EFFECTIVENESS OF UTILIZATION OF COMMUNITY HEALTH VOLUNTEERS IN THE IDENTIFICATION AND MANAGEMENT OF HYPERTENSION CASES IN KAJIADO COUNTY, KENYA.

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DECLARATION

This research thesis is my original work and has not been presented for a degree in any other University or for any other award.

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DEDICATION

My work is dedicated to my family: My parents (Mr. Francis Kiarie (the late) and Esther Kiarie), my husband Evans Kimathi, my children, and my siblings for making this journey a success.

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This academic journey has been amazing, thanks to the tremendous support and input from many people, even though I cannot mention them all; I am forever thankful.

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ABBREVIATIONS AND ACRONYMS

AMPATH	Academic Model Providing Access to Healthcare
BP	Blood Pressure
CCM	Chronic Care Model
CHA	Community Health Assistant
CHC	Community Health Committee
CHEWs	Community Health Extension Workers
CME	Continuous Medical Education
CHO	Community Health Officer
CHPs	Community Health Promoters
CHU	Community Health Unit
CVD	Cardiovascular Diseases
CHVs	Community Health Volunteers
ECCM	Expanded Chronic Care Model
ECHIS	Electronic Community Health Information System
HTN	Hypertension
KCHS	Kenya Community Health Strategy

KII	Key Informant Interview
KUERC	Kenyatta University Ethics Review Committee
NACOSTI	National Commission for Science, Technology and Innovation
MOH	Ministry of Health
NCDs	Non-communicable Diseases
NGOs	Non-governmental Organizations
NPHWs	Nonphysician health workers
SPSS	Statistical Package for Social Sciences
STEPs	STEPwise approach to Surveillance
USAID	United States Agency for International Development
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Awareness: Comprehension of the existence of something.

Barriers to Health: Factors hindering the provision of best health services. They are specific obstacles and are often external (systemic, structural or resource based.) All barriers can be challenges but not vice-versa.

Care: Identification and management services offered to improve health, including early detection through screening, education on lifestyle modifications, adherence support, and regular monitoring of blood pressure levels.

Challenges: Difficulties CHVs experience in carrying out hypertension care and are mostly operational, individual or context-dependent.

Community Health Volunteers: Nominated community members tasked with linking individuals to health care services and improving community health.

Community Health Unit: A health service delivery composition in a specified geographical locality serving about 5,000 people. It consists of one Community Health Assistant/Officer and 10 CHVs, providing promotive, preventive, and basic curative services.

Community Health Assistant/ Officer: A trained personnel employed by the County Government who links the community with health facilities and performs duties as stated in the Kenya Community Health Policy (2020 – 2030).

Community Dialogue: A public meeting involving community members who share personal stories and experiences, exchange

information and collaboratively come up with solutions to problems in their community.

Community Action Day: Public events aimed at raising awareness and building resilience on community and health development matters, implementing solutions discussed during community dialogues.

Expanded Chronic Care Model: A systematic approach for healthcare teams to lessen the burden of chronic diseases among patients and support people and communities in maintaining good health.

Effectiveness: The capability of an intervention to produce the desired result or beneficial effect.

Facilitator: Factors that promote, enable, or aid health workers in providing primary healthcare, unobtrusively guiding to achieve desired outcomes.

Hypertension: A chronic disease whereby blood vessels have persistently elevated pressure.

Identification: An act of recognizing; in this case recognizing those with symptoms of elevated blood pressure.

Knowledge: Facts, comprehension, information and skills obtained through education or experience, typically assessed to compare community understanding biomedical concepts.

Lifestyle: Way of living, modelled by cultural beliefs, values and influenced by personal socio-economic setup.

Management: Efforts to lower costs for people with chronic diseases and improve their life quality by using integrated care to lessen the effects of a disease.

Morbidity: Sickness; a state of condition in which the body or mind is not functioning as it should.

Mortality: The number of deaths in a population as a result of the health event under investigation i.e. Hypertension.

Palpitations: A short-lived feeling of your heart fluttering, racing, pounding or thumping in your chest. With elevated blood pressure, patients can complain of being more aware of their heart rate in addition to other symptoms.

Practice: The customary or expected habit, procedure or way an activity is carried out.

Premature death: Death occurring earlier than expected, typically between 30 and 69 years.

Risk factor: Characteristics, attributes or exposures that increase the probability of developing a disease.

Utilization: The act of making practical and effective use of available resources, such as using services provided by CHVs to prevent and cure health problems, promote health and well-being, and achieve good health outcomes.

ABSTRACT

Hypertension, despite being a preventable and manageable non-communicable disease, significantly contributes to the overall morbidity and mortality rates. In Kajiado County, Community Health Volunteers (CHVs) offer various healthcare services, but their utilization in hypertension care has not been thoroughly explored nor emphasized. This study aims to assess the sociodemographic profiles, knowledge levels, the challenges, barriers, and facilitators that influence CHVs' effectiveness in hypertension identification and management in Kajiado County. A cross-sectional study with a mixed-methods approach targeting 221 CHVs in Kajiado South Sub- County was conducted. Almost all respondents (99.6%) reported having a role in hypertension identification and management in the community; however, only 34.1% had ever received specific training on hypertension. The results show that CHVs play a major role in screening (32.6%), education (74.1%), and referral (99.6%). More than three-quarters stated that their work was purely voluntary, with all of them recommending a need for a monthly stipend as a motivation and enabler for their work to be effective. Hypertension screening was significantly higher among the middle-aged group (41-50 years*)* (χ^2 8.9, p=0.031, 95% CI). A significant association was found between having received hypertension training and knowledge levels on hypertension (Fisher's exact test*,* p=0.000, 95% CI). Screening was conducted more among those who had been trained on hypertension (χ2= 9.06, p= *0.003*, 95% CI). Multiple logistic regression in our final model found that the odds of identifying hypertension cases in the community was 3.74 times higher among CHVs who knew the symptoms of hypertension as compared to those who lacked this knowledge. CHVs received support from healthcare personnel through training (100% for basic CHV training and 34.1% for hypertension-specific training) and supportive supervision (94.7%). Additionally, CHVs who received supportive supervision (Fisher's exact test, p=0.029) and had automatic digital Blood Pressure machines (Fisher's exact test, p=0.001) were more likely to identify hypertension cases in the community than the rest who lacked this support and essential equipment. The study recommends intensified training of CHVs to improve knowledge on hypertension in the basic module and continuous updates, supportive supervision, and provision of automatic digital blood pressure equipment to empower them and support their activities in hypertension care.

CHAPTER ONE: INTRODUCTION

1.1 Background

Chronic diseases also known as non-communicable diseases (NCDs) are life-altering conditions which require lifetime management. They are estimated to be the cause of 70% of all mortalities in the world, yearly; almost 15 million of these deaths are premature with approximately 85% of these demises happening in low- and middle-income countries (WHO, 2025). Globally, NCDs also account for around 50% of hospital admissions taking a significant toll on health budgets; 25% of NCD deaths are attributed to hypertension (WHO, 2025). In addition, hypertension is also the biggest contributor of cardiovascular disease and the number one cause of morbidity and premature mortality, with the prevalence still higher in low- and middle-income countries (Mills *et al.,* 2020). Common risk factors for all NCDs include alcohol consumption, tobacco exposure, unhealthy diets, and a sedentary lifestyle. All the aforementioned risk factors are modifiable through awareness creation and mass health education. Research in most parts of the world indicates that Community Health Volunteers (CHVs) can play a great part in hypertension prevention, management and blood pressure (BP) control (Islam *et al.,* 2023). CHVs are volunteers who go through some basic training and have the capability to provide preventive, promotive and rehabilitative services.

In Africa, there is insufficient knowledge on hypertension, poor treatment uptake and inadequate control, and therefore a major public health concern as the population continues to increase. The World Hypertension League call for action set three goals to be attained in Africa by 2030: 80% of adults with high blood pressure should be diagnosed; 80% of diagnosed hypertensives, that is, 64% of all hypertensives, are treated;

and 80% of treated hypertensive patients have their blood pressure controlled (Parati et al., 2022). Prevention, prompt identification, management and follow up are vital elements in curbing hypertension. Reliance on CHVs for more essential health services has been on an upward trend, more so in resource-limited areas (Woldie *et al.,* 2018). CHVs responsibilities are well known in the fields of sanitation, mother and child, communicable diseases such as Malaria, HIV and Tuberculosis. However, not much is known in regards to their role in hypertension and other non-communicable diseases; they may act as health educators, advisors, support group facilitators and rehabilitators. At the grassroot level, they also identify and link patients to the facility and help them in navigating the formal system. These varied roles are mostly in response to the individual community needs and are shaped by the health system expectations (Lakin & Kane 2022). Evidence portrays a positive impact where CHVs have been incorporated into hypertension programs (Safary *et al.,* 2021).

Kenya is also undergoing an epidemiological transition, characterized by a reduction in illness and fatality caused by communicable diseases, coupled with an increase in NCDs. As the years progress, NCDs have become a major cause of death in Kenya, with an 18% probability of dying at a young age (MOH, 2019). NCDs, including hypertension, account for 27% of mortalities among Kenyans between the ages of 30 and 70 years. This situation reduces productivity, hinders economic growth, and traps the poorest individuals in a vicious cycle of poverty. A survey conducted in Kenya on hypertension revealed that the prevalence is alarmingly high, with low awareness levels, inadequate treatment, and poor control (Mohamed et al., 2018). Significantly, over half of adults (56%) have never checked their blood pressure, yet about 1 in every 4 Kenyans has elevated blood pressure,

with only about a quarter receiving treatment. Moreover, more than 90% of those diagnosed with hypertension have yet to achieve disease control (WHO, 2022). This poor blood pressure control can be attributed to both patient-related factors and health system factors. Patient-related factors include lack of time, poor drug adherence due to side effects, low education levels, competing priorities, and a lack of health-seeking behavior, as patients may deny their illness due to the disease's asymptomatic nature (Mbau et al., 2022). Health system-related factors include long distances to clinics, inadequate counseling, high medication costs or lack of medication, use of counterfeit medication, and ineffective treatment approaches that focus on a single drug while neglecting lifestyle changes. In the Kenyan context, all these factors can be addressed by Community Health Volunteers (CHVs) who provide services at the community level (level 1 of care) and facilitate linkage to the health system. Therefore, it is recommended that the health system develop various methods to promote disease prevention through risk factor control; because even though it is not immediate, prevention is far more cost-effective than curative care (Wouterse et al., 2025).

1.2 Problem statement

Despite hypertension having a genetic susceptibility, it is greatly linked to lifestyle factors that can be modified. The greatest returns in curbing the hypertension epidemic start with prevention, early diagnosis and the correct multifaceted management (Dzudie *et al.*, 2017); (Steven *et al.*, 2013). In Kenya, almost a quarter of adult population (24.5%) have high BP with unawareness as the major hindrance to attaining acceptable control rates. This lack of awareness on the disease, lack of treatment and inadequate control in the diagnosed remains a big challenge (Ogola *et al.*, 2019). A possible contributing factor

would be the high cost of health services, which has always been a huge deterrent in the Africa with the major source of payment for health care costs being out-of-pocket expenditure. Another common cause is poor treatment adherence and poor patient follow-up; an estimated 43% to 65.5% of patients who do not adhere to stipulated chronic treatment medication are hypertensive patients (Abegaz *et al.,* 2017). This rising burden is partly because of lack of awareness and inadequate access to preventive services. Many hypertensive patients face barriers to early diagnosis due to inadequate community-level engagement and limited preventive services a gap that CHVs can seamlessly occupy. A 'bottom-up approach' of involving communities in making decisions about their health choices and resulting in a behaviour change and ultimately an incremental change towards NCDs reduction is an unexplored area in health promotion programmes in Kenya. Home visits by CHVs reduce the number of trips made by the patients to the hospital reducing the cost while educating and screening the people at the community (Mwiti, B. 2020).

A study in Kajiado County found that the crude prevalence of hypertension was 72.7% (80.6% among men and 63.8% among women). In addition, the age-standardized hypertension prevalence was a little bit higher (26.2%) than the average prevalence of hypertension in the country, Kenya, which is at 24.5% (Ongosi *et al.,* 2020). Kajiado County, characterized by its rural and nomadic population and health service access challenges, presents a critical opportunity to explore community-based strategies for hypertension detection and the potential for findings that inform health policy and practice in similar settings across Kenya (Brown T.A. 2015). Despite CHVs being integrated into the health system, their potential in hypertension care remains underutilized and underexplored.

CHVs have for a long time been the community linkage to the formal health system offering varied services; their involvement in hypertension care has, however, not been accentuated. Aligned to the Ministry of Health's attempts to halt and regulate the increase of NCDs by educating the public on risk factors and advocating for adoption of healthy lifestyles; this study explores the utilization of CHVs in hypertension identification and management in Kajiado County.

1.3 Justification

The 2015 STEPwise approach to Surveillance (STEPs) survey showed that about 25% of Kenyans have hypertension. Among those who were previously diagnosed and receiving treatment, only 4% had attained control. Furthermore, only 1 in 6 people reported they had been diagnosed in the year before the survey. Notably, only 12% of individuals with high blood pressure were on treatment, with effective coverage at just 3.8%. Disturbingly, even with such a high prevalence of elevated blood pressure (72.7%), a significant proportion (46.7%) has never checked their blood pressure; and only 34.7% were aware of their elevated blood pressure. This highlights a substantial gap in screening and treatment (Ongosi *et al.,* 2020). Likewise, the national Stepwise survey revealed the same trend whereby 56% of the population had never had a blood pressure check session. Some studies in western and central Kenya suggested CHV-led home BP monitoring, linkage to care and lifestyle interventions as a way to address the emerging burden of hypertension, however, there lacks an uptake of evidence-based community-based CHVs interventions in Hypertension care in the Kenyan settings (Mbuthia *et al.,* 2024).

Research indicates that our focus should be on sensitization, proper linkage to care, and redesigning the healthcare system to increase follow-up to achieve effective population

control. The Kenya National Strategy for the Prevention and Control of NCDs 2015-2020 objectives 3, 5, 6 and 10 were focused on incorporating CHVs in disease prevention, health promotion, and measures to reduce disease burden (MOH,2015). This is emphasized in pillar 2, 3 and 4 of the Kenya-Non-Communicable-Disease-NCDs-Strategic-Plan-2021-2025 (MOH, 2021). The objective of this study was to determine the utilization of CHVs in hypertension identification and management; to examine barriers, challenges and facilitators for their activities. This will enlighten us on the current CHVs' practices in hypertension and help us to enhance pre-existing structures and adopt working mechanisms to prevent the catastrophe that is most certain to occur with the increasing hypertension-related morbidity and mortality.

1.4 Research Questions

The following research questions guided the study:

i. What are the socio-demographic characteristics of CHVs in Kajiado County?
ii. What is the CHVs' level of knowledge on Hypertension identification and management in Kajiado County?
iii. What are the barriers and challenges to hypertension identification and management by CHVs in Kajiado County?
iv. What are the facilitators of hypertension identification and management by CHVs in Kajiado County?

1.5 Study Hypotheses

i. H_0 There is no relationship between Community Health Volunteers' socio-demographic characteristics and their utilization in hypertension identification and management in the community

ii. H_0 There is no relationship between Community Health Volunteers' knowledge and their utilization in hypertension identification and management in the community

iii. H_0 Barriers and challenges do not influence Community Health Volunteers' utilization in hypertension identification and management in the community

iv. H_0 Facilitators do not influence Community Health Volunteers' utilization in hypertension identification and management in the community

1.6 Study Objectives

1.6.1. Broad objective

The broad objective of this study was:

To determine the utilization of Community Health Volunteers in hypertension identification and management in Kajiado County.

1.6.2. Specific objectives

The specific objectives of the study were:

i. To determine the socio-demographic characteristics of CHVs involved in hypertension identification and management in Kajiado County.

ii. To assess the CHVs’ level of knowledge in Hypertension identification and management in Kajiado County.

iii. To identify the barriers and challenges to hypertension identification and management by CHVs in Kajiado County.

iv. To identify the facilitators of hypertension identification and management by CHVs in Kajiado County.

1.7 Significance of the study

These study findings provided valuable insights to the county and national government, NGOs, and other key stakeholders regarding policies guiding CHVs' scope of practice and their role in hypertension care. The findings also highlighted the importance of involving CHVs and recognizing their contributions to identifying and managing hypertension cases. Additionally, the study created an opportunity for CHVs to share feedback on effective strategies and areas requiring improvement to enhance their efficiency and effectiveness. It further identified areas of success and gaps needing support to reduce hypertension-related morbidity and mortality.

1.8 Limitation & Delimitation

1.8.2 Limitations

This study faced several limitations that may affect the interpretation and generalizability of the findings. First, limited baseline data was available on the utilization of CHVs in hypertension identification and management in Kajiado County, making it difficult to conduct comparisons or assess trends. Secondly, the study relied on self-reported data from CHVs, which introduces the possibility of recall bias or social desirability bias, where respondents may have overreported their involvement in hypertension identification and management.

Furthermore, not every health facility had an active community unit, and only a few facilities with active community units were included in the study. Due to resource and logistical constraints, the study was conducted in only one subcounty—Kajiado South—despite Kajiado County having five sub-counties. While this may limit the generalizability of the findings to the entire county, Kajiado South shares important characteristics with other parts of the county, offering useful insights into the role of CHVs in hypertension identification and management.

