PROFILING THE PERFORMANCE OF COMMUNITY HEALTH VOLUNTEERS IN HEALTH SERVICE DELIVERY DURING THE COVID-19 PANDEMIC IN NAKURU COUNTY

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

KABARAK UNIVERSITY

NOVEMBER, 2024

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DEDICATION

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ABSTRACT

In response to the global shortage of healthcare workers, including Kenya, the World Health Organization (WHO) recommended utilizing Community Health Workers (CHWs), known as Community Health Volunteers (CHVs) in Kenya, to provide basic health services. This study aimed to assess the performance of CHVs in routine community health services in Nakuru County during the COVID-19 pandemic, evaluating their preparedness and challenges faced. The study employed concurrent triangulation mixed method research design, sampling 262 CHVs and 12 key informants. Data was collected from the Kenya Health Information System (KHIS), through in-depth interviews and through structured questionnaires. Descriptive statistics was used to analyze quantitative data while thematic analysis was applied to collected qualitative data. The study enrolled 262 CHVs, with a notable gender imbalance where 76.3% were females, and only 23.7% were males. The age distribution among CHVs was varied, with a majority falling within the 40-59 age range, comprising 65.6% of the total participants. The majority of CHVs were married (63.7%) and had completed secondary education (45.8%). A significant proportion of CHVs were engaged in business (47.8%) or farming (24.8%). Nearly all CHVs (98.9%) had volunteered for more than five years. A considerable number had completed technical training modules (62.6%). CHVs generally rated their performance as good both before and during the COVID-19 pandemic, albeit with slight agreement between the two periods ($\kappa = 0.061$). CHVs demonstrated resilience and adaptability during the pandemic, expanding their services to include COVID-19 responseactivities such as contact tracing. Despite initial disruptions, CHVs resumed their duties shortly after. The study highlights a significant delay in the preparedness of Community Health Volunteers (CHVs) for service delivery during the COVID-19 pandemic. CHVs faced various challenges in service delivery, including logistical constraints, lack of clear communication channels, and organizational shortcomings. Psychosocial challenges included fear of infection, stress, exhaustion and social isolation. The lack of frequent psychosocial support and counseling compounded the emotional toll on CHVs, leading to burnout and mental health issues. In conclusion, CHVs performed relatively betterduring the pandemic but there was a delay in terms of preparedness and notable challenges faced during service delivery. The study recommends, targeted recruitment of male volunteers, mentorship for younger recruits, continuous education for all CHVs, integrating pandemic preparedness into training, increased stakeholder investment, and comprehensive psychosocial support programs for CHVs.

Keywords:*Trained Health Workers, Community Health Workers, Community Health Strengthening, Community Health Volunteers, Disease Emergencies*

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CHA	Community Health Assistants
CHC	Community Health Committee
CHEWS	Community Health Extension Workers
CHO	Community Health Officers
CHU	Community Health Units
CHPs	Community Health Promoters
CHVs	Community Health Volunteers
CHWs	Community Health Workers
CMC	Christian Medical Model
CORPS	Community Oriented Resource Persons
COVID-19	Corona Virus Disease 2019
DRC	Democratic Republic of Congo
EVD	Ebola Virus Disease
HCWs	Health Care Workers
HIV	Human Immunodeficiency Virus
ICCM	Integrated Community Case Management
IFAS	Iron and Folate Supplementation
LMIC	Low and Middle-Income Countries
MNCHS	Maternal Neonatal Child Health Services
MOH	Ministry of Health
NCD	Non Communicable Disease
NHSRC	National Health Systems Resource Centre
PHC	Primary Health Care

PHO	Public Health Officer
PPE	Personal Protective Equipment
SA	South Africa
SARS	Severe Acute Respiratory Syndrome
SDGs	Sustainable Development Goals
TB	Tuberculosis
TH	Traditional Healer
UHC	Universal Health Coverage
UNICEF	United Nations Children's Fund
USA	United States of America
VAS	Vitamin A Supplementation
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Community Health Workers: A reference name for all volunteer community health workers in the world. These are community members who serve their communities in health promotion, prevention, treatment, palliative care and rehabilitation.

Community Health Volunteers: The term previously referring to community health workers in Kenya. These are community members selected to serve in a community unit.

Community Health Promoters: The term currently referring to community health workers in Kenya since June 2023.

Level 1 Services: This is the community level of healthcare. It's the most basic level of the national health system in Kenya primarily involved in promotional and preventive health, integrated community case management of basic conditions, palliative and rehabilitative health. This is the level where CHVs work.

SARS-COV-2 : Severe Acute Respiratory Syndrome Coronavirus 2

No touch Policy: Health service delivery without touching the patient.

Low Touch Policy: No body contact of CHVs and client. Screening to be done by caretaker with CHV offering guidance. CHV should be 2 meters away from the patient.

Contact Tracing: Notifying people who have been in close contact with someone diagnosed with COVID-19 and guiding on steps to take.

Isolation Centers: Areas or structures set aside for the management of COVID 19 positive patients.

Community Transmission: COVID-19cases occurring with no clear source of origin.

Standard Care: Patient care without primary care involvement

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter covers the study background, statement of the problem, purpose, objectives, research questions, justification, and limitations.

1.2 Background of the Study

A country's health system determines its overall social and economic development (World Health Organization [WHO], 2019). Primary Health Care (PHC) is a key aspect of any country's health system. It consists of both community health services and services at the lower-level health facilities. It serves as the entry point for individuals, families and communities into the national health system and brings health services closest possible to where people live and work (Gofin & Gofin, 2005). These services are provided by the PHC team amongst them Community health workers (CHWs). Community health workers have been given different titles in different parts of the world but overall, they serve as community health aides selected by members of the community. They offer health services in the communities they live in, after a period of training. Since the declaration of the Alma Atta on Primary Health, the CHW teams were tasked to provide basic community health needs. These services include: promotion of good health and basic sanitation practices, provision of maternal, new-born and child health services, offer education programs on prevention and control of infectious diseases among other functions (Hartzler et al., 2018). However, these roles vary from country to country.

The achievement of Universal Health Coverage (UHC) and Strategic Development Goals (SDGs) requires a strong PHC system as this is the first point of engagement in a health system (WHO, 2019).

In most parts of the world, community health programs have made a positive impact in improving the health status of both communities and individuals. In the United States, evidence has shown that the participation of CHWs in hypertension management, reduction of cardiovascular risk factors, diabetes control, and cancer screening has contributed to the reduction of disease burden, especially among the low-income populations (Perry et al., 2014). Brazil has one of the largest, best-performing community health programs in the world. This has helped the country reduce under-five mortalities by almost 75 percent, maternal mortality by 50 percent, and achieved nearly universal immunization coverage (Grossman- Kahn et al., 2017). The Brazilian community health worker's services are more holistic going beyond health service provision but also addressing the social determinants of poor health for example by helping families to access cash transfers and social services. Nepal is one of the few countries to achieve Millennium Development Goal (MDG) 4 on significantly reducing under five mortalities from 79.1 per 100 live births in 2000 to 33.7 in 2016 and further to 28.2 in 2020 and MDG 5 on reducing maternal mortality by 80% from 850 to about170 deaths per 100,000 live births between 1991 and 2011. It has a strong community health workers program despite its political and economic instability (Panday et al, 2017; WHO, 2020).

Health achievements have similarly been made in Africa since the Alma Atta Declaration on PHC including the eradication of smallpox, elimination of leprosy and reduced measles incidences. Major steps have been taken towards eradication of

poliomyelitis and guinea-worm disease (Gauld et al., 2012). While Africa contributes up to 25 percent of the global health burden (Crisp, 2011), most African countries meet the WHO criteria for critical health workforce shortage (Campbell, 2013).Due to the shortage of trained health workforce together with the heavy burden of infectious and non-communicable diseases (NCDs), many African countries utilize community health workers (CHWs) to strengthen their healthcare system (WHO, 2008). As shown by several studies, community health interventions in Africa have demonstrated effectiveness in malaria prevention, immunization coverage, breastfeeding, tuberculosis management and neonatal health as compared to standard care (Chipukuma et al., 2020; Mituki- Mungiria et al., 2020; Nzioki et al., 2017; Jack et al., 2016). For example, due to its extensive investment in the Primary Health extension program, Ethiopia managed to reduce its disease burden by 39 percent between 2005-2015 (WHO, 2008).

The first Community Health Strategy in Kenya was developed in 2006 to provide guidelines regarding provision of community health (level 1) services for all citizens (Njiraini & Hussein, 2022). Community Health Units (CHUs) were established, each constituting approximately 5,000 citizens. Community Health Volunteers (CHVs) then referred to as Community Oriented Resource Persons (CORPS) were tasked to provide community health services in these CHUs. Their duties included: health promotion, disease prevention and curative services of basic health conditions (Njiraini & Hussein, 2022). Since then, Community Health Volunteers have been instrumental in improving health outcomes in Kenyan communities. An experimental study conducted in Kitui county, infant vaccination coverage (IVC) increased by 10.1 percent due to community strategy implementation (Nzioki et al., 2017). However, several challenges continue to face the community health workforce as highlighted in the Kenya Community Health Strategy 2020-25. These include: inadequate community health workforce thus hindering

efficient service delivery, insufficient capacity building forums and low-level supervision and mentorship programs which limit the scope of service amongst others (Ministry of Health [MoH], 2020).

Disease emergencies can worsen an already weakened community health system and reverse gains previously made through direct and indirect effects especially if inadequately prepared. A study done to analyze the indirect effects of COVID-19 pandemic in Kenya highlighted supply chain disruptions that affected access to basic medical commodities to continue delivering their services. Some programs like TB, Malaria and oncology also faced some shortages in commodities that needed to be imported from China, India and USA (Barasa et al., 2021). Although healthcare providers were listed as essential care workers, CHVs were affected by the informality of their jobs. While there is scarcity of empirical literature on the effects of COVID-19 on community health services, available literature shows that CHVs were to be involved in sensitization of members of the public on health measures to control COVID-19 transmission, case identification and surveillance, contact tracing and facilitating referrals, this in addition to continued routine health services. Community Health Volunteers were not prioritized in accessing the psychosocial services availed to health workers through a toll free number but rather seek support from their supervisors. This study, therefore, assessed Nakuru County CHVs' performance on routine health services during the COVID-19 pandemic, their level of preparedness for continuation of community health services in the face of a pandemic and the challenges experienced.

1.2 Statement of the Problem

The Kenyan community health program has contributed positively in the improvement of health indicators. However, health emergencies that arise from time to time challenge all

levels of the health system if inadequately prepared. The recent SARS-CoV-2 pandemic that was first reported in China in December 2019 affected everyone and their daily way of living. Healthcare system in most African countries were not prepared for the pandemic due to various pre-existing challenges. Kenya experienced high community transmission of the virus with healthcare facilities being overstretched to cater for the high number of positive cases. COVID-19 home based care services were advised by the government to mitigate this challenge. Due to their vast knowledge of their communities, CHVs were given new roles in the emergency response such as referring patients with COVID-19 signs and symptoms to isolation centers, contact tracing, assisting in home based care, sensitizing members of the public on infection prevention measures and vaccine uptake and administration.

This was in addition to continuation of routine health services under amended protocols sensitive to preventing COVID-19 transmission. Despite availability of these guidelines, reports are lacking on how prepared these CHVs were to handle these duties. Nakuru County was among the top Kenyan counties with high COVID-19 cases. As of 26th March 2022, the total number of cases were 16,722 with 798 deaths and a case fatality rate of 4.8 percent. These large numbers of infections led to the government taking measures such as curfews and lockdowns to reduce community transmission. Inadequate preparedness, constrained resources, new unfamiliar roles, curfews, travel restrictions, social stigma and fear of infection might have affected how CHVs performed their routine community services which was required to go on.

Failure to assess and address these situations could lead to more indirect consequences in future pandemics. This study therefore aimed to assess how CHVs performance varied in the background of these challenges.

1.3 Justification of the Study

Community Health Workers assist communities and individuals to better take care of themselves with a vital impact in hard-to-reach areas and to the vulnerable communities. They have been found most critical during disease emergencies as outlined in the study by Bhaumik et al. (2020). In the setting of a health system weakened by emergencies and a shift of focus to emergency response, CHVs form a crucial backup for the frontline healthcare teams in the management of less complicated conditions at the community level. However, CHVs' level of performance in community service delivery, preparation and challenges in an emergency is still unclear with scarcity of empirical literature.Additionally, by evaluating the performance of Nakuru County CHVs before and during the pandemic, the study helps in understanding the resilience and adaptability of community health systems, directly contributing to Sustainable Development Goals 3 (Good Health and Well-being) and 10 (Reduced Inequalities).

This evaluation can inform evidence-based strategies for strengthening primary healthcare, essential for achieving Universal Health Coverage in Kenya. Moreover, assessing CHVs' preparedness for pandemic continuation supports Kenya's Vision 2030 by enabling community resilience and preparedness, aligned with the vision's goal of a globally competitive and prosperous nation. Strengthening community health systems also resonates with the bottom-up economy model, empowering grassroots actors and promoting inclusive development.Lastly, identifying challenges faced by CHVs during the pandemic informs policy interventions aimed at overcoming systemic barriers, ultimately enhancing health service delivery equity and efficacy. Thus, this study serves as a vital cornerstone for advancing Kenya's health agenda, contributing to broader socio-economic development and the realization of global health and development targets.

1.4 Objectives of the Study

i. To evaluate the performance of Nakuru County CHVs in routine community health services delivery before and during the COVID-19 pandemic.

ii. To determine the COVID-19 pandemic preparedness of the Nakuru county CHVs for the continuation of routine community health services.

iii. To determine challenges to the effective performance of CHVs during the COVID-19 pandemic in Nakuru County.

1.5 Research Questions

i. How was the performance of CHVs in community health service delivery affected during the COVID-19 Pandemic in Nakuru County as compared to before the pandemic?

ii. How were the Nakuru County CHVs prepared for the continuity of routine community health services during the COVID 19 Pandemic?

iii. What challenges affected the performance CHVs in health service delivery during COVID-19 pandemic in Nakuru County?

1.6 Significance of the Study

Kenya and many parts of the world have not, in the recent past, experienced a pandemic of the magnitude that came with SARS-CoV-2. It exposed the strengths and weaknesses of health systems and the difficulties faced by frontline health workers around the world. The pandemic gave an opportunity to conduct studies within the health sector and related sectors and identify areas that need improvement and strengthening. In various disease outbreaks, few studies are done at the community level where majority of the vulnerable population is served. This study assessed how well the community level health volunteers performed, how they were prepared for emergency response and continuation

of health services. Disruption of health services can lead to increased morbidity and mortality from other conditions other than the one causing the emergency. It is therefore important to assess whether COVID-19 caused disruption in vital community health services and identify challenges that could contribute to that. This can assist policy developers at national and county levels on measures to ensure continuity of services even when a disease emergency occurs. The CHVs will benefit from the policies as their challenges will be addressed thus ensuring smooth service delivery at all times. The community will remain healthy as their health services will continue to be delivered despite an outbreak or a pandemic.

1.7 Limitations and Delimitations of the Study

Lack of funding for the study to support other methods of data collection like focus group discussions (FGD). Reporting or memory bias noted. I shared a sample questionnaire earlier to give the CHVs time to recal the events during COVID 19.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter constitutes reviews of available literature on the performance of CHVs. It is organized as the history of Community Health Service, role performance, preparation, and the challenges faced by CHVs in community health service delivery. The chapter also contains the conceptual framework which gives a representation of the interaction among the study variables.

2.2 Literature Review of the Study Variables

2.2.1 History of Community Health Service-Programs

Community healthcare workers (CHWs) comprise a diverse group of individuals within the health sector who work in community settings where they live and work (Olaniran et al., 2019). They serve as a key link between their communities and the country's health systems. Their training in health provision is basic and formal but limited in time and to the various tasks they undertake. Present-day CHW-programs trace their origin to Ding Xian, China in the 1920s (Perry et al., 2013). These individuals were illiterate and their training lasted three months. They were trained on recording births, deaths, carrying out smallpox vaccination, providing first aid, and giving the community members health education (Rifkin, 2017).

They were then referred to as 'farmer scholars' and were the predecessors of the barefoot doctor program; a program that increased in numbers reaching over one million in the period between the 1950s and the 1970s in China (Sidel, 1972; Parker & Parker, 2017). The barefoot doctors served similar functions to their predecessors but central to their

roles was their service aschange agents through addressing health problems and implementing health policies.

The dawn of the 1960s through the end of 1970s saw the emergence of small groups of CHW-programs across the world (Perry et al., 2017). In the United States of America (USA), this was especially driven by the fact that modern trained physicians could not manage to serve health needs of the poor and rural population in the country. Thus, “barefoot doctor program” laid a foundation for the establishment of CHWs not only in the USA but also in Tanzania, Honduras, Venezuela, Indonesia, and other states. In addition, it was becoming apparent that the missionary model and the Christian Medical Model (CMM) formulated by the western states and one of the units of the world council of churches in Geneva respectively were failing (Litsios, 2004).

The CMM and the World Health Organisation (WHO) developed newer ideologies based on analysis of case studies in different countries where CHW programs were established. These ideologies supported the fact that CHW programs were quite innovative for delivery of healthcare services. Thus WHO published the book, “Health by the People" in 1975 reflecting those ideas (Newell, 1975). The book served as one of the intellectual foundations in the international conference on primary healthcare in 1978 at Alma-Ata, Kazakhstan. The conference resulted in the declaration of the Alma-Ata that proclaimed health for all through PHC by the year 2000 (Pandey, 2018).

The Alma-Ata declaration led to mushrooming of more community health programs in various regions of the world. It directed governments to take the responsibility of providing health for all through the provision of quality healthcare and social measures (Pandey, 2018). It was envisioned that through PHC all people of the world would achieve a level of health that would lead to a socially and economically productive life

by the year 2000 (Rifkin, 2017). This declaration defined the role of CHWs in to two broad aspects: one was service-oriented that included curative and preventive services and the second was the transformative agenda that sought to engage communities and teach them on how to take care of their health.

However, during the start of the '80s, many of the established CHWs programs failed and encountered serious bottlenecks. The major challenge was loss of momentum earlier generated by the Alma-Ata declaration during its enactment (Hall & Taylor, 2003). In addition, the oil crisis that ravaged the world in the 1970s forced developing countries into debt in the '80s. This led to a reduction in public sector financing which ultimately affected healthcare financing. Thereby the finances earlier planned to establish and run CHW programs were unavailable (Segall, 2003; Standing & Chowdhury, 2008). The CHW programs did not completely drain away as towards the end of 1980s and ‘90s, successful CHW programs were established. Among them were the Brazil National Health Care Program started in 1987, Nepal's Female Community Health Volunteer Program started in 1988 and Pakistan's Lady Health Worker Program started in 1992 (Hafeez et al., 2011).

Since 2000, several small successful CHW programs have come up in several countries and their impact in reducing child mortality and providing healthcare services to the community are being realized. A report by WHO in 2008 demonstrated that countries which adopted and invested in PHC recorded fast improvement in the health of their population and made social and economic progress compared to countries that lagged behind (WHO, 2008). In 2018 during the renewal of the Alma Atta Principles in Astana, Kazakhstan member states were convinced that PHC was the driver to Universal Health Coverage (UHC). A declaration was then made to strengthen PHC through continued

investment in training and caring for the well fare of human resource for primary health (WHO, 2018).

Twenty-four African countries have had well established and documented CHW programs since the 1980s (Gilroy & Winch, 2006). These include South Africa, Tanzania, Kenya, Somali, Uganda, Ethiopia, Nigeria and Zimbabwe among others. Uganda and South Africa have the most documented studies on the performance of CHW-program. By thematic analysis, most of the African CHW-programs focused on management of malaria, followed by provision of essential health services, tuberculosis, HIV/AIDS, maternal and nutritional services (Bhattacharyya et al., 2001). In Africa, CHWs are known by various titles: community drug distributor/community resource person in Uganda, community health agent in Ethiopia, community health volunteer in Malawi and Kenya, and village drug-kit manager in Mali. The study by Van et al. (2010) on emergence of CHW-programs in South Africa (SA) concluded that such programs were driven by the struggle against apartheid.

In addition, the study which involved eight witness-seminars and 13 historical interviews reported that earlier programs were more innovative, comprehensive and empowering to all involved parties. "*Ujamaa"* movement and liberation struggle in Tanzania and Zimbabwe respectively were focused on systemic transformation with a view of showing self-reliance, development and eradication of social inequities (Lehmann & Sanders, 2007). In Ghana during reorganization of the MoH in 1970s, significant numbers of CHWs were recruited, trained and supervised by the national government with the view of establishing PHC policies within communities.

In Niger on the other hand, earlier CHW programs evolved from volunteers who worked in the agricultural Maradi department in the late 1960s and grew into volunteer health

workers for the national government (Sandrel, 2018). One notable characteristic of the African CHW-programs in their earlier initiation was their literacy levels. In Demographic Republic of Congo (DRC), Somali and Peru, background literacy was a prerequisite requirement. Kenyan AMREF-led CHW programs and Tanzania programs required the individual to have at least seven years of primary education. In Nigeria, a prerequisite on ability to write and read "Hausa" was required to join CHW-programs (Lehmann & Sanders, 2007).

Kenya took part in both the Alma Atta declaration and the Astana, Zakakhstan agreement. Following the Alma Atta declaration of 1978, Kenya developed a community health approach in 1980 but mainly focused on healthcare facilities with little attention to community involvement (MoH, 2020). For example, in 1990 and 1991, 70 percent of the health budget was allocated for curative (hospital) services while only 19 percent was allocated for promotive and preventive services. This was despite the fact that the major causes of morbidity and mortality were conditions that could be prevented through aggressive primary and preventive healthcare programs. A 2004 evaluation of the Kenya Health Policy Framework reported a decline in the trends of health-related indicators, despite increased funding to the health sector. For example, infant mortality increased from 51 per 1000 live births in 1992 to 74 in 1998 and 78 in 2003 while under five mortalities alsoincreased from 74 per 1000 live births in 1992 to 112 in 1998 and 114 in 2003. This led to the formation of the first community health strategy that established level 1 service.

The second Community Strategic plan 2014-2019 focused on strengthening the delivery of integrated, comprehensive, and quality community health services for all population cohorts, strengthening community structures and systems for effective implementation of

community health actions and services at all levels. Currently, the Kenyan community health workforce includes Community Health Assistants or Officers (CHAs/Os), CHVs and Community Health Committee (CHC) (MoH, 2020). One CHA/CHO oversees 10 CHVs who are in charge of up to 5,000 people or about 500 – 1000 households. The CHC is the governing body for the unit (MoH, 2020). Kenya has adopted PHC as the approach to deliver universal health as articulated in the Kenya Primary care strategic framework 2019-2024 (MoH, 2020). By 2020, Kenya had approximately 6,359 Community Health Units out of an expected 9513, coverage of 67 percent (MoH, 2020). By August 2020 when the Kenya Community Health Policy was signed, there were 3,250 CHA/Os out of the expected 9,513, giving a coverage of 34 percent and 63,590 CHVs out of the expected 95,130, giving a coverage of 69 percent (MoH, 2020).

2.2.2 Preparedness ofCommunity Health VolunteerstoContinue Routine Community Health Services in The Presence of COVID-19 Pandemic

Frameworks for public health disease emergency preparedness are routinely lacking, yet these emergencies impact population health. Preparedness is essential to avert disaster risks, reduce the magnitude of the effects of the emergencies and ensure resilience of the system. A resilient health system is one that will rapidly acquire information of its environment, adjust behavior and structures to changing circumstances, communicate efficiently and adequately mobilize resources to handle the situation.

A Canadian qualitative study to assess performance measurement for public health emergency preparedness was conducted (Khan et al,2018).Six FGDS, with participantsselected purposively and using snowball sampling, assessed the important elements for assessing public health preparedness in emergencies (PHEP). The important elements from this study included: 1. Clear leadership to articulate the roles of public

health and governance 2. Coordination and integration 3. Clarity in relation to authority, roles and responsibilities 4. Dynamic, collaborative planning process 5. Developing collaborative networks 6. Engaging the community by involving community groups in planning decisions 7. Risk analysis to inform planning 8. Surveillance and monitoring 9. Practice through simulation, drills, exercises, or experiences to revise and reinforce protocol and identify irrelevant practices 10. Physical, structural, and financial resources, 11. Creating time schedules for response 12. Develop and support knowledgeable, skilled and resilient workforce through training, experience, and possessing specialized expertise. 13. A clear channel of communication to managers, within, and to the public 14. Learning and evaluation through debriefing, post incident reviews to facilitate feedback.

