authorization Letter

COUNTY GOVERNMENT OF THARAKANITHI
DEPARTMENT OF HEALTH SERVICES AND SANITATION
OFFICE OF THE DIRECTOR

Email: countyhealthdirector@gmail.com

P. O. BOX 10, 60406
KATHWANA

REF: TNC/CDH/R/VOL.2/128

DATE: 25th July, 2023

Dr. Elijah Muthini Kameti
kametielijah@kabarak.ac.ke

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research in Tharaka Nithi County on **"Preparedness of Primary HealthCare Facilities in Management of Hypertension in Tharaka Nithi County - Kenya"** for the period ending 25th July, 2024, I am pleased to inform you that your request to carry out the exercise has been approved

Ensure that you comply with the research Regulations and Ethics. After the completion of the research you are required to give a copy of research report to the Department of Health Services and Sanitation.

This approval is valid for the stated duration of your research.

Wishing you all the best

JOHN MBOGO
Ag. COUNTY DIRECTOR – HEALTH SERVICES AND SANITATION
THARAKA NITHI COUNTY

Appendix VIII: Conference Participation Certificate

CU/05.10.2023/152

CHUKA **UNIVERSITY**

Knowledge is Wealth *(Sapientia divitia est)/Akili Ni Mali*

CERTIFICATE OF PARTICIPATION
In the 10th International Research Conference
Awarded to:

*Elijah Kameti*1, Joy Mugambi1 & Paul Opare1*

Paper Title: Preparedness Of Primary Healthcare Facilities In Management Of Hypertension In Tharaka Nithi County, Kenya

Conference Theme:
Mainstreaming Research, Innovation and Technology Transfer and Commercialization for Sustainable Economies (MRIT-TCSE)

Conference Subthemes:
- Agriculture and Environmental Science
- Education & Training
- Hospitality & Business
- Law, Humanities & Social Sciences
- Science, Engineering & Technology
- Health for Sustainable Economies

Issued on 6th October, 2023

Prof. Shelmith W. Munyiri, Ph.D.
Director (Research and Extension)

Prof. Gilbert M. Nduru, Ph.D.
**Ag. Deputy Vice-Chancellor
(Academic, Research & Student Affairs)**

Chuka University is ...... Inspiring Environmental Conservation for Better Life

Appendix IX: List of Publication

Utilization of Hypertension Management Guidelines in Primary Healthcare Facilities in Tharaka Nithi County, Kenya

Elijah Kameti*[1], Joy Mugambi[2], Opare-Addo Paul[1]

[1]Department of Family Medicine, School of Medicine & Health Sciences, Kabarak University.

[2]Department of Health, County Government of Nakuru, Kenya

*Corresponding Author: kametielijah78@gmail.com

To read this paper online, please scan the QR code below:

ABSTRACT

Hypertension (HTN) is a leading contributor to the global burden of non-communicable diseases (NCDs). The effective management of hypertension constitutes an urgent need in developing countries, where its prevalence is on the rise. Available data shows that Tharaka Nithi County is one of the regions with high hypertension burden in the Kenya. Information on the adoption and implementation of HTN management guidelines is either limited or completely lacking. We evaluated the level of utilization of HTN management guidelines among primary healthcare facilities in Tharaka Nithi County. The study adopted a cross – sectional analytical design. Ninety-three healthcare facilities were sampled using a multi-stage sampling technique and data collected using the modified World Health Organization (WHO) Service Availability and Readiness Assessment (SARA) questionnaire. The data were analyzed using the Statistical Package of Social Sciences (SPSS) version 27 for both descriptive statistics and inferential statistics. Ethical approval was obtained from the Kabarak University Research Ethics Committee (KUREC) and data collection permit from the National Commission of Science, Technology and Innovation (NACOSTI). Most of the health facilities (96.8%) diagnose and manage HTN patients. Only a third (32.3%) of the facilities received a support supervision visit more than two years ago. A third (34.4%) of the health facilities had a guideline utilization score of two and a mean score of 2.11. The majority (64.5%, n=60) of health facilities reported unsatisfactory utilization of guidelines in the management of hypertension. Healthcare facility category was found to have a significant association with the availability of national guidelines (P = 0.001). ANOVA test showed a statistically significant difference in the mean guideline score based on the type of health facility. Health centres had the highest score while private medical clinics had the lowest score (F = 5.270, P value = 0.007). Statistically significant differences were noted in guideline utilization among dispensaries and health centres. The study reveals a notable deficiency in hypertension management guideline utilization (64.5% reporting suboptimal adherence), compounded by infrequent support supervision visits (32.3% without visits in over two years). The significant association between healthcare facility category and national guideline availability, along with variations in mean scores, highlights the need for targeted interventions to address existing disparities. We recommend implementation of a systematic support framework, ensuring regular support supervision visits for all health facilities, prioritizing those lacking oversight for an extended period. Tailored interventions, particularly for private medical clinics with lower guideline scores, are essential.

Keywords: Blood pressure, Guidelines utilization, Hypertension, Non-communicable diseases, Primary healthcare facilities,