These limitations were mitigated through the use of a mixed-methods approach, which allowed for triangulation of data through key informant interviews with supervisors, thereby enhancing the depth, validity, and reliability of these findings.

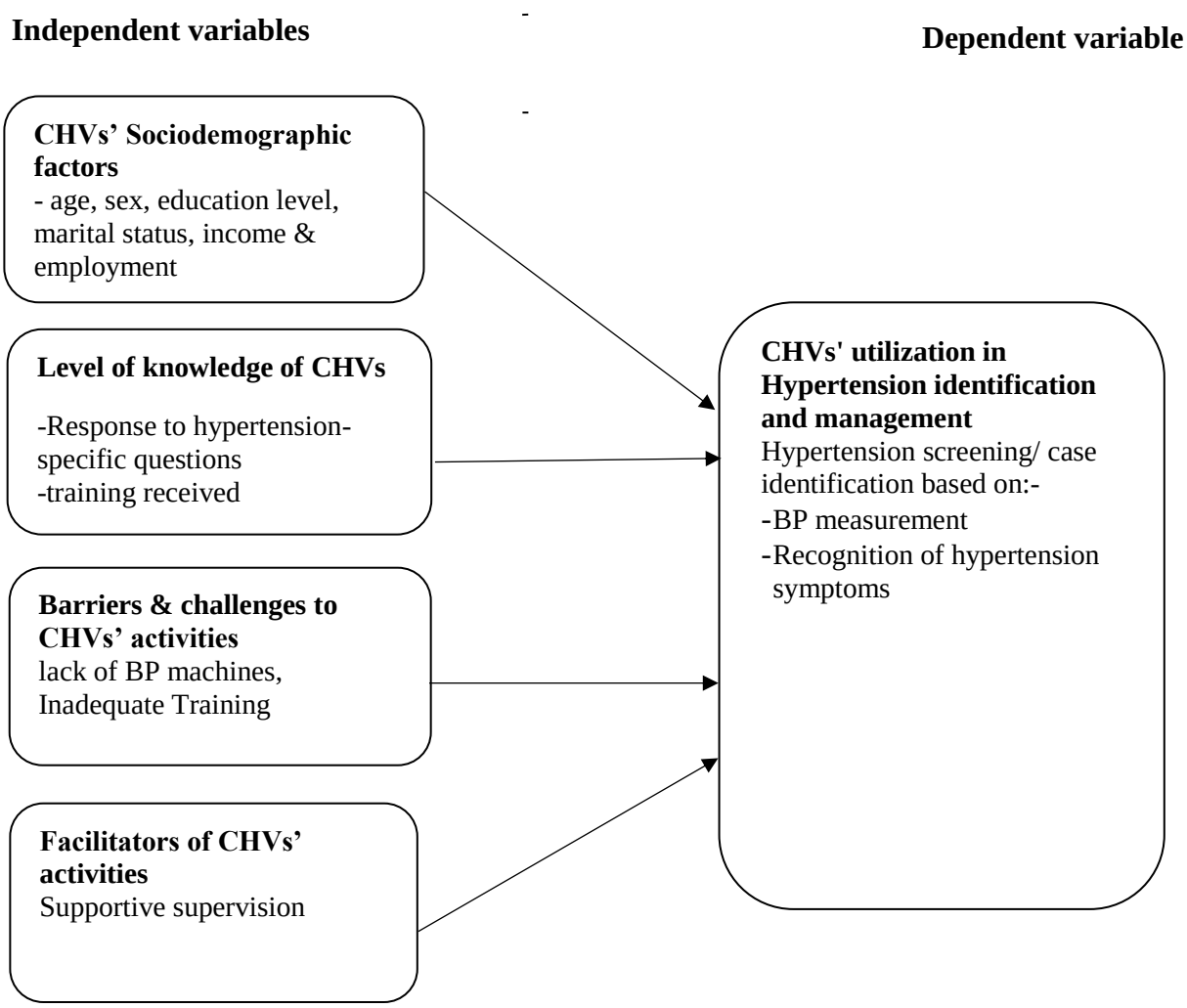
1.8.2 Delimitation

The study deliberately set specific boundaries to maintain a focused and manageable research scope. It targeted CHVs who were active in the six months preceding the study, defined as those participating in activities at their linked health facilities and submitting required reports. This ensured the inclusion of CHVs with recent, relevant community engagement.

Additionally, the study was confined to Kajiado South sub-county. This sub-county was purposively selected based on its active community health strategy implementation, presence of trained CHVs, and accessibility for data collection. While the broader aim was to examine CHV utilization across Kajiado County, practical considerations necessitated narrowing the focus to a single, representative sub-county.

As such, the findings are most applicable to similar settings—those with functional community units and comparable health system structures—and may not be generalizable to the entire county. However, they provide a valuable foundation for further research and offer policy-relevant insights into strengthening CHV-based hypertension identification and management.

1.9 Conceptual framework



Source: Adopted from the Expanded CCM (Barr *et al*, 2003).

Figure 1.1: Conceptual framework on Utilization of CHVs in Hypertension identification and management

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section delves into other similar studies worldwide and in Kenya. This review provided facts in regards to Community Health Volunteers' utilization in hypertension identification and management, which contributed tremendously to my comprehension of this topic, the key concepts, and to identifying the existing gaps as per my study objectives.

2.2 Overview of Community Health Volunteers' utilization in Hypertension identification and management globally

The Expanded Chronic Care Model (ECCM) builds on the Chronic Care Model by empowering the community to address health determinants and integrating population health promotion. It helps in managing chronic diseases by incorporating disease prevention, health promotion and care. It includes a pervious border representing the exchange of ideas and resources between the formal health system and the community (Barr *et al*, 2003). CHVs efficiently occupy this pervious border between their community and health facilities and would aid in hypertension identification and management as described in this model. By using CHVs in community-based screening programs, we encourage community involvement which also eases the burden on the primary doctors. This also enables us to include the marginalized individuals who are most neglected from health services, helps in early detection, and prevents disease complications (Rajaa *et al.,* 2022).

Studies indicate that nonphysician health workers (NPHWs) can enhance hypertension identification and blood pressure regulation. Community Health Volunteers (CHVs) particularly, have been shown to positively influence the community when incorporated

into hypertension programs in Africa, although their exact impact on linkage to hypertension care is mostly undetermined (Vedanthan. *et al.,* 2019).

Community health volunteers (CHVs) are community members who go through very basic training, unlike formal healthcare workers, but are known and supported by the health system to offer services at the community thereby bridging the gap between the community and the formal health system (Karuga *et al.,* 2023). Being at the grassroot level, they also fall within a task-shift action plan that addresses the increasing health workers shortage due to the evidence on their effectiveness in healthcare (Karinja, 2021).

A notable number of hypertensive individuals are unaware of their condition and, among the diagnosed, treatment is often inadequate. It is therefore recommended that intervention measures be implemented at a population level to improve awareness, prevention, early diagnosis and control of hypertension in the community (Alexander *et al.*, 2019). There has been great interest in using CHVs as a measure to improve health altogether, which acknowledges the influence of peer relations in individual and community health decisions, more so in chronic diseases such as hypertension. They are therefore potential enablers to effective management of hypertension because they are the community's role models and act as a catalyst by offering their support (Karuga *et al.,* 2023; Rachlis *et al.,* 2016). They are strategically stationed to make health messages comprehensible to the community and rid off cultural and social barriers.

Usually, CHVs provide health messages, system navigation, self-care support, home visits, follow-up and social support. They also perform managerial and communication tasks such as scheduling hospital check-ups and setting reminders, interpretation,

outreaches, translation, and cultural mediation. According to the listed tasks, it is apparent that most communities are yet to tap into the gains that can be reaped from utilizing CHVs in hypertension management. However, according to (Safary *et al.,* 2021) CHVs' tasks are often blurry and non-specific as they overlap with other health professionals' roles. Over the years, their responsibilities have advanced mainly from prevention and health promotion only to include additional roles such as screening, monitoring, and patient referral.

The most common services provided by the CHVs in hypertension care are lifestyle counselling, cardiovascular risk screening, blood pressure checks and referring those with suggestive symptoms for further management. They have a fundamental responsibility at the grassroot level to monitor health as they share similar challenges and experiences as they are part of the communities. Management of hypertension encompasses both the use of medication and lifestyle changes. The functions of CHVs in hypertension include health education on the risks, symptoms of hypertension, measuring and monitoring blood pressure, referral and linkage to care, follow up and offering social support to the ill and their households (Vedanthan *et al.,*2019). CHV interventions have shown marked improvements in BP control (significant decrease in the blood pressure) and self-management behaviors, including adhering to appointments and antihypertensive treatment (Ursua *et al.,* 2018).

2.3 Community Health Volunteers' utilization in hypertension identification and management in Kenya

The Kenyan government instigated the Community Health Strategy (CHS) in 2006 as a way to broaden accessibility to health services This strategy is centered around the

Community Health Unit (CHU), or level one of Kenya's health system, which covers approximately 5,000 people (or about 1,000 households). Health services are delivered through a network that includes Community Health Committees (CHCs), Community Health Extension Workers (CHEWs), now known as Community Health Assistants (CHAs) and Community Health Officers (CHOs), and Community Health Volunteers (CHVs) - currently known as Community Health Promoters or CHPs). CHVs are the key implementers of the CHS at the household level, performing tasks that fall into three main categorization: family health services, prevention and control of diseases, and hygiene and environmental sanitation (KCHS, 2021). Estimates from a national survey in Kenya show that hypertension prevalence is rather high, unawareness, low treatment levels and poor control giving the impression that we should embrace preventive initiatives and early management (Shukri *et al.,* 2018). Although there is not much data on CHVs and hypertension care in Kenya, CHVs are with no doubt in a strategic position whereby they can promote preventive measures, screen and refer clients as they encourage healthy lifestyle and adherence to treatment and clinics.

The government in Kenya recognizes CHVs as part-time volunteers and expects them to conduct 20 and 100 monthly household visits within a designated catchment area in rural and urban areas, respectively. The CHVs gather fundamental health data and identify patients who require linkage and refer the individuals to the link health facility during these routine visits (MOH, 2013). The Kenyan CHV manual states 14 other responsibilities, such as organizing “community dialogue days” whereby data from routine checks is used to devise participatory solutions that can improve the well-being of

the community, promoting good practices and “community action days” where they illustrate the same (Aseyo, *et al*., 2018).

According to the Kenya Gazette (2023), the Kenya government introduced Community Health Promoters (CHPs) under the Primary Health Act, 2023. A CHP must be a Kenyan citizen, above the 18 years and of sound mind; a respected and responsible community member; a resident of the respective community for a minimum continuous duration of five years; literate and can read and write in at least one of the national languages and the local language. They are chosen by the community through a public participation forum and appointed by the county government.

The CHPs will be implementing the Community Health Strategy which focuses more on preventive and promotive healthcare, rather than curative care. Hypertension screening is both preventive and promotive and would ensure a healthy community, early diagnosis, and good prognosis. They will offer advice on prevention and management of chronic diseases, enroll, monitor and collect data on the health status of members of the households assigned to them (Kenya Gazette, 2023).

2.4 Socio-demographic characteristics of Community Health Volunteers

The average age of CHV in a study conducted in Asia is between 25 and 34 years with males somewhat more than females. The majority are married, able to read and write. Most of the them had no prior working experience concerning health before and had been volunteers for more than 2 years. They worked as agriculturists and small-scale business owners(Aung *et al.,* 2018).

In contrast, the vast majority (96%) of CHVs in a study in South Africa were female, with an average age of 35 years, with a little secondary education and working for 4 years or more. (Tsolekile *et al.,* 2018). Similar to a study in Nepal where they have only female CHVs with a median age of 41.3 years, who can all read and write and 45% of them have at least primary level education (Tan *et al.,* 2020). According to a recent report (WHO 2024), CHWs generally earn meagre incomes and in Sub-Saharan Africa, less than 15% of them receive any money at all for their work.

Study findings from western Kenya disclosed that CHVs are predominantly female. There was a higher probability of CHVs being married, followed closely by those who were single; divorced and widowed were the lesser proportion. Strikingly, the middle age females, those with some level of formal education and trained CHVs had better performance than their counterparts. (Njororai *et al.,* 2021). Another study in Kenya showed that all CHVs were literate offering services on volunteer basis but getting 2000 Kenyan Shillings per month as stipend and received training for home-based HIV testing and blood-pressure taking with certificates by AMPATH for a specific project (Rachlis *et al.,* 2016). Over the years, not much has changed and many CHWs in Kenya generally earn between 2,000 to 5,000 Kenyan shillings a month, equivalent to $15 to $35 (Shah & Mensing, 2025).

2.5 Level of knowledge and training of Community Health Volunteers on hypertension identification and management.

CHVs are chosen from the community by their community and are accountable to them. In Kenya, the CHVs training course, has 2 sections that consist of 13 modules. Basic training (6 modules) is the first course and takes 10 days to qualify one as a CHV. It covers

the fundamentals such as communication & counselling skills, leadership, lifesaving skills and basic health promotion practices. The Technical Modules is the second course and it covers specific, detailed aspects based on the local community needs. Each technical module can take 2 to 5 days depending on the content (MOH, 2013). Low levels of numeracy and literacy among CHVs, have been stated among the barriers to successful use of CHVs that could potentially be addressed by using technology to complement their training (Khetan *et al.,* 2017). Counties in Kenya such as Meru have considered scaling up digital tools throughout their health programs and over 90% of CHVs were reported to prefer transitioning from current paper forms to digital reporting, however fewer than half had access to smartphones (Lusava *et al.,* 2021). According to Ogutu *et al.* (2023), support and training is essential for persons tasked in modifying other people's health-related behaviors to convince them to adopt healthy behaviors. The existing training and supervision structure is not adequate to make sure CHVs have the required skills to influence behaviors at the household and community level. There was no consistency and uniformity in training topics, content, approaches, and duration. Refresher training in enhancing the knowledge and skills was rarely offered even though it is important.

According to a systemic review on CHVs involvement in hypertension by (Mbuthia *et al.,* 2022); CHVs' training included, home visits, fundamentals of hypertension and risk factors assessments including BP measurement techniques, monitoring and anthropometric measurements, tailored health talks on risks and behaviour change communication strategies, the referral process and survey methods. A study conducted on CHVs skills and training indicate that they are not adequately trained suggesting that training should include hypertension grading, assisting patients to devise self-care plans

and patient linkage to suitable health services (Rahmawati & Bajorek, 2015). Training is very crucial to enable CHVs share accurate and updated information on hypertension screening and management. Research done in Western Kenya implies that CHVs should get comprehensive training to make sure they share relevant and correct information; complete their tasks effectively doing so with the utmost confidentiality (Rachlis *et al.,* 2016).

Community-based health literacy initiatives are very crucial in preventing and managing hypertension to improve understanding of the symptoms and help people seek health care in a timely fashion. Such programs should involve CHVs and take into consideration their education and literacy level to be accommodative to all; this would help reduce the hypertension risk and related complications at the grassroot level (Rawal *et al.,* 2022).

2.6 Barriers and challenges to Community Health Volunteers' activities in hypertension identification and management

The value of CHVs' involvement is well evidenced, and the only concern is that CHVs' services are not as effective as they should be. Therefore, it is most certainly not a matter of whether CHVs are beneficial in improving health, but rather how this potential can be embraced and optimized. CHVs can effectively deliver a range of preventive, promotive, and curative health services that increase access to care, ultimately reducing morbidity and mortality (Ballard *et al.,* 2021).

The underserved populations have barriers to health, including misconceptions, unenlightened traditional health myths, varied values, limited access to culturally accepted screening and treatment, lack of self-management skills when ill, and little access to

necessary health-related resources (e.g. recommended diet, practices including physical activity opportunities) (USAID, 2015). This becomes challenging as CHVs strive to demystify myths and offer these essential services. CHVs face barriers such as lack of supplies and resources, inadequate training, lack of support and motivation as a result of the voluntary nature of this role and being at periphery of the formal health sector. Lack of resources for example, BP machines, constrains their bigger role in continuous blood pressure monitoring. CHVs can create awareness, encourage behavior change to adopt healthy living and positive health-seeking behaviors (Robusto et al., 2025). Studies highlight that lack of regular pay contributes to high attrition, conflicts with CHVs' economic survival needs, and limits motivation. CHVs in Kenya value remuneration and incentives, including non-financial supports such as transport and tools of trade (Abuya, *et.al* 2021).

Despite training on technical modules including NCDs to bridge the knowledge gap, the households do not receive the correct health information and advice if the CHVs are not trained appropriately (Gatimu *et al.,*2020). There are some knowledge gaps on hypertension and the CHVs lacked a standard protocol on conducting health education in the community. They also lacked a well-defined follow-up system for referral and linkage of patients and getting feedback after they have gone to the facility for further checkup (Safary *et al.,* 2021). Barriers reported by interviewees in the Communities for Hearts (CH2) program were lack of financial incentives, heavy workloads, ineffective patient linkage systems, and the pending incorporation of the digital patient management registry (Hoang *et al.*, 2020). A situational analysis done in Kenya following the adoption of the Community Health Strategy (CHS) noted a lack of funding for community health and

huge cross-county discrepancies in distribution and coverage of the community health workforce (KCHS, 2021).

CHVs in Kenya are usually well accepted in their communities however, resistance may occur during home visits more so when the households presume that they will not benefit in anyway (Rachlis *et al.,* 2016).