The United Nations (UN) and World Health Organization (WHO) advised that lessons from the 2013-2016 West African Ebola outbreak should serve as a wakeup call to all nations to avert health crises in future disease emergencies (WHO,2018). Thus WHO developed a unifying strategic framework for emergency preparedness with important principles and elements for effective country emergency preparedness (WHO,2017). The elements are similar to that of the Canadian study. Important to both is adequate development of the human resource for health through training and equipping them for a health emergency. Community involvement is highlighted in this strategy as community members are the first responders and first victims of an emergency. They are therefore critical in the emergency preparedness planning and should be involved in all aspects.

Communities should take ownership of the preparedness process and strengthen it through implementation (WHO, 2018). The preparation planning should include capacity building for basic and safe health as well as the prevailing emergency amongst other

components. Risks and capacities vary in different regions and societies and therefore the plans, level of preparedness and tools will vary from one context to another. During the COVID pandemic, the Brazilian CHWs experienced fear, lack of confidence in their work and a great strain in their personal life since they were poorly prepared on how to carry out their services in the face of a disease emergency. They were not adequately trained, lacked direction on how to re-organize their work and did not clearly understand their roles (Lotta et al., 2022). In Kenya, guidelines for continued provision of community health services were released in April 2020 (MoH, 2020). Each county government was meant to implement these guidelines through the departments of health and community channels.

2.2.3 Roles of Community Health Volunteers in Kenya Before and During COVID-19

The Kenya health service delivery structure has four main tiers that are hierarchically arrayed from national referral services (tier 4), county health services (tier 3), primary care services (tier 2) and community health services (tier 1). The community health services are actively delivered by the CHVs with the role of helping people achieve healthy lives. Some of the key roles and responsibilities include sensitization of communities on health promotion and preventive practices to improve their health; making household visits to determine health situation and deliver key health information; treatment of common illnesses and minor injuries (ICCM); implementing protocols for maternal and new-born health. They also promote homecare for the sick, promote community compliance to treatments, mobilize community health programs and refer cases to the nearest health facilities (MoH, 2020).

In 2020, the Ministry of Health (MoH) Kenya came up with guidelines on continuity of essential community services as community transmission of COVID-19 infections increased (MoH, 2020). Community Health Volunteers were to continue giving health education and promotive messages to community members especially on hygiene, hand washing and physical distancing. They would also carry out family planning services, maternal nutrition of pregnant mothers, antenatal services, getting mothers to have skilled delivery at health facilities, community based postnatal services and assisting transportation to health facilities during curfew hours. They would give new born care through assessment of breastfeeding and danger signs. Integrated community case management (iCCM) of malaria, pneumonia, diarrhoea and malnutrition. Nutritional supplements like Vitamin A, iron and folate (IFAS), support for complementary foods for children 6-23 months, deworming, vaccination, care for persons living with chronic conditions, house hold visits for old people and those living with disabilities, community mental health and psychosocial services, community surveillance and reporting of challenges in accessing basic commodities like food, water, shelter and healthcare. They would also report maternal and perinatal deaths in the community. These services were to be offered through "low touch" policy graduating to phone based services when the disease transmission increased. CHVs were to be provided with Personal Protective Equipment (PPEs) and offered support supervision with a right to opt out for any reason during the Pandemic. This would ensure that even with measures to reduce transmission such as movement restrictions, vulnerable Kenyans would not suffer increased morbidity and mortality.

Emergency response had additional roles given to CHVs. At the beginning of the pandemic they were tasked to encourage and educate communities on infection prevention practices like social distancing, use of masks, hand washing and appropriate

cough practices. Other roles included supporting community surveillance, identification of presumptive cases, contact tracing and appropriately linking these contacts to health facilities or isolation centers for further management. After the COVID-19 vaccines were rolled out, CHVs were very instrumental in driving community vaccinations through sensitization of local communities, local vaccination campaigns, identification of target populations like the elderly and those with comorbidities, administering the vaccines and follow-ups during the second doses (WHO, 2021).

2.2.4 Performance of Community Health Volunteers During Disease Emergencies

Experience across the globe has shown that CHWs are key resources in the delivery of health care services and in empowering community members to make informed health care decisions.Ref,,However, the public health sector has been questioning the performance of CHWs. Reports emerging from diverse studies have indicated poor service delivery by the CHWs during disease emergencies (Celletti et al., 2010; Greenspan et al., 2013). (confirm) By virtue of their job being voluntary, the aspect of ensuring quality in services delivered is fundamental.

The WHO has reported lack of evidence that supports sustainability of CHV-programs (WHO, 2018). As such, assessing their performance underpins one of the critical aspects of ensuring that quality health care is delivered at the community level. The commonly used standard method of monitoring and evaluating performance of CHVs entails assessing their health knowledge, household coverage, and reporting rate per month (Chung et al., 2017).

These aspects of performance focus more on the job domain and are largely misleading in demonstrating the overall performance of CHWs. As such, Milkovich and Boudreau (1997), suggested that the job title be replaced with role title with a focus on the role

theory. The theory requires that such analysis incorporate personal attributes of CHWs and their work setting which gives a more complete and overall performance assessment (Olang'o et al., 2010). The performance of CHW-programs can be rated in terms of the success rate of individual members. Just like any other community program, the success of CHWs relies greatly upon factors that influence their role performance. Factors such as demographic characteristics, knowledge background, motivation, and organizational input influence a lot of the quality of healthcare services delivered by CHWs (Njororai et al., 2021). Therefore, in assessing the performance of CHWs these factors should be critically evaluated based on the role theory. Demographic factors such as gender, age, income level; motivation factors such as skills, altruism, motivators both extrinsic and intrinsic, and organizational input that includes the training, recruitment process, and supervision have to be factored in during analysis (Rahman et al., 2010).

Disease emergencies such as SARs Cov-2 and others in the past adversely affect health Care systems across the World. Despite this, all levels of health management have to ensure that health needs are addressed while the caregivers and the communities are protected. The effect is due to both direct and indirect causes of the emergency. A systematic review of various studies on the Ebola Virus disease (EVD) outbreak of 2013-2015 in West Africa, revealed that EVD affected facility-based health services. Not only were Maternal, Neonatal and Child Health Services (MNCH services) affected but also others including malaria treatment and prevention, vaccination, family planning, surgeries, HIV and TB services.

Community health services were significantly affected too. In a mixed methods study on the evaluation of CHWs during the Ebola outbreak in West Africa, Miller N., et al (2018), noted that in the initial stages of the outbreak there was a decline in the

community MNCHs. This was mainly due to the pre-existing weak health system, the overwhelming nature of the disease outbreak with fear of being infected, confusion over roles and lack of support. However, CHWs remained vital in this response as they would get more reliable information from members of the community on suspected cases and deaths unlike other health providers who were viewed as outsiders. Eight months after EVD began, CHWs were trained on 'no touch' policy thus restarting their community health services once more. Overall health indicators declined with the suspension of vaccinations, outreaches, and reduced hospital visits. This led to direct and indirect mortalities from preventable and treatable conditions. Notably, Ebola contributed to only 2 percent of all these deaths (Elston et al., 2017).

A report drawn from Practitioner expert across 4 WHO regions documented that Community Health Workers play a crucial role in epidemics especially in Low- and Middle- Income Countries (LMIC) and in societies with vulnerable health systems. Therefore, their roles should be prioritized. If well equipped, well trained and supported, they can help keep the epidemic in check. Due to the low number of health workers as well as the highest disease burden in LMICs, the existing staff need to be properly protected from disease infection by provision of personal protective equipment, proper on-going training (as case definitions keep changing) and be well compensated or motivated.

Community health workers should be included. In order to better manage disease emergencies, CHWs should be supported to carry out expansive testing, contact tracing, assisting people in isolation and quarantine. Since previous pandemics like the EVD of West Africa led to loss of many lives from declining of essential services than from the pandemic itself, it's advisable that care for other conditions should continue during times

of crisis. CHWs should therefore continue with PHC services e.g. vaccinations, Integrated Community Case Management (iCCM) of children with malaria, pneumonia and diarrhea. They should monitor patients' progress and carry out emergent referrals for patients whose conditions deteriorate. Outreaches to at risk populations should continue while communities should be taught on infection prevention measures. CHWs can help shield the vulnerable community members by helping them in self-isolation, helping reduce misinformation in the communities on the pandemic, reduce fear and mistrust for the health system during the pandemic, assisting in community behavior change and educating populations at risk e.g. the elderly, those with comorbidities and the immunocompromised.

COVID-19 is the most recent pandemic. In the peak of the pandemic in Italy, Nacoti et al. (2021) on their commentary on Changing Perspectives on Preparation and Mitigation emphasized that patient centered care was inadequate response to a Pandemic. There was need to change perspective and invest more on Community centered Care. They learnt that hospitals might have been the main carriers of the spread of infection, ambulances, ambulance personnel, and health personnel. They applauded that the crisis could have been averted by more outreach services, home care with delivery of oxygen and pulse oximetry, mobile clinics, and intensified surveillance. These measures would reduce the stretch on hospitals, reduce contagion and ultimately reduce infection to health workers.

A 3-week survey by WHO in 155 countries confirmed that management services for non-communicable diseases had been grossly disrupted during the pandemic (WHO, 2020). About 53 percent of the countries that were surveyed had either completely or partially disrupted hypertension treatment; 42 percent for cancer, 49 percent for diabetes and its complications while 31 percent of the countries disrupted services for cardiovascular emergencies. Around 67 percent of the countries in the world had placed

NCD services under the national COVID-19 preparedness plan of which 72 percent of higher-income countries adhered to it. In contrast, only 42 percent of low-income states included NCD services under the COVID-19 response plans (WHO, 2020). As such, NCD services were grossly affected in developing countries due to the pandemic.

While analyzing the indirect effects of the COVID pandemic in Kenya, minimal effects were found to have occurred. The notable effects included reduced outpatient visits by patients especially the old and those with chronic conditions, disruption of international supply chain, inadequate supply of personal protective equipment to healthcare workers leading to "go slows", disruption of health infrastructure as some facilities were converted to isolation centers. There was also a significant increase in the number of gender based violence cases. These impacts remained minimal since the MoH took fast measures to mitigate them and further reduced by the moderate restriction measures taken by the government. With travel restrictions associated with the pandemic and fear of hospital visits, more emergencies may have been presented to the community health workers. Thus, these community health workers needed to be trained and supported in early recognition of emergent situation, providing basic first aid or giving simple treatment and referring acute conditions early enough (Elsto,2017). It is yet to be clearly understood whether CHVs in Kenya were able to attend effectively to health emergencies if any that were presented to them at the community level.

Just as with the case of EVD, some endemic diseases like malaria may present with symptoms similar to COVID-19. These conditions can be fatal if not treated promptly. To reduce the COVID-19 negative consequences, the delivery of essential health services to communities needed to be strengthened and supported. Despite the guidelines given by the MoH on community services, analysis of the community services would be

important to advise future preparedness in case disease outbreaks or epidemics of such magnitude happens again.

2.2.6 Health System Related Challenges Faced by Community Health Volunteers During Disease Outbreaks

Health systems face various challenges during disease outbreaks, epidemics and pandemics. Miller et al. (2018) noted a number of these challenges during the Ebola Virus Disease outbreak in West Africa. These included: (1) Lack of Support; Services being re-oriented towards Ebola in some areas, leading to cessation or decline of essential services in the communities when the EVD was at its peak. The services affected included integrated Community Case Management, childhood immunization, malnutrition screening. (2) Directives from the supporting partners or from facilities to stop providing services; Delay in training on 'no touch' services policy since the outbreak began in some places up to 8 months later.

This led to a number of CHWs dying of EVD. (3) Difficulty diagnosing conditions presenting with symptoms similar to Ebola e.g. Malaria and diarrhea since the training and policy was not very clear. (4) When recruitment of CHWs for Ebola response was done, irregularities were reported with nepotism topping the list. (5) Drug stock outs during and after the Ebola epidemic affected CHWs service delivery. Community members would even seek the services of Traditional Healers for lack of medicines from the CHWs and local health facilities. When the epidemic was over, CHWs complained that the government gave no recognition to their fight against Ebola outbreak. The promises that had been made to them e.g. financial packages, and scholarships to join the Army amongst others were not fulfilled. Bhaumik et al. (2020) noted that logistics and funding was a common challenge. Shortfalls in routine support supervision, health

system information management, financial incentives and inadequate training were found to be significant barrier to effective service delivery.

In countries with well-established CHW programs, roles and tasks of CHWS changed substantially during pandemics. During the 2015 cholera outbreak in Kenya, the ministry conducted a study to assess the Community Health Care workers' experience , Curran, et al. They reported barriers in the health system that included confusion regarding roles and reporting systems, and poor coordination. This led to inefficiencies and delays. Engagement with supervisors was one- way and their needs were not discussed. There was a disconnection between the Health Care workers (HCWs) with the managers. HCWs often felt that their supervisors were unaware of barriers to providing quality health care and managing the outbreak at the community and health facility levels. They recommended better engagement by managers and supportive supervision over fault finding visits.

Inadequate healthcare supplies to nurses, Community Health Extension Workers (CHEWs) now called CHA/Os, and CHVs and uncertainty about salaries was also a challenge raised. Nurses recommended that it was an important thing to have CHEWs and CHVs on the ground. The CHVs views were however not included.

Community health volunteers face various challenges in the delivery of community health care services (Lewin et al., 2010). Provision of quality health care services requires optimization of these factors since challenges lead to poor performance of CHWs.

2.2.7 Community Related Challenges Facing Community Health Volunteers in Health Service Delivery During Disease Emergencies

While CHWs remained committed to their communities despite the Ebola epidemic, some communities responded differently by seeking less services from the CHWs. Miller et al. (2018) noted that there was fear and mistrust of CHWs by community members including hiding their sick ones for fear of being referred to health facilities, where they thought Ebola causing medicines were being issued. In some areas, CHWs were rejected by the community and family members as they were seen as Ebola carriers and spreaders. They were harassed by family members who reported of having a sick relative. Since they were primarily involved in Ebola activities, their families rejected them for their failure to contribute to family farming activities. Some community members did not heed to seek healthcare services when they were sick in hospitals, neither did some communities heed to behavior change even when preventive measures were well described to them. Bhaumik et al. (2020) resonates similar findings where CHWs were seen as infection spreaders and minimal community support was given to them. Study in New York on the experiences of Home Health Care Workers on service delivery during the COVID-19 pandemic found that they faced varied challenges including but not limited to unreliable support from their organizations, contracting the virus and putting their own families at risk. Some faced rejection by their chronic care patients for the fear that they would infect them with the virus (Stirling et al. 2020). The geographical set up of a community may affect the performance of CHVs. A study done by Kok et al. (2015) found out that volunteers are more common in urban areas where the population is dense but nucleated population. CHVs in sparsely populated areas have to cover longer distances between one homesteads to the other.

2.2.8 Psychosocial Challenges Community Health Volunteers Experience During Disease Emergencies

SARS CoV-19 has led to notable mental health issues in the general population and amongst healthcare workers. Serafini et al. (2020) reported that socio-economic crisis and psychological stress followed the emergence of COVID-19 pandemic. Social isolation, quarantine, overwhelming media reports, travel restrictions, loneliness and fear of infection have led to stress, anxiety, depression, frustration, uncertainties, fear, mood alterations, irritability, insomnia, posttraumatic stress disorders, amongst others psychological issues. CHV's psychosocial support, safety, wellbeing and other motivating benefits e.g. insurance, recognition were not noted in the study by Bhaumik et al. (2020). Sato et al. (2014) found a high prevalence of Mental Health Disorders amongst health care workers in Mali hospitals in the initial stages of the pandemic. A reviewed mental health response to the Covid-19 pandemic in Kenya found that there were no mental health structures for the community yet there was great need for community psychosocial first aid (Jaguga & Kwoba, 2020). In addition, the MoH has set up a call center for health care workers but this does not include CHVs.

2.3 Conceptual Framework

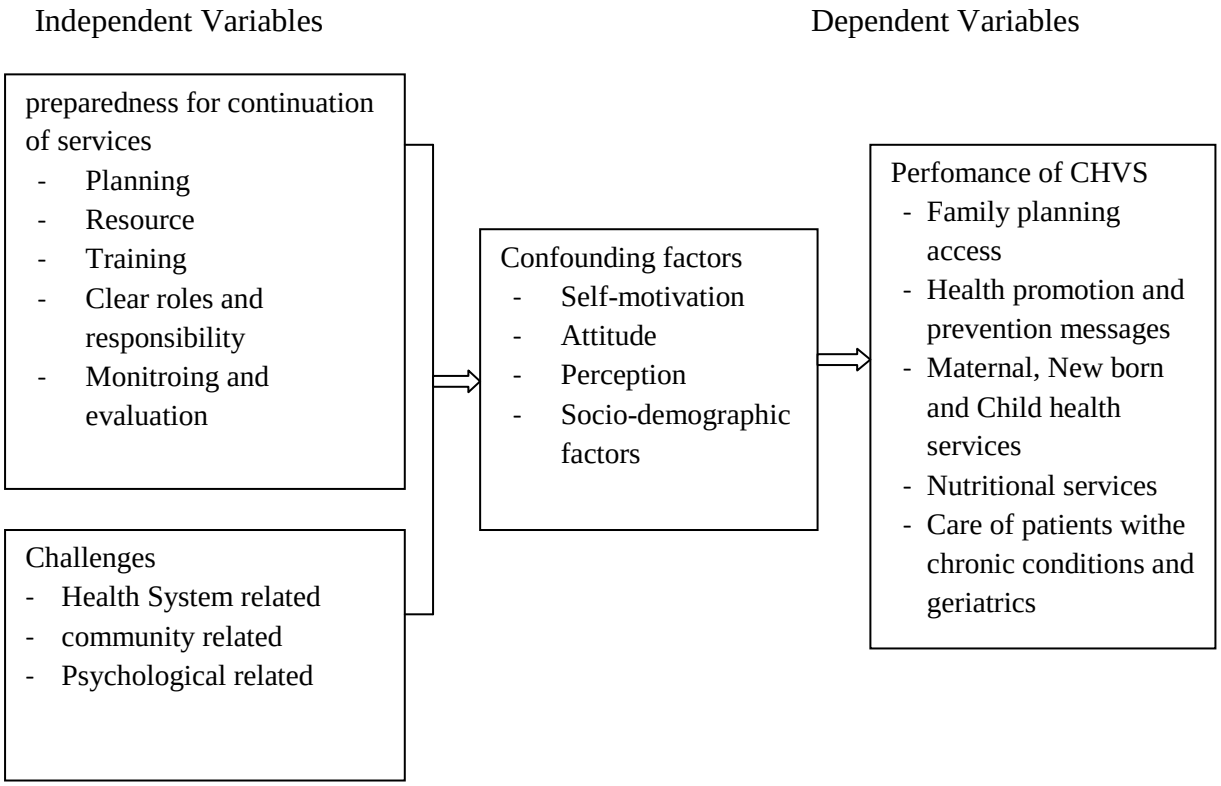
This study was guided by the conceptual framework (CF) below (Figure 1). The dependent variable was the performance of CHVs before and during the COVID pandemic. In this study, performance was determined by the CHVs activities that involved health education and health promotion, family Planning services access, antenatal care services, skilled birth deliveries, community postnatal care, newborn care services, iCCM of malaria, diarrhea and pneumonia, nutritional services, household visits, community surveillance, community maternal& perinatal deaths reported. The independent variables were subdivided into the level of preparedness of CHVs for

continuity of community health services in the face of an ongoing pandemic and the challenges they encountered during the pandemic.

The performance of community health volunteers to meet the quality healthcare needs of the population can be influenced by the level of preparedness and the challenges experienced. A well prepared workforce like proper training can be trusted to continue with services ensuring quality and consistency. Health system challenges included supply of basic essential drugs and commodities which influence effective provision of essential health service. Others were support supervision, CHVs logistics management e.g. airtime, transport, reporting materials, remuneration, recognition and motivation. The community system that provides an enabling environment for CHVs to work may be faced by challenges such as lack of community support from NGOs and CBOs and individual community members. The psychosocial stability of CHVs determines their performance especially in health emergencies situation. Rejection by community members and family may hinder CHVs' performance and lead to attrition. Addressing performance challenges is important for improving health care related goals.

Figure 1

Conceptual Framework



Source: Author (2024)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter covered the methodology that the researcher used to achieve the objectives of the study. It is organized as research design, target population, sampling method, data collection procedures, research instruments used, methods of data analysis and ethical considerations.

3.2 Research Design

The study employed concurrent triangulation mixed method research design according to (Alexander, 2020). Both quantitative and qualitative data were collected and analyzed simultaneously. Data on CHVs performance was extracted from the KHIS system, CHVs filled questionnaires and heads of CHVs and other supervisors wereinterviewed. This enabled analysis of CHVs performance, their preparedness for service delivery during the COVID 19 pandemic and the challenges they experienced.

3.3 Location of the Study

This study was carried out in Nakuru County, Kenya. Nakuru county was the fourth leading county in COVID-19 disease burden as of March 2022 (Statista, 2022). The county has a total of eleven sub counties and has a robust community health volunteers program. The top 4 sub counties in COVID-19 disease burden were Nakuru East, Naivasha, Nakuru West and Bahati respectively (Nakuru County Situational Report (SITREP) 420). 3 subcounties: Nakuru East, Bahati and Naivasha were selected for this study, each representing different geographical locations. Nakuru East and Nakuru West sub counties were found to have similar geographical characteristics, both being in the urban setup. Comparing Nakuru East and Nakuru West, Nakuru East had a higher

COVID 19 disease burden. For that reason and due to constrained resources to conduct a study in 4 subcounties, Nakuru West was left out in the main study but considered as the sub county where the study pretest was done.

3.3.1 Inclusion Criteria

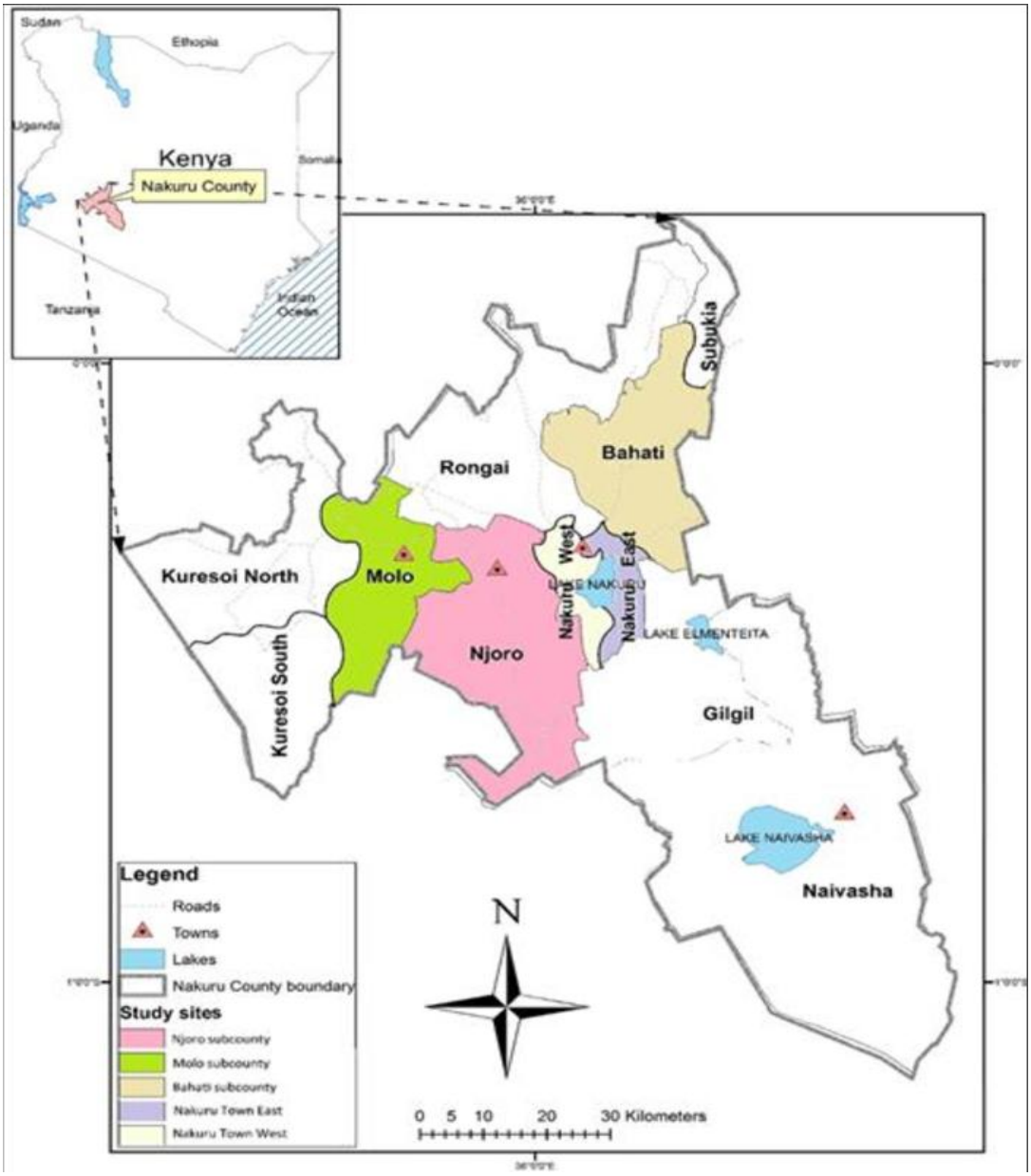
i. Community Health Volunteers who were in service at least 1 year before March 2020 (before the first case of Covid-19 was announced in Kenya).
ii. Community Health Volunteers registered at the sub-county and underwent basic module training.
iii. Community Health Volunteers who despite offering Covid-19 response were involved in giving routine community health services.