2.7 Facilitators of Community Health Volunteers' activities in hypertension identification and management.

CHVs are often cited as a solution to the health professional's shortage and lack of worldwide access to health services in low-income settings. They are featured remarkably in the WHO's Workforce 2030 strategy for Human Resources for Health. They stand out in comparison to other potential healthcare providers: being from the community in which they serve instigates trust, more so when the community participates in their selection. Home visits then alleviate the need for lengthy, challenging and/or costly trips to health facilities. Accumulating evidence shows that CHVs can offer health interventions effectively, such as, encourage screening and treatment uptake (Taylor *et al.,* 2017).

The Kenya Community Health Strategy 2020 – 2025 (KCHS 2020 – 2025) was founded on the learnings gained from implementing the Community Health Strategy 2014 – 2019. Devising incentive packages tailored to the needs of CHVs, is essential to improving their performance and also the community health outcomes. A combined incentive of both monetary and non-financial benefits (work recognition, transport, identification materials, low workload, reporting and job aid tools), is important to create a conducive work environment for CHVs (Abuya, *et.al* 2021).

A study in Vietnam conducted after the implementation of the Communities for Healthy Hearts Program found that overall, the diverse communication strategies- such as mobile messages and embracing technology, training sessions and robust support by key stakeholders were major facilitators of the program (Hoang., *et al.,* 2020). The program not only increased the knowledge of residents but also accessibility of the difficult-to-reach people hence early identification of hypertension and initiation of care; they were however concerned about the program's sustainability in the long run and the potential for scale-up.

2.8 Summary of Literature review

Hypertension, being a chronic illness is resource-intensive as it requires a change in lifestyle, treatment and regular check-ups. This can take a toll on the patient and family and hence the need for a support system. Good prognosis and quality of life is based on early diagnosis and proper management of hypertension. Early diagnosis is possible with knowledge on the symptoms and frequent screening. CHVs demystify the health system, and successfully promote linkage and service uptake in the community, even among those who are skeptical or reluctant. They save on cost and improve accessibility to care by conducting home visits, which are essentially a support system. Literature review has shown that CHVs are indeed beneficial in healthcare in numerous ways but their utilization in hypertension has not been explored especially in Kajiado county and Kenya as whole. CHVs generally have been shown to have insufficient knowledge and lack resources (such as BP machines, reporting tools, incentives, financial support) to effectively contribute in hypertension identification and management. It is also paramount

to provide avenues to receive feedback from CHVs on the support they require to ensure the success of these interventions.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter looks into the study methodology used. It entails the study design, variables, area, target population, sampling procedure, data collection, analysis and ethical considerations.

3.2 Study design

The study design was cross-sectional with a mixed-methods approach. It was carried out by interviewing the CHVs on their tasks in hypertension care. Researcher-administered questionnaires were used which minimized the non-response rate and increased uniformity in the responses. A Key Informant guide was used to collect information from key health care workers. Additional data was gathered from the health records in the hypertension clinics and the outpatient department.

3.3 Study variables

3.3.1 Independent variables

Independent variables were founded on the study objectives; the sociodemographic factors, CHVs' knowledge level, Barriers and facilitators of CHVs' activities in hypertension care.

Sociodemographic factors such as the age, sex, level of education, marital status, income & employment. The level of knowledge was assessed through a set of questions on the initial training, Basic Module for CHVs, and Hypertension specific training, their understanding of the risk factors, symptoms and management of hypertension.

Facilitators and barriers were explored through a series of questions on the hypertension-specific activities they carried out, support needed or provided and challenges faced in carrying out these activities.

3.3.2 Dependent variable

The dependent variable was: Community Health Volunteers' utilization in hypertension identification and management. The success of CHVs' work in hypertension is derived from their ability to screen and monitor patients. This was assessed through assessment of CHVs activities in hypertension case identifications by BP measurement and recognition of hypertension symptoms derived from their roles as stated in the Kenya Community Health Strategy.

3.4 Study location

Kajiado County is classified among the semi-arid and arid counties in the Rift Valley region in Kenya and has 5 sub-counties. Kajiado South/ Loitokitok Sub County is situated between longitudes 36º 5' and 37º5' east and between latitudes 1º0' and 3 º0' south. It borders Kajiado Central to the North West, Taita Taveta to the South East, Kibwezi on the East side, and the Republic of Tanzania to the West. Kajiado South Subcounty has five wards; Kimana, Entonet, Kuku, Rombo and Imbirikani/Eselenkei (Appendix I). Loitoktok sub-county Hospital is the referral center and serves the government health centers and dispensaries, private and mission health facilities and also NGOs. The CHVs in the area are volunteers under the government. A few of them are supported by NGOs such as Kenya Red Cross, Dandelion Africa, Operation Blessing Kenya, Shokut Nairetoi, Big Life Foundation and AMREF. In addition, there are, clinical officers, nurses, CHOs

and CHAs who support CHVs in their day-to-day activities, including administration, reporting and supervision.

3.5 Study population

Our target population was all the active CHVs (those who had taken part in assigned community work and submitted necessary reports in the past 6 months) in a community unit that was attached to a link facility in the five wards.

3.6 Inclusion criteria

The study included all study participants aged 18 years, who had been actively engaged in community health activities in the six months preceding the study, linked to an operational Community Unit that was attached to a link facility and had willingly signed an informed consent form to participate.

3.7 Exclusion criteria

CHVs who had been newly recruited (less than 6 months) or on extended leave (the past six months), CHVs who had not been actively participating in community activities and submitting routine monthly reports to the link facility or declined to provide informed consent were excluded from the study.

3.8 Sampling technique

Multi-stage sampling was applied to sample the primary study respondents. Kajiado South Sub- County was purposively selected due to its relatively high number of active Community Units (CUs), well-established community health structures, and ongoing non-communicable disease (NCD) interventions—making it a suitable setting for examining CHV utilization in hypertension identification and management. All five wards in Kajiado

South Sub- County—Kuku, Kimana, Imbirikani/Eselenkei, Entonet/Lenkisim, and Rombo—were included in the study. In the second stage, link facilities were purposively sampled based on the presence of active Community Units. A total of 15 CUs were included, spanning 1 sub-county hospital, 7 health centers, and 5 dispensaries (Table 3.1). Systematic random sampling was applied to select CHVs, with every 2nd active CHV included in the study. This interval was determined by dividing the total number of CHVs in Kajiado South, 441 (DHMIS 2019) by the desired sample size of 226.

Table 1.1 Sampling Frame

SUB-COUNTY	WARD	LINK FACILITY	FACILITY LEVEL	LINK CU	CHVs RECRUITED
Kajiado sub-county	Kuku	Loitoktok sub-county	4	Ololopon CU	26
		Nkama dispensary	2	Nkama CU	15
	Kimana	Kimana Health Center	3	Elerai CU	16
				Enkii CU	12
		Namelok Health Center	3	Namelok CU	21
		Enkariak Ronkena Dispensary	2	Enkariak Ronkena CU	16
	Imbirikani/ Eselenkei	Isinet Health Center	3	Isinet CU	13
		Imbirikani Dispensary	2	Imbirikani CU	15
	Entonet / Lenkism	Immurtot Health Center	3	Entonet CU	8
				Immurtot CU	6
		Olgulului Health Center	3	Olgulului CU	11
		Olchorro Dispensary	2	Olchorro CU	16
	Rombo	Entarara Health Center	3	Entarara CU	20
		Rombo Health Centre	3	Rombo CU	18
		Illasit Health Center	3	Illasit CU	13
TOTAL					**226**

Purposive sampling was also used to select Key Informant Interview (KII) participants, including healthcare workers involved in community health. These comprised the Sub-county MOH representative, Community Health Strategy Coordinator, CHOs/CHAs, facility in-charges, and two representatives from NGOs working with CHVs in the area.

3.9 Sample size determination

The sample size was calculated using Fisher's Formula for Sample Size determination for populations not exceeding 10,000 as interpreted by Mugenda,O and Mugenda,A, 2003 as shown below:-

$$\frac{n = Z^2pq}{d^2}$$

Where; n = desired sample

Z = Standard normal deviate at 1.96 for 95% confidence level

p = the proportion of the CHVs used in hypertension care

q = the proportion of the CHVs not used in hypertension care

d = the level of statistical significance set at (0.05)

$$= \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = \frac{0.9604}{0.0025} = 384.16$$

The calculated sample size was 384. However, because the target population was less than 10,000 that is 441 CHVs (DHMIS, 2019) the formula below was adjusted as below:

$$nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where,

nf= desired sample size (when the population is < 10,000).

n = the desired sample size (when the population is > 10,000)

N = the estimated population target.

1 = a constant

$$nf = \frac{384}{1 + \left(\frac{384}{441}\right)}$$

$$nf = \frac{384}{1.8707} = 205.27 = 205$$

An additional 10% was added to cater for the non-response rate.

The desired sample size is 226 CHVs.

3.10 Data collection instruments

The study included both quantitative methods (researcher administered questionnaires) and qualitative methods (Key Informant interviews- KII guide) of data collection.

Structured Interview questionnaire (Appendix III): This was a researcher administered tool for quantitative data collection from the 226 CHVs. The questionnaire covered sections on demography, knowledge, role, activities carried out by CHVs, enablers and challenges in conducting these activities.

Sociodemographic: There were 8 questions that captured age, gender, education levels, marital status, religion, employment, years of work experience and remuneration as a CHV.

Knowledge on hypertension: There were 11 questions in this section with 30 entries that entailed training on hypertension, source of information on the disease, risk factors, causes, symptoms of hypertension, their role and identification of hypertension cases. A correct response was scored 1 and a wrong response was scored 0. The total score was from 0-16 points, categorized into three as shown below using Bloom's cut off point:

Good/ high level knowledge/ (80-100%)

Moderate level (60-80%)

Low levels/ poor knowledge (Less than 59%)

Barriers and facilitators of CHVs in Hypertension: The questions in this section delved into the CHVs activities in hypertension as per the Kenya Community Health Policy 2020–2025 (and include sensitization, educating, screening, referral/ linkage to care, follow up and defaulter tracing), support received and challenges faced in carrying out their activities.

Key Informant Guide (Appendix IV): This guide was used to gather information from medical personnel who work closely with CHVs. A total of 11 health care workers including the Ministry of Health- Subcounty officer, the Community Health Strategy Co-ordinator,1 Community Health officers, 2 Community Health Assistants, 4 facility in charges and 2 representatives from NGOs working with Community Health Volunteers in

the area were interviewed. It captured questions on their interaction with CHVs and activities carried out in hypertension care by CHVs.

3.11 Pre-testing

The data collection instruments were pretested by administering to 23 participants at Mashuru Community Unit which has similar characteristics to the study area. The pre-test study helped to establish clarity and accuracy of questions and capture the length of the interview. This was also a training opportunity for the research assistants. The data collection instruments were amended where necessary as per the objectives of the study.

3.12 Validity and Reliability

3.12.1 Validity

Content and construct validity were attained by pretesting the data collection tools at Mashuru Community Unit to determine whether the questions comprehensively cover the research objectives and through professional review of the tools by supervisors from Kenyatta University to ensure the questions aligned to the conceptual framework and study objectives.

3.12.2 Reliability

Data collection was done by research assistants with a community health background who were familiar with study area and understood the local dialect to minimize bias and increase the interrater reliability. Training on interview basics and subject matter of the study was also done before study execution to ensure consistency. The pretest feedback was also incorporated into the final study tools to improve their consistency and dependability.

3.13 Data collection technique

Structured researcher administered questionnaires were used to gather information from CHVs over a four weeks period. A Key informant guide was used to interview key resource personnel who worked with Community Health Volunteers. This included Ministry of Health sub-county officials, Community Health strategy coordinator, Community Health Officers, Community Health Assistants, Public Health Officers and Facility incharges.

3.14 Logistical and ethical considerations

The approval to conduct the study was sought from the Kenyatta University graduate school and the ethics approval from the Kenyatta University Ethics Review Committee. Research license to conduct the study was obtained from the National Commission for Science, Technology and Innovation, NACOSTI. Authorization to execute this study was obtained from Kajiado county Office of Public Health and MOH- Kajiado South Sub-county. The participants voluntarily signed the informed consent to take part in the study. Data was coded to ensure the respondents remained anonymous.

3.15 Data analysis

All the questionnaires collected were reviewed to check for completeness.

3.16 Quantitative data

The collected data was coded and entered in the Microsoft Excel 2010. Statistical analysis was performed using the Statistical Package for Social Sciences software (SPSS version 23). Descriptive statistics were computed to generate frequencies. Pearson Chi-square and

multivariate logistical regression was applied to get the association between categorical variables.

3.17 Qualitative data

Qualitative data collected to support quantitative data was transcribed, and analyzed using content thematic analysis then presented in the narrative.

CHAPTER FOUR: RESULTS

4.1 Introduction

To achieve the study objective, 226 Community Health Volunteers were recruited, 1 declined to participate and was replaced bringing the response rate to 100%. Data was collected from all the respondents and analyzed. We had 11 health care workers who were the key informants and comprised of the Ministry of Health- Subcounty officer, the Community Health Strategy Co-ordinator,1 Community Health officers, 2 Community Health Assistants, 4 facility in charges and 2 representatives from NGOs working with Community Health Volunteers in the area. This chapter summarizes the study findings from the responses gathered in the field.

4.2 Socio-demographic characteristics of the study respondents

The total number of respondents was 226, and out of these, 154(68.1%) were female while 72(31.9%) were male. The majority 75(33.2%) were middle age (41-50years); 79.2% of the respondents were married with more than half of the participants indicating they were Protestants.

Most of the respondents 191(84.5%) had been to school with 49.6% having attended primary school; 30.5% having attended secondary school and 4.4% had tertiary education. Only 15.5% lacked formal training but could read and write. Of the total respondents; 57.1% were self-employed, 38.0% were unemployed and 4.9% were employed in various informal sectors. The majority (56.2%) had been working as CHVs for more than 9 years with 32.7% having served for between 5-9 years. 80.5% reported that their work was purely voluntary with only 19.5% reporting to have received a monthly stipend from an NGO up until May 2021 when the NGOs stopped supporting them since this was based

on the project being conducted and donor funding. None of the CHVs reported to have gotten any stipend from the government. (Table 4.1)

Table 4.1 Socio-demographic data of Community Health Volunteers in Kajiado County

Variable	**Frequency**	**Percentage %**
Age (Years)		
21-30	35	15.5
31-40	71	31.4
41-50	75	33.2
>50	45	19.9
Gender		
Male	72	31.9
Female	154	68.1
Level of education		
No formal education (Can read and write)	35	15.5
Primary	112	49.6
Secondary	69	30.5
Tertiary	10	4.4
Marital status		
Married	179	79.2
Single	21	9.3
Divorced	7	3.1
Widowed	19	8.4
Religion		
None	5	2.2
Catholic	97	42.9
Protestant	120	53.1
Muslim	4	1.8
Employment		
Self-employed	129	57.1
Employed	11	4.9
Unemployed	86	38.0
CHV Years of work experience		
< 1	4	1.8
1-4	21	9.3
5-9	74	32.7
>9	127	56.2
Remuneration		
Voluntary	182	80.5
Monthly stipend by NGOs	44	19.5

Table 4.2 Chi-square test of association between demographic characteristics and screening of hypertension in the community

Variable	**Do you screen**		***Significant at p<0.05***
	No n (%)	**Yes n(%)**	
Age (Years)			**χ^2= 8.9, df= 1, *p= 0.031***
21-30	20(57.31%)	15(42.9)	
31-40	24(33.8)	47(66.2)	
41-50	23(30.7)	52(69.3)	
>50	13(28.9)	32(71.1)	
Gender			χ^2= 5.6, df= 1, *p= 0.453*
Male	28(38.9)	44(61.1)	
Female	52(33.8)	102(66.2)	
Level of education			χ^2= 1.51, df= 3, *p= 0.681*
Can read and write	11(31.4)	24(68.6)	
Primary	41(36.6)	71(63.4)	
Secondary	26(37.7)	43(62.3)	
Tertiary	5(50)	5(50)	
Marital status			χ^2= 5.39, df= 3, *p= 0.145*
Married	67(37.4)	112(62.6)	
Single	6(28.6)	15(71.4)	
Divorced	4(57.1)	3(42.9)	
Widowed	3(15.8)	16(84.2)	
Religion			χ^2= 7.92, df= 4, *p= 0.095*
None	3(60)	2(40)	
Catholic	25(25.8)	72(74.2)	
Protestant	50(42.4)	68(57.6)	
Muslim	0	6(100)	
Employment			χ^2= 0.337, df= 2, *p= 0.845*
Self-employed	46(35.7)	83(64.3)	
Employed	5(45.5)	6(54.5)	
Unemployed	31(36)	55(64)	
Years of work experience			χ^2= 4.01, df= 4, *p= 0.404*
< 1	2(50)	2(50)	
1-4	7(33.3)	14(66.7)	
5-9	22(29.7)	52(70.3)	
>9	49(39.5)	78(60.5)	
Remuneration			χ^2= 6.09, df= 3, *p= 0.107*
Voluntary	59(32.4)	123(67.6)	
Monthly stipend by NGOs	21(47.7)	23(52.3)	

There is a strong association between age and hypertension screening with the likelihood of screening being higher among the middle age group (41-50 years) **(χ^2 =*8.9, df=, p=* 0.031, 95% CI).** (Table 4.2)

This is supported by the qualitative data:-All CHVs were residents of the area, mostly established members who would not relocate easily and had worked for more than 5 years.

"They(CHVs) have been there for the last 10 years." (NGO representative)

"All can read and write, but the criteria is mostly form four and they get a stipend or lunch and transport allowance when they go for a training or outreach which is mostly funded by a partner." (Community Health Assistant)

They all could read and write, were on volunteer basis with exception of occasional

stipends from various partners as confirmed by the qualitative data.

"….we want those who have established themselves they are residents of that area so that they can't move from that area . Most of them are just voluntary work, most of them we do… we reward them when we have an activity, we engage them so that they are able to get lunch allowance, transport and so on. But we have some who are being engaged by partners for specific projects to do some activities like follow-up adherence of HIV drugs so those are given stipends by the partner." (MOH Sub-county Officer)

4.3 The level of knowledge of Community Health Volunteers on hypertension identification and management

The overall CHV knowledge level on hypertension was poor as assessed by the Bloom's cut-off point whereby 81-100% indicated High level/ good knowledge, 60-80% was Moderate level and below 59% depicts Low levels/ poor knowledge. Participants had responded to 11 questions which entailed training on hypertension, source of knowledge

on the disease, symptoms of hypertension, causes/ risk factors, their role and identification of hypertension cases. The score varied from 0-16 points; the correct response was 1 point and any wrong response was 0. (Table 4.3)

Table 4.3 The overall Community Health Volunteers' knowledge levels on hypertension

Knowledge	**Frequency**	**Percentage (%)**
Good	3	1.3
Moderate	12	5.3
Poor	211	93.4

All CHVs had completed the basic module training as required. However, only 34.1% had attended a CHV training specifically for hypertension with 65.9% reporting that they had never attended a training on Hypertension. Of those trained 40.2% had been trained in facility sessions by MOH staff, 59.8% had been trained by NGOs. In terms of severity, 87.6% of the CHVs reported that hypertension was a serious killer disease with only 11.5% and 0.8% reporting that hypertension is averagely grave and not serious , respectively. (Table 4.4)

Table 4.4 Level of training and knowledge of Community Health Volunteers on hypertension

Variable	Frequency	Percentage
Ever attended a training for CHVs on Hypertension	T	
Yes	77	34.1
No	149	65.9
Training Organization		
NGOs	46	59.8
MOH Facility Staff	31	40.2
Suffer from Hypertension		
Yes	15	6.7
No	207	91.6
I did but got cured	1	0.4
I don't know	3	1.3
Seriousness of hypertension/killer disease		
Very serious	198	87.6
Somewhat serious	26	11.5
Not very serious	2	0.9
Knowledge on the symptoms		
Yes	182	80.5
No	44	19.5
Is Hypertension infectious		
Yes	6	2.7
No	220	97.3
HTN Curable		
Yes	21	9.3
No	12	5,3
Managed by treatment and lifestyle changes	193	85.4
Is Hypertension common		
Yes	173	76.5
No	53	23.5
HTN Identification ways		
Using a blood pressure machine	50	22.1
Through symptoms	128	56.7
I refer any sick person	48	21.2

A strong statistical difference between ever-received training on hypertension and knowledge levels was found with the likelihood of having good knowledge being recorded among those who received training. None of those who had never attended training had good knowledge. (***p*<0.000, 95% CI**). (Table 4.5)

Table 4.5 Chi-square test to test the association between ever being trained on hypertension and knowledge level

Variable	**Knowledge Level**			***p* value**
	Poor n (%)	Moderate n (%)	Good n (%)	
Ever been trained				**0.000***
Yes	62(29.4)	12(100)	3(100)	
No	149(70.6)	0	0	

It was also clear from the qualitative data that CHVs get generalized training and are engaged in a number of activities majorly communicable diseases, including HIV/AIDs, water and sanitation (WASH), livelihoods and family planning. Non-communicable diseases were yet to pick up the pace. In addition, NGOs remain the major driver of activities in the area.

"*They do get trainings but hypertension they have not been trained; mostly they have been trained and are most involved in family planning, antenatal, immunization, TB, HIV, trachoma, nutrition and malezi bora, COVID."* (Health facility in-charge).

"As the CHVs were working within the community, we realized that it is something that has always been coming up. Every time they pay a household a visit we would hear someone say when I went to the hospital I was told that my blood pressure is very high,

so we said why don't we do the training on the same and empower the CHVs rather than waiting for them to go to the facilities at least people would be knowing at the grass route level before they reach the dispensary." (NGO representative)

There has being great milestones with the health care system providing a curriculum that now trains CHOs and CHAs at certificate, diploma and degree levels. They are provided with recognition, certification and are on a monthly payroll as well. This is in alignment with the Community Health Workers Bill which is yet to be fully implemented in Kajiado County to accommodate CHVs as well.

"Before the community health strategy started, we called them CHEWs. It's because we didn't have trained personnel who were specifically meant for the community work that is why they were called extension workers. But now they trained purely for community work and they were given that name assistants (Community Health Assistants and Community Health Officers). They are there to assist. CHVs have the basic modules before they start and the rest is project or community based." (Community Health Strategy Coordinator)

Majority (96.5%) of the respondents' source of information on Hypertension was Health care workers seconded by family and friends (57.5%). Other sources included religious leaders, radio, television, posters and printed material (Figure 4.1).

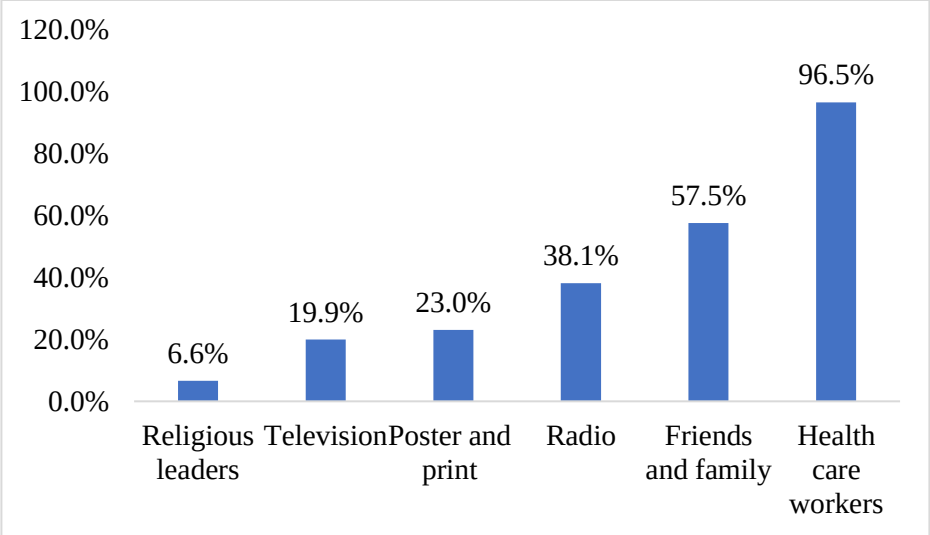


Figure 4.1 Community Health Volunteers' source of information on hypertension

All respondents had some knowledge on the risk factors with 89.7% associating hypertension with stress, 52.7% with old age, 39.3% with obesity, 37.5% with unhealthy diet. Other risk factors mention were alcohol and tobacco, genetics, lack of physical activity, pregnancy and underlying conditions at 26.3%, 16.5%, 12.5%, 7.6% and 4.0% respectively. (Figure 4.2)

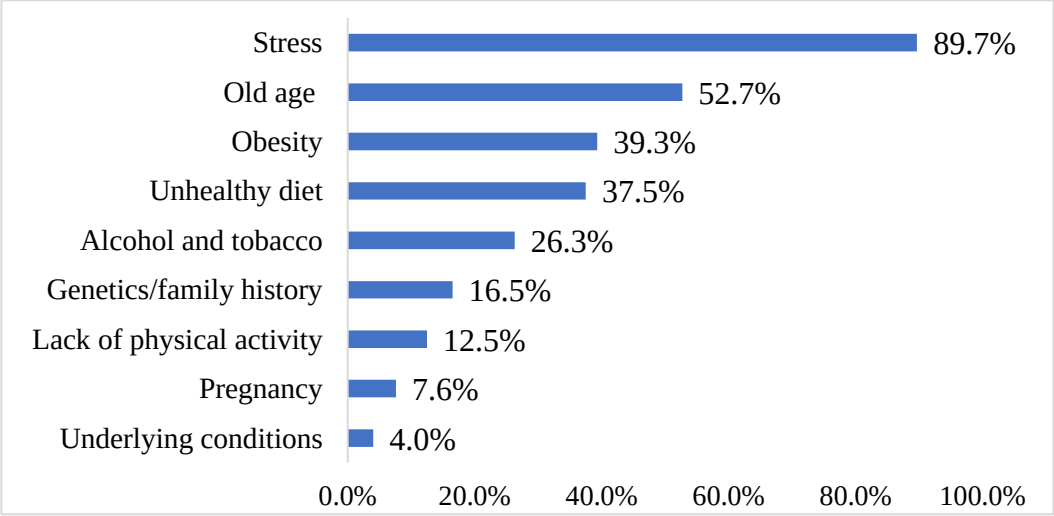


Figure 4.2 Risk factors for hypertension stated by Community Health Volunteers

Among the respondents, 88.6% could mention at least one symptom experienced by patients with hypertension with 19.5% lacking knowledge on the symptoms. The majority (97.3%) confirmed that hypertension was a non-communicable disease and was thus not infectious with 85.4% stating that hypertension cannot be cured but only managed by treatment and lifestyle changes. On hypertension case identification methods; 22.1% of the respondents had a blood pressure machine at their disposal and the know-how on how to use it for screening purposes. 56.6% used only symptoms recognition in their screening and 21.2% referred any sick person since they were not versed on the symptoms (Figure 4.3).

Hypertension being a silent killer often has no obvious/specific signs and symptoms. Regardless of the cause of any symptom, the BP check will rule out elevated blood pressure and the patient will be referred to the facility for further screening and management.

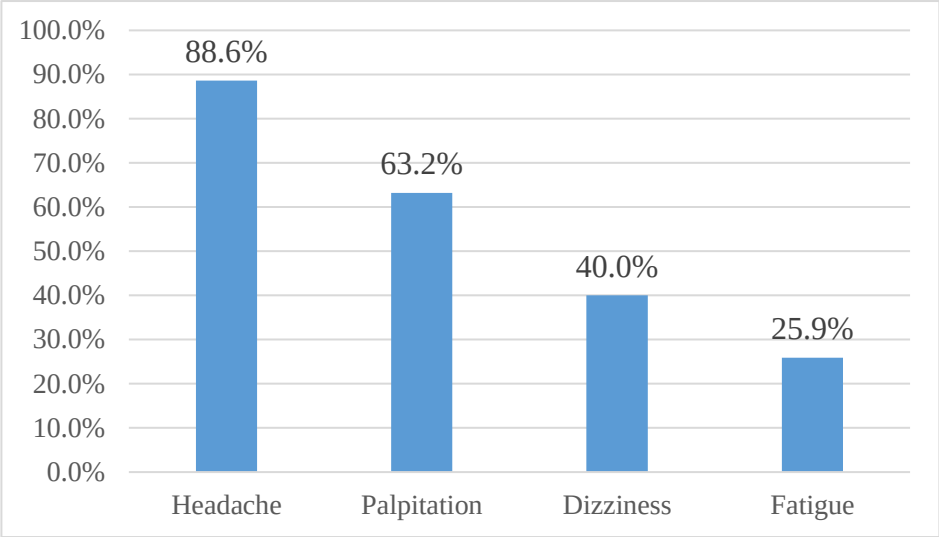


Figure 4.3 Symptoms of hypertension stated by Community Health Volunteers

Hypertension screening among the public was highly recommended by 64.6% of the respondents with 61.5% confirming that they had checked their blood pressure in the recent 6 months. 92.9% had given health education on hypertension in the recent 6 months; 49.6% in individual one on one sessions and 43.4% in group sessions.

Most CHVs (98.7%) had referred patients for check up to the nearest facility, 41.2% did follow up on referred patients, newly diagnosed patients and those living with hypertension. Only 39.8% reported to carrying our defaulter tracing for clients who are no longer adhering to their scheduled appointments. Only 7.1% had not conducted any health education. 64.2% had conducted screening in the past 6 months and 98.7% reported they had referred at least one person to the link facility for further screening or Blood pressure check-up (Table 4.6).

Table 4.6 The role of Community Health Volunteers in hypertension identification and management

Variable	Frequency	Percentage
CHV Work motivation		
Personal satisfaction	39	17.3
Love helping my people	121	53.5
To improve livelihood	66	29.2
Myths		
Curse	173	79.4
Witchcraft	145	66.5
Rich people disease	69	31.7
Role in HTN identification		
Yes	225	99.6
No	1	0.4
Recommended screening of hypertension		
Yes	146	64.6
No	89	35.4
Ever screened for HTN		
Never	23	10.2
< 6 months	139	61.5
>6 months	64	28.3
Health education past 6 months		
Yes	210	92.9
No	16	7.1
Health education past 6 months		
None given	16	7.1
Individual	112	49.6
Group session	98	43.4
Currently screen for HTN		
Yes	146	64.2
No	80	35.4
Referred someone with the symptoms		
Yes	223	98.7
No	3	1.3
Follow up on HTN Patients		
Yes	93	41.2
No	133	58.8
Defaulter Tracing of HTN patients		
Yes	90	39.8
No	136	60.2

A strong association was found between ever attended hypertension training and hypertension screening with screening being higher among those who were trained (***p<0.003*, 95% CI**). Those trained by NGOs had a higher likelihood of screening than those trained by government (MOH). (***p<0.008*, 95% CI**) (Table 4.7).

The likelihood of screening was significantly higher among those who knew/ perceived hypertension to be a serious killer disease (***p<0.033*, 95% CI**); and among those who knew hypertension is not curable but is managed with treatment and lifestyle adjustments (***p<0.005*, 95% CI**) (Table 4.7).

A strong statistical difference between knowledge of the symptoms of hypertension and screening was found with screening being higher among those informed on the symptoms (***p<0.001*, 95% CI**).

A significance was found between screening and referring patients for hypertension care. The number of CHVs who used the symptoms as a method to identify hypertensive cases was significantly more than use of BP machines (***p<0.000*, 95% CI**) (Table 4.7).

Table 4.7 Chi-square test of association between knowledge, training and hypertension identification and management

Variable	**Do you screen**		***Significant at p<0.05***
	No n (%)	**Yes n (%)**	
Ever attended a training for CHVs on Hypertension			**$\chi 2$= 9.06, df= 1, p< *0.003***
No	63(42.3)	87(58)	
Yes	17(22.4)	59(77.6)	
Training Organization			**$\chi 2$= 9.73, df= 2, p< *0.008***
NGOs	10(21.7)	36(78.3)	
MOH Facility Staff	7(22.6)	24(77.4)	
Suffer from Hypertension			$\chi 2$= 7.08, df= 3, *p= 0.069*
No	70(33.8)	137(66.2)	
Yes	7(46.7)	8(53.3)	
I did but got cured	0	1(100)	
I don't know	3(100)	0	
Seriousness of hypertension/killer disease			**$\chi 2$= 6.85, df= 2, *p< 0.033***
Very serious	65(32.7)	134(67.3)	
Somewhat serious	15(57.7)	11(42.3)	
Not very serious	0	1(100)	
Knowledge on the symptoms			**$\chi 2$= 29.36, df= 1, *p<0.001***
No	31(70.5)	13(29.5)	
Yes	49(26.9)	133(73.1)	
Is Hypertension infectious			Fishers Exact Test
No	77(35)	143(65)	*p= 0.668*
Yes	3(50)	3(50)	
HTN Curable			**$\chi 2$= 10.41, df= 2, *p<0.005***
No	1(8.3)	11(91.7)	
Yes	13(61.9)	8(38.1)	
Managed by treatment and lifestyle changes	66(34.2)	127(65.8)	
Is Hypertension common			$\chi 2$= 6.21, df= 2, *p<0.059*
No	24(45.3)	29(54.7)	
Yes	56(32.4)	117(67.6)	
HTN Identification ways			**$\chi 2$= 32.87, df= 2, *p<0.000***
Through the symptoms	42(32.8)	86(67.2)	
Using a blood pressure machine	6(12)	44(88)	
I refer any sick person	32(66.7)	16(33.3)	

Most respondents (99.6%) stated that they had a role in the community in hypertension care and carried out activities such as educating, sensitizing, screening, referral, follow up and defaulter tracing as depicted in Figure 4.4.