3.3.2 Exclusion Criteria

i. Community Health Volunteers recruited for Covid-19 response program only
ii. Community Health Volunteers who showed symptoms of Covid-19 at the point of screening during data collection.
iii. Community Health Volunteers who opted out of community service during the Covid-19 pandemic.

Figure 2

Map of Nakuru County



3.4 Target Population

The population of study were CHVs working in Nakuru County. Nakuru County had a total of 2923 active CHVs at the time of proposal setting. The target population comprised all CHVs working in Nakuru East, Naivasha and Bahati sub counties and were as follows:

Table 1

Total Community Health Volunteers in Sampled Sub Counties

	Nakuru East	Bahati	Naivasha	Total
No of CHVs	202	212	337	751

3.5 Sampling Procedures and Sample Size

The sample size was calculated using Yamane (1967) sample size calculation for finite populations. Available data showed that there were 751 CHVs working in Nakuru East, Bahati and Naivasha. A sample size of 262 CHVs was obtainedusing the Yamane's formula as follows.

3.5.1 Sample Size Determination

$$n = \frac{N}{1 + Ne^2}$$

Where;

n is the sample size

N is the population under study

e is the margin of error under study in this case 0.05.

$$n = \frac{751}{1 + 751(0.05)^2}$$

n = 262

Table 2

Sample Size Proportions in the 3 Sub Counties Studied was as follows

	Nakuru East	Bahati	Naivasha	Total
Sample Size	70	74	118	262

The proportions were calculated using the total number of CHVs in each sub county.

12 key informants were interviewed. These comprised of CHU chairpersons, who also serve as CHVs, Community Health Officers (CHOs) who are public health officers that supervise the CHVs in the community level and finaly the Sub County Community Strategy Focal Persons.

3.5.2 Sampling Procedure

Purposive sampling technique was used to select the 3 sub counties included in the study. Purposive sampling is used in research to select information-rich cases related to the phenomenon of interest (Palinkas et al. 2013). Nakuru East, Bahati and Naivasha sub counties were selected for the study due to the high COVID-19 cases reported and the geographical location representing urban (Nakuru East), Peri urban (Naivasha) and rural (Bahati) set ups.

262 CHVs were randomly selected to fill the questionnaires for the quantitative study. Nakuru County has eleven sub counties.Three of the eleven sub counties were representative of the 10-30 percent of the study area as described by Mugenda & Mugenda (2003). Twelve(12) persons were purposively sampled for In-depth Interviews (IDI). These included CHVs who were chairpersons of CHUs with heavy burden of COVID 19, CHAO and SCCFP. With purposive sampling, saturation is achieved within the first 12 interviews (Guest et al., 2006).

3.7 Data Collection Tools

3.7.1 Quantitative Data Collection Tools

Secondary data on the performance of CHVs was extracted from the KHIS using a data collection schedule attached herein as Appendix IA. A semi-structured questionnaire with open and closed ended questions was used to collect quantitative data directly from the CHVs. The questionnaire had sections covering information on all the three

objectives of the study. This tool was also adapted with permission from the study done in Liberia to assess the role played by community health workers in creating a resilient health system during the West African Ebola outbreak (Seikmans et al., 2017). The tool was available in both English and Kiswahili languages. Copies of the questionnaires are herewith attached as appendix IC.

3.7.2 Qualitative Data Collection Tools

Semi structured interview guide was used to collect data through in-depth Interviews (IDI) with the key informantson their roles in community health service delivery during the pandemic, how they were prepared before the pandemic started affecting their community, and the challenges they encountered. This tool was also adapted with permission from the study done in Liberia to assess the role played by community health workers in creating a resilient health system during the West African Ebola outbreak (Seikmans et al., 2017).

A copy of the tool was availed in both English and Kiswahili languages and is herein attached as Appendix 1B. A voice recorder was used to capture all the proceedings of the IDIs. Field notes were taken by the trained research assistant.

3.7.3 Pilot Testing

The study pre-test was conducted in Nakuru West Sub County. The sub county was the third leading in COVID-19 burden but was not sampled due to geographic similarities to Nakuru East Sub County. A total of 26 subjects representing 10% of the study sample size were recruited. This verified technical and content sufficiency of the research tools. Inadequacies noted during the pre-test was corrected before the actual study.

The Cronbach's Alpha test was used with a threshold of reliability set at 0.7. The results in Table 3 below indicate that Cronbach's alpha reliability coefficients for the data were

above 0.7, which was within the acceptable reliability range hence the data for performance before COVID-19 and during COVID-19 was reliable. The Cronbach's alpha of 0.922 and 0.909 indicate high level of internal consistency for the performance before and during COVID-19 scales.

Table 3

Cronbach's Alpha Reliability of the Data

Cronbach's Alpha		
Constructs	α	Corrected Item – Total Correlation
Performance before COVID - 19	0.922	0.544
Performance during COVID - 19	0.909	0.809

3.8 Data Collection Procedures

Quantitative data on the performance indicators of CHVs was obtained from the KHIS database with permission from the county administration. 12-month performance of CHVs one year before (March 2019 to Feb 2020) and the two subsequent years (March 2020- February 2021& March 2021- February 22) representing the COVID-19 pandemic period were compared. Primary data on CHVs general performance, preparedness for COVID-19 pandemic and the challenges encountered during service delivery in the face of a pandemic were obtained using a semi-structured questionnaire. CHVs meeting the inclusion criteria filled in the questionnaire after filling a written consent attached herein.

In-depth interview guides were administered to key informants who comprised of CHVs who were chairpersons of CHUs and CHOs of CHUswhich had high COVID 19 burdenand SCCFP of 2 sub counties under study. In each sub county, 4 IDI were conducted by the lead researcher to obtain qualitative data on the roles and activities

performed by the CHVs during the pandemic, how prepared the CHVs were for healthcare service delivery in the face of the COVID-19 pandemic and the challenges encountered. This was conducted through face to face interactions. Audio recording of the proceedings wasdone after getting interviewee consent and assurance on confidentiality and anonymization of the interviews.All COVID-19 protocols were observed during the data collection process.

3.9 Data Analysis and Presentation

Quantitative data was entered, cleaned and analyzed for statistical significance on SPSS version 25 or STATA 15. Specific analysis was done as stipulated in Table 5.

Table 4

Data Management and Analysis

Objectives	Variables	Method of analysis
1. To assess how CHVs were prepared for the continuation of community health service delivery during the COVID-19pandemic.	• Planning • Resource • Training • Clear roles and responsibility	• Descriptive statistics • Codes and Themes
2. To assess the performance of CHVs in the delivery of community health services before and during the COVID-19 pandemic in Nakuru County	• Family planning services • MNCH services • Under 5 well child services • Integrated community case Management of Common Childhood Diseases (ICCM) • Care of patients with chronic conditions	Quantitative • Descriptive statistics • Bar Graphs • Line graphs Qualitative • Trends • codes • Thematic evaluation
3. To determine challenges to the effective performance of CHVs during the COVID-19pandemic in Nakuru County	System related • Logistics-transport, airtime • Motivation • Commodity/supplies • Community health financing • Health information system/data management • Support supervision Community related • Community acceptability of CHVs • Community support of CHVs Psychosocial related • Motivation • Psychosocial support system • Job satisfaction • Attrition	Qualitative • Trends • codes • Thematic evaluation Quantitative • Descriptive statistics

3.10 Ethical Considerations

Approval to proceed with data collection was obtained from the Institute of Postgraduate Studies (IPGS). Ethics approval was sought from Kabarak University Institutional Scientific and Ethics Review Committee (KABU – ISERC). Data collection permit was obtained from the National Commission of Science Technology and Innovation (NACOSTI). Permission to collect data from the DHIS and sampled participants was sought from the department of health services, Nakuru County.Informed consent was sought from each participant before commencement of data collection. Participation in the study was voluntary and each subject was given a chance to decline participation or withdraw from the study at any point during the process. A tool that was used to facilitate the consenting process is herewith attached as appendix IV.Voice alteration on the audio records was done. Data collected was stored under a password protected computerized device while printed data from the DHIS and filled in questionnaires was stored under locked cabinets accessible only by the lead researcher. All data will be discarded by deletion and shredding after three years post completion of the study.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents the study findings, interpretations and discussion according to the objectives and research questions. It first details the general and demographic information of the study participants and then presents and discusses the results based on the study objectives.

4.2 Sociodemographic Characteristics of CHVs in Nakuru County

The Table below show a that majority of participants (65.6%) were within the middle-aged category (40-59 years old). Across all age groups [except 20 to 29 years], females outnumbered their male counterparts. Further, the majority of CHVs were married (63.7%) with nearly half of the CHVs having completed secondary education (45.8%). Only 16.4% had obtained tertiary education and a similar proportion had completed primary education. A total of 47.8% of the CHVs were engaged in while only 24.8% practiced subsistence farming as an economic activity of significance to this study, most CHVs had volunteered for more than 5 years (98.9%) while all included in this study had volunteered for more than 1 year. All CHVs had under taken some training in Community Health modules either basic or technical and most had done both modules.

Table 5

Distribution of Participants' Demographic Characteristics

Characteristics		n	%
Gender	Male	62	23.7
	Female	200	76.3
Age (years)	20 – 29	8	3.1
	30 – 39	58	22.1
	40 – 49	96	36.6
	50 – 59	76	29.0
	60+	24	9.2
Marital status	Single	62	23.7
	Married	167	63.7
	Widowed	26	9.9
	Separated	7	2.7
Education	Primary completed	43	16.4
	Primary incomplete	13	5.0
	Secondary completed	120	45.8
	Secondary incomplete	41	15.6
	Tertiary	44	16.8
	None	1	0.4
Occupation	None	25	9.5
	Business	125	47.8
	Formal employment	25	9.5
	Farmer(peasant)	65	24.8
	Farmer(large scale)	1	0.4
	Other	21	8.0
Service duration	3 yrs. – 4 yrs.	3	1.1
	5+ yrs.	259	98.9
Training	Basic modules	98	37.4
	Technical modules	78	29.8
	Basic & Technical modules	86	32.8

Demographically, the study found a significant gender disparity among CHVs, with females comprising 76.3% and males 23.7%. This finding is consistent with the general trend observed in community health work, where women often outnumber men as volunteers. Similar gender imbalances have been reported in other studies focusing on CHVs. For instance, a study conducted in Puducherry, India found that 66% of CHVs were female (Sahu et al., 2022). This gender skew might be attributed to cultural norms

and societal expectations regarding caregiving roles, where women are more likely to engage in community health activities (Keeru, 2017; Sharma et al., 2016). The age distribution of CHVs indicates that the majority fall within the middle-aged category (40-59 years old), comprising 65.6% of the total sample. This finding suggests that middle-aged individuals are more inclined to volunteer for community health services. Similar age distributions have been reported in other studies. For example, the study by McConnell et al. (2016) in Kenya found that the mean age of CHVs was 45 years. This age group might be preferred due to their life experiences, maturity, and perceived reliability in community service roles.

Evidently, across all age groups except 20 to 29 years, females outnumbered their male counterparts, which further reiterates the notion that women are more likely to partake in community health work compared to men. Further, more than half of the CHVs were married (63.7%). Nearly half of the CHVs had completed secondary education (45.8%). These findings support the view that married individuals with at least secondary education levels may have more stability to engage in volunteer activities as pointed out by Chatio et al. (2019). However, it's noteworthy that a considerable proportion had only completed either primary education (16.4%) or tertiary education (16.8%), indicating that education level alone may not be a barrier to participation in CHV programs. Similar findings have been reported in studies conducted in sub-Saharan Africa (Jigssa et al., 2018; Medhanyie et al., 2016).

The majority of CHVs had volunteered for more than 5 years (98.9%). This suggests that CHVs often may have long-term commitment to volunteer community service. The high retention rate observed in this study aligns with the findings of other research highlighting the dedication of CHVs over time (Sahu et al., 2022). Lastly, all the CHVs had undergone either basic modules or technical modules or both. According to the

Kenya Ministry of Health (2013), before beginning their duties, CHVs must complete the basic modules, which comprise their introductory training. Fundamental qualities including counseling skills, leadership, effective communication, basic health promotion methods, and vital life-saving procedures are all covered in these modules. These courses, establish the foundation for the responsibilities of CHVs. They can then advance to technical modules after completing the basic modules, which are customized to meet regional needs MOH (2013). These courses cover certain technical topics and can last anywhere from two to five days, depending on the material. This comprehensive training approach is necessary to enhance CHVs' capacity to address a wide range of health issues effectively. However, it's essential to ensure ongoing training and skill development to maintain CHVs' effectiveness and motivation.

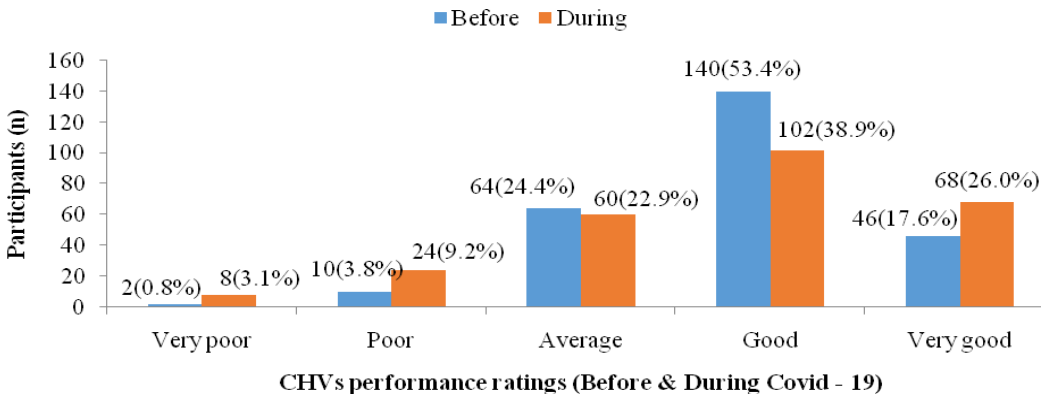
4.3 Performance of CHVs in the Delivery of Community Health Services Before and During the COVID-19 Pandemic

4.3.1 Overall Self-Rating Performance of Nakuru County CHVs

The performance of CHVs in the delivery of community health services before and during the COVID–19 pandemic was evaluated. Most CHVs (53.4%) rated their performance before COVID-19 as good, 24.4% as average, 17.6% as very good, 3.8% as poor and 0.8% as very poor. 38.9% rated their performance during COVID-19 as good, 26.0% rated very good, 22.9% as average, 9.2% as poor while 3.1% rated their performance as very poor. The CHVs performance ratings before and during COVID–19 are summarized in Figure 3.

Figure 3

Distribution of CHVs Performance Self Ratings Before And During COVID-19



Further, Cohen's Kappa (κ) test was used to determine the patterns of agreement based on matched (paired) cases for the study. Cohen's test was run to determine the pattern of agreement between CHVs performance rating before and during COVID–19. Test suggest Kappa result be interpreted as follows: values ≤ 0 as indicating no agreement and 0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61 – 0.80 as substantial, and 0.81–1.00 as almost perfect agreement. There was slight agreement between the two groups of CHVs [κ = 0.061, $p > .05$] as summarized in Table 7.

Table 6

Pattern of Agreement between CHVs Self-Reported Performance Rating Before and During COVID-19

		During COVID-19							
Performance		Very poor	Poor	Average	Good	Very good	Total	Kappa (κ)	P
Before COVID-19	Very poor	0	0	0	2	0	2	0.061	.104
	Poor	0	1	0	9	0	10		
	Average	2	3	21	31	7	64		
	Good	4	18	28	50	40	140		
	Very good	2	2	11	10	21	46		
	Total	8	24	60	102	68	262		

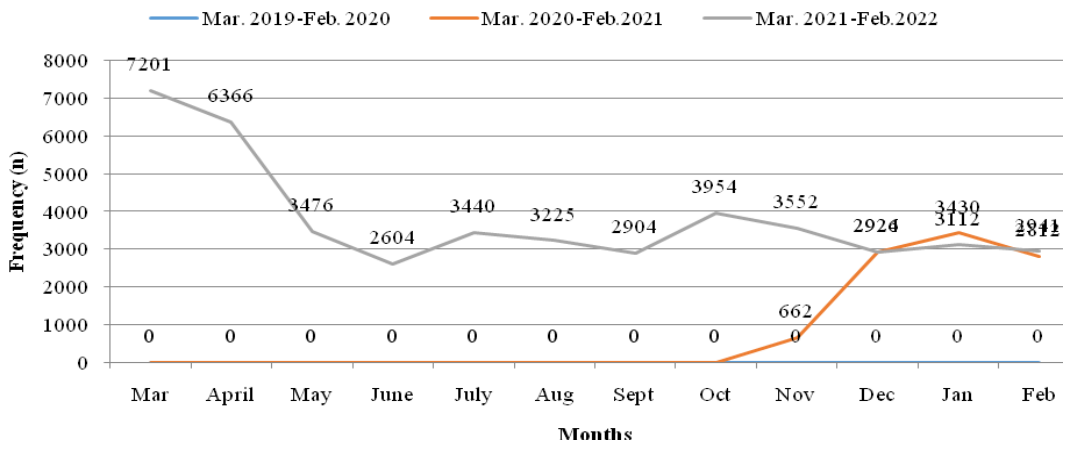
Before the COVID-19 pandemic, most of the CHVs rated their performance as good (53.4%), with a slight decrease during the pandemic, where 38.9% rated their performance as good. Conversely, during the pandemic, more CHVs rated their performance as very good compared to before. The slight decrease in self-rated performance during the pandemic could be attributed to various factors such as fear of infection, increased workload, stress, and challenges in delivering services amidst health crises. However, the increase in the proportion of CHVs rating their performance as very good during the pandemic suggests that many CHVs rose to the occasion and adapted effectively to the new challenges. A comparison of self-rated performance before and during the pandemic highlights the resilience and adaptability of CHVs in responding to emergent health crises while continuing to deliver essential services.

4.3.2 Performance in the Delivery of Family Planning Services

The number of women who were offered family planning services by the CHVs during the stated study period (March 2019 to February 2022) was 57,906 according to data from DHIS as illustrated in Figure 3.

Figure 3

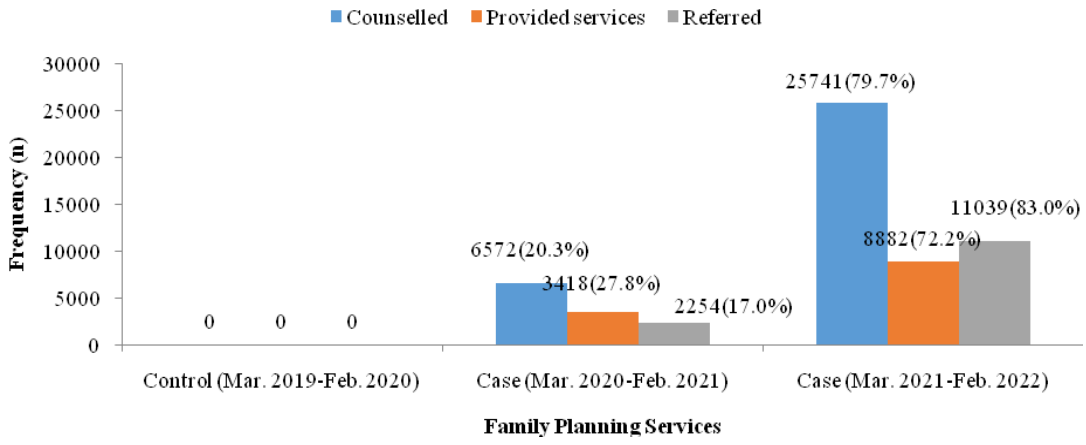
Family Planning Services Offered by CHVs



Out of these (number of women who were offered family planning services), 32,313 patients were counselled for family planning, 12,300 were provided family planning services and 13,293 were referred for family planning during the Covid-19 period. Amongst the women who were counselled, the majority (79.7%) were counselled during the March 2021 to February 2022 compared to only 20.3% who were counseled during the March 2020 to February 2021 period. Further, amongst women who were provided family planning services, the majority (72.2%) were offered the services during the March 2021 to February 2022 period compared to 27.8% who received the services during the March 2020 to February 2021 period as shown in Figure 4.

Figure 4

Family Planning Services



The study demonstrates a significant shift in the types of services offered by CHVs before and during the COVID-19 pandemic. Evidently, there was a significant increase in family planning services offered by CHVs over the two-year period from March 2020 to February 2022. Notably, the majority of family planning services, counseling sessions, and referrals occurred in the latter year (March 2021 to February 2022) compared to the earlier year (March 2020 to February 2021). This surge could be attributed to various factors such as reduction in the virulence of the COVID 19 strain from Delta to Omicron,

availability of PPE and better training or the adaptation to and recovery from the initial impacts of the COVID-19 pandemic (Zapata et al., 2021).However, during the early stages of the pandemic, health services, including family planning, faced substantial disruptions due to lockdowns, poor resource reallocation and fear of contracting the virus among both healthcare providers and recipients. As the situation evolved, healthcare systems and CHVs implemented more effective strategies to continue providing essential services, resulting in the observed increase in family planning activities.

The increase in counseling sessions to 79.7% and the provision of family planning services to 72.2% in the latter period indicates a successful ramp-up in service delivery. This suggests that CHVs played a crucial role in addressing the unmet need for family planning services during the pandemic's ongoing challenges (Pillai & Nagoshi, 2023). However, the data also highlights the importance of maintaining and potentially expanding such services to ensure continuity and accessibility, especially in times of crisis. Evidently, the results showed resilience and adaptability of healthcare systems, particularly the role of CHVs in sustaining and enhancing service delivery during a global health crisis as reported by Pradhan et al. (2023).

Furthermore, the disparity in service delivery between the two periods may point to underlying issues such as resource allocation, training, and support for CHVs. Ensuring that CHVs are well-equipped and supported is vital for the sustained provision of these services (Woldie et al., 2018). The results also indicate a need for targeted interventions during crises to mitigate the initial drop in service provision. In terms of referrals, the balance between direct provision of services and referrals needs careful consideration as depicted in the above results. Referrals are essential for cases requiring specialized care, but they must be coupled with ensuring that referral centers are accessible and equipped to handle the referred cases. The slight difference between the counseling and actual

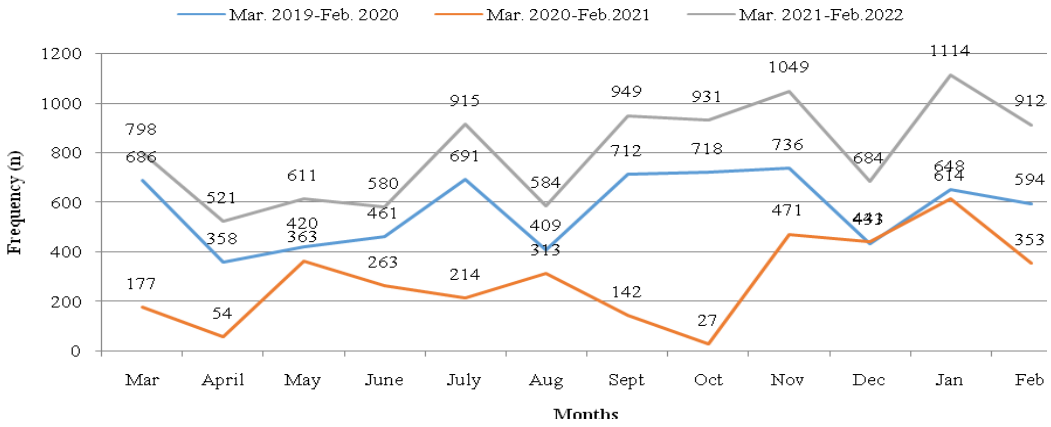
provision of services suggests that there could be barriers preventing the transition from counseling to service uptake. Identifying and addressing these barriers could enhance the overall effectiveness of family planning programs. Overall, while the increased performance in the delivery of family planning services during the second year of the study period is commendable, it underscores the need for robust systems capable of withstanding and adapting to crises. Continuous monitoring, evaluation, and support for CHVs are imperative for sustaining and improving family planning service delivery.

4.3.3 Performance in the Delivery of MNCH Services

The MNCH services offered by the CHVs during the stated study period (March 2019 to February 2022) was 16,031 out of which, the majority (9,648) were services offered between March 2021 to February 2022, followed by 3,432 services offered between March 2020 to Feb. 2021 while only 2,933 services were offered between March 2019 and February 2020. Of these, 8,818 pregnant women were counselled on ANC services, 1,452 were women receiving community-based postnatal services within 48 hours of delivery and 5,743 were newborns visited within 48 hours of birth assessing for breastfeeding and danger signs.

Figure 5

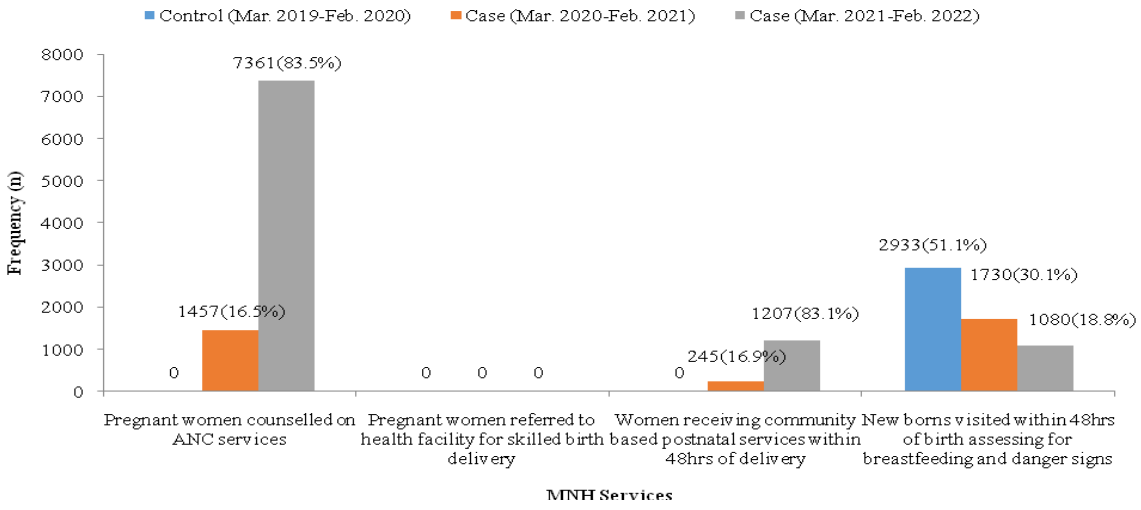
Total Number of MNH Services Offered by the CHVs



Further, amongst the pregnant women counselled on ANC services, the majority (83.5%) were counselled during the March 2021 to February 2022 compared to the 16.5% who were counseled during the March 2020 to February 2021 Covid-19 period. Amongst the women receiving community-based postnatal services within 48 hours of delivery, the majority (83.1%) were offered the services from March 2021 to February 2022 compared to 16.9% who received the services from March 2020 to February 2021 period. Lastly, amongst the newborns visited within 48 hours of birth assessing for breastfeeding and danger signs, nearly half (51.1%) were referred from March 2019 to February 2020 compared to the 30.1% who were referred from March 2020 to February 2021 and the 18.8% who were offered the services during the March 2021 to February 2022 Covid-19 period (Figure 19).

Figure 6

Distribution of MNH Services



Notably, inferential analysis showed there was a significant difference in groups of MNH services as determined by ANOVA test (F (2, 33) = 26.341, p < .001). Further, a Tukey post hoc test revealed that the MNH services offered were statistically significantly improved in March 2021 to February 2022 (804.00 $\pm$ 201.72, p = .007) compared to

March 2020 to February 2021 (286.00 $\pm$ 174.83, $p < .001$) and March 2019 to February 2021 (572.17 $\pm$ 144.08, $p = .001$) groups.

The above study's findings underscore the significant disruptions to maternal, newborn, and child health (MNCH) services during the pandemic, highlighting a critical area of concern for public health. The observed decline in services such as ANC counseling and community-based postnatal care of the newborns illustrates the vulnerability of routine healthcare provisions in crisis situations. This decrease likely stems from the change in policy for CHVs not to visit homesteds with new borns or probable reduced mobility, poor resource reallocation, and heightened fear of infection, which collectively impeded access to essential services. Conversely, the increase in referrals for family planning and immunization services suggests a shift in the role of CHVs. This shift may be attributed to the pressing need to adapt to the new health landscape imposed by the pandemic (Alabi et al., 2023). Community health volunteers had to prioritize immediate and high-impact interventions, reflecting their flexibility and responsiveness to changing community needs.

Evidently, these findings unravel the dual role of CHVs in both facing and mitigating the challenges posed by health crises. On one hand, the reduction in certain MNCH services points to gaps in preparedness and resilience of the healthcare system, highlighting the need for robust contingency planning and support mechanisms for CHVs. On the other hand, the increased referrals for family planning and immunization demonstrate the pivotal role of CHVs in maintaining essential health services and adapting to emerging health priorities.

To strengthen the healthcare system’s resilience, it is imperative to develop comprehensive strategies that ensure the continuity of MNCH services during crises.

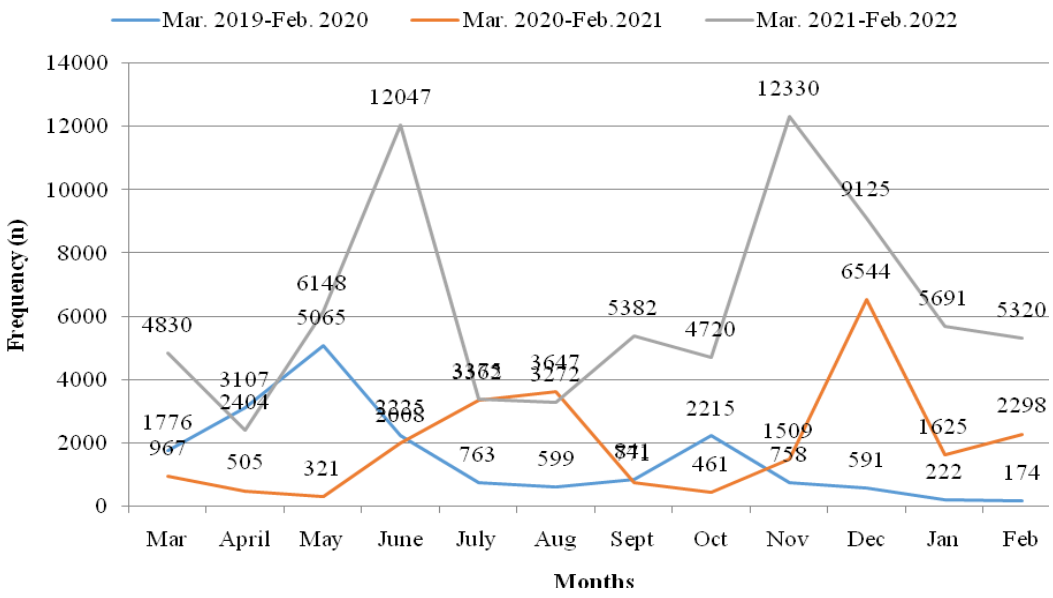
This includes investing in training and resources for CHVs, enhancing their ability to provide a broader range of services even under constrained conditions (Pradhan et al., 2023). Additionally, enhancing strong community trust and communication channels can empower CHVs to perform their roles more effectively, ensuring that essential health services remain accessible and functional. Altogether, the study highlights the critical importance of CHVs in sustaining healthcare services during pandemics and other crises. Their role in referral and preventive measures is vital, but so too is the need to support them with adequate resources and planning to handle such disruptions. This balance between immediate response and long-term resilience is crucial for improving MNCH outcomes in the face of future challenges.

4.3.4 Performance in the Delivery of Under 5 Well Child Services

The figure below shows that the Well Child Services offered by the CHVs during the stated study period (March 2019 to February 2022) was 117,008 out of which, the majority, 74,644 were services offered between March 2021 to February 2022, followed by 24,028 services offered between March 2020 to Feb. 2021 while 18,336 services were offered between March 2019 and February 2020. Of these total children of 6-59 months, 669 children with malnutrition were identified, 17,257 were referred for Vitamin A supplementation (VAS), 92,388 were dewormed, 5,119 were referred for immunization while 1,575 were immunization defaulters referred.

Figure 7

Tally of Well-Child Services Offered by CHVs

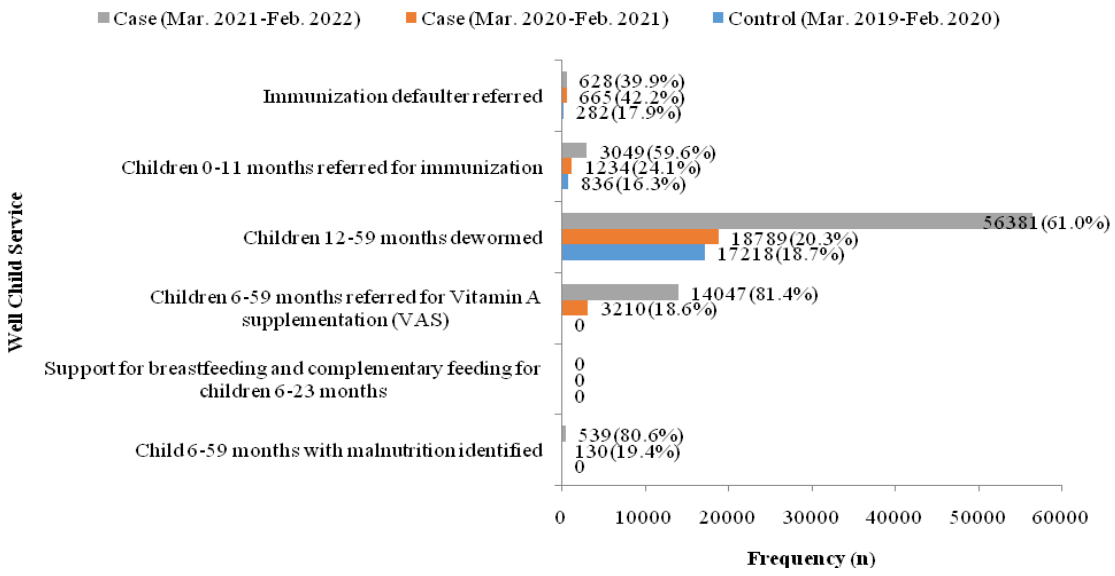


Further analysis of the results show that among children identified with malnutrition, the majority (80.6%) were identified during March 2021 to February 2022 compared to 19.4% who were identified during the March 2020 to February 2021 Covid-19 period. Further, Amongst the children referred for Vitamin A supplementation, 81.4% were referred from March 2021 to February 2022 compared to only 18.6% who were referred from March 2020 to February 2021 Covid-19 period. Out of the total children who were dewormed, the majority (61.0%) were dewormed from March 2021 to February 2022 compared to only 20.3% who were dewormed during the March 2020 to February 2021 and the 18.7% who were dewormed during the March 2019 to February 2020 Covid-19 period. In terms immunization, the nearly more than half of recorded children (59.6%) were referred for immunization during the March 2021 to February 2022 period compared to only 24.1% who were referred during the March 2020 to February 2021. Only 16.3% of the children under five were referred for immunization during the March 2019 to February 2020 Covid-19 period. Lastly, the majority (42.2%) of children who

had defaulted immunization were referred from March 2020 to February 2021 compared to the 39.9% who were referred from March 2021 to February 2022. Only 17.9% were referred during the March 2019 to February 2020 Covid-19 period.

Figure 8

Distribution of Well Child Services



The data reveals a significant increase in Well Child Services provided by CHVs. The most substantial portion of these services occurred between March 2021 and February 2022, suggesting a notable escalation in health service outreach and possibly a response to increased health initiatives or heightened health awareness in the community during this time. Further, it is evident that the latter period (2021-2022) saw a marked rise in service delivery, more than doubling the services offered in the initial period (2019-2020). This increase could be attributed to several factors, including improved training and capacity of CHVs, enhanced community engagement, or possibly an increased birth rate, necessitating more well-child visits (Avery et al., 2017). However, this surge also raises questions about the consistency and sustainability of such service levels, as well as the potential strain on CHVs and health resources.

The identification of 669 children [figure 20] with malnutrition highlights a persistent public health challenge. Despite the extensive services provided, malnutrition remains a significant concern. The data indicates a substantial increase in the identification of malnutrition among children during the period from March 2021 to February 2022. This rise, with 80.6% of malnutrition cases identified during this time [figure 21], suggests an improvement in the CHVs' ability to detect and respond to malnutrition. This could be attributed to enhanced training, increased awareness, or improved screening protocols. This figure suggests that while CHVs are effective in identifying malnutrition cases, additional measures are needed to address the root causes and provide effective interventions. The rate of malnutrition detection compared to the total number of children served points to the need for ongoing nutritional assessments and interventions within the community.

Referrals for Vitamin A supplementation (VAS) reached 17,257, indicating a substantial effort to address micronutrient deficiencies. Moreover, these Referrals similarly saw a significant increase, with 81.4% occurring in the most recent period possibly due to heightened awareness or better reporting systems. This high number of referrals underscores the importance of VAS in preventing childhood blindness and boosting immune function (Mostafa et al., 2019). However, it also implies a widespread deficiency issue that requires comprehensive nutritional education and sustainable food programs to prevent future deficiencies rather than solely relying on supplementation.

The deworming of 92,388 children is commendable and reflects a proactive approach to tackling parasitic infections, which are prevalent in many low-resource settings. Evidently, result showed that a majority (61%) of children were dewormed from March 2021 to February 2022. The lower deworming rates during the previous periods, particularly the Covid-19 impacted years, reflect the challenges faced in maintaining

routine health services during the pandemic. Nonetheless, deworming is essential for improving children's nutritional status and overall health. This high number suggests a relatively successful campaign but also points to the potential high burden of parasitic infections in the community. Continuous monitoring and periodic deworming are necessary to maintain this health benefit.

Immunization referrals (5,119) and defaulter referrals (1,575) together highlight the ongoing efforts and challenges in maintaining high immunization coverage. Further, nearly 60% of immunization referrals occurred in the most recent period, demonstrating an improvement in immunization outreach and follow-up. The significant drop in referrals during the Covid-19 pandemic highlights the adverse impact of the pandemic on immunization services. Among the defaulters, a larger proportion (42.2%) of defaulters were referred during the Covid-19 period (March 2020 to February 2021), indicating that the pandemic significantly disrupted immunization schedules. The slight reduction in defaulters in the subsequent period suggests some recovery but also points to continued challenges in ensuring complete immunization coverage.

Inferential analysis showed there was a significant difference in Well Child services groups as determined by the Analysis of the variance test (F (2, 33) = 15.042, $p < .001$). A Tukey post hoc test revealed that the CHVs' services offered were statistically significantly improved from March 2021 to February 2022 (6220.33 $\pm$ 3262.06, $p < .001$) compared to March 2020 to February 2021 (2001.50 $\pm$ 1801.68, $p < .001$) and March 2019 to February 2021 (1528.00 $\pm$ 1444.52, $p < .001$) groups. Correspondingly, ANOVA results, showing a significant difference in the well-child services across the three periods, confirmed that the services provided by CHVs improved markedly in the latest period. The Tukey post hoc test reinforces this, demonstrating that the number of

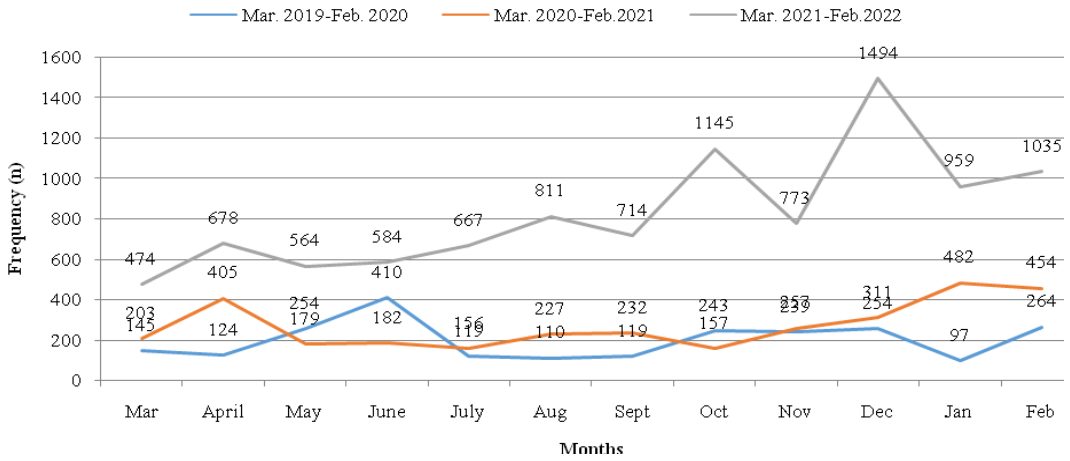
services offered from March 2021 to February 2022 was statistically significantly higher compared to the earlier periods. This statistically significant improvement could be linked to multiple factors including better resource allocation, enhanced training for CHVs, and increased community mobilization post-pandemic. The notable differences in service provision underscore the positive impact of these efforts but also highlight the disparities in service delivery during the pandemic years, emphasizing the need for strategies to mitigate such disruptions in future public health emergencies.

4.3.5 Performance in the Delivery of Care for Patients with Chronic Conditions

The number of persons with known chronic conditions who were cared for by the CHVs during the stated study period (March 2019 to February 2022) was 15,069. Out of this, majority (9899) of the care services were offered between March 2021 to February 2022, followed by 3263 services offered between March 2020 to February 2021. Only 1907 services were offered between March 2019 and February 2020 as shown in figure below.

Figure 9

CHVs' Care of Persons with Known Chronic Conditions

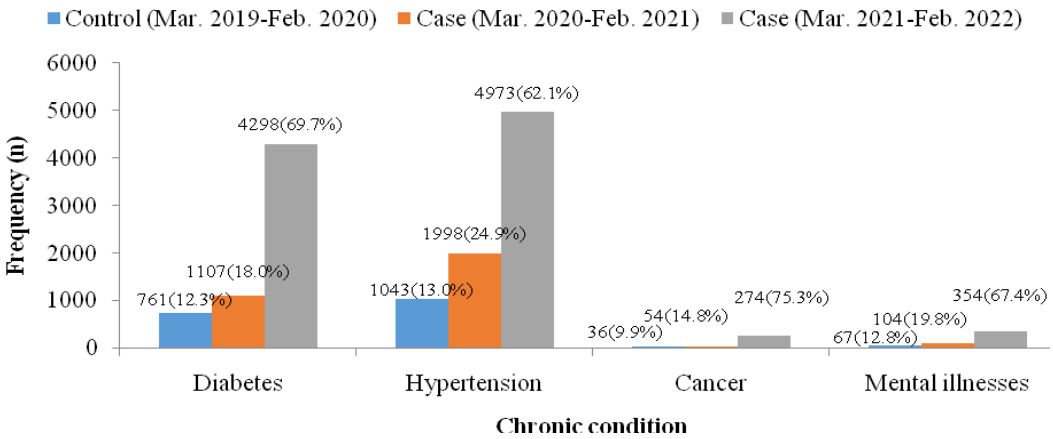


Furthermore, Figure shows that out of all the care services offered by CHVs: 6,166 were for diabetes, 8014 for hypertension, 364 for cancer and 525 for mental illnesses. Further,

amongst the diabetes cases, 69.7% were offered from March 2021 to February 2022 compared to only 18% offered from March 2020 to February 2021. Only 12.3% care services were offered during the March 2019 to February 2020. Similarly, in terms of spread of care for hypertension cases, the majority (62.1%) were offered from March 2021 to February 2022 compared to 24.9% hypertensive-care-related services offered from March 2020 to February 2021; while only 13.0% were offered from March 2019 to February 2020. Among the cancer-care related services, 75.3% were offered from March 2021 to February 2022 compared to 14.8% offered from March 2020 to February 2021. Only 9.9% were offered during the March 2019 to February 2020. Lastly, the (67.4%) majority of mental illness-related care services were offered from March 2021 to February 2022 compared to 19.8% offered from March 2020 to February 2021. Only 12.8% were offered during the March 2019 to February 2020 period.

Figure 10

Distribution of Care of Persons with Known Chronic Conditions



Inferential analysis showed there was a significant difference in CHVs' care of persons with known chronic conditions services groups as determined by the Analysis of variance test ($F(2, 33) = 39.799, p < .001$). A Tukey post hoc test revealed that the CHVs' services offered were statistically significantly improved in March 2021 to

February 2022 (824.83 ± 289.70, $p < .001$) compared to March 2020 to February 2021 (270.42 ± 116.17, $p < .001$) and March 2019 to February 2021 (198.17 ± 94.38, $p < .001$) groups.

The care of patients with chronic conditions by CHVs saw a remarkable increase over the study period, with the most significant rise occurring between March 2021 and February 2022. This notable escalation in service delivery likely reflects a combination of factors such as improved training, greater community engagement, and perhaps the easing of pandemic-related restrictions. The substantial increase from the previous years also underscores the potential backlog and unmet needs during the earlier phases of the Covid-19 pandemic, which may have limited CHVs' ability to provide consistent care. Similar studies have emphasized the importance of CHVs in delivering integrated care for chronic conditions and geriatric care (Scott et al., 2018; Zulu et al., 2014).

In particular, diabetes care services saw a significant majority (69.7%) provided in the latest period, suggesting that either the incidence of diabetes management needs increased or that CHVs became more effective in identifying and managing these cases. The relatively lower service provision in earlier periods points to potential barriers that were overcome, such as improved access to supplies, better patient tracking, or enhanced CHV training in diabetes management (Woldie et al., 2018).

Hypertension care followed a similar trend, with 62.1% of services delivered in the most recent period. This again indicates an improved capacity or possibly an increased focus on managing hypertension. The consistent rise in service provision over the years suggests a growing recognition of hypertension as a significant health concern within the community. However, the challenge remains to maintain and further enhance these service levels to ensure long-term management of hypertensive patients.

Cancer-related services showed the most dramatic increase, with 75.3% provided in the final period. This substantial rise highlights an increased focus on cancer care, which could be due to improved diagnostic capabilities, heightened awareness, or the implementation of specific cancer-related health initiatives. The low percentage of services in earlier periods suggests that cancer care was significantly underserved, and while the recent improvements are commendable, they underscore the need for sustained efforts in cancer screening, diagnosis, and treatment.

Mental illness care services also increased markedly, with 67.4% of the services delivered in the last period. This increase likely reflects improved recognition and destigmatization of mental health issues, along with better training of CHVs to handle such conditions. The earlier low levels of service provision indicate that mental health was a neglected area, which has since seen significant improvements. Continued focus on mental health services is essential to build on this progress and ensure comprehensive care.

The inferential analysis confirms that the improvements in CHVs' care for persons with chronic conditions are statistically significant. The ANOVA results and the Tukey post hoc test highlight that the number of services provided from March 2021 to February 2022 was significantly higher than in the previous years. This statistical significance underscores the effectiveness of recent initiatives and interventions aimed at improving chronic disease management.