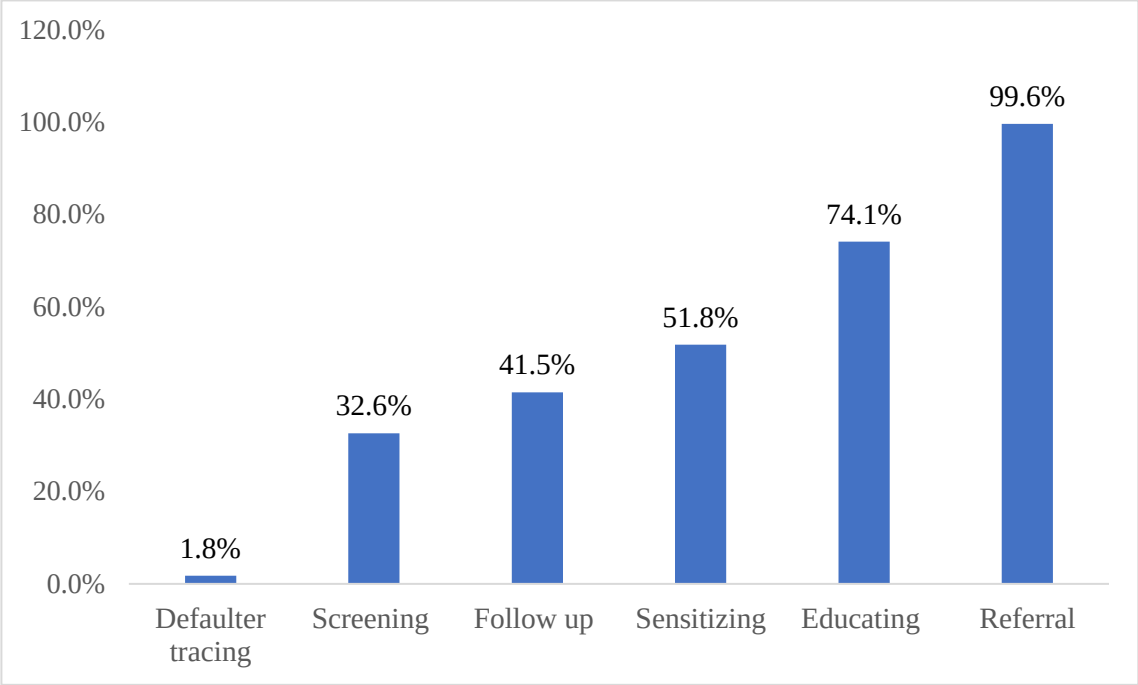


Figure 4.4 Role of Community Health Volunteers on Hypertension care in the community

CHVs have a role in sensitization, education, follow ups, screening, referral and defaulter tracing as communicated by a CHA and NGO representative in the area.

" CHVs are the key person in follow ups and health education in the household level. what I can say about the biggest role of the CHVs; hypertension is among the top ten illnesses in the area so most of the role they play is to refer them from the community level. After getting somebody is somehow with some complication related to hypertension, they try to refer them for further checkup and follow up on household level so that they cannot default attending the clinics." (Community Health Assistant)

“ …one role is sensitization, to sensitize the masses on significance of knowing your hypertension status because it’s related to other diseases. Second is actual screening; thirdly which is very key, referral to the facility of which you are attended to swiftly since it’s a referral from the first responder at grassroot level.” (NGO Representative)

*“Yes wanafanya follow ups na defaulter tracing kwasababu ukishaestablish a good rapport with them hata ukisahau huyo beneficiary anakukumbusha. “ kuja unagalie unajua ulinisaidia ile siku”. (*They do follow ups and defaulter tracing because once you establish a good rapport the members of the community will remember you helped then and will remind you to come check on them.) (NGO Representative)

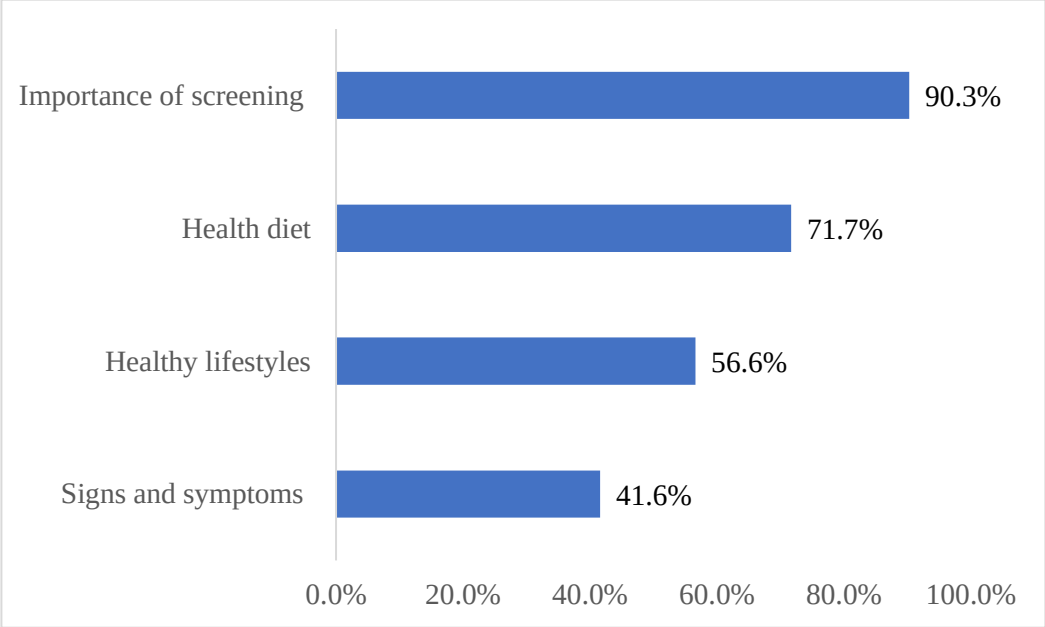


Figure 4.5 Community Health Volunteers’ hypertension education topics

Health education conducted was mostly on importance of screening (90.3%), healthy diet (71.1%) Healthy lifestyle (56.6%) and the symptoms (41.6%) (Figure 4.5).

4.4 Barriers to Hypertension identification and management by Community Health Volunteers'

CHVs have adopted various methods of service delivery; with home visits being the most commonly used (98.7%) followed by group sessions (95.6%), Individual in person sessions (71.2%), community outreaches (75.2%), community dialogues (70.8%) and lastly Individual sessions via phone at 51.3%. (Figure 4.6)

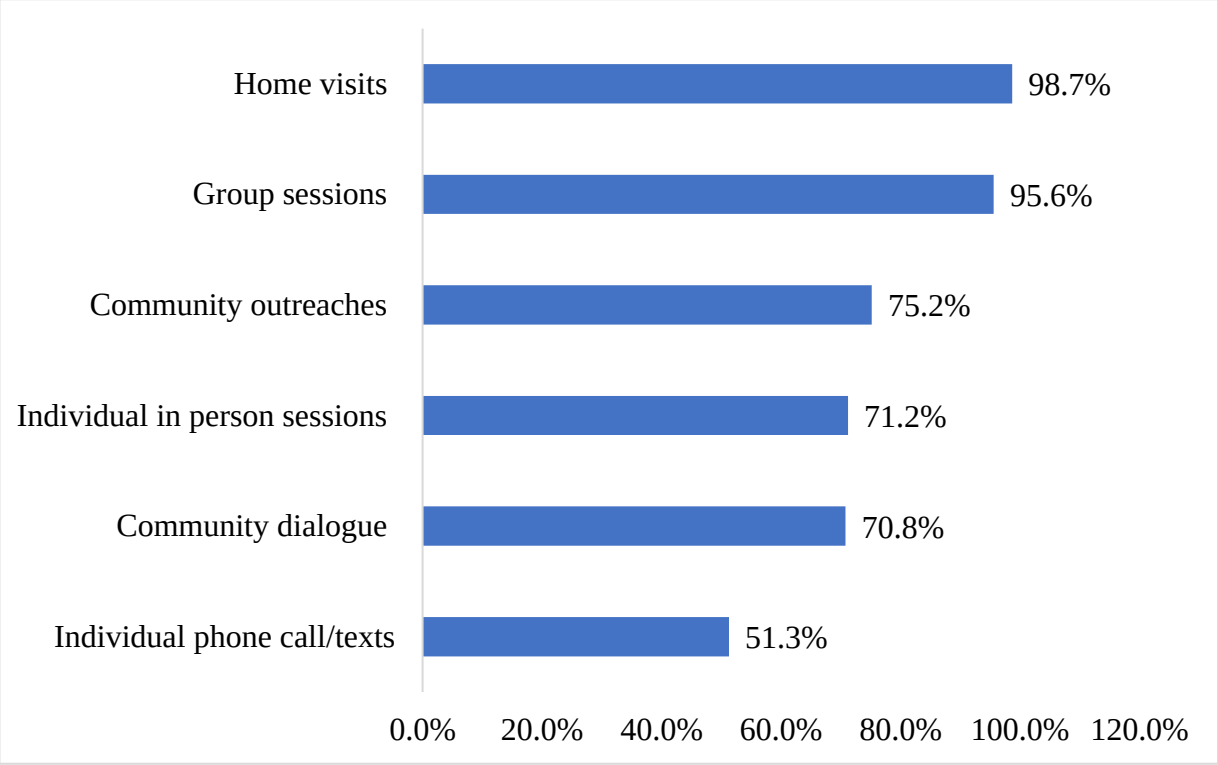


Figure 4.6 Service delivery methods used by Community Health Volunteers in Hypertension identification and management

The barriers and challenges of CHVs activities in their hypertension care service delivery included the challenges faced in screening, follow up and defaulter tracing were cited as lack of transport, poor linkage from the facilities, lack of airtime, distance between

households, few numbers of CHVs and lack of time at 89.6%, 69.4%, 57.2%, 40.5%,24.8% and 23.4% respectively as shown in Figure 4.7.

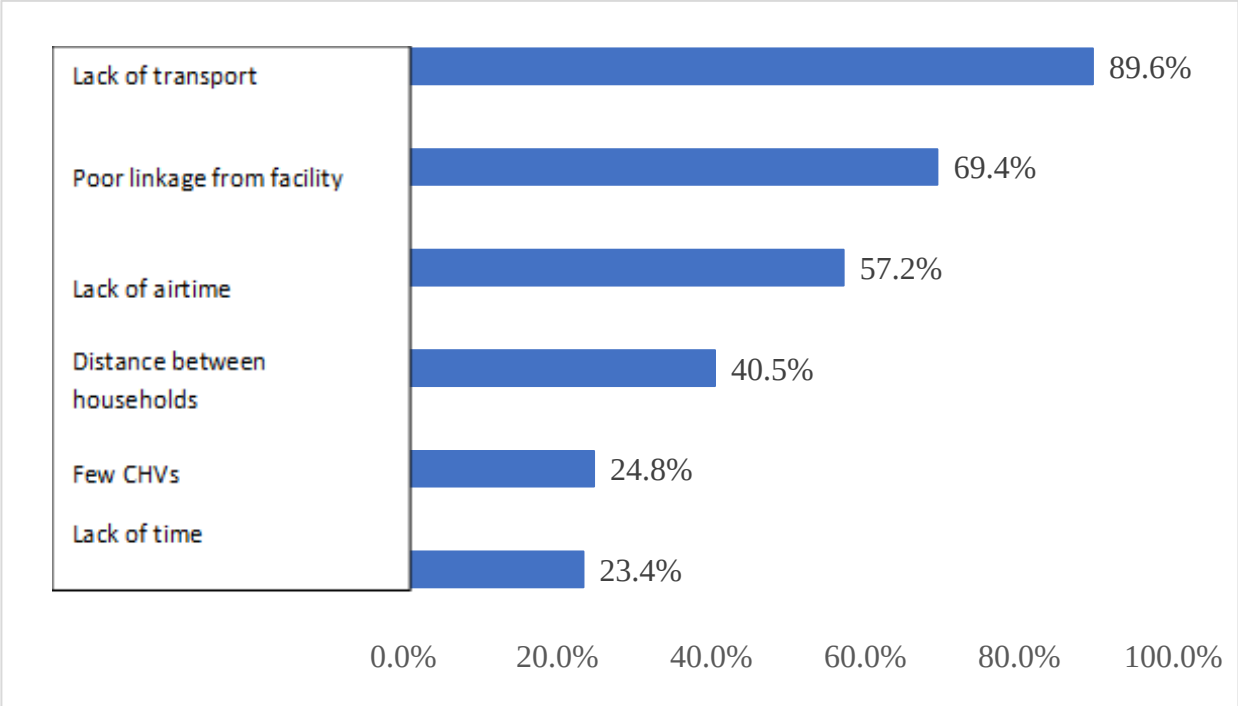


Figure 4.7 Barriers & challenges experienced by Community Health Volunteers in hypertension identification and management

Most of the respondents (81.4%) did not have BP machines and relied solely on symptoms for screening and referral. Only 37.6% reported they had a referral form (MOH 100) while the remaining 62.4% refer verbally. Once referred 92.9% reported to follow up on the patients and only 7.1% did not follow up to ensure the patients visited the health facility. The greatest challenge in hypertension case identification was cited as lack of BP machines (89.4%) followed by 10.6% who cited inadequate knowledge of the symptoms. Referral of suspected hypertension cases was hindered by lack of awareness and ignorance by the community reported by 95.1% of respondents and distance to the facilities (83.9%) (Table 4.8).

Table 4.8 Barriers and Challenges to Community Health Volunteers' activities in Hypertension identification and management

Variable	Frequency	Percentage(%)
BP Machine provided for work		
Yes	42	18.6
No	184	81.4
Referral form used		
MoH 100	85	37.6
Verbal referral	141	62.4
Follow up on referral patients		
Yes	210	92.9
No	16	7.1
Challenges in hypertension care		
Lack of BP machines	204	89.4
Inadequate knowledge of the symptoms	22	10.6
Lack of awareness and ignorance by the community	212	95.1
Distance	187	83.9
How COVID 19 has affected CHV activities (MR)		
No home visits	187	78.6
No gathering/meetings	176	83.5
Fear of hospitals by everyone	176	78.6

The COVID 19 pandemic curtailed CHV activities due to the measures put in place. Respondents reported halting of home visits (78.6%), halting of gathering/meetings (83.5%) and fear of hospitals by everyone in the community (78.6%).

Table 4.9. Chi-square test of association between barriers and challenges of hypertension identification and management in the community

Variable	**Do you screen**		***Significant at p<0.05***
	No n (%)	**Yes n (%)**	
BP Machines provided for work			
No	75(40.8)	109(59.2)	**Fishers Exact Test**
Yes	4(11.9)	38(88.1)	***p= 0.001***
Referral form used			
MoH 100	37(43.5)	48(56.5)	$\chi 2$= 3.939, df= 1, *p= 0.05*
Verbal referral	43(30.5)	98(69.5)	
Follow up on referral patients			
No	12(75)	4(25)	**Fishers Exact Test**
Yes	68(32.4)	142(67.6)	***p= 0.002***
Lack of transport			
No	6(42.9)	8(57.1)	Fishers Exact Test
Yes	74(34.9)	138(65.1)	*p= 0.164*
Distance between households			
No	13(33.3)	28(66.7)	No significance
Yes	67(35.8)	120(64.2)	

A strong statistical difference was found between having BP machines and hypertension screening with screening being higher among those with BP machines (***p=0.001*, 95% CI**). The number of CHVs who conduct screening was significantly higher among those who followed up on patients they have referred (***p=0.002*, 95% CI**) (Table 4.9)

According to qualitative data, CHVs have not been actively engaged; they lack BP machines and training and their number keeps on reducing due to inadequate funds to support them.

"… the CHVs on the ground are less ideal because now they don't have the capacity to to do blood pressure checkup because they don't have the equipment and also they have not been orientated on checking the BPs and all they do is to advise the client on the ground

led by the complaints that they are presenting to seek health care services in the nearby health facilities or the link facilities that they operate. Most of the units are inactive and we are experiencing a lot of dropouts in this engagement because it is something voluntary others may get some other opportunities they move to because we only engage them when a partner comes on board." (MoH Sub County Official)

Qualitative data confirmed that a number of organizations exist that support the CHVs as per the projects they implement. This is not frequent and it all depends with the partners' presence and availability of funds.

"We are supported by Global fund and the grant is only directed to HIV programs, so we have never ever done anything to do with Hypertension before. But I think that maybe other partners but, on our side, we have never even done anything related to hypertension. We support them (CHVs) with 1800(Ksh) on monthly basis that is 1000 is the stipend, 500 is the airtime for calling the client or the beneficiary and then 300 is transport when we meet them when they submit reports to the facility. So, the total amount we give them is Ksh 1800 unlike before when we gave them Ksh 3000." (NGO Representative)

In addition to training, BP machines and stipends the CHVs would need transport and airtime to support their activities:

"Okay I don't know if the stipend will cover on their transport but if they get these motorbikes and airtime, they can reach the patients wherever they are." (Facility In charge)

Most key informants reported inadequate funds to support the CHVs as the main reason why there is a poor identification and follow-up of patients suspected of hypertension.

According to a Community Health Strategy Coordinator, the solution is the community health workers' bill recommendation on supporting CHVs with monthly stipend which is yet to be implemented.

"There is that bill that was passed about the stipend of the CHVs though up to date they are still saying they are waiting for finances but the bill passed. What I can say is we have that limitation; Like it is, the county has not been able to take it up on its own. Each county was supposed to do their own. I think we were the third or fourth county to pass the Bill." (Community Health Strategy Coordinator)

4.5 Facilitators of Community Health Volunteers' activities in hypertension identification and management

The facilitators of CHVs activities in their expected roles included the support received in carrying out their activities. Majority (94.7%) reported that they received supportive supervision mostly from the CHAs (89.4%) the facility in-charges (4.9%) and occasionally by MOH Sub- County staff (5.8%). They reported the purpose of the supervisory visits as: assists with reporting (95.3%), training and getting updates (74.6%) source of motivation (44.6%), and help resolving challenges (21.6%). (Table 4.10)

Table 4.10 Facilitators of Community Health Volunteers' activities in Hypertension identification and management

Variable	Frequency	Percentage (%)
Receive support supervision		
Yes	214	94.7
No	12	5.3
Support supervision by who?		
CHA	202	89.4
Facility in charge	11	4.9
Sub County MoH Staff	13	5.8
Role of supervisor (MR)		
Train and give updates	159	74.6
Help with reporting	203	95.3
Motivate	95	44.6
Help with resolving challenges	46	21.6

A strong statistical difference was found between received support supervision and hypertension screening with the likelihood of screening being higher among those who received supportive supervision (***p=0.029,* 95% CI**). (Table 4.11)

Table 4.11 Chi-square test of association between facilitators and hypertension identification and management in the community

Variable	Do you screen		*Significant at p<0.05*
	No n (%)	Yes n (%)	
Receive support supervision			**Fishers Exact Test**
No	8(66.7)	4(33.3)	***p= 0.029***
Yes	72(33.6)	142(66.4)	
Support supervision by who?			No significance
CHA	71(35.1)	131(64.9)	
Facility in charge	1(9.1)	10(90.9)	
Sub County MoH Staff	8(61.5)	5(38.5)	

Since the inception of the Community Health Strategy, many of the Community Health Extension Workers (CHEWs) were trained and included in the formal health system to support the Level 1 care (community) and guide the CHVs in their activities.