4.3.7 Performance in the Delivery of Care for Geriatrics

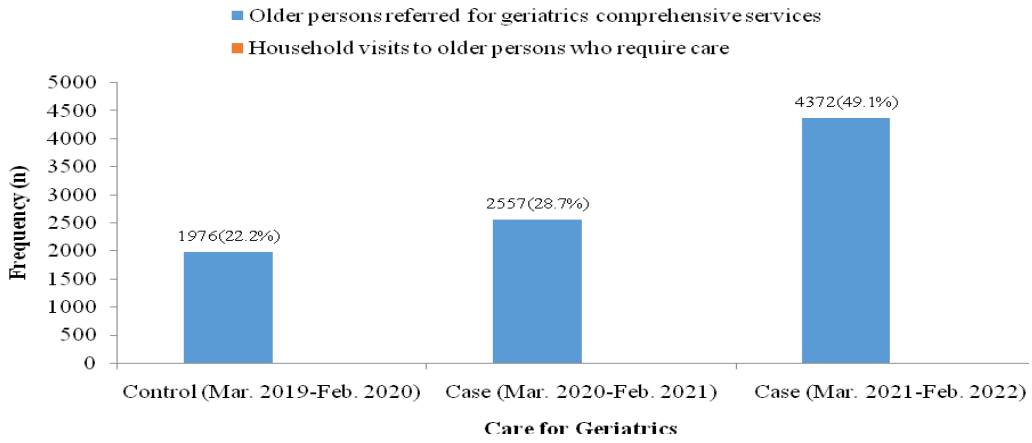
The total number of care-services for geriatrics offered by the CHVs during the stated study period (March 2019 to February 2022) was 8905 as shown in figure below. The

figure represents the number of older persons referred for geriatrics comprehensive services.

Notably, the majority (4,372) of services were offered between March 2021 to February 2022, followed by 2,557 services offered between March 2020 to February 2021 and lastly 1,976 services offered between March 2019 and February 2020 as shown in inthe folowing figure.

Figure 11

Number of Geriatrics Referred for Comprehensive Care



There was a significant difference in CHVs' care of geriatrics services groups as determined by the Analysis of the variance test (F (2, 33) = 24.778, p < .001). A Tukey post hoc test revealed that the CHVs' services offered were statistically significantly improved in March 2021 to February 2022 (364.33 $\pm$ 66.64, p < .001) compared to March 2020 to February 2021 (213.08 $\pm$ 96.15, p < .001) and March 2019 to February 2021 (164.67 $\pm$ 45.55, p < .001) groups.

The data on the delivery of care for geriatrics by Community Health Volunteers (CHVs) between March 2019 and February 2022 shows a clear upward trend in the number of services provided. This improvement in service delivery is particularly noteworthy when examining the significant increase in the number of services offered in the final year of

the study period. The analysis of variance (ANOVA) results ($F(2, 33) = 24.778$, $p < .001$) indicate that there is a statistically significant difference in the number of geriatric services provided across the three annual periods. The increase in services from the first year (March 2019 to February 2020) to the second year (March 2020 to February 2021) and then a more substantial rise in the third year (March 2021 to February 2022) suggests that there have been effective measures implemented over time to enhance the delivery of geriatric care by CHVs. The Tukey post hoc test confirms that each subsequent period saw significant improvements compared to the previous one. Specifically, the increase in services from 164.67 in the first year to 213.08 in the second year and a further jump to 364.33 in the third year underscores a consistent and accelerating improvement in the performance of CHVs.

Several factors could contribute to these improvements. Enhanced training and capacity building for CHVs might have played a crucial role in enabling them to deliver more comprehensive and effective geriatric care (Allen & Brownstein, 2016). Additionally, increased awareness and prioritization of geriatric health within the community could have led to more referrals and a higher demand for services, which CHVs have successfully met. Improvements in logistical support and resource allocation to CHVs could also be a factor, ensuring they are better equipped to provide the necessary services.

However, while the overall trend is positive, the variability within each period suggests that there are still challenges to achieving consistent performance across all CHVs. The higher standard deviation in the second year, for instance, indicates that while some CHVs performed exceptionally well, others may have struggled, pointing to potential disparities in training, resources, or support. Moreover, the significant improvement in

the final year could also reflect external factors such as policy changes or increased funding, which might not be sustainable in the long term. Therefore, it is essential to understand the specific drivers behind this increase to ensure that these improvements can be maintained and further built upon.

4.4 Preparation of CHVs for Continuation of Community Health Service Delivery During Covid-19 Pandemic

This study assessed preparedness of CHVs in terms of: planning , resource mobilization, training, and provision of clear roles and responsibility for continuation of community health service delivery in Nakuru county.

Before the advent of COVID-19, interviewees consistently reported a lack of preparation within the community. They noted that there were no preparation measures in place, as the disease was not yet known or understood. One respondent succinctly stated:

> *"We didn't have any preparation because we didn't know what COVID 19 was by then, so there was nothing to prepare for."*

Another echoed this sentiment, highlighting that even higher authorities were caught off guard as the disease spread within the community.

> *"Even the higher offices were preparing themselves as the disease was already in the community."*

Despite all this, CHVs played a significant role in community risk assessment, particularly in identifying hotspots and areas of high risk. They conducted regular assessments in places such as schools, churches, markets, and areas with large gatherings to identify potential risks and implement preventive measures.

4.4.1 Planning for Continuation of Community Health Service Delivery as a Preparation Measure

The table below shows that most (58.0%) of the CHVs agreed that they were involved in pre-COVID planning to ensure continuity of routine community health services during the pandemic while 42.0% of the CHVs disagreed. Further, (72.9%) of the CHVs agreed that there was a plan in their CHU on how routine community health services would continue during the COVID-19 pandemic. Finally, whereas the majority (64.1%) of the CHVs agreed that other members of their community unit were involved in COVID-19 emergency response planning, a few of them (35.9%) disagreed.

Table 7

Planning for Continuation of Community Health Service Delivery

	Agree		Disagree	
Characteristics	n	%	n	%
Involved in pre-COVID planning to ensure continuity of routine community health services during the pandemic.	152	58.0	110	42.0
There was a plan in place in CHU on how routine community health services would continue during the COVID-19 pandemic.	191	72.9	71	27.1
Other members of the community unit were involved in COVID-19 emergency response planning.	168	64.1	94	35.9

The study revealed a mixed picture regarding the preparedness of CHVs before and during the pandemic. While some CHVs reported being involved in pre-COVID planning and feeling adequately prepared to continue service delivery, others expressed disagreement. Some indicated active participation, stating they were engaged through seminars, on-job training, and monthly meetings, where their opinions were solicited and incorporated into planning decisions. However, others noted a lack of direct involvement, mentioning that planning mainly occurred at higher administrative levels,

with CHVs being informed rather than being consulted. Similar findings have been reported in other studies conducted in various contexts.

For example, the study by Chengo et al. (2022) conducted across various Sub-Saharan countries, found that CHVs faced challenges in accessing timely training and resources for COVID-19 response, impacting their preparedness and effectiveness. This suggests that disparities in preparedness among CHVs may be a common issue across different settings. The lack of meaningful involvement may result in overlooked community needs and inefficient resource allocation. Strengthening participatory approaches that involve CHVs in planning, risk assessment, and decision-making can enhance the relevance and effectiveness of public health interventions as reported by Woldie et al. (2018). Collaborative partnerships between CHVs, health authorities, and community stakeholders are essential for fostering ownership and sustainability of initiatives.

4.4.2 Resource Mobilization for Continuation of Community Health Service Delivery as a Preparation Measure

The shows that more (57.6%) of the CHVs agreed that adequate supplies were provided before COVID-19 began in their community unit in contrast to 42.4% that disagreed.

Table 8

Resource Mobilization for Continuation of Community Health Service Delivery

	Agree		Disagree	
Characteristics	n	%	n	%
Adequate supplies provided before COVID-19 began in the community unit.	151	57.6	111	42.4

The availability of resources for CHVs varied widely among respondents. While some mentioned the timely provision of resources such as personal protective equipment

(PPE), gloves, masks, sanitizers, and handwashing facilities, others reported significant delays in resource allocation, with supplies arriving months after the onset of the pandemic, as seen during the interviews;

> *"the resources were not there; they came when the disease had arrived..."*
> *"They were not availed before COVID. They were brought about the second month after COVID began in our community unit"*

Lack of consistent and sufficient resources posed challenges in effectively carrying out CHV duties. In terms of budgetary allocation, many respondents indicated a lack of budget allocation specifically for community health units, attributing it to the emergent nature of the pandemic. While some mentioned receiving support from external partners, others noted a complete absence of budgetary provisions for CHV activities, highlighting financial constraints in carrying out their duties effectively;

> *"No there was no budget because this thing came as an emergency"*
> *"I'm not sure, because I never saw anything. We gave out a budget but we never saw any allocation."*

Notably, there was minimal recruitment of additional CHVs reported among respondents, with most indicating that existing CHVs were deemed sufficient to handle the workload as pointed out by one of the CHV leaders;

> *"The CHVs who were in the units were the ones who did that work. They were enough, we didn't recruit new ones."*

However, some mentioned the need for additional CHVs in areas with high COVID-19 cases or where CHVs had left their positions, suggesting potential gaps in coverage and service delivery;

> *"There was no addition. There was need for more since some CHVs left earlier, so in some community units didn't have CHVs."*

4.4.3 Training for Continuation of Community Health Service Delivery as a Preparation Measure

Table below shows that more than two-thirds (77.1%) of the participants agreed that before COVID-19, they were trained on how to continue giving community health services while 22.9% disagreed. A majority (67.9%) also agreed that they trained on the "low touch" and "no-touch" method of service delivery contrary to 32.1% of CHVs that disagreed. Nearly two-thirds (74.0%) agreed that they were advised/trained on using the mobile phone for service delivery if community transmission increased while 26.0% disagreed. More than half (60.3%) of the CHVs agreed they were involved in practice exercises through simulation and drills to reinforce COVID-19 prevention protocol while 39.7% disagreed. Lastly a majority (63.4%) agreed that they were advised on how to communicate with their supervisors, peers and community members before the COVID-19 pandemic began while 36.6% disagreed.

Table 9

Training for Continuation of Community Health Service Delivery

	Agree		Disagree	
Characteristics	n	%	n	%
Before COVID-19, I was trained on how to continue giving community health services	202	77.1	60	22.9
Trained on "low touch" and "no touch" method of service delivery.	178	67.9	84	32.1
Advised/trained on using the mobile phone for service delivery if community transmission increased	194	74.0	68	26.0
Involved in practice exercises through simulation and drills to reinforce COVID-19 prevention protocol.	158	60.3	104	39.7
Advised on how to communicate to supervisors, peers and community members before the COVID-19 pandemic began.	166	63.4	96	36.6

It was widely agreed among the interviewees that preparation efforts, including training sessions, only began after COVID-19 had already become prevalent in the community. They noted that these efforts commenced at least two months after the onset of the pandemic. Training for CHVs primarily focused on COVID-19 response, including infection prevention, home-based care, and community sensitization. However, the consistency and comprehensiveness of training varied among respondents. Preparation efforts, including training sessions, were perceived to have begun only after COVID-19 had already spread in the community. An interviewee noted;

> *"The preparation came later, at least 2 months after COVID began."*

Additionally, training for CHVs primarily focused on COVID-19 response, including topics such as transmission, prevention, home-based care, and community sensitization. While some respondents reported comprehensive training sessions;

> *"Yes, there were several trainings. The training entailed what was COVID 19, transmission, prevention, home based care and also to check what was to be in place to prevent COVID 19 especially the hand washing facilities, the CHVs were responsible to check whether there was water, soap, to health educate people, about the transmission of the disease itself and the importance of people wearing the masks."*

Others noted limitations in coverage and consistency, with training mainly conducted after the onset of the pandemic;

> *"Before, the CHVs had been trained on their Modules in 2019, however, it wasn't on pandemic response. The training happened 3-6 months after the pandemic but it was mainly on COVID response."*

Further, community health volunteers received comprehensive training on infection prevention and control (IPC), home-based care, and other essential skills, which equipped them to navigate the challenges posed by COVID-19 more effectively. This

capacity building initiative not only boosted their confidence but also enhanced their professionalism, as observed by an increase in their focus and readiness to tackle healthcare challenges. Multi-sectoral support from government agencies and donors played a crucial role in empowering CHVs to fulfill their roles more effectively. Collaborative efforts between the national and county governments, along with other organizations, facilitated the dissemination of accurate information, resource allocation, and coordination of healthcare services.

As CHVs became more enlightened and empowered, their performance improved significantly. They demonstrated heightened vigilance in their reporting, with monthly reporting rates progressively increasing. The community health indicators showed signs of improvement, with a notable decrease in upper respiratory tract infection (URTI) cases and prompt reporting of health issues. Despite the overwhelming focus on COVID-19 response, CHVs continued to address other healthcare needs within their communities, albeit with some decline in certain services. The prevalence of gender-based violence (GBV), alcoholism, drug use, and teenage pregnancy increased during the pandemic, while cases of diarrhea decreased due to improved hand hygiene practices.

External organizations such as USAID, played a role in providing training support, particularly regarding COVID-19 awareness and handling positive cases. CHVs received on-job training sessions facilitated by various entities, such as the Ministry of Health (MoH), sub-counties, and donors. These sessions covered topics including TB, HIV, disaster preparedness, and COVID-19 response. Additionally, CHVs were equipped with personal protective equipment (PPEs), masks, and sanitizers to enhance their effectiveness. Frontline healthcare workers, including CHVs, underwent sensitization on COVID-19 prevention and response measures. This sensitization initially occurred at the sub-county level by a team from Nairobi. As one respondent recalled;

"A team came from Nairobi and sensitized the frontline healthcare workers, mostly at the sub county level. Those sensitized then went on to sensitize the rest including the CHVs."

4.4.3 Clear Roles and Responsibility for Continuation of Community Health Service Delivery as a Preparation Measure

More than half (66.0%) of the CHVs agreed that they were informed of their roles and responsibilities before COVID-19 cases started being recorded in their community contrary to 34% that disagreed; as noted in table 9 below. Further, 64.5% of the CHVs agreed that they were informed of the chain of authority before COVID-19 cases started being recorded in their community while 35.5% disagreed. More than half (63.0%)of the CHVs agreed that before COVID-19 began, an evaluation process had been put in place for debriefing, post-incidence previews and feedback whereas 37% disagreed. Lastly, majority (62.6%) of the CHVs agreed that they felt adequately prepared to continue giving health services during COVID-19 while 37.4% disagreed.

Table 10

Clear Roles and Responsibility for Continuation of Community Health Service Delivery

	Agree		Disagree	
Characteristics	n	%	n	%
Informed of roles and responsibilities before COVID-19 cases started being recorded in the community.	173	66.0	89	34.0
Informed of the chain of authority before COVID-19 cases started being recorded in the community.	169	64.5	93	35.5
Before COVID-19 began an evaluation process had been put in place for debriefing, post incidence previews and feedback.	165	63.0	97	37.0
Felt adequately prepared to continue giving health services during COVID-19.	164	62.6	98	37.4

Role clarification and communication channels were identified as important factors for CHVs' effectiveness. Respondents highlighted the importance of clear communication channels and role clarification for CHVs. While some indicated that roles and communication channels were clearly defined,

> *"…the communication channel was made clear; we were to inform the CHEW of the incidences in our communities who would then escalate to the sub county level."*

Others mentioned challenges such as lack of financial support for communication tools and limited sustainability in reporting mechanisms;

> *"It was very clear. The only challenge with communication was that they were not supported financially and logistics wise, so they would just flash and I would call them back. No phones for those who didn't have. Even the CHEWS were not given the airtime, they would just use their money."*

Debriefing plans for CHVs varied among respondents, with some mentioning regular debriefing sessions facilitated by trained personnel to address mental health concerns and burnout;

> *"Yes, this would happen say quarterly especially for the areas with high number of COVID cases. But since we used to meet monthly, this would also happen during such meetings. It would also be done daily through WhatsApp."*

However, others noted a lack of formal debriefing plans, highlighting potential gaps in providing psychosocial support to CHVs;

> *"We usually have plans for debriefing but not on COVID-19, just mental illnesses"*

Finally, monitoring and evaluation of CHV services were reported to varying extents, with some respondents mentioning ongoing monitoring through regular meetings and phone communication as noted by one of the CHV leaders;

> *"The tools used were somehow used to evaluate their functions. These were the usual MoH tools. MoH 513,514, 100 continued. Contact was avoided, and thus CHVs would take the photos of the tools and send the reports to the sub county. Those who couldn't use photos made calls."*

Initially, the pandemic induced fear and uncertainty among CHVs and the community at large, leading to a decrease in their service delivery. Many individuals lacked sufficient information about COVID-19, contributing to heightened anxiety and a reluctance to engage with healthcare services. Additionally, lockdown measures further hindered access to healthcare, as people remained confined to their homes, limiting CHVs' ability to conduct household visits and provide essential services. However, as the pandemic progressed, CHVs underwent a process of learning and adaptation. Clear definition of roles and effective communication mechanisms are essential for enhancing CHVs' understanding of their responsibilities and facilitating coordination with healthcare authorities. Studies such as Zulu et al. (2020) have emphasized the importance of ongoing training and support for CHVs to enhance their competencies and adaptability to evolving health challenges. Continuous professional development opportunities can empower CHVs to deliver quality health services and address community needs effectively.

4.5 Challenges to the Effective Performance of CHVs During the Covid-19 Pandemic

The findings from the current study pinpointed challenges faced by community health volunteers (CHVs) during the pandemic that we categorized into health system-related, community-related, and psychosocial-related challenges.

4.5.1 Health System Related Challenges

The CHVs' were evaluated on the health systems related challenges to effective performance during the COVID-19 pandemic.

Logistics

The Table shows that the majority of CHVs (81.7%) did not have a means of transport to move about in the community delivering community health services. Only 18.3% of the CHVs in Nakuru county had transport means that they used to deliver community health services.

Table 11

Frequency of CHVs Who Had a Means of Transport

Challenges		n	%
Had transport means	Yes	48	18.3
	No	214	81.7

The low availability of means of transport for CHVs as indicated above posed logistical challenges such as transportation and mobility thereby hindering CHVs' ability to reach community members effectively. Some volunteers faced long distances to travel, exacerbated by the closure of businesses during lockdowns, making it difficult to access essential resources.

"They were not supported in terms of movements from household to household."

Motivation

Out of the 262 CHVs, only 6 (2.3%) received airtime for contacting patients while 157(59.9%) received motivation from the County government as shown in Table 13 below. Among the CHVs who received motivation from the County, 16.6% were adequately motivated, while 83.4% were not.

Table 12

Frequency and Perception of Motivation Given to CHVs

Challenges		n	%
Received airtime	Yes	6	2.3
	No	256	97.7
Received motivation	Yes	157	59.9
	No	105	40.1
Motivation adequate	Yes	26	16.6
	No	131	83.4

Notably, only a small percentage received airtime for communication further hindering their mobility and outreach efforts. Moreover, from the interviews and focus discussions, the issue of stipends emerged as a significant concern among CHVs. Delayed stipend payments and lack of budget allocation for CHV activities contributed to financial instability among volunteers. Many reported delays in receiving payments, with some receiving stipends only twice in a span of several months.

"The stipends would delay so much, some CHVs even opted out... So up to 50 CHVs dropped out."

This financial instability led to the dropout of numerous volunteers who could not sustain their commitment without adequate compensation. The lack of funding also affected

essential services like airtime provision, leaving CHVs to cover communication costs themselves, further straining their resources.

Commodity/Supplies

The frequency of CHVs who received various commodities/supplies needed to conduct their community health services is as shown from the table belwo. Amongst the CHVs who regularly received PPEs from the supervisor or County, 250(95.4%) received masks, 77(29.4%) received gloves, 189(72.1%) received sanitizers, 19(7.3%) received overalls, and 66(25.2%) received goggles. During the COVID-19 pandemic, 59(22.5%) had enough drugs for treating diarrhea, 229(87.4%) CHVs regularly received dewormers, 131(50.0%) received vitamin A supplements, 54(20.6%) received IFAS and 28(10.7%) received supplements for elderly. Finally, majority (42.4%) of the CHVs noted that the supplies/drugs reduced during the COVID-19 pandemic, 29.0% noted an increase while 28.6% noted that the supplies remained the same.

Table 13

Frequency of CHVs Who Received Various Commodities/Supplies Essential for Their Service Delivery

Challenges		n	%
Received PPEs	Masks	250	95.4
	Gloves	77	29.4
	Sanitizers	189	72.1
	Overall	19	7.3
	Goggles	66	25.2
Availability of drugs for treating conditions	Diarrhoea	59	22.5
	Pneumonia	0	0
	Malaria	0	0
Received supplements	Vitamin A supplements	131	50.0
	Dewormers	229	87.4
	IFAS	54	20.6
	Elderly supplements	28	10.7
Change in supplies/drugs	Increased	76	29.0
	Reduced	111	42.4
	Remained the same	75	28.6

CHVs faced shortages of essential supplies and drugs, impacting their ability to deliver healthcare services effectively. The provision of PPE was inconsistent across different areas. While some CHVs received masks and gloves, others lacked adequate supplies, relying on sporadic distributions from external partners like UNICEF. This inconsistency created risks for CHVs and undermined their ability to carry out their duties safely as noted by one of the CHVs during focus discussion groups.

"We were given like 20 masks yet the COVID period was very long."

Health Information System/Data Management

Community health volunteers have an important role when it comes to data collection especially from households. They gather medical information from household members

which are then transmitted to health centers for monitoring purposes. Being the case, they need tailor-made tools to collect and report their data in an efficient and easy manner. Evidently Table 15 shows that less than half of the CHVs in Nakuru (42.7%) received data reporting tools to help with collection of data during the COVID-19 period. This under-provision could potential undermine accurate reporting of the true statistics concerning medical conditions of household members.

Table 14

Frequency of CHVs Who Received Data Reporting Tools

Challenges		n	%
Received data reporting tools	Yes	112	42.7
	No	150	57.3

Support Supervision

Table 16 below shows that a majority of CHVs (80.9%) received supervision visits during the COVID-19 pandemic compared to the 19.1% who did not. Further, among the CHVs who received supervision visits, 56.1% were visited by CHEW/CHA, followed by 20.8% visited by both CHEW/CHA and NGO, 14.6% visited by the County Health Managers and finally 8.5% being visited by all the supervisors. The frequency of the supervisory visits ranged from 5.7% CHVs being visited daily, to 22.6% weekly, 35.4% twice a month and 36.3% once a month. All the CHVs who received supervision visits got feedback from the support supervision with a majority (98.6%) being allowed to express the challenges they experienced giving services during COVID-19 pandemic.

Table 15

Frequency of Challenges CHVs Faced Concerning Support Supervision

Challenges		n	%
Supervision visit	Yes	212	80.9
	No	50	19.1
Supervision visitor	Health manager	31	14.6
	CHEW/CHA	119	56.1
	CHEW/CHA & NGO	44	20.8
	Health manager, CHEW/CHO & NGO	18	8.5
Frequency of supervisor visit	Daily	12	5.7
	Weekly	48	22.6
	Twice monthly	75	35.4
	Once monthly	77	36.3
Received supervisor feedback	Yes	212	100
Allowed to express challenges	Yes	209	98.6
	No	3	1.4

From Table above, while a majority of CHVs received supervision visits, the frequency and quality of these visits varied. Some CHVs reported receiving feedback and support, while others faced challenges such as inadequate provision of PPEs, drugs, and supplies. Furthermore, organizational shortcomings, including communication gaps and incoordination, hampered the effectiveness of CHVs' efforts. Many volunteers expressed frustration with the lack of guidance and support from county officials, who seemed detached from the realities on the ground. This disconnect led to delays in the dissemination of guidelines and resources, leaving CHVs feeling unsupported and undervalued in their roles as noted by one of the CHVs:

> *"The organizational structures were not perfect... It could affect service since if you are just in meetings in hotels, when do you get the time for implementation?"*

CHVs often felt demoralized and ignored by healthcare workers, who sometimes dismissed their assessments and failed to provide necessary support for patient referrals and community linkages. This lack of recognition further compounded the challenges faced by CHVs in their volunteer efforts.

> *"When they discharge the patients from hospitals they don't do the community linkage. So the CHVs feel ignored."*

4.5.2 Community Related Challenges

Current study also evaluated community related challenges to effective performance of CHVs during the COVID-19 pandemic. While none of the respondent CHVs suffered from any form of rejection by the family members, 29.8% suffered rejection by community members, while 10.3% suffered rejection from chronic care patients. Additionally, 28.2% of the CHVs experienced some form of harassment by community members while only 1(0.4%) was harassed by family members. Notwithstanding, a total of 89.7% CHVs reported that the community members followed the health prevention/promotive messages. However, half of the CHVs reported that there were community members who hid their sick relatives from accessing services. In terms of financial incentives, while 87.8% of the CHVs received financial support from NGOs, 12.6% and 1(0.4%) received from community-based organization and community members respectively. The community related challenges to effective performance of CHVs during the COVID-19 pandemic are summarized in Table17.

Table 16

Community Related Challenges to Effective Performance of CHVs During the COVID-19 Pandemic

Challenges		n	%
Suffered rejection	Family members	0	0
	Community members	78	29.8
	Chronic care patients	27	10.3
Harassment	Family members	1	0.4
	Community members	74	28.2
Community adherence to health prevention messages	Yes	235	89.7
	No	27	10.3
Community members hiding sick relatives	Yes	131	50.0
	No	131	50.0
Received financial support	NGOs	230	87.8
	Community-based organization	33	12.6
	Community members	1	0.4

Majorly, community-related challenges that CHVs encountered during the pandemic included: (1) community rejection and stigma where CHVs faced rejection and stigma from community members, particularly in gated communities where access was restricted.

> *"It was very difficult for the CHVs accessing the gated communities... So it was difficult to access those on home based care especially the Indians. They said they had their own doctors."*

Additionally, misinformation and fear of COVID-19 led to distrust and reluctance to engage with CHVs, impacting their ability to provide essential services. Community members, fearing COVID-19 transmission, refused to open gates, hindering CHVs' ability to provide essential services. Some CHVs reported being rejected outright, facing insults and derogatory remarks from community members. This rejection extended to

CHVs' personal lives, with friends distancing themselves and communities viewing them with suspicion.

> *"We were called the people who spray dawa. And they incited others not to even to greet us."*

Secondly, high expectations and pressure where community members had high expectations of CHVs, often expecting material support during household visits. This pressure to provide beyond their capacity contributed to frustration and demoralization among CHVs. Similar challenges were documented by Ndu et al. (2022), who found that CHVs in Kenya faced stigma and discrimination from community members, hindering their ability to effectively deliver healthcare services during the COVID-19 pandemic. Community members had high expectations of CHVs, often expecting material support such as food during household visits. CHVs faced pressure to provide beyond their capacity, leading to frustration and demoralization. Additionally, CHVs encountered harassment and verbal abuse, with some community members blaming them for government policies of spreading rumors about COVID-19.

> *"E.g. we are the ones who caused COVID, they would relate deaths after vaccination with the COVID vaccine, and that would be taken out on us with harsh words."*

CHVs faced difficult working conditions, including inadequate community education on COVID-19 and safety concerns such as harassment and seduction. Safety protocols were not always observed, with CHVs risking exposure to the virus while providing essential services.

> *"Some female CHVs were seduced by some community members when they went to give services in the household."*

Despite the challenges, some positive outcomes emerged, including improved community bonds and increased trust in CHVs' abilities. Over time, communities began to appreciate the importance of CHVs' roles in providing essential healthcare services and responding to emergencies.

> *"With COVID, they really saw the need for the CHVs. The CHVs were even trusted more than the health workers"*

4.5.3 Psychosocial Related Challenges

Current study lastly evaluated psychosocial-related challenges to the effective performance of CHVs during the COVID-19 pandemic. From the results, 90.1% of the CHVs received psychosocial support; with 75.4% receiving the support once a month, 11% every three months, another 11% occasionally and 2.3% once weekly. This study also noted that during service delivery, a majority (90.3%) of the CHVs experienced fear of infection, 68.2% experienced stress, 59% experienced exhaustion, 1.8% experienced mental health disorder and 0.5% experienced social isolation. Further, of the total CHVs respondents, 11.8% stated to have been infected with COVID-19. While most (37.4%) of the CHVs reported that none of their community members died from COVID-19 infection, an almost similar frequency (35.9%) reported 1 to 5 deaths, 10.7% reported 6 to 10 deaths, while 11.1% reported more than ten deaths. About 5% of the CHVs were not aware of the number of their community members who died from COVID-19 infection. Lastly, more than three quarters (86.6%) of the CHVs experienced difficulties meeting family obligations during the pandemic. All CHVs reported that their income(hustle) was affected during the COVID-19 pandemic. The psychosocial-related challenges to the effective performance of CHVs during the COVID-19 pandemic are summarized in Table 18.

Table 17

Psychosocial Related Challenges to Effective Performance of CHVs During the COVID-19 Pandemic

Challenges		n	%
Experienced psychosocial support	Yes	236	90.1
	No	26	9.9
Frequency of psychosocial support	Once weekly	6	2.5
	Once monthly	178	75.5
	Every three months	26	11.0
	Occasionally	26	11.0
Service delivery experience	Stress	148	56.5
	Social isolation	1	0.3
	Fear of infection	196	74.8
	Mental health disorder	4	1.5
	Exhaustion	128	48.9
COVID-19 infected	Yes	31	11.8
	No	231	88.2
Deaths from COVID-19 infection	None	98	37.4
	1 – 5	94	35.9
	6 – 10	28	10.7
	10+	29	11.0
	Not aware	13	5.0
Difficulties meeting family obligations	Yes	227	86.6
	No	35	13.4
Source of income affected	Yes	262	100.0
	No	0	0

The study highlights various psychosocial-related challenges experienced by CHVs, including: Fear and Stress-CHVs reported experiencing fear of infection, stress, exhaustion, and mental health disorders while carrying out their duties. The lack of frequent psychosocial support and counseling exacerbated these challenges, leading to

burnout and emotional distress among CHVs. CHVs faced difficulties meeting family obligations due to financial strain and job losses. Domestic violence and family conflicts further compounded their stress and emotional burden. These findings are consistent with existing literature on the psychosocial impact of volunteering during health crises. A study by Kang et al. (2020) found that CHVs involved in pandemic response efforts experienced increased stress, anxiety, and depression due to the demands of their role and lack of support mechanisms. During the interviews, CHVs expressed deep concerns about contracting COVID-19 while carrying out their duties. Many reported feeling vulnerable due to a lack of protective equipment and inadequate understanding of the disease as hinted below;

> *"We just had basic knowledge on COVID. So we relied on what we were being told."*

Some CHVs even contracted COVID-19, heightening anxiety among their peers and discouraging others from volunteering.

> *"There was fear. One of us was even infected with COVID 19 and admitted in the hospital. However, after we were fully equipped through training and after vaccination, the tension reduced and we worked with ease."*

Community health volunteers encountered challenging working conditions, including long hours, insufficient training, and lack of stipends. Many CHVs faced burnout from covering extensive areas, conducting health education, and tracing defaulters. The absence of adequate support and recognition contributed to demoralization and stress among CHVs.

> *"Some CHVs would go without lunch... There was burnout. It was overwhelming for us."*

Additionally, challenges such as limited financial support for transportation and logistical constraints were noted, impacting the effectiveness of monitoring efforts.

> *"Yes, we did but not as it was supposed to be done due to logistics. You are not given money, even for contact tracing, transportation you use your own means. And you have to go to the household level and some are very far."*

The absence of psychosocial counselling and debriefing sessions compounded the emotional toll on CHVs. Witnessing deaths in the community, dealing with family conflicts, and facing job losses led to mental instability and depression among some CHVs. The lack of support systems exacerbated feelings of isolation and distress.

> *"No psychosocial counselling for the CHVs... Even seeing patients die yet we are not used to this level of medical care."*

Community health volunteers faced family conflict and financial strain, with some experiencing domestic violence and job losses. The inability to provide for their families due to volunteering exacerbated tensions at home, leading to instances of abuse and strain on familial relationships.

> *"Beatings by spouse-for not bringing money home at the end of the day... she was beaten."*

Community health volunteers encountered stigma from their communities, with some being ostracized and blamed for the spread of COVID-19. This stigma, coupled with the psychological toll of their work, contributed to feelings of depression, anxiety, and isolation among CHVs. This, in turn, eroded their confidence and contributed to a slowdown in service delivery as they implemented precautionary measures. A respondent shared,

"Some had mental instability, because of going to the community and not being able to provide for their families."

"The CHVs were stigmatized, they were not sure of themselves, they had to take precaution, so their services slowed up for lack of safety measures."

4.5.4 Mitigating Challenges in Future Pandemics

Strategies for mitigating CHV-related challenges in future pandemics were extracted from interviews with the CHV leaders. Interviewees stressed the importance of comprehensive emergency preparedness, emphasizing the need for involvement of CHVs from the outset. They highlighted the necessity of community-based emergency preparedness teams and multi-sectoral approaches to ensure swift responses to pandemics. Continuous training and capacity-building exercises for CHVs were deemed essential to equip them with the knowledge and skills required to effectively respond to future health crises.

"Right from the preparation, CHVs should be involved as stakeholders. This should continue throughout the process."

Ensuring adequate resources and support for CHVs emerged as a critical aspect of mitigating challenges in future pandemics. This includes providing CHVs with necessary protective equipment, facilitating access to training and education, and offering financial incentives such as stipends. Interviewees emphasized the importance of recognizing the voluntary nature of CHV work and advocated for satisfactory remuneration to motivate and retain volunteers.

"In case we are supporting one group, we need to support everyone participating in that pandemic, not one group... Those in hospitals even got a risk allowance but the CHVs got nothing except the stipends from the partners."

Efficient communication channels and streamlined coordination mechanisms were identified as crucial for effective pandemic response. Interviewees called for clear chains of command, direct communication between CHVs and healthcare facilities, and reduced bureaucratic processes to expedite decision-making and resource allocation. Community engagement and involvement were underscored as essential for disseminating accurate information and fostering trust among community members.

> *"The long communication channel should be reduced completely because you can find in that long process some lives are lost."*

Addressing the mental health and psychosocial needs of CHVs emerged as a pressing concern. Interviewees emphasized the importance of providing regular counseling, mental health assessments, and debriefing sessions to mitigate stress, burnout, and emotional distress among CHVs. Additionally, they highlighted the need for comprehensive training on psychosocial support and basic counseling skills to enable CHVs to effectively address mental health issues within their communities.

> *"CHVs should be given mental health assessment... This should help reduce stress on the CHVs."*

To ensure the retention and motivation of CHVs, interviewees stressed the importance of fair compensation, recognition, and support. They called for sustained efforts to address financial constraints, provide opportunities for career advancement, and create a conducive working environment that values the contributions of CHVs. Additionally, efforts to address community perceptions and enhance the status of CHVs were deemed crucial for fostering appreciation and respect for their work.

> *"If it is left as is, most of the CHVs will not be able to continue. Satisfactory stipends will actually even hold our families together..."*

In general, the findings from the study provide valuable insights into mitigating challenges faced by community health volunteers (CHVs) in future pandemics. The key themes identified include emergency preparedness, resource allocation, communication, mental health support, and retention strategies. The study emphasizes the importance of involving CHVs in emergency preparedness from the outset. This aligns with findings from other studies that highlight the critical role of CHVs in pandemic response efforts (Scott et al., 2020). For example, a study by Scott et al. (2020) underscores the need for comprehensive training and capacity-building exercises for CHVs to enhance their preparedness for future health crises.

Ensuring adequate resources and support for CHVs emerged as a critical aspect of mitigating challenges in future pandemics. Similar studies have emphasized the importance of providing CHVs with necessary protective equipment, training, and financial incentives (Ndu et al., 2022). However, there remains a disparity in resource allocation, as highlighted by interviewees who noted the discrepancy between the support received by CHVs and healthcare workers in hospitals. Efficient communication channels and streamlined coordination mechanisms are crucial for effective pandemic response. This finding resonates with other studies that emphasize the importance of clear communication and coordination among stakeholders (Kang et al., 2020). A study by Kang et al. (2020) highlights the need for direct communication between CHVs and healthcare facilities to expedite decision-making and resource allocation. Addressing the mental health and psychosocial needs of CHVs emerged as a pressing concern in the study. This aligns with findings from other research indicating that CHVs often experience stress, burnout, and emotional distress during health emergencies. Providing regular counseling, mental health assessments, and debriefing sessions can help mitigate these challenges and support the well-being of CHVs. To ensure the retention and

motivation of CHVs, interviewees stressed the importance of fair compensation, recognition, and support. This finding is consistent with existing literature highlighting the need for sustained efforts to address financial constraints and create a conducive working environment for CHVs (Scott et al., 2020). Additionally, efforts to enhance the status of CHVs within their communities can foster appreciation and respect for their work.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study results, analysis and discussion as described previously. Additionally, the chapter highlights the conclusions drawn from the study results and discussion and also lists recommendations to improve service delivery by CHVs.

5 2. Summary of the Findings

In the current contemporary world, roles and responsibilities of community health workers are expanding, in a bid to ensure as many as possible community members are able to access primary healthcare. In situations of medical emergencies such as outbreaks, epidemics and pandemics, CHVs remain a crucial part of healthcare system in linking the community to the national healthcare system. To meet such dynamic demands, CHVs have to be well trained and competent for the job. The recent COVID-19 pandemic unravel how a crucial a tool CHVs can be in educating and preventing community level transmission. Correspondingly, this study aimed to assess performance, preparedness for service delivery and challenges faced by CHVs in Nakuru county during the COVID-19 pandemic.

The study involved 262 CHVs, all of whom participated, resulting in a 100% response rate. Among these CHVs, 76.3% were females and 23.7% were males. Most CHVs were aged between 40 to 59 years, with females outnumbering males in all age groups except for CHVs aged 20 to 29 years. Additionally, the majority of CHVs were married, had completed at least secondary education, and were engaged in occupations such as business or farming.

Nearly all CHVs had volunteered for more than 5 years, with varying levels of training completed, with basic modules being the most common.The gender distribution reflects a common trend in community health work, where females typically outnumber males, potentially influenced by cultural norms. Middle-aged individuals, particularly those aged 40 to 59 years, are predominant among CHVs, possibly due to their life experiences and perceived reliability. Marital status and education level, particularly having completed at least secondary education, seem to correlate positively with CHV participation, although a notable portion has lower educational attainment. Similarly, various occupational backgrounds are represented among CHVs, with a significant commitment to long-term volunteering.Regarding training, most CHVs have completed basic modules, which cover fundamental skills necessary for their roles. Some had also completed technical modules, reflecting a comprehensive approach to skill development tailored to regional needs.

5.2.1 Performance of Nakuru County CHVs in routine community health services delivery before and during the COVID-19 pandemic

The evaluation of CHVs performance in delivering community health services before and during the COVID-19 pandemic revealed notable insights into their roles, challenges, and adaptability. Before the pandemic, the majority of CHVs rated their performance as good, with a slight decrease observed during the pandemic. However, more CHVs rated their performance as very good during the pandemic compared to before, indicating their ability to adapt effectively to emerging challenges.During the pandemic, CHVs significantly increased their provision of additional services, including COVID-19 health education, identification and referral of COVID-19 cases, contact tracing, and mobilization/administration of COVID-19 vaccinations.

This expansion of services underscores the crucial role of CHVs as frontline responders during public health emergencies.The study highlighted changes in reported cases based on the services provided by CHVs during the pandemic. While some CHVs reported the same number of cases, a majority noted an increase, attributed to various factors such as community concerns, lack of staff and resources in health facilities, transportation challenges, and increased trust in CHVs' services.However, there were also instances of decreased cases, attributed to community members' fear of contracting COVID-19 from CHVs, preferences for traditional healers, and self-treatment at home. These findings emphasize the complex nature of community perceptions and trust in shaping healthcare-seeking behaviors during public health emergencies.

Despite the challenges posed by the pandemic, CHVs exhibited remarkable resilience by maintaining their duties uninterrupted and expanding their roles to include COVID-19 response efforts. The pandemic necessitated adjustments in reporting and communication methods, with physical meetings being replaced by phone calls for reporting purposes. However, this shift had implications for the efficiency of data collection and transmission. Community health volunteers also adapted their service delivery methods to mitigate the spread of COVID-19, refraining from certain assessments and limiting home visits, particularly for non-urgent cases. Despite facing initial disruptions, some CHVs temporarily ceased services due to fears surrounding community transmission; they were subsequently recalled, retrained, and reintegrated into their roles with a heightened understanding of COVID-19 prevention and management.

Remarkably, CHVs played a crucial role in imparting information about COVID-19 signs and symptoms, acting as frontline identifiers, and facilitating referrals to appropriate healthcare authorities. They also championed efforts to ensure widespread adherence to preventive measures and actively engaged communities in vaccination

campaigns.Furthermore, the study highlighted significant shifts in the types of services offered by CHVs before and during the pandemic. While family planning promotion and referral remained key services, there was a decrease in the number of CHVs providing this service during the pandemic. Instead, COVID-19 health education and contact tracing emerged as leading additional services provided by CHVs during the pandemic.

Similarly, there were changes observed in maternal, newborn, and child health (MNH) services offered by CHVs during the pandemic. While there was a decrease in certain MNCH services, such as ANC counseling and community-based postnatal services, there was an increase in referrals for family planning and immunization. The CHVs continued to provide care for persons with chronic conditions and older persons, with significant improvements noted in the number of services provided during the pandemic period. These findings underscore the resilience and commitment of CHVs in addressing the holistic healthcare needs of their communities, including vulnerable populations.Despite facing numerous challenges, CHVs demonstrated remarkable adaptability, resilience, and commitment in responding to emergent health crises and ensuring continuity of care for their communities. Their efforts underline the importance of strengthening community health systems and investing in the training, support, and recognition of CHVs as essential frontline responders in public health emergencies.

5.2.2 Preparedness of the Nakuru county CHVs for the continuation of routine community health services during COVID-19 Pandemic

The study highlighted disparities in preparedness among CHVs and emphasizes the importance of their involvement in planning and decision-making processes. While some CHVs reported feeling adequately prepared and involved in planning, others expressed disagreement.According to the findings, some CHVs were actively engaged in pre-

COVID planning and felt prepared to continue service delivery. They participated in training sessions, seminars, and monthly meetings where their input was considered in decision-making. However, others felt less involved, with planning primarily occurring at higher administrative levels without consulting CHVs directly.Similar findings have been reported in other studies, indicating that disparities in preparedness among CHVs are common across different settings. Lack of meaningful involvement may lead to overlooked community needs and inefficient resource allocation.

The study also highlighted the delayed onset of preparedness efforts, with training and resource allocation largely beginning after COVID-19 had already spread in the community. Role clarification and effective communication channels were identified as important factors for CHVs' effectiveness in service delivery. Moreover, clear definition of roles and communication mechanisms were viewed to enhance CHVs' understanding of their responsibilities and facilitate coordination with healthcare authorities.External organizations, such as USAID, played a role in providing training support, particularly regarding COVID-19 awareness and handling positive cases. Community health volunteers received on-job training sessions facilitated by various entities, including the Ministry of Health and donors.

Initially, the pandemic induced fear and uncertainty among CHVs and the community, leading to a decrease in service delivery. However, as the pandemic progressed, CHVs underwent a process of learning and adaptation, receiving comprehensive training on infection prevention and control (IPC), home-based care, and other essential skills. Multisectoral support from government agencies and donors played a crucial role in empowering CHVs to fulfill their roles more effectively.Despite the focus on COVID-19 response, CHVs continued to address other healthcare needs within their communities,

albeit with some decline in certain services. Notably, the prevalence of gender-based violence, alcoholism, drug use, and teenage pregnancy increased during the pandemic, while cases of diarrhea decreased due to improved hand hygiene practices.

In terms of resource allocation, respondents reported variations in the availability of resources such as PPE, gloves, masks, sanitizers, and handwashing facilities. Some mentioned timely provision, while others experienced significant delays, impacting their ability to carry out duties effectively.Budgetary constraints were also noted, with some respondents indicating a lack of budget allocation specifically for community health units. While some received support from external partners, others reported a complete absence of budgetary provisions for CHV activities.Training for CHVs primarily focused on COVID-19 response, with variations in coverage and consistency. Clear communication channels and role clarification were identified as important factors for CHVs' effectiveness. Debriefing plans and monitoring and evaluation of CHV services varied among respondents, with challenges such as limited financial support and logistical constraints impacting effectiveness.

5.2.4 Challenges to the effective performance of CHVs during the COVID-19 Pandemic in Nakuru County

The study examines the challenges faced by Community Health Volunteers (CHVs) during the COVID-19 pandemic, categorizing them into health system-related, community-related, and psychosocial-related challenges.The CHVs faced various challenges within the health system, including inconsistent supervision and support. While most CHVs received supervision visits, the quality and frequency varied. Additionally, there were shortages of essential supplies and drugs, and only a small percentage received airtime and transportation support. Inadequate provision of personal protective equipment (PPE) was also noted, leading to risks for CHVs. Delayed stipend

payments and lack of budget allocation for CHV activities contributed to financial instability and dropout rates among volunteers. Furthermore, logistical challenges and organizational shortcomings hampered CHVs' effectiveness.

CHVs encountered rejection and stigma from community members, particularly in gated communities where access was restricted. Misinformation and fear of COVID-19 led to distrust and reluctance to engage with CHVs. Some CHVs reported being rejected outright and facing insults from community members. High expectations from community members, coupled with pressure to provide beyond their capacity, contributed to frustration among CHVs. Additionally, harassment, verbal abuse, and blaming CHVs for government policies or COVID-19 rumors were observed. However, positive outcomes such as improved community bonds and increased trust in CHVs were also noted.CHVs reported experiencing fear of infection, stress, exhaustion, mental health disorders, and social isolation while carrying out their duties. Lack of psychosocial support exacerbated these challenges, leading to burnout and emotional distress.

Financial strain, difficulties meeting family obligations, and job losses further compounded CHVs' stress. Witnessing deaths in the community and facing stigma from communities also contributed to mental instability and depression among CHVs.

To address these challenges in future pandemics, comprehensive emergency preparedness involving CHVs from the outset is essential. Continuous training, adequate resources, efficient communication channels, and streamlined coordination mechanisms are crucial. Addressing the mental health and psychosocial needs of CHVs through regular counseling and support is imperative. Fair compensation, recognition, and support are necessary to retain and motivate CHVs. Additionally, efforts to enhance the

status of CHVs within their communities can foster appreciation and respect for their work.Overall, the study emphasizes the importance of involving CHVs in emergency preparedness, providing adequate support and resources, addressing mental health needs, and enhancing the status of CHVs within their communities.

5.3 Conclusions

In conclusion, the study enrolled 262 CHVs, with a notable gender imbalance; 76.3% were females, and only 23.7% were males. The age distribution among CHVs was varied, with a majority falling within the 40-59 age range, comprising 65.6% of the total participants. The majority of CHVs were married (63.7%) and had completed secondary education (45.8%). A significant proportion of CHVs were engaged in business (47.8%) or farming (24.8%). Nearly all CHVs (98.9%) had volunteered for more than five years, indicating a high level of commitment and experience within the community health system. Moreover, a considerable number had completed technical training modules (62.6%), equipping them with specialized skills to address community health challenges.

Community health volunteers generally rated their performance as good both before and during the COVID-19 pandemic, albeit with slight agreement between the two periods ($\kappa = 0.061$). This suggests that while CHVs maintained a satisfactory level of performance during the pandemic, there may have been changes or challenges affecting their service delivery.They demonstrated resilience and adaptability during the pandemic, expanding their services to include COVID-19-related activities such as health education, contact tracing, and vaccination mobilization. The pandemic led to changes in the delivery of essential health services, with a shift in focus towards COVID-19 response efforts.Despite initial disruptions, CHVs quickly resumed their duties, 4emphasizing the

role they play in maintaining essential health services, particularly during crises such as the COVID-19 pandemic.

The study highlights a significant delay in the preparedness of CHVs for service delivery during the COVID-19 pandemic. The lack of preparation before the onset of the pandemic indicates a failure in early recognition and response to the emerging threat. This delay likely contributed to initial confusion and challenges in effectively managing the spread of COVID-19 within communities.External organizations, particularly USAID, played a crucial role in providing training support to CHVs, focusing on COVID-19 awareness and response measures. However, the reliance on external support also highlights potential gaps in local capacity and resource allocation.The study reveals inconsistencies in the availability of resources for CHVs, including PPE, medications, and financial support.

The lack of consistent and sufficient resources posed challenges in effectively carrying out CHV duties, indicating a need for improved resource allocation and support mechanisms to enhance their effectiveness.Community health volunteers faced various challenges in service delivery, including logistical constraints, lack of clear communication channels, and organizational shortcomings. These challenges hindered their ability to reach community members effectively.They experienced significant psychosocial challenges during the pandemic, including fear of infection, stress, exhaustion, and social isolation. The minimal provision of psychosocial support and counseling compounded the emotional toll on CHVs, leading to burnout and mental health issues.

Community engagement and support were identified as essential factors in mitigating challenges faced by CHVs. Building trust and increasing community participation are

crucial for disseminating accurate information, promoting adherence to health guidelines, and addressing stigma associated with COVID-19. In general, the study provides valuable insights into the lessons learned from the COVID-19 pandemic to improve preparedness and response for future health crises.