"We work with them like to co-ordinate their villages to do follow ups on what they do in their villages, we educate them and give them reporting tools. We do trainings on need be basis; at times we are supported by the MOH like they can say I need 5 CHVs to train them on high cases in the village." (Community Health Assistant)

"…we all work together and most issues go to the CHA unless there is need of escalation to me. Supportive supervision on a day-to-day basis is done directly by the CHA, but I attend most of those meetings." (Facility In charge)

"… the ones(formerly CHEWs) with a degree are the CHOs and those with diplomas are CHAs; most upgraded from the certificate. That structure has really helped us and the CHVs in supportive supervision. They help in guidance and reporting. I attend their monthly meetings when I am able to due to transport challenges, I listen to their issues and I also intervene in terms of addressing their challenges and whatever they are going through which they feel is beyond them. I talk to them I encourage them since they are mostly on a volunteer basis." (Community Health Strategy Coordinator)

In order to make the CHVs work in hypertension service delivery easier and more effective 100% of the respondents stated that they would need a monthly stipend. In addition to a monthly stipend or being on payroll; other support measures included facilitating means of transport (93.4%), availing BP machines (89.4%), training (85.8%), airtime (72.6%), identification badges (56.2%) and PPEs (22.1%) as shown in Figure 4.8.

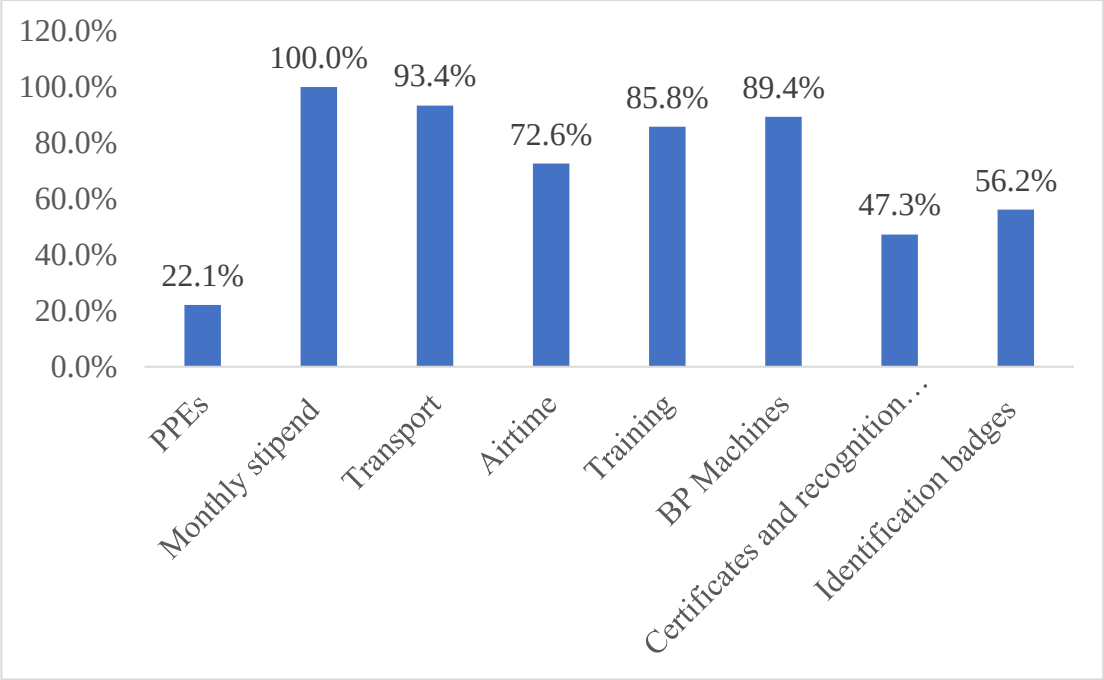


Figure 4.8 Support needed to facilitate Community Health Volunteers' service delivery in hypertension care

A conversation with a health facility in charge confirmed that the few CHVs who were trained and given BM machines were vital in the identification, referral and follow-up of suspected cases of hypertension at the community as shown below.

"I must say that the CHVs in this area (Enkariak Ronkena) are lucky having been given BP machines by OBK that they use in the community. They also refer the patients, educate them and do follow up although the follow up of patients depends on presence of funds that the CHVs use in calling and travelling where the specific community members live." (Health facility in-charge)

The Ministry of Health and NGOs in parts of the region implement hypertension programs and support CHVs through training, equipment, and stipends. However, to enhance

sustainability and maximize impact, there is a need for improved coordination and integration of efforts among these key stakeholders, rather than working in silos.

"we provide great support in livelihood and hypertension care. When we were starting there were no CHVs in the area so we recruited our own but with the help of the ministry and we facilitated the ministry to do the hypertension trainings. We did a 3 days initial training, provided BP machines and continued with refresher trainings from time to time. We have been giving them around…Other organization are giving them around 2-3k(Ksh 2000-3000) a month ;but for us we give them 9k(Ksh9000) a month." (NGO Representative)

"…. So they(CHVs) are doing their best on the days that they can, there is high attrition rates but if they were all supported(training, stipends, BP machines) we would have more referrals and follow-ups then we would talk of effectiveness; but still they are doing it and we are somewhere. Some NGOs support different programs but the issue at times is they start working on their own and also the sustainability plan, I think we have one that is wrapping up on hypertension." (Community Health Strategy Coordinator)

Multiple logistic regression in our final model found that the odds of identifying hypertensive persons in the community was 3.74 times higher among those who knew the symptoms of hypertension compared to those who did not know as shown below:-

Table 4.12 Multiple Logistic Regression Model on the likelihood of hypertension identification and management by Community Health Volunteers

Independent Variables in Model	**B**	**df**	**Sig**	**OR**	**95% CI for OR**	
					Lower	Upper
Age		3				
21-30	19.77	1	0.167	-	0.346	1.97
31-40	18.52	1	0.632	-	0.322	1.724
41-50	-17.96	1	0.301	-	0.336	1.800
>50 (Ref)						
Religion		3				
None	17.57	1	0.534	-	0.387	1.69
Catholic	18.92	1	0.245	-	0.589	1.84
Protestant	20.21	1	0.053	-	0.336	1.89
Muslim (Ref)						
Training organization		2				
OBK	-17.57	1	0.266	-	0.298	1.456
Amref Kenya	-19.74	1	0.108	-	0.287	1.376
MOH (Ref)						
Hypertension severity		2				
Very serious	-19.32	1	0.457	-	0.367	1.785
Somewhat serious	-37.49	1	0.097	-	0.389	1.875
Not very serious (Ref)						
Knowledge of the symptoms	-1.442	1	<**0.001***	3.74	2.018	6.932
Hypertension identification method		2				
Symptoms Recognition	22.14	1	0.074	-	0.289	1.986
BP checks using machines	17.24	1	0.372	-	0.567	1.564
I refer any sick person (Ref)						

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Community Health Volunteers' socio-demographic characteristics

All CHVs in the study were able to read & write, and most had some basic formal education. This is in accordance with the Kenya Community Health Policy 2020–2025, which indicates that CHVs should be selected based on the fact that they are residents of communities they serve, can communicate in the local dialect, can read and write, and accept that this role is voluntary (MOH, 2021).

Majority of the CHVs were middle age, female, had been CHVs for > 4 years and their role was voluntary in nature with exception of a few who on specific instances received a monthly stipend from a donor/ NGO. This is also as depicted by Agarwal & Abuya (2021), with CHVs been mostly female with high attrition rates due to the voluntary nature of their role. This was the finding as well with CHVs starting out in large numbers but gradually reducing with time. They were mostly self-employed mainly doing small scale business and agriculture or doing odd jobs to sustain themselves. Striking a balance between volunteer work and other economic and social demands of life such as child care, household chores, community functions and work makes their work really challenging as it can wear them down and eventually lead to high attrition rates. (Lusambili *et al.*, 2021). A study in Kenya by Gatimu *et al.*, (2020) also found that CHVs were mostly female of middle age group, working voluntarily alongside their income-generating activities.

5.1.2 Level of knowledge of Community Health Volunteers on hypertension identification and management

Overall, the CHVs had poor knowledge on hypertension identical to findings by Neupane *et al.*, (2018); that CHVs in general have little knowledge on hypertension; the risk factors, causes, symptoms, management and prognosis. This in contrast to findings in Nepal, whereby CHVs had good knowledge about causes/risks factors, long-term effects, and complications of hypertension (Adhikari *et al.,* 2024). CHVs who had ever received training on hypertension had good knowledge on hypertension as compare to those who had only the basic module training. In addition to knowing how to read and write and undergoing the basic training module; it is important for CHVs to be trained specifically on hypertension. This would allow them to identify high-risk populations through targeted screening. They would then be able to identify patients with elevated blood pressure, link them to care, offer continued blood pressure monitoring, dietary and lifestyle education. Abdel-All M. *et al.* (2017) conducted a review which demonstrated that CHVs with even little education can be successfully trained to assess risk factors of CVD, prevent it, identify those at high risk of CVD, educate community members and encourage positive behavior change, including engagement with healthcare workers.

From this study majority of CHVs conduct home visits in service delivery which is a wholesome approach to their role; they are able to educate, screen and follow up on a household all at once. CHVs have been suggested as an approach to achieve reduced hypertension related illness and death due to their potential capability to seamlessly blend into the health system with brief training duration, offer cost-effective community-based interventions, and achieve high-quality outcomes (Khetan *et al.,* 2017).

Interventions carried out by the CHVs in our study were general health education on diet and lifestyle, sensitization, community screening to identify individuals with possibly elevated blood pressure, referral and linkage to care, follow-up of referred patients and those on treatment and defaulter tracing as well. This is in accordance to the Kenya National Strategy for the prevention and control of Non-Communicable Diseases 2015 – 2020. (MOH, 2015). Findings from Safary., *et al.*, (2021) depict them as health educators and lifestyle counselors who also performed screening, monitor blood pressure and assist individuals to navigate the health system. These tasks are shaped largely in response to respective community needs. A systematic review by Mbuthia *et al.*, (2022) indicate that CHVs have different functions varying from promotive, preventive, therapeutic and rehabilitative health services in the hypertension management. Their intervention entailed hypertension control strategies screening and monitoring of BP both at home and at community levels. According to Vedanthan *et al.*, (2019), trained NPHWs can perfectly screen for cardiovascular risk and counsel the high-risk individuals on lifestyle adjustments. The recent Kenya Community Health Policy (MOH, 2020) outlines the new detailed curriculum and training approach, emphasizing the modular structure and certification process for CHVs to improve their overall knowledge and capabilities.

5.1.3 Barriers and challenges to Community Health Volunteers activities in hypertension care

In as much as supportive supervision was robust, CHV training was inadequate and they often lacked the required tools for their work such as BP machines, referral forms and identification badges. Similar findings in Kenya are documented in a different study

whereby CHVs receive a lot of support from the MOH, but the training was inconsistent and inadequate (Aseyo *et al.,* 2018).

Globally, CHVs mostly volunteer and among those remunerated there is lack of clear guidance and structure. Often, CHVs start in high numbers but have a high attrition rate as well as they indulge in other money-making activities, they lack time for these voluntary services. Following the WHO guideline, additional evidence has emerged reaffirming the importance of remunerating CHWs in accordance to their workload, skills, and responsibilities (Ballard *et al.,* 2021). In our context, CHVs reported that they were willing to participate in community hypertension screening programs; however, they need and would appreciate being salaried health workers or receiving monthly stipends due to the time and cost incurred in these activities. Little or no compensation was also cited as a major demotivating factor (Aseyo *et al*., 2018). This finding is seen in a similar study where CHVs, in addition to a lack of remuneration, report to incur further costs while implementing these interventions at the community as they have to cater for transport and airtime from their pocket (Safary *et al.,* 2021). This contrasts a study in Ethiopia, whereby CHVs were given money as a stipend from a household Kitty established by household members' contributions to motivate them (Gatimu *et al.,* 2020).

According to Vareilles *et al.,* (2021), CHVs' performance and the determining factors (such as education level, training, supervision, incentives, etc.) greatly depends on the context. Where there are great poverty levels, CHVs cannot feel recognized without money as incentives and/or incentives that are of financial importance and thus cannot be expected to improve their livelihood by volunteering only. However, in Nepal a study by Neupane *et al.,* (2018); community engagement with female CHVs benefits the CHV by

elevating the individual and family social status, irrespective of monetary benefits. These CHVs stated that they were inclined to participate in community hypertension screening programs without receiving any incentives, monetary or otherwise. The CHVs are more efficient in serving the greater population than facility-based health providers, who are restricted by location and specific working hours and days, which limits their availability to offer services. FCHVs can rise above these hurdles through their outreach to everyone at their most convenient times and place.

The study findings indicate that most often than not, CHVs lack referral notes to give to the patients and are forced to refer by word of mouth and follow up with the client later. There is also no proper linkage system that allows the facilities to link newly diagnosed patients with the respective CHV. This poses a big problem when it comes to follow-up of patients and defaulter tracing. Inadequate infrastructure, lack of equipment plus a functional referral system, and the CHVs being very few is also a challenge in hypertension care (Safary *et al.,* 2021).

The Kenya Community Health Strategy 2020 – 2025 (KCHS 2020 – 2025), similar to a study in Nigeria by Agu. *et.al.,* (2021) also depicts similar challenges: low workforce numbers, inadequate capacity building, lack of proper remuneration structures, lack of career progression path and reward structure (MOH, 2021). The CHVs were on volunteer basis, with a small proportion receiving occasional stipends from NGOs and a facilitation fee for donor-funded projects. In Kajiado County, despite the policy revision and distribution of the eCHIS toolkit to the majority of the CHPs (formerly CHVs), household registration rates remain between 50% and 80%, with a notably low CHP-to-household

registration ratio, a situation attributed to delayed deployment and challenges such as unpaid stipends exceeding nine months (Kipsang, 2024).

5.1.4 Facilitators of Community Health Volunteers' activities in hypertension identification and management

Facilitators generally fall under 2 broad categories: monetary and non- monetary. Monetary facilitators include constant remuneration, airtime and transport while non-monetary include supportive supervision, availability of work resources, training, recognition and identification badges. According to Vareilles *et al.,* (2021) the effectiveness of CHVs is grounded on clear-cut selection of role model CHVs by the community, initial skill- based and refresher training, recognition and compensation for their work through financial and non-monetary incentives, designing comprehensible roles (tasks clearly stated to CHVs, health care providers and respective communities), supportive supervision and help with task sharing and implementation logistics.

Supportive supervision was a key facilitator of CHVs activities in this study and those supervised were more likely to screen for hypertension. Reviews conducted recently on shifting tasks from physicians to non-physicians for CVD and other NCD management in LMICs reveal that proper training, close supervision and feedback are key for community measures to be successful (Abdel-All *et al.* 2017).

Training of CHVs, incentives, motivation, supervision, career growth and a favorable work environment, influence the long-term utilization, performance and retention of CHVs, which eventually impacts the health of the households and the community. A study in Rwanda suggested three approaches to facilitate CHWs' capacity to work:-

educational support, compensation for services and essential health-care equipment (Toki, 2021).

5.2 Conclusions

Most CHVs in this study were middle age female, married and self-employed in small scale farms and businesses. This brings in the aspect of having less time to volunteer since they need to fend for their families. CHVs were volunteer members of the community who wanted to improve the livelihood of their people. It is evident that hypertension is among the major health issues in Kajiado but there is no proper system in place for sensitization, screening and linkage to care.

The CHVs have very little knowledge of hypertension (risk factors, symptoms and management) because it is only taught together with NCDs in their basic module after which they rely on CMEs by health care workers or NGOs for continuous training. Hypertension training among CHVs needs to be intensified to help them in linking individuals to the formal health system. CHVs are extremely useful in hypertension care because they have proven capable of carrying out their roles as aforementioned. They achieve their role through sensitization of the community, screening for hypertension, educating, referrals to the health facility from the community, follow-up to ensure adherence to diet, lifestyle, clinic appointments, treatment and defaulter tracing. Their intervention contributes greatly to hypertension prevention, early diagnosis and treatment leading to a better prognosis and quality of life. CHVs thrive when they are facilitated through monetary compensation, supportive supervision, training and availability of work resources. They, however, have barriers in conducting their activities since they are not

remunerated, they lack blood pressure machines, means of transport, airtime and proper recognition as part of the health care workforce.

This study shows the potential of CHVs once empowered (through training, supportive supervision, tools of work such as blood pressure machine and financial support) in hypertension identification and management in the community. They have a huge role to play and as trusted members of the community, they are the biggest tool for behavior change, adoption of healthy lifestyle and adherence to care. The CHVs are an untapped resource and can curb the upward trend of hypertension through primary prevention and improved quality of life and the prognosis of patients through education and follow-up.