5.4 Recommendations

Based on the above result(s), discussion and conclusion(s), this study recommends:

5.4.1 Recommendations for Policy

Existing policies should be enhanced to prioritize comprehensive training programs for CHVs, focusing on pandemic preparedness, infection control measures, and crisis response protocols. Continuous training and capacity building initiatives should be established to equip CHVs with the necessary skills and knowledge to effectively respond to public health emergencies like the COVID-19 pandemic.

Policies should be revised to facilitate the seamless integration of CHVs into formal health systems, ensuring clear communication channels, referral pathways, and support mechanisms. This integration will enhance the coordination and collaboration between CHVs and healthcare facilities, optimizing the delivery of essential health services, especially during emergencies.

There is a need to formulate comprehensive national guidelines outlining the roles and responsibilities of CHVs during public health emergencies. These guidelines should delineate specific tasks, protocols for reporting, communication strategies, and mechanisms for resource allocation and support.

Practical Interventions: Implementation of targeted recruitment strategies to attract more male volunteers.

Active recruitment and mentorship of younger individuals to ensure intergenerational knowledge transfer within the CHV system.

Increasing stakeholder investment in CHV programs to address resource gaps and ensure sustainable service delivery.

Development of comprehensive psychosocial support programs to address the mental health needs of CHVs.

5.4.2 Recommendations for Further Research

Further research is warranted to conduct longitudinal studies on CHV performance and impact, tracking changes in performance indicators, service delivery outcomes, and community health outcomes over time. These studies can provide valuable insights into the sustained effectiveness of CHV interventions and identify factors influencing long-term program success.

Comparative analyses of CHV models and strategies across different contexts and settings can contribute to evidence-based policymaking and programmatic decision-making. By comparing the effectiveness, scalability, and sustainability of various CHV approaches, policymakers can identify best practices and tailor interventions to local needs and priorities.

REFERENCES

Alabi, Q. K., Oyedeji, A. S., Kayode, O. O., & Kajewole-Alabi, D. I. (2023). Impact of COVID-19 pandemic on mother and child health in sub-Saharan Africa – a review. *Pediatric Research*, *94*(4), 1278-1283. https://doi.org/10.1038/s41390-023-02651-w.

Allen, C. G., & Brownstein, N. (2016). Capacity building and training needs for community health workers working in health care organizations. *Journal of Community Medicine & Health Education*, *06*(01). https://doi.org/10.4172/2161-0711.1000403.

Avery, L. S., Du Plessis, E., Shaw, S. Y., Sankaran, D., Njoroge, P., Kayima, R., Makau, N., Munga, J., Kadzo, M., Blanchard, J., & Crockett, M. (2017). Enhancing the capacity and effectiveness of community health volunteers to improve maternal, newborn and child health: Experience from Kenya. *Canadian Journal of Public Health*, *108*(4), 427-434. https://doi. org/10.1 7269/cjp h.108.5578.

Bezbaruah, S., Wallace, P., Zakoji, M., Padmini Perera, W. S., & Kato, M. (2021). Roles of community health workers in advancing health security and resilient health systems: Emerging lessons from the COVID-19 response in the south-east Asia region. *WHO South-East Asia Journal of Public Health*, *10*(3), 41. https://doi.org/10.4103/2224-3151.309872.

Bhattacharyya K, Winch P, LeBan K &Tien M. (2001). Community health worker incentives and disincentives: how they affect motivation, retention and sustainability. Arlington, Virginia, basics/USAID.

Bhaumik, S., Moola, S., Tyagi, J., Nambiar, D., & Kakoti, M. (2020). Community health workers for pandemic response: A rapid evidence synthesis. *BMJ Global Health*, *5*(6), e002769. https://doi.org/10.1136/bmjgh-2020-002769.

Bujang, M. A. (2021). A step-by-step process on sample size determination for medical research. *Malaysian Journal of Medical Sciences*, *28*(2), 15-27.

https://doi.org/10.21315/mjms2021.28.2.2.

Campbell, J. (2013). Towards universal health coverage: A health workforce fit for purpose and practice. *BulletinoftheWorldHealthOrganization*,*91*(11), 887- 888.

https://doi.org/10.2471/blt.13.126698.

Celletti, F., Wright, A., Palen, J., Frehywot, S., Markus, A., Greenberg, A., De Aguiar, R. A., Campos, F., Buch, E., & Samb, B. (2010). Can the deployment of community health workers for the delivery of HIV services represent an effective and sustainable response to health workforce shortages? Results of a multicountry study. *AIDS*, *24*(Suppl 1), S45- S57. https://doi.org/10 .1097/01.aids .0000366082.68321.d6

Chatio, S., Welaga, P., Tabong, P. T.-N., & Akweongo, P. (2019). Factors influencing performance of community-based health volunteers' activities in the Kassena-Nankana Districts of Northern Ghana. *PLOS ONE*, *14*(2), e0212166.

https://doi.org/10.1371/journal.pone.0212166

Chengo, R., Esho, T., Kuria, S., Kimani, S., Indalo, D., Kamanzi, L., Mouhamed, B., Wabwire, A., Camara, K., Kapsandui, T., Kagurusi, P., Nankanja, M., Oele, G., & Osur, J. (2022). A situation assessment of community health workers' preparedness in supporting health system response to COVID-19 in Kenya, Senegal, and Uganda. *Journal of Primary Care & Community Health*, *13*, 215013192110734. https://doi.org/10.1177/21501319211073415

Chipukuma, H. M., Halwiindi, H., Zulu, J. M., Azizi, S. C., & Jacobs, C. (2020). Evaluating fidelity of community health worker roles in malaria prevention and control programs in Livingstone district, Zambia-A bottleneck analysis. *BMC HealthServices Research*, *20*(1). https://doi.org/10.1186/s12913-020-05458-1

Chung, M. H., Hazmi, H., & Cheah, W. L. (2017). Role performance of community health volunteers and its associated factors in Kuching district, Sarawak. *Journal of Environmental and Public Health*, *2017*, 1-9. https://doi.org/1 0.1155/201 7/9610928

Crisp, L. N. (2011). Global health capacity and workforce development: Turning the world upside down. *InfectiousDiseaseClinicsofNorthAmerica*, 25(2), 359-367. https://doi.org/10.1016/j.idc.2011.02.010

Elston, J., Cartwright, C., Ndumbi, P., & Wright, J. (2017). The health impact of the 2014–15 Ebola outbreak. *Public Health*, *143*, 60-70. https://doi .org/10.10 16/j.puhe.2016.10.020.

Gauld, R., Blank, R., Burgers, J., Cohen, A., Dobrow, M., Ikegami, N., Kwon, S., Luxford, K., Millett, C., & Wendt, C. (2012). The world health report 2008 – Primary healthcare: How wide is the gap between its agenda and implementation in 12 high-income health systems?*HealthcarePolicy | PolitiquesdeSanté*, 7(3), 38-58. https://doi.org/10.12927/hcpol.2013.22778

Gilroy KE, Winch P (2006). Management of sick children by community health workers. Intervention models and programme examples. Geneva, WHO/UNICEF.

Glenton, C., Colvin, C. J., Carlsen, B., Swartz, A., Lewin, S., Noyes, J., & Rashidian, A. (2013). Barriers and facilitators to the implementation of lay health worker programmes to improve access to maternal and child health: qualitative evidence synthesis. *Cochrane Database of Systematic Reviews*, *2*. https://doi.org/10.1 002/14651858.c d010414.pub2.

Gofin, J., & Gofin, R. (2005). Community-oriented primary care and primary health care. *American Journal of Public Health*, *95*(5), 757-757. https://doi.org/1 0.2105/ajph .2004.060822

Grossman- Kahn, R., Schoen, J., Mallett, J. W., Brentani, A., Kaselitz, E., & Heisler, M. (2017). Challenges facing community health workers in Brazil's family health strategy: a qualitative study. *The International Journal of Health Planning and Management*, *33*(2), 309-320. https://doi.org/10.1002/hpm.2456

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough? An Experiment with Data Saturation and Variability. Field Methods, 18(1), 59–82.

https://doi.org/10.1177/1525822X05279903

Hafeez A, Mohamud, K., Shiekh, M. R., Shah, S. A., & Jooma R. (2011). Lady health workers program in Pakistan: challenges, achievements and the way forward. *JPMA the Journal of the Pakistan Medical Association*, *61*(3), 210-5.

Hall, J. J., & Taylor, R. (2003). Health for all beyond 2000: The demise of the Alma-Ata declaration and primary health care in developing countries.*Medical Journal of Australia, 178*(1), 17-20. https://doi.org/10.5694/j.1326-5377.2003.tb05033.x

Hartzler, A. L., Tuzzio, L., Hsu, C., & Wagner, E. H. (2018). Roles and functions of community health workers in primary care. *The Annals of Family Medicine*, 16(3), 240- 245. https://doi.org/10.1370/afm.2208

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, *18*(1), 3-20. https://doi.org/10.1177/1525822x05282260

Jack, H. E., Arabadjis, S. D., Sun, L., Sullivan, E. E., & Phillips, R. S. (2016). Impact of community health workers on the use of healthcare services in the United States: A systematicreview.*JournalofGeneralInternalMedicine*, 32(3), 325-344. https:// doi.or g/10.1007/s11606-016-3922-9

Jigssa, H. A., Desta, B. F., Tilahun, H. A., McCutcheon, J., & Berman, P. (2018). Factors contributing to motivation of volunteer community health workers in Ethiopia: the case of four woredas (districts) in Oromia and Tigray regions. *Human Resources for Health*, *16*(57). https://doi.org/10.1186/s12960-018-0319-3

Kang, L., Ma, S., Chen, M., Yang, J., Wang, Y., Li, R., Yao, L., Bai, H., Cai, Z., Xiang Yang, B., Hu, S., Zhang, K., Wang, G., Ma, C., & Liu, Z. (2020). Impact on mental health and perceptions of psychological care among medical and nursing staff in wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. *Brain, Behavior, and Immunity*, *87*(87). https: //doi.org /10.1016/j.bbi.2020.03.028.

Keeru, L. (2017, June 26). *Women in the changing world of community health work*. CHW Central. https://chwcentral.org/twg_article/women-in-the-changing-world-of-community-healthwo rk/#:~:text= Globally%2C% 20it%20is%20e stimat ed% 2 0around,is%20on%20a%20voluntary%20basis.

Kok, M. C., Kane, S. S., Tulloch, O., Ormel, H., Theobald, S., Dieleman, M., Taegtmeyer, M., Broerse, J. E., & De Koning, K. A. (2015). How does context influence the performance of community health workers in low- and middle-income countries? Evidence from the literature. *Health Research Policy and Systems*, *13*(1). https://doi.org/10.1186/s12961-015-0001-3.

Lehmann, U., & Sanders, D. (2007). *Community health workers: what do we know about them? The state of the evidence on programs, activities, costs, and impact on health outcomes of using community health workers* (42). Geneva: World Health Organization.

Lewin, S., Munabi-Babigumira, S., Glenton, C., Daniels, K., Bosch-Capblanch, X., Van Wyk, B. E., Odgaard-Jensen, J., Johansen, M., Aja, G. N., Zwarenstein, M., & Scheel, I. B. (2010). Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database of Systematic Reviews*. https://doi.org/1 0.1002/1465 1858.cd0 04015.pub3.

Litsios, S. (2004). The Christian medical commission and the development of the World Health Organization's primary health care approach. *American Journal of Public Health*, *94*(11), 1884-1893. https://doi.org/10.2105/ajph.94.11.1884.

Lotta, G., Nunes, J., Fernandez, M., & Garcia Correa, M. (2022). The impact of the COVID-19 pandemic in the frontline health workforce: Perceptions of vulnerability of Brazil's community health workers. *Health policy* Open.3, (100065) https://doi.org/10.1016s.

Maes, K., Closser, S., Vorel, E., & Tesfaye, Y. (2015). Using community health workers: *Annals of Anthropological Practice*, *39*(1), 42–57. https://do i.org/10.1 111/na pa.12064.

McConnell, M., Ettenger, A., Rothschild, C. W., Muigai, F., & Cohen, J. (2016). Can a community health worker administered postnatal checklist increase health-seeking behaviors and knowledge?: evidence from a randomized trial with a private maternity facility in Kiambu County, Kenya. *BMC Pregnancy and Childbirth*, *16*(1). https://doi.org/10.1186/s12884-016-0914-z.

Medhanyie, A., Spigt, M., Kifle, Y., Schaay, N., Sanders, D., Blanco, R., GeertJan, D., & Berhane, Y. (2012). The role of health extension workers in improving utilization of maternal health services in rural areas in Ethiopia: a cross sectional study. *BMC Health Services Research*, *12*(1). https://doi.org/10.1186/1472-6963-12-352.

Milkovich, G. M., & Boudreau, J. W. (1997). *Human Resource Management*, (8th Ed.). Irwin, Chicago, Ill, USA.

Miller, J. S., English, L., Matte, M., Mbusa, R., Ntaro, M., Bwambale, S., Kenney, J., Siedner, M. J., Reyes, R., Lee, P. T., Mulogo, E., & Stone, G. S. (2018). Quality of care in integrated community case management services in Bugoye, Uganda: A retrospective observational study. *Malaria Journal*, *17*(1). https://doi.org/ 10.1186/s 12936-018-2241-5

Ministry of Health. (2020). *Kenya Community Health Strategy 2020-2025*. www.health.go.ke.https://www.health.go.ke/wp-content/uploads/2021/01/Kenya-Community-Health-Strategy-Final-Signed-off_2020-25.pdf

Mituki- Mungiria, D., Tuitoek, P., Varpolatai, A., Ngotho, D., & Kimani- Murage, E. (2020). Effectiveness of community health workers in improving early initiation and exclusive breastfeeding rates in a low- resource setting: A cluster-randomized longitudinal study. *Food Science & Nutrition*, *8*(6), 2719-2727. https://doi.org/10.1002/fsn3.1559

MoH.(2020).*KenyaCommunityHealth Policy*. Ministryof Health. https://www.heal th.go.ke/wp-content/uploads/2020/07/Kenya-Community-Health-Policy-Signed. p df

MOH. (2013). *Community Health Volunteers (CHVs) Basic Modules Handbook*. http://guidelines.health.go.ke:8000/media/CHV_handbook_PDF-F.pdf

Mostafa, I., Islam, S. F., Mondal, P., Faruque, A., Ahmed, T., & Hossain, M. I. (2019). Factors affecting low coverage of the vitamin A supplementation program among young children admitted in an urban diarrheal treatment facility in Bangladesh. *Global Health Action*, *12*(1), 1588513. https://doi.or g/10.1080/165 49716.2019.1588513

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches*. African Centre for Technology Studies. Nairobi, Kenya.

Mutegi, K. M. (2020). *Determinants of Performance of Community Health Volunteers in Delivery of Community Health and Nutrition Services in Buuri Sub-County, Meru County, Kenya* [Doctoral dissertation]. http://erepo.usiu.ac.ke/11732/6812

Nacoti, M., Ciocca, A., Brambillasca, P., Fazzi, F., Pisano, M., Giupponi, M., Pesenti, A., Valoti, O., & Cereda, M. (2021). A community-based model to the COVID-19 humanitarian crisis. *FrontiersinCellularand Infection Microbiology, 11*. https:/ /d oi.org/10.3 389/fcimb.2021.639579

Naimoli, J. F., Frymus, D. E., Wuliji, T., Franco, L. M., & Newsome, M. H. (2014). A Community Health Worker "logic model": towards a theory of enhanced performance in low- and middle-income countries. *Human Resources for Health, 12*(1). https://doi.org/10.1186/1478-4491-12-56

Ndu, M., Andoniou, E., McNally, S., Olea Popelka, F., Tippett, M., & Nouvet, E. (2022). The experiences and challenges of community health volunteers as agents for behaviour change programming in Africa: A scoping review. *Global Health Action, 15*(1). https://doi.org/10.1080/16549716.2022.2138117

Newell, K. W. (Ed.). (1975). *Health by the People. Geneva, Switzerland*. World Health Organization.

Njiraini, R., & Hussein, S. (2022, February 14). *Kenya's community health volunteer program*. CHW Central. https://chwcentral.org/kenyas-community-health-volunteer-program Njororai, F., Ganu, D., Nyaranga, K. C., & Wilberforce, C. (2021). Role of socio-demographic and environmental determinants on the performance of community health workers in western Kenya. *International Journal of Environmental Research and Public Health, 18*(21), 11707. https://doi.org/10.3390/ijerph182111707.

Nzioki, J. M., Ouma, J., Ombaka, J. H., & Onyango, R. O. (2017). Community health worker interventions are key to optimal infant immunization coverage, evidence

Olang'o, C. O., Nyamongo, I. K., & Aagaard-Hansen, J. (2010). Staff attrition among community health workers in home-based care programs for people living with HIV and AIDS in westernKenya.*HealthPolicy*,*97*(2-3),232-237. https://doi.org/10.1016/j.healthpol.2010.05.004

Olaniran, A., Madaj, B., Bar-Zev, S., & Van den Broek, N. (2019). The roles of community health workers who provide maternal and newborn health services: Case studies from Africa and Asia. *BMJ Global Health, 4*(4), e001388. https://doi.org/10.1136/bmjgh-2019-001388.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2013). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research, 42*(5), 533-544. https://doi.or g/10.100 7/s10488-013-0528-y.

Panday, S., Bissell, P., van Teijlingen, E., & Simkhada, P. (2017). The contribution of female community health volunteers (FCHVs) to maternity care in Nepal: a qualitative study. BMC health services research, 17(1), 623. https://doi.org/ 10.1186/s12 913-017-2567-7.

Pandey, K. R. (2018). From health for all to universal health coverage: Alma ATA is still relevant. *Globalization and Health*, *14*(1). https://doi.org/10.1186/s12992-018-0381-6.

Parker, F., & Parker, B. J. (2017). Medical education: Barefoot doctors, health care, health education, nursing education, pharmacy education. *Education in the People's Republic of China, Past and Present*, 437-473. https://doi.org/10.4324/9781315146706-41

Perry, H., Crigler, L., Lewin, S., Glenton, C., LeBan, K., & Hodgins, S. (2017). A new resource for developing and strengthening large-scale community health worker programs. *Human Resources for Health*, *15*(1). https://doi.org/10.1186/s12960-016-0178-8

Pillai, V. K., & Nagoshi, J. L. (2023). Unmet family planning need globally: A Clarion call for sharpening current research frame works. *Open Access Journal of Contraception*, *14*, 139-147. https://doi.org/10.2147/oajc.s378042

Pradhan, N. A., Samnani, A. A., Abbas, K., & Rizvi, N. (2023). Resilience of primary healthcare system across low- and middle-income countries during COVID-19 pandemic: A scoping review. *Health Research Policy and Systems*, *21*(1) . https://doi.org/10.1186/s12961-023-01031-4

Rahman, S. M., Ali, N. A., Jennings, L., Seraji, M. H., Mannan, I., Shah, R., Al-Mahmud, A. B., Bari, S., Hossain, D., Das, M. K., Baqui, A. H., El Arifeen, S., & Winch, P. J. (2010). Factors affecting recruitment and retention of community health workers in a newborn careinterventioninBangladesh. *Human Resourcesfor Health*, *8*(1). https://doi.org/10.1186/1478-4491-8-12.

Rifkin, S. B. (2017). Community health workers. *International Encyclopedia of Public Health*, 93-102. https://doi.org/10.1016/b978-0-12-803678-5.00083-7.

Sahu, S., Rajaa, S., & Thulasingam, M. (2022). Contribution of community health care volunteers in facilitating mobilization for diabetes and hypertension screening among the general population residing in urban puducherry – An operational research study. *Journal of Family Medicine and Primary Care*, *11*(2), 638. https://doi.org/10.4103/jfmpc.jfmpc_1316_21.

Sandrel, R. (2018, June 5). *Niger's program of agents de sante communautaire and RELAIS VOLUNTEERSº*. CHW Central. https://chwcentral.org/nigers-program-of-agents-de-sante-communautaire-and-relais-volunteerso.

Scott, K., Beckham, S. W., Gross, M., Pariyo, G., Rao, K. D., Cometto, G., & Perry, H. B. (2018). What do we know about community-based health worker programs? A systematic review of existing reviews on community health workers. *Human Resources for Health*, *16*(1). https://doi.org/10.1186/s12960-018-0304-x.

Segall, M. (2003). District health systems in a neoliberal world: A review of five key policy areas. *The International Journal of Health Planning and Management*, *18*(S1), S5- S26. https://doi.org/10.1002/hpm.719.

Sharma, N., Chakrabarti, S., & Grover, S. (2016). Gender differences in caregiving among family - caregivers of people with mental illnesses. *World Journal of Psychiatry*, *6*(1), 7. https://doi.org/10.5498/wjp.v6.i1.7.

Sidel, V. W. (1972). The barefoot doctors of the People's Republic of China. *New England JournalofMedicine*,*286*(24),1292-1300. https://doi.org/1 0.1056/nejm 197206152862404

Standing, H., & Chowdhury, A. M. (2008). Producing effective knowledge agents in a pluralistic environment: What future for community health workers? *Social Science & Medicine*, *66*(10), 2096-2107. https://do i.org/10.101 6/j.socsc imed .2008.01.046

Van Ginneken, N., Lewin, S., & Berridge, V. (2010). The emergence of community health worker programmes in the late apartheid era in South Africa: An historical analysis. *Social Science & Medicine*, *71*(6), 1110-1118. https://doi.org/1 0.1016 /j.soc scimed.2010.06.009

Woldie, M., Feyissa, G. T., Admasu, B., Hassen, K., Mitchell, K., Mayhew, S., McKee, M., & Balabanova, D. (2018). Community health volunteers could help improve access to and use of essential health services by communities in LMICs: An umbrella review. *Health Policy and Planning*, *33*(10), 1128-1143. https:// doi.org/10.1093/heapol/czy094

Woldie, M., Feyissa, G. T., Admasu, B., Hassen, K., Mitchell, K., Mayhew, S., McKee, M., & Balabanova, D. (2018). Community health volunteers could help improve access to and use of essential health services by communities in LMICs: An umbrella review. *Health Policy and Planning*, *33*(10), 1128-1143. htt ps://doi .org/10.1093/heapol/czy094

Woldie, M., Feyissa, G. T., Admasu, B., Hassen, K., Mitchell, K., Mayhew, S., McKee, M., & Balabanova, D. (2018). Community health volunteers could help improve access to and use of essential health services by communities in LMICs: An umbrella review. *Health Policy and Planning*, *33*(10), 1128-1143. htt ps://doi.o rg/10.1093/heapol/czy094

World Health Organization. (1978). *Declaration of Alma-Ata*. Adopted at the Int. Conf. Primary Health Care, Sept.6–12,Alma-Ata, USSR. http://www.who.int/pub lications/almaa ta_declaration_en.pdf

World Health Organization. (2008). *World Health Organization, Global Health Workforce Alliance. Scaling up, saving lives*.WorldHealthOrganization. http://www.who.int/wor kforcealliance /documents/Gl obal_Heal th%20 FINA L%20REPORT.pdf

World Health Organization. (2019, May 30). *Social determinants of health*. WHO | World Health Organization. https://www.who.int/health-topics/social-determin ants- of-health.

World Health Organization. (2020, June 1). COVID-19 significantly impacts health services for non-communicablediseases.*WHO|World Health Organization.* https://www.who.int/news/item/01-06-2020-covid-19-significantly-impacts health-services-for-noncommunicable-diseases.

Zapata, L. B., Curtis, K. M., Steiner, R. J., Reeves, J. A., Nguyen, A. T., Miele, K., & Whiteman, M. K. (2021). COVID-19 and family planning service delivery: Findings from a survey of U.S. physicians. *Preventive Medicine*, *150*, 106664. https://doi .org/10.1016/j.ypmed.2021.106664.

Zulu, J. M., Kinsman, J., Michelo, C., & Hurtig, A.-K. (2014). Integrating national community-based health worker programmes into health systems: a systematic review identifying lessons learned from low-and middle-income countries. *BMC Public Health, 14*(1). https://doi.org/10.1186/1471-2458-14-987.