Conclusions from this study as per the objectives are as follows: -

Majority of the CHVs were female who had worked for more than 5 years on voluntary basis with occasionally stipends from NGOs. There is a strong association between age and hypertension care with middle age group (41-50 years) being more actively involved.

Overall, poor knowledge level of hypertension among the CHVs was noted. A strong association was found between ever attended hypertension training and hypertension care and those who were trained were more involved and likely to screen patients. Significant associations were also found between knowledge levels and screening, with the likelihood of screening being higher in CHVs with knowledge of the symptoms, severity of the disease, it’s non-curable but is managed with treatment and lifestyle. The odds of identifying hypertensive persons in the community was higher among those who had knowledge of the symptoms of hypertension compared to those who lacked the knowledge.

The key facilitator to CHV activities was provision of supportive supervision with the biggest barrier been lack of BP machines and poor knowledge. Significant associations were also found between screening and supportive supervision and availability of BP machines with the likelihood of screening being higher among those who had BP machines and received supportive supervision thereby rejecting the null hypothesis.

5.3 Recommendations

According to the conclusions above, the study recommends the following are: -

5.3.1 Recommendations for practice

There is need for: -

Initial and continuous training on hypertension for all CHVs by the Ministry of health (National and County) is highly recommended to improve knowledge levels.

The county of Kajiado should provide automatic digital blood pressure machines for all CHVs to support their efforts in the community after which they can refer to the facility for diagnosis and management.

Continued supportive supervision of CHVs by the CHOs, CHAs, facility in charges and the Community Health Strategy team.

The Division of Community Health Services should revise the CHV manual to include hypertension training and use of the automatic digital blood pressure machines as a compulsory module.

5.3.2 Policy recommendations

There is need for: -

Full implementation of the CHV Bill by Kajiado county to ensure CHVs are fully recognized and incorporated in the formal health care system. This includes consistent

renumeration of CHVs and inclusion during planning and implementation of hypertension programs in the community.

Enhanced Public Private Partnerships with all Key players such as NGOs to support the training, availability of resources and supervision to avoid working in silos.

5.3.3 Suggestions for further research

It is evident from the study that CHVs have a huge role in hypertension identification and management, but require support to fully utilize their potential. However, quantifying the impact of CHVs was difficult as we could not link them directly to particular patients since they lack referral forms and there is no formal system in place for proper linkage of patients to CHVs in their community unit.

Studies should be done to further assess the impact of CHVs involvement in hypertension on health outcomes and also how technology(for example the eCHIS) can aid the reporting, referral and linkage of hypertensive patients to their respective CU and health facility.

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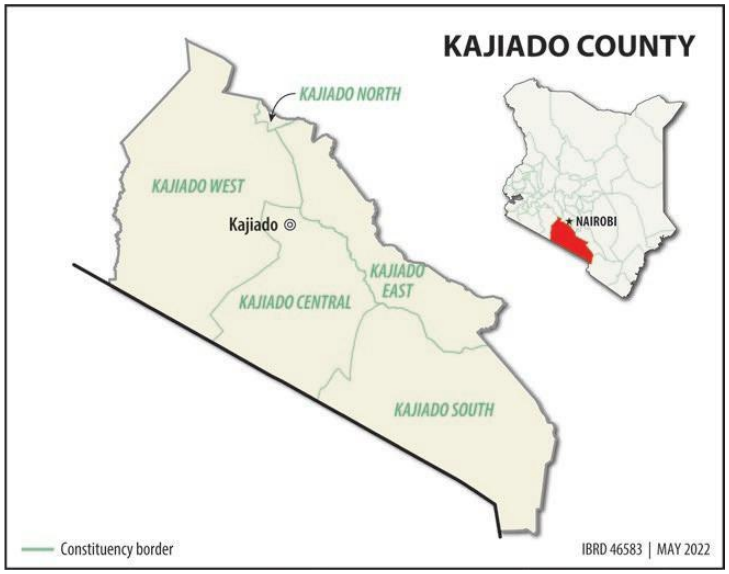
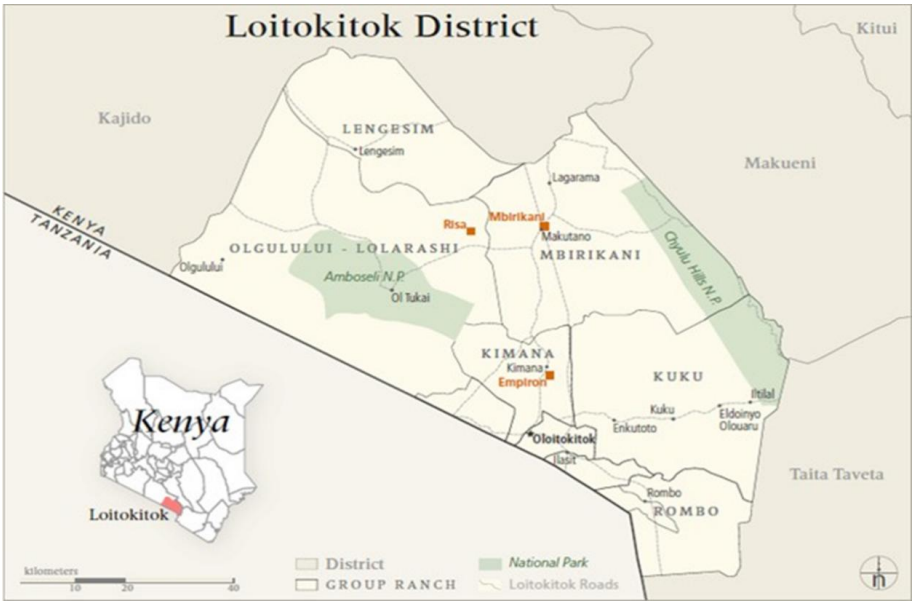
APPENDICES

Appendix I: Kajiado County Map





Appendix II: Participant's Consent form

I am Jessicar Claris Wanjiru, a Master student from Kenyatta University pursuing a Master's degree in Public Health (Epidemiology and Disease Control). I am conducting a study titled "Effectiveness of utilization of CHVs in the identification and management of hypertension cases in Kajiado County, Kenya.'' The information will be used to assist policy makers, Ministry of Health, donors and program implementers plan for and embrace using CHVs in hypertension care.

Procedure

Participants in the study will respond to a number of questions. There are no invasive procedures or health risks involved, and no specimens will be collected for testing. The information provided will be filled in a questionnaire.

Voluntarism

The respondent can decline to participate. Your access to the facility and your service to the community will remain the same whether you choose to participate or not, and the decision will not alter the quality of care given now or in the future. Participation is entirely voluntary. Feel free to enquire about the study at any point, refuse to respond to any question, or halt the interview at any point without any repercussions.

Discomforts and Risks

Some topics could be personal and could be embarrassing or uncomfortable. If you feel this way, you can choose not to skip these questions or end the interview. The interview may extend your wait time by approximately half an hour after which you can resume usual activities.

Benefits

By participating, you will contribute to improving the effectiveness of hypertension-related services offered and the impact of these services on the community. If there are any concerns, they will be handled or escalated appropriately.

Reward

Participants in this study will receive reimbursement for transport expenses at 200/- per visit. There are no rewards or payments for participation.

Confidentiality

These sessions will take place in a private setup within the facility. Names will not be captured on the questionnaire, which will then be stored securely at Kenyatta University. All information is confidential and will be accessible to the study team only.

Contact Information

For any questions or concerns, kindly contact me on 0725837385. If you have further clarifications, please reach out to my supervisors' Dr J.P. Oyore on 0722335878 or Dr G. Ogweno on 0725715623.

For any questions regarding the study participant's rights: kindly contact Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke.

Participant's statement

The above details in regards to my participation in the study has been clearly explained. I was given room to ask questions which have been satisfactorily answered. My

participation is completely voluntary. I comprehend that my name will not be captured and all information is confidential and that I can exit the study at any point. My care and treatment whether I participate or not remains the same and my decision will not influence the care that I will get from the facility today or in the future.

Name of Participant: _____

Signature or Thumbprint _____ Date _____

Name of Representative/Witness (where necessary) _____

Relationship to Subject _____

Investigators statement

I, the undersigned, have explained to the volunteer in a language s/he comprehends, the study procedures, the benefits and risks involved

_____

Name of Interviewer

_____ _____

Signature Date

Appendix III: Study Questionnaire

Kindly select the most appropriate answer

Demographic data

1.How old are you?

18- 20 years [ ] 21-30 years [ ] 31-40years [ ] 41-50years [ ] above 50years [ ]

2.Education level?

Can read & write [ ] Primary [ ] Secondary [ ] College [ ]

3.Marital status

Married [ ] Single [ ] Divorced [ ] Widowed [ ]

4.Religion

None [ ] Catholic [ ] Protestant [ ] Muslim []

5.Employment

Employed (Salary/casual job) [ ] Self-employed [ ] Unemployed [ ]

6.Years of work as a CHW

<1 year [ ] 1-4 years [ ] 5-10 years [ ] above 10years [ ]

CHV Remuneration

Voluntary [ ] Government monthly stipend [ ] NGO Monthly stipend [ ]

Knowledge questions

1. What was your first source of hypertension information? (Check all that apply)

[ ] Ihave not heard about it [ ] Health workers

[ ] Newspapers [ ] Family, friends, colleagues, neighbours

[ ]Radio [ ] Religious leaders and teachers

[ ]TV [ ] Other (please specify)

[ ]Posters and other printed material

2. Have you undergone the CHV's Basic module training?

No [ ] Yes [ ]

3. Have you had hypertension-specific training tailored for CHVs?

No [ ] Yes [ ]

If Yes, who conducted this training?

Operation Blessings Kenya(OBK) [ ]

Amref Kenya [ ]

MOH (facility) [ ]

4.Are you hypertensive?

No [ ] Yes [ ] I did, but got treated [ ] I don't know [ ]

5. In your opinion, is Hypertension a common condition in this community? (Check one.)

[ ] Very common [ ] Somewhat common [ ]Not very common

6.In your opinion, is Hypertension a fatal/killer disease? (Check one.)

[ ] Very serious [ ] Somewhat serious [ ]Not very serious

7.Do you know the symptoms of Hypertension?

Yes [ ] No [ ]

If Yes, name them:

Headache [ ] Palpitations [ ]

Dizziness [ ] Fatigue [ ]

8.What are the risk factors/ causes for Hypertension?

Old age [ ] Lack of physical activity [ ]

Unhealthy diet[ ] Use of alcohol/tobacco [ ]

Obesity [ ] Genetics/Family history [ ]

Stress [ ] Pregnancy [ ]

9.What methods do you use to identify suspected Hypertension cases for hospital referral?

Using a blood pressure machine [ ]

Through symptom recognition [ ]

10.Is hypertension infectious to people around the sick person?

Yes [ ] No [ ]

11. Is Hypertension a curable disease?

Yes [ ] No [ ] Manageable using treatment and lifestyle adjustments [ ]

Role of CHVs in hypertension care

1. What is your reason for becoming a CHV?
2. Would you advocate for community hypertension screening?

   Yes [ ] No [ ]

3. Do you give hypertension related health talks in your community?

   Yes [ ] No [ ]

If YES, What message is shared?

Importance of screening [ ] Symptoms [ ]

Healthy diet [ ] Healthy lifestyle [ ]

4. In your opinion, do you have a role in community hypertension care?

Yes [ ] No [ ]

If YES, What role(s) ?

Sensitization [ ] Educating [ ]

Screening [ ] Refer to hospital [ ]

Follow up [ ] Defaulter tracing [ ]

5. What myths and beliefs are in your community concerning hypertension?

Hypertension is a curse [ ]

Hypertension is caused by witchcraft [ ]

6. Have you ever undergone hypertension screening?

Yes, between 6 months and 1 years ago [ ]

Yes, between 1 & 5 years ago [ ]

Yes, beyond 5 years ago [ ]

Never been screened [ ]

7. Currently, do you perform community hypertension screening?

Yes [ ] No [ ]

How?

8. Currently, do you give hypertension health talks in your community?

Yes [ ] No [ ]

What message do you give?

Importance of screening [ ] Symptoms [ ]

Healthy diet [ ] Healthy lifestyle [ ]

In the past 6 months:

9. Have you offered hypertension education in the community?

Yes [ ] No [ ]

10. Have you referred any hypertension suspect to the health facility?

Yes [ ] No [ ]

11. Do you conduct follow ups to ensure check-ups and drug adherence by hypertension patients?

Yes [ ] No [ ]

Barriers and facilitators of Community Health Volunteers

1.State the service delivery methods you use in providing Hypertension care?

Individual in person sessions-

Individual call/ texts -

Group sessions-

Community outreach sessions-

Community action/dialogue days-

2.Do you have the supplies and equipment you needed to offer the assigned tasks?

Yes [ ] No [ ]

If yes, list them

3.Do you have a referral document that you fill as you refer any hypertension suspected case?

Yes [ ] No [ ]

4.Do you get any support supervision?

Yes [ ] No [ ]

If Yes who majorly offers supportive supervision and how frequently?

What entails a supervisory visit?

Train & give updates [ ] Help with reporting [ ]

Motivate [ ] Help with resolving challenges [ ]

5.What are the barriers in Hypertension care?

Lack of BP machines [ ]

Lack of awareness and ignorance by the community [ ]

Distance/Lack of fare to the facility [ ]

Inadequate knowledge on symptoms [ ]

Poor linkage from the facility [ ]

Lack of time [ ]

Distance between the homes [ ]

Few CHVs [ ]

Lack of transportation [ ]

Lack of airtime [ ]

6.Has COVID 19 affected your activities in hypertension care?

No home visits [ ]

No gatherings/ meetings [ ]

Fear of hospitals by everyone [ ]

7.How can you be assisted / supported to make your work in hypertension care easier and for you to become more effective in-service delivery?

Monthly stipend/ formal employment [ ]

Transport [ ]

Airtime [ ]

Training [ ]

Identification badges [ ]

BP machines [ ]

Certificates and recognition after training [ ]

Thank you

.

Appendix IV: Key Informant Guide

My name is Claris Jessicar Wanjiru. I am a Masters student at Kenyatta University conducting a study on the Effectiveness of utilization of CHVs in the identification and management of hypertension cases in Kajiado County, Kenya. As an essential component of the research, delving into the activities of Community Health Volunteers (CHVs) in hypertension care, their work environment, interactions with health personnel and the community is crucial. I am conducting interviews with major community stakeholders as component of data collection. These interviews will be recorded, and emerging themes analysed to enhance healthcare processes. The sessions will be confidential and not exceeding half an hour. With your consent, I kindly request to begin.

Interview Questions:

1.Is hypertension a prevalent issue in Kajiado South Sub-county?

2.How do you collaborate with CHVs in the local community?

3.What is the knowledge level and training among CHVs regarding hypertension?

4.What role do CHVs play in identification and management of hypertension cases?

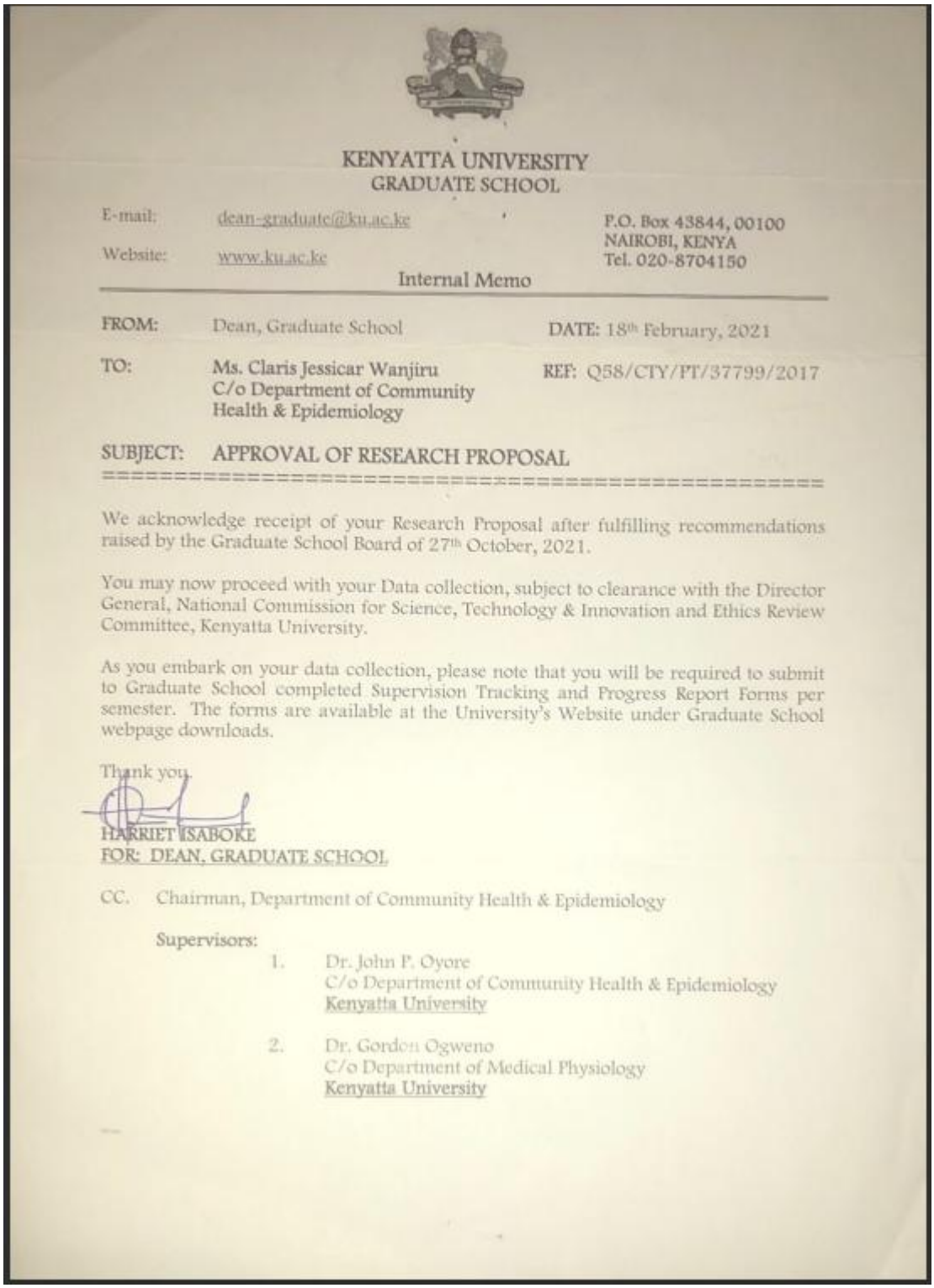
5.What barriers, challenges and facilitators affect CHVs activities in identification and management of hypertension cases? Were there any impacts on CHVs' activities due to COVID-19?

Closing Remarks: Are there any other individuals we should interview for this study? Have we covered all the topics you consider important? Any additional comments?

Debriefing: Much appreciation for your time and input. The insights given are invaluable and are greatly appreciated. Upon completion of the study, I would be happy to share these findings with you. Would you like to get a summary?

Thank you once again, and have a wonderful day.

Appendix V: Research Proposal Approval



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School

DATE: 18th February, 2021

TO: Ms. Claris Jessicar Wanjiru
C/o Department of Community
Health & Epidemiology

REF: Q58/CTY/PT/37799/2017

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

We acknowledge receipt of your Research Proposal after fulfilling recommendations raised by the Graduate School Board of 27th October, 2021.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation and Ethics Review Committee, Kenyatta University.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

HARRIET ISABOKE
FOR: DEAN, GRADUATE SCHOOL

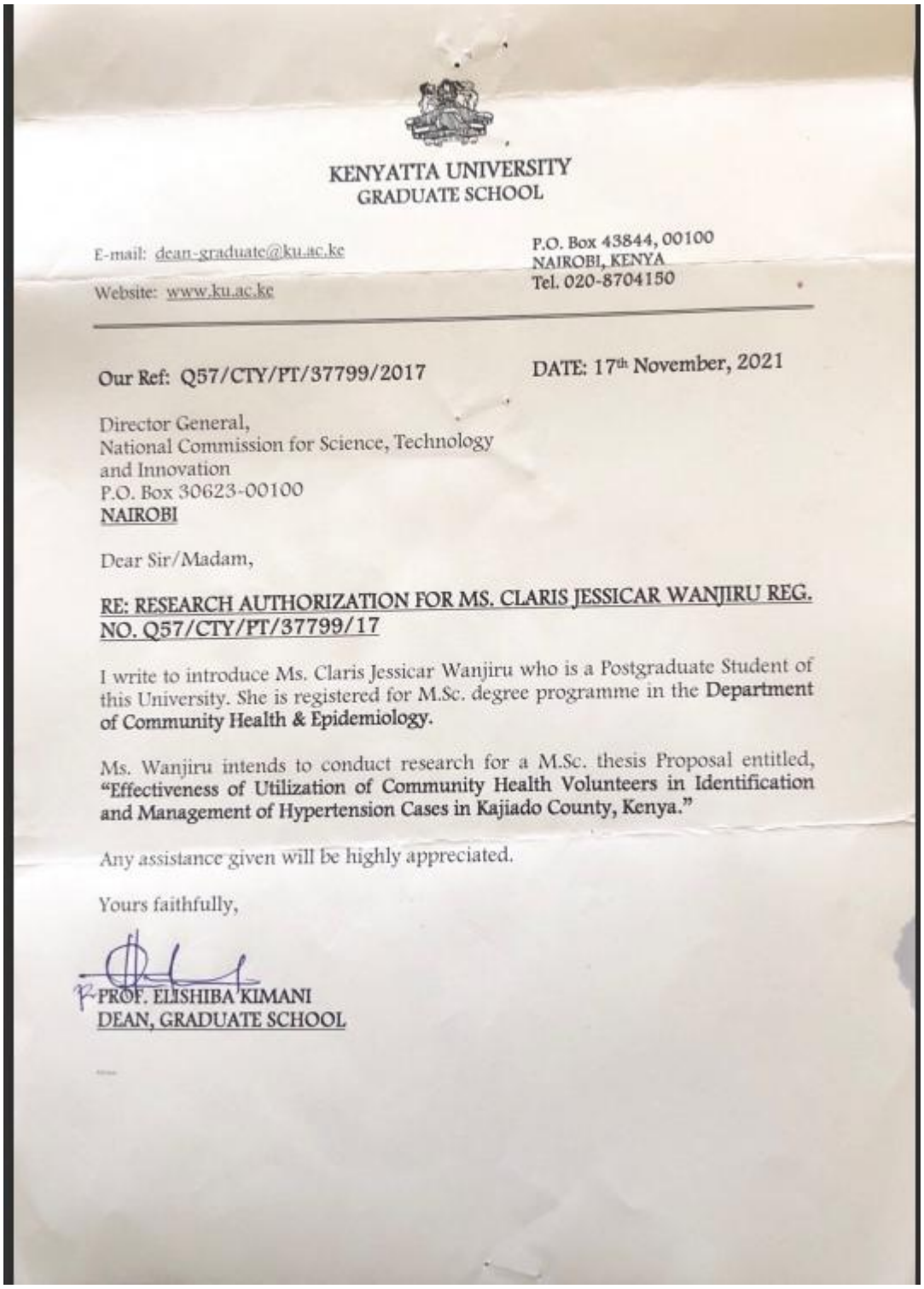
CC. Chairman, Department of Community Health & Epidemiology

Supervisors:

1. Dr. John P. Oyore
C/o Department of Community Health & Epidemiology
Kenyatta University

2. Dr. Gordon Ogweno
C/o Department of Medical Physiology
Kenyatta University

Appendix VI: Graduate School Research Authorization



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: Q57/CTY/PT/37799/2017

DATE: 17th November, 2021

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. CLARIS JESSICAR WANJIRU REG. NO. Q57/CTY/PT/37799/17

I write to introduce Ms. Claris Jessicar Wanjiru who is a Postgraduate Student of this University. She is registered for M.Sc. degree programme in the **Department of Community Health & Epidemiology.**

Ms. Wanjiru intends to conduct research for a M.Sc. thesis Proposal entitled, **"Effectiveness of Utilization of Community Health Volunteers in Identification and Management of Hypertension Cases in Kajiado County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

Appendix VII: Ethics Clearance

KENYATTA UNIVERSITY
CENTRE FOR RESEARCH ETHICS AND SAFETY

Fax: 8711242/8711575 **P. O. Box 43844,**
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1** Date: 3rd /03/2022

Claris Jesicar Wanjiru
P.O BOX 43844-00100
Nairobi.

Dear Ms. Wanjiru,

APPLICATION NUMBER: PKU/2434/I1567- EFFECTIVENESS OF UTILIZATION OF COMMUNITY HEALTH VOLUNTEERS IN IDENTIFICATION AND MANAGEMENT OF HYPERTENSION CASES IN KAJIADO COUNTY, KENYA

This is to inform you that ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** has reviewed and approved your above research proposal. Your application approval number is **PKU/2434/I1567.** The approval period is ***3rd /03/2022 to 3rd /03/2023***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours

v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. 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.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following website link; ;(https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_VIn0xbxg3uGdlDzMXFWNDsMrRPQ/edit?usp=sharing

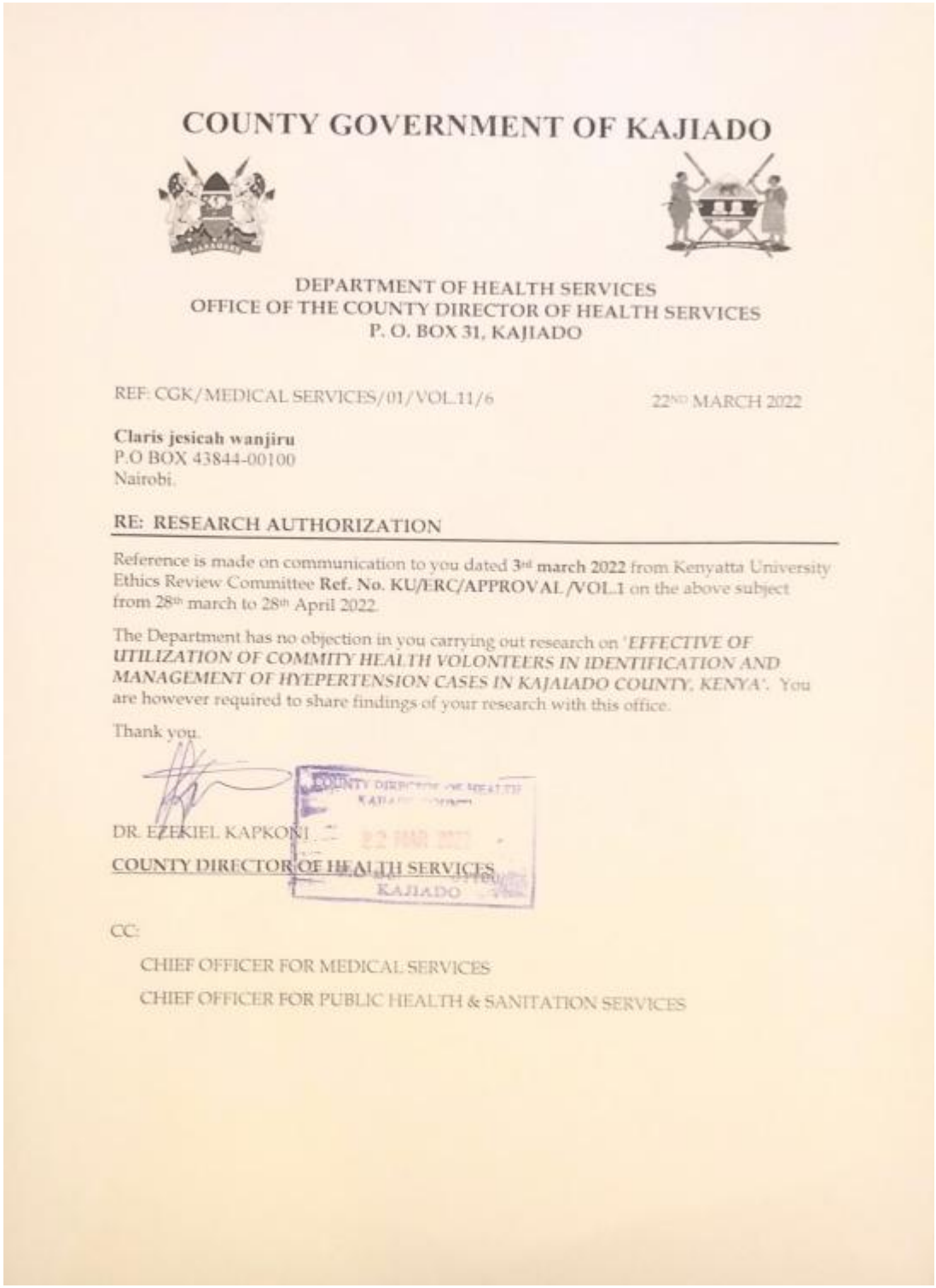
Yours sincerely

KENYATTA UNIVERSITY
02 MAR 2022

Prof. Judith Kimiywe

Director: Centre for Research Ethics and Safety

Appendix VIII: Department of Public Health, Kajiado County Research Authorization



COUNTY GOVERNMENT OF KAJIADO

DEPARTMENT OF HEALTH SERVICES
OFFICE OF THE COUNTY DIRECTOR OF HEALTH SERVICES
P. O. BOX 31, KAJIADO

REF: CGK/MEDICAL SERVICES/01/VOL.11/6 22ND MARCH 2022

Claris jesicah wanjiru
P.O BOX 43844-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Reference is made on communication to you dated 3rd **march 2022** from Kenyatta University Ethics Review Committee **Ref. No. KU/ERC/APPROVAL /VOL.1** on the above subject from 28th march to 28th April 2022.

The Department has no objection in you carrying out research on '***EFFECTIVE OF UTILIZATION OF COMMITY HEALTH VOLONTEERS IN IDENTIFICATION AND MANAGEMENT OF HYEPERTENSION CASES IN KAJAIADO COUNTY, KENYA***'. You are however required to share findings of your research with this office.

Thank you.

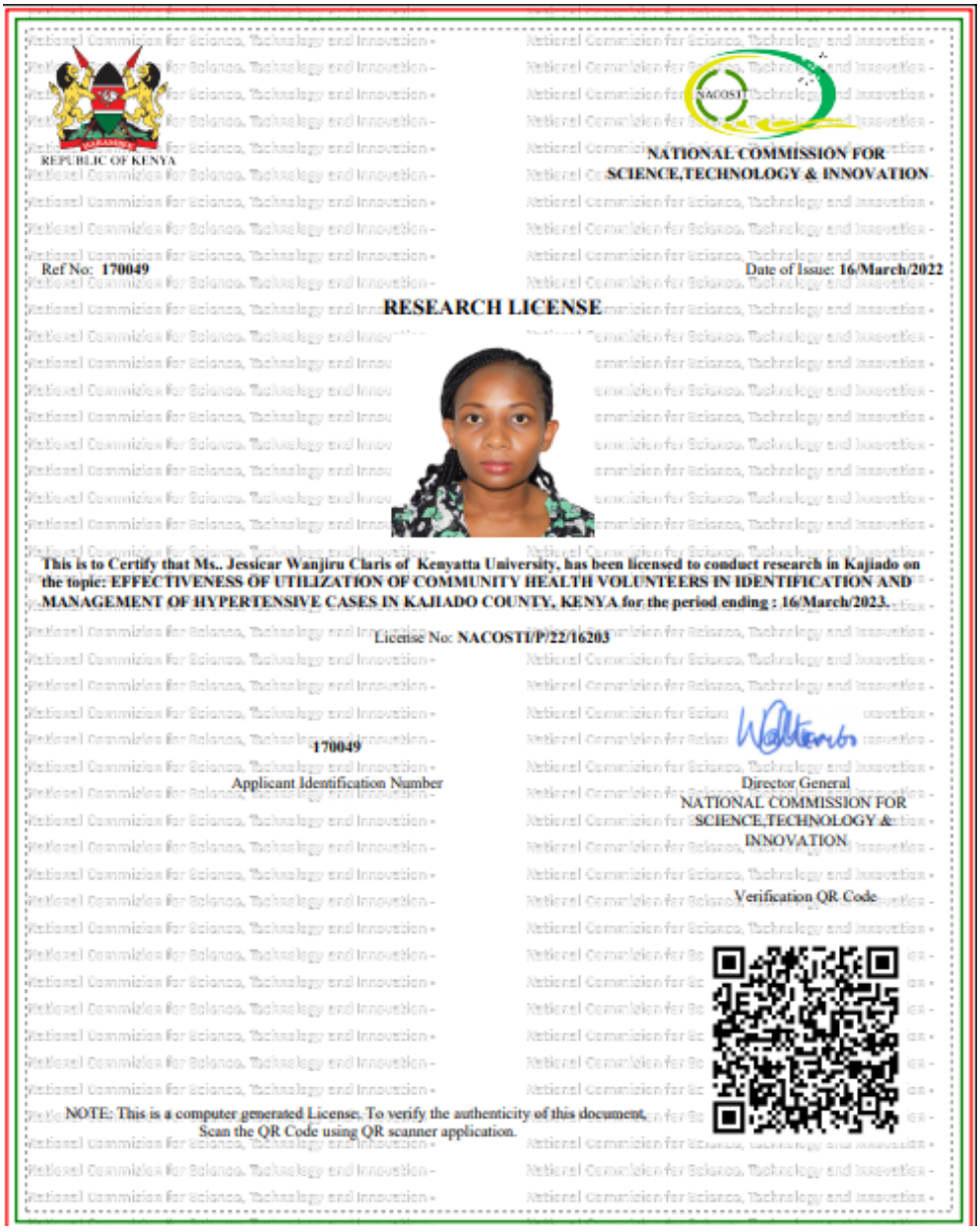
DR. EZEKIEL KAPKONI
COUNTY DIRECTOR OF HEALTH SERVICES

CC:

CHIEF OFFICER FOR MEDICAL SERVICES

CHIEF OFFICER FOR PUBLIC HEALTH & SANITATION SERVICES

Appendix IX: Research Permit- NACOSTI



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **170049**

Date of Issue: **16/March/2022**

RESEARCH LICENSE

This is to Certify that Ms.. Jessicar Wanjiru Claris of Kenyatta University, has been licensed to conduct research in Kajiado on the topic: EFFECTIVENESS OF UTILIZATION OF COMMUNITY HEALTH VOLUNTEERS IN IDENTIFICATION AND MANAGEMENT OF HYPERTENSIVE CASES IN KAJIADO COUNTY, KENYA for the period ending : 16/March/2023.

License No: **NACOSTI/P/22/16203**

170049

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

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