APPENDICES

Appendix I: Data Collection Schedule for Secondary Data from DHIS

SUB COUNTY NAME: ……
PERIOD OF DATA:

- Year…….
- Months……

Indicator	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Total**
Family planning services: No of women 15-49yrs counselled on family planning													
No of women 15-49yrs provided with family planning services													
No of women referred for Family planning services													
MNH services: No of pregnant women counselled on ANC services													
No of pregnant women referred to health facility for skilled birth delivery													
Noofwomenreceivingcommunity based postnatal services within 48hrs of delivery													
No of new born visited within 48hrs of birth assessing for breastfeeding and danger signs													
Well Child services: Child 6-59 months with malnutrition identified													
Support for breastfeeding and complementary feeding for children 6-23 months													

Indicator	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Total**
No of children 6-59 months referred for Vitamin A supplementation (VAS)													
No of children 12-59 months dewormed													
Children 0-11 months referred for immunisation													
Immunisation defaulter referred													
CCM services: Number of iCCM cases referred													
CareofpersonswithKnownChronic conditions. Known cases referred: Diabetes													
Hypertension													
Cancer													
Mental illnesses													
Care for Geriatrics Olderpersonsreferredforgeriatrics comprehensive services													
Household visits to older persons who require care													

Appendix II: Key Informant Interview Guide

Introduction:

I am a student from Kabarak University doing a research on the performance of community health volunteers in Nakuru County on health service provision during the COVID-19 pandemic. The objectives will be to understand how CHVs were prepared to continue with routine community health services during the pandemic, their roles and the challenges they encountered. The interview will be strictly confidential and will only take 1 hour. With your consent I request to start the interview.

1. Before COVID-19 was first reported in your community how were the CHVs in your jurisdiction prepared to ensure continuity of community health services in the face of a pandemic?
   a) *Was there a county/community plan or guideline for continuation of community health services during the pandemic?*
   b) *Were the CHVs involved in the planning process? Were CHVs involved in community risk assessment, capacity assessment and prioritization?*
   c) *Were there resources for use by the CHVs planned and availed before the community transmission of COVID-19 Infection began? Was there a budget set aside for community emergency preparedness? Were additional CHVs recruited to assist with community health services?*
   d) *Was there training for CHVs on how to conduct routine services during the pandemic done? What did the training entail? Did the training include drills and exercises to simulate real situations?*
   e) *Were CHVs roles and responsibilities made clear to them as well as their reporting/ communication channels?*
   f) *Were there plans for debriefing, monitoring and evaluation for continuity of routine health services available?*

2. Kindly mention some of the roles CHVs were involved in during the COVID-19 pandemic.
3. If you compare CHVs performance before and during the pandemic in regard to community health service provision, was there a change? Kindly give further details.
4. What were some of the challenges CHVs faced as they offered community health services?

i. *Health System related?*
ii. *Community related?*
iii. *Personal psychosocial challenges?*

In your opinion how can these challenges be mitigated in future disease outbreaks and pandemics?

5. *What was the opt out rate of CHVs in your community unit? What factors led CHVs to opt out?*

Appendix III: Structured Questionnaire

Socio-Demographic data of CHVs`		
1.	Gender	☐ Male ☐ Female
2.	Age	☐ Below 20 years ☐ 20-29 Years ☐ 30-39 Years ☐ 40-49 Years ☐ 50-59 Years ☐ 60 + Years
3.	Marital Status	☐ Single ☐ Married ☐ Widowed ☐ Separated
4.	Level of Education	☐ Primary Completed ☐ Primary Incomplete ☐ Secondary Completed ☐ Secondary Incomplete ☐ Tertiary ☐ None
5.	Occupation	☐ None ☐ Business ☐ Formal employment ☐ Farmer (peasant) ☐ Farmer (Large scale) ☐ Others specify……
6.	For how long have you been a government Community Health Volunteer?	☐ 1 -2 Years ☐ 3 -4 Years ☐ Above 5 Years
7.	What type of CHV training have you completed?	☐ Basic Modules ☐ Technical modules ☐ None

CHVs Preparedness for service delivery during Covid Pandemic			
		Agree	Disagree
1.	I was involved in pre COVID planning to ensure continuity of Routine community health services during the pandemic		
2.	There was aplan in place in my CHU on how routine community Health services would continue during the COVID-19 pandemic		
4.	Other members of my communityunit/ communitygroups were engaged/ involved in the emergency response planning decisions		
5.	I was trained on how to conduct/ reorganize routine Service delivery during thepandemic		
6.	I was trained on "lowtouch"and "no-touch" method of service delivery		
7.	I was advised/ trained on using the mobile phone for service Delivery when community transmission was high		
8.	I was involved in practice exercises through simulation, drills, exercises, or experiences to revise and reinforce protocol		
9.	There were adequate supplies provided before the pandemic began in my community		
10.	Clear channel of communication to managers, amongst peers and to the public to be used during the pandemicwere explained to me		
11.	I was informed of myroles, responsibilities and chain of authority Before COVID-19 case started being recorded in my community		
12	An evaluation process was put in place for debriefing, post Incident reviews to facilitate feedback		
13.	Ifelt adequatelyprepared forcontinuation of community health service delivery before community transmission of COVID-19 be		

The delivery of community health services before and during theCOVID-19pandemic inNakuru County					
14.On a scale of 1-5 (5 as very good performances and 1 as very poor performance), how would your ateyour performance be fore and during COVID-19					
	Verypoor	Poor	Average	Good	VeryGood
Myoverall performanceas aCHVbeforeCOVID-19					

		Verypoor	Poor	Average	Good	VeryGood
My overall performance as a CHV during COVID-19						
What services did you provide during year 2019 as a CHV?	☐ Family planning access ☐ Health education messages ☐ Health promotion messages ☐ Antenatal care services ☐ Referral for skilled birth deliveries ☐ Community postnatal care ☐ New-born care services ☐ ICCM of malaria, diarrhea and pneumonia ☐ Nutritional services ☐ No. of household visits ☐ Community surveillance ☐ Community maternal and perinatal deaths reported					
What services mentioned above did you stop providing during COVID-19 (March 2020 to 2022)?	☐ Family planning access ☐ Health education messages ☐ Health promotion messages ☐ Antenatal care services ☐ Referral for skilled birth deliveries ☐ Community postnatal care ☐ New-born care services ☐ ICCM of malaria, diarrhoea and pneumonia ☐ Nutritional services ☐ No. of household visits ☐ Community surveillance ☐ Community maternal and perinatal deaths reported					
What additional services were you providing during COVID-19	☐ COVID-19 Health education (infection prevention) ☐ Identification and referral of COVID-19 cases ☐ Contact tracing ☐ Home-based care of COVID-19 patients ☐ Mobilization of COVID-19 vaccination ☐ Administration of COVID-19 vaccinations ☐ Others (specify)					

18.	If youcomparethenumberof cases of all types thatyouprovidedservicesfor before andduringthe Covid-19 pandemic, would you say it remained the same, increased or decreased?	☐ Same ☐ Increased (if so then proceed to Q 19)Decreased(ifsothenproceedto Q20)
19.	(If increased) Why was there an increase in the number of cases you saw? Do not read the answers; check all applicable answers	☐ *Fear of patients getting COVID infection from the hospitals* ☐ *No staff at Health facilities* ☐ *No medicine at Health Facilities Health facilities were closed Health facility is too far* ☐ *No transport or money to pay for transport to go to health facility* ☐ *Community trust the services of CHVs Other (please state):*
20	(If decreased) Why do you think there was a decrease in the number of cases you saw? Do not read the answers; check all applicable answers	☐ *People afraid to seek treatment due to fear of Covid-19 pandemic* ☐ *People choosing to consult traditional healers People choosing to treat at home* ☐ *Community did not trust CHV Other (please state):*

Challenges to effective performance of Nakuru County CHVs during the Covid-19 pandemic		
Health-system related challenges		
21	During the COVID 19 Pandemic, did you receive any supervision visits?	☐ Yes ☐ No
22	If yes, who conducted the supervision visit?	☐ *CHMT Member* ☐ *CHO* ☐ *Other NGO* ☐ *Other……..*
23	If yes (to Q21) how often were the supervision visit done	☐ Weekly ☐ Twice a month ☐ Once a month ☐ Once per quarter
24	Did you receive any feedback from the support supervision	☐ Yes ☐ No
25	Were you allowed to express the health-related difficulties you experienced giving services during COVID 19 pandemic?	☐ Yes ☐ No Specify
26	Did you regularly receive PPEs from the supervisor/County?	☐ Yes ☐ No
27	During the COVID Pandemic, did you routinely receive infection prevention supplies like sanitizers soaps and disinfectants from your supervisors	☐ Yes ☐ No
28	During the COVID 19 pandemic, did you have enough drugs for treating the conditions listed	Diarrhea Pneumonia Malaria
29	During the pandemic, did you regularly receive:	Vitamin A Supplements Yes No Dewormers Yes No IFAS Yes No Supplements for geriatrics Yes No Was there a change with the pre COVID situation?
30	Did you routinely receive	☐ Yes

	airtime for contacting your patients?	☐ No
31	Did you have transport means or allowance to carry out community health service provision?	☐ Yes ☐ No
32	Did you receive data reporting tools regularly during the COVID-19 Pandemic?	☐ Yes ☐ No
33	During the pandemic, did you receive any incentive, recognition or motivation from the county government or MoH?	☐ Yes ☐ No
34	In a scale of 1 to 5 (1 strongly agree and 5 strongly disagree) do you think the compensation above was adequate?	1……..2……..3……..4……5
Community related challenges		
35	During the pandemic did you suffer any form of rejection by?	☐ Family members Yes No ☐ Community members Yes No ☐ Chronic care patients Yes No
		Explain further……
36	Did you experience any form of harassment from:	☐ Family members Yes No ☐ Community members Yes No ☐ If yes please explain…….
37	Did you observe poor compliance to health prevention/ promotive messages from the community members after sensitizing them?	☐ Yes ☐ No
38	Were there community	☐ Yes

	members who hid their sick relatives from accessing your services?	☐ No
39	Did you receive any form of support from;	☐ NGOs yes no ☐ CBO yes no ☐ Community as whole yes no ☐ Individual Community members yes no ☐ Others
Psychosocial related challenges		
40	Did you receive any form of psychosocial support from your immediate supervisor/county?	☐ Yes ☐ No
41	If the answer to Q40 above is yes, how often was the support offered.	☐ Once weekly ☐ Once a month ☐ Every three months ☐ Occasionally
42	Did you experience any of the following during service delivery?	☐ Stress ☐ Social isolation ☐ Fear of infection ☐ Mental health disorder
		☐ Exhaustion
43	Were you ever infected with SARS-CoV-2 infection (COVID-19)	☐ Yes ☐ No
44	How many of your community members succumbed to COVID-19 infection?	☐ None ☐ 1 to 5 ☐ 6 to 10 ☐ More than 10 ☐ Not aware
45	Did you experience any difficulties meeting family obligations during the COVID-19 pandemic period? Was your source of income affected during COVID-19?	☐ Yes ☐ No …… …… …… ……

Thank you for your responses.

AppendixIV: Structured Questionnaire in Kiswahili

Taarifa ya kijamii na kiuchumi ya CHVs`		
1.	Jinsia	☐ Kiume ☐ Kike
2.	Miaka	☐ Chini ya miaka 20 ☐ Kati ya miaka 20-29 ☐ Kati ya miaka 30-39 ☐ Kati ya miaka 40-49 ☐ Kati ya miaka 50-59 ☐ Zaidi ya miaka 60
3.	Hadhi ya Ndoa	☐ Mmoja ☐ Nimeolewa ☐ Mjane ☐ Mmetengana
4.	Kiwango cha elimu	☐ Amemaliza shule ya msingi ☐ Hajamaliza shule ya msingi ☐ Alimaliza shule ya Upili ☐ Hakumaliza shule ya upili ☐ Elimu ya juu ☐ Asiyesoma
5.	Ajira/ Kazi	☐ Hajapata kazi ☐ Biashara ☐ Ameajiriwa ☐ Mkulima mdogo ☐ Mkukima mkubwa ☐ Kazi zinginezo……
6.	Umekuwa Community Health Volunteer kwa miaka mingapi?	☐ 1 -2 ☐ 3 -4 ☐ Zaidi ya 5
7.	Umepata mafunzo gani ya CHV?	☐ Moduli ya msingi ☐ Moduli ya vitendo ☐ Sijapata mafunzo bado

Maandalizi ya Wahudumu wa Afya Wa Kijamii (CHVs) kwa Huduma Wakati wa Janga la Covid-19			
		Nakubali	Nakataa
1.	Nilishiriki katika mipango ya kabla ya COVID ili kuhakikisha kuendelea kwa huduma za afya ya jamii za kawaida wakati wa janga hilo		
2.	Kulikuwa na mpango uliowekwa katika CHU yangu kuhusu jinsi huduma za afya ya jamii za kawaida zingeweza kuendelea wakati wa janga la COVID-19.		
4.	Wanachama wengine wa kitengo cha jamii/ vikundi vya jamii walihusishwa/kushirikishwa katika maamuzi ya mipango ya dharura ya kujibu janga la COVID 19		
5.	Nilipata mafunzo juu ya jinsi ya kutekeleza/kuandaa upya utoaji wa huduma za kawaida wakati wa janga la COVID 19		
6.	Nilipata mafunzo juu ya njia za "kugusa kidogo" na "kutogusa kabisa" katika utoaji wa huduma.		
7.	Nilipewa ushauri/mafunzo juu ya kutumia simu ya mkononi katika utoaji wa huduma wakati ambapo maambukizi katika jamii yalikuwa juu.		
8.	Nilishiriki katika mazoezi ya vitendo kupitia mazoezi ya mifano, mashindano, mazoezi au uzoefu ili kurekebisha na kuimarisha itifaki.		
9.	Kulikuwa na ugavi wa vifaa vya kutosha kabla ya janga la Covid-19 kuanza katika jamii yangu.		
10.	Nilielezwa Kituo wazi cha mawasiliano kwa mameneja, kati ya wenzao na kwa umma kutumika wakati wa janga lilielezwa kwangu."		
11.	Nilielezwa majukumu yangu, wajibu wangu na mnyororo wa mamlaka kabla ya kesi za COVID-19 kuanza kurekodiwa katika jamii yangu.		
12	Mchakato wa tathmini uliwekwa kwa ajili ya vikao vya kujadili, mapitio baada ya tukio ili kurahisisha maoni.		
13.	Nilijisikia nimejiandaa vya kutosha kwa ajili ya kuendelea na utoaji wa huduma za afya kwa jamii kabla ya maambukizi ya COVID-19 kuanza katika jamii.		

Utoaji wa huduma za afya ya jamii kabla na wakati wa janga la COVID-19 katika Kaunti ya Nakuru

14.Kwenye kiwango cha 1 hadi 5 (5 ikiwa ni utendaji mzuri sana na 1 ikiwa ni utendaji mbaya sana), ningepima utendaji wangu kabla na wakati wa COVID-19 kuwa:

	1	2	3	4	5
Utendaji wako kama CHV ulivyokuwa kabla ya janga la COVID-19.					

		1	2	3	4	5
Utendaji wangu kwa jumla kama Mchungaji wa Afya ya Jamii (CHV) wakati wa COVID-19						
Huduma gani ulizotoa mwaka 2019 ukiwa Mchungaji wa Afya ya Jamii (CHV)?	☐ Upatikanaji wa mipango ya uzazi ☐ Elimu ya afya ☐ uhamasishaji wa afya ☐ Huduma za ujauzito ☐ Upelekeaji kwa kujifungua kwa wataalamu mahiri ☐ Huduma ya baada ya kujifungua kwa jamii ☐ Huduma za utunzaji wa mtoto mchanga ☐ Kuhudumia kesi ya malaria, kuhara na pneumonia kwenye jamii ☐ Huduma za Lishe Bora ☐ Idadi ya ziara za nyumbani ☐ Uangalizi wa jamii ☐ Vifo vya kujifungua na vya perinatali vilivyoripotiwa katika jamii					
Huduma gani zilizotajwa hapo juu ulizisitisha wakati wa COVID-19 (Machi 2020 had Machi 2022)	☐ Upatikanaji wa uzazi wa mpango ☐ Upatikanaji wa huduma za uzazi wa mpango ☐ Ujumbe wa kuhamasisha afya ☐ Huduma za ujauzito ☐ Maelekezo kwa ajili ya kujifungua kwa wataalamu ☐ Huduma ya baada ya kujifungua katika jamii ☐ Huduma za utunzaji wa watoto wachanga ☐ *Kuhudumia kesi ya malaria, kuhara na pneumonia kwenye jamii* ☐ *Huduma za Lishe Bora* ☐ Idadi ya ziara za nyumbani ☐ Uangalizi wa jamii ☐ Vifo vya kujifungua na vya perinatali vilivyoripotiwa katika jamii					
Zaidi ya huduma gani ulikuwa unatoa wakati wa COVID-19	☐ Elimu ya afya ya COVID-19 ya kuzuia maambukizi ☐ Ugunduzi na rufaa ya kesi za COVID-19 ☐ Ufuatiliaji wa malioambukizwa ☐ Uhudumu wa nyumbani kwa wagonjwa wa COVID-19 ☐ Uhamasishaji kwa ajili ya chanjo ya COVID-19 ☐ Upeanaji wa chanjo za COVID-19 ☐Kazi Zinginezo (eleza Zaidi)…….					

☐
☐
☐

18.	Ukilinganisha idadi ya kesi za aina zote ambazo ulitoa huduma kabla na wakati wa janga la Covid-19, ungependa kusema zilisalia vilevile, ziliongezeka au kupungua	☐ Zilisalia vilevile ☐ Ziliongezeka (Kama ndivyo basi endelea na swali 19) Kupungua (kama ndivyo basi endelea na swali 20).
19.	(Kama iliongezeka) Kwa nini kulikuwa na ongezeko la idadi ya kesi ulizoziona? Usisome majibu; weka alama majibu yote yanayofaa."	☐ Hofu ya wagonjwa kupata maambukizi ya COVID kutoka hospitalini. ☐ Ukosefu wa wafanyakazi katika vituo vya afya ☐ Ukosefu wa dawa katika vituo vya afya. ☐ Vituo vya afya vilifungwa ☐ Kituo cha afya kiko mbali sana. ☐ Hakuna usafiri au pesa za kulipia usafiri kwenda kituo cha afya. ☐ Jamii wanatumaini huduma za Wahudumu wa Afya wa Jamii (CHVs) ☐ Nyingine (taja):……
20	(Ikiwa kulipungua) Kwa nini unafikiri kulikuwa na kupungua kwa idadi ya kesi ulizoziona? Usisome majibu; weka alama majibu yote yanayofaa."	☐ Watu wanaogopa kutafuta matibabu kutokana na hofu ya janga la Covid-19. ☐ Watu wanachagua kuwatembelea waganga wa jadi. ☐ Watu wanachagua kutibu nyumbani. ☐ Jamii haikuwa na imani na Wahudumu wa Afya wa Jamii (CHV) ☐ Nyingine (taja):"

"Mikakati ya kutekelezwa kwa ufanisi na wahudumu wa kaunti ya Nakuru wakati wa janga la Covid-19		
Changamoto zilizohusishwa na mifumo ya afya		
21	Je, ulipokea ziara yoyote ya usimamizi wakati wa janga la COVID-19?	☐ Ndio ☐ Hapana
22	Ikiwa ndio, nani alifanya ziara ya usimamizi?	☐ Mjumbe wa Afya wa Kaunti ☐ Afisa wa Afya wa Jamii ☐ Shirika la Kiraia Lingine (NGO) ☐ Zingenezo…….
23	Kama ndiyo (kwa swali la 21), ziara za usimamizi zilifanyika mara ngapi?	☐ Kila wiki ☐ Mara mbili kwa mwezi ☐ Mara moja kwa mwezi ☐ Mara moja kwa robo
24	Ulipokea maoni yoyote kutoka kwa ziara ya usimamizi?	☐ Ndio ☐ Hapana
25	Je, uliruhusiwa kueleza changamoto za kiafya ulizokutana nazo wakati wa janga la COVID-19?	☐ Ndio ☐ Hapana ☐ Eleza Zaidi……
26	Je, ulipokea mara kwa mara vifaa vya kinga binafsi (PPEs) kutoka kwa msimamizi/kaunti?	☐ Ndio ☐ Hapana
27	Wakati wa janga la COVID-19, ulipokea mara kwa mara vifaa vya kuzuia maambukizi kama vile sanitaiza, sabuni na dawa za kusafisha kutoka kwa wasimamizi wako?	☐ Ndio ☐ Hapana
28	Wakati wa janga la COVID-19, ulikuwa na dawa za kutosha za kutibu hali zilizoorodheshwa?	☐ *Kuhara* ☐ *Nimonia* ☐ *Malaria*
29		Vitamin A Ndio La Dawa za minyoo Ndio La IFAS Ndio La Virutubisho za geriatrics Ndio La Kulikuwa na mabadiliko na hali ya awali ya COVID-19?
a	Wakati wa janga, ulipokea mara kwa mara muda wa mawasiliano (airtime) kwa ajili ya kuwasiliana na wagonjwa?	☐ Ndio ☐ Hapana

31	Je, ulikuwa na njia za usafiri wa kufanya utoaji wa huduma za afya ya jamii wakati wa janga la COVID-19?	☐ Ndio ☐ Hapana
32	Je, ulipokea mara kwa mara zana za kuripoti data wakati wa janga la COVID-19?	☐ Ndio ☐ Hapana
33	Wakati wa janga, ulipokea motisha, kutambuliwa au msukumo wowote kutoka serikali ya kaunti au Wizara ya Afya?	☐ Ndio ☐ Hapana
34	Kwenye kiwango cha 1 hadi 5 (1 - ninakubaliana kabisa, na 5 - sina kukubaliana kabisa), je, unaona fidia iliyotolewa ilikuwa ya kutosha?	1……..2……..…..3…….……..4……5
Changamoto za jamii		
35	Wakati wa janga la COVID-19, ulikumbana na aina yoyote ya kukataliwa na?	☐ Wanafamilia Ndio Hapana ☐ Wana jamii Yes No ☐ Wagonjwa wa matunzo ya muda mrefu Yes No
		Elezea zaidi……
36	Je, ulipata aina yoyote ya unyanyasaji kutoka kwa:	☐ Wanafamilia Ndio Hapana ☐ Wana jamii Yes No ☐ Elezea Zaidi…….…….
37	Je, uliona kutofuata kwa kiwango kizuri cha ujumbe wa kuzuia na kukuza afya kutoka kwa wanajamii baada ya kuwaelimisha?	☐ Ndio ☐ Hapana
38	Je, kulikuwa na wanajamii ambao walificha ndugu zao wagonjwa wasipate huduma yako?	☐ Ndio ☐ Hapana
39	Ulipokea aina yoyote ya msaada kutoka:	☐ *Mashirika yasiyo ya Kiserikal* ☐ *Mashirika ya Kijamii (Community-Based Organizations* ☐ *Jamii nzima* ☐ *Wanajamii binafsi* ☐ *Zinginezo*

Changamoto za kisaikolojia		
40	Ulipokea aina yoyote ya msaada wa kisaikolojia kutoka kwa msimamizi wako wa moja kwa moja/kaunti?	☐ Ndio ☐ La
41	Ikiwa jibu la swali la 40 hapo juu ni ndio, msaada ulitolewa mara ngapi?	☐ Mara moja kwa wiki ☐ Mara moja kwa mwezi ☐ Kila baada ya miezi mitatu ☐ Mara chache
42	Je, ulipitia yafuatayo wakati wa kutoa huduma?	☐ Msongo wa mawazo ☐ Kutengwa kijamii ☐ Hofu ya maambukizi ☐ Matatizo ya afya ya akili ☐ Uchovu
		☐ Zinginezo…….
43	Je, uliwahi kuambukizwa na maambukizi ya virusi vya SARS-CoV-2 (COVID-19)?	☐ Ndio ☐ Hapana
44	Wajumbe wangapi wa jamii yako walipoteza maisha kutokana na maambukizi ya COVID-19?	☐ 0 ☐ 1 hadi5 ☐ 6 hadi 10 ☐ Zaidi 10 ☐ Sina Habari
45	Je, ulipata ugumu wowote katika kukidhi majukumu ya familia wakati wa kipindi cha janga la COVID-19? Je, chanzo chako cha kipato kilikumbwa na athari wakati wa COVID-19?	☐ Ndio ☐ Hapana …… …… …… ……

Asante kwa majibu yako.

Appendix V: KUREC Approval Letter

KABARAK UNIVERSITY RESEARCH ETHICS COMMITTEE

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

Tel: 254-51-343234/5
Fax: 254-051-343529
www.kabarak.ac.ke

OUR REF: KABU01/KUREC/001/05/04/23

Date: 4th April, 2023

Salome Nyambura,
Reg. No: GMMF/M/2688/09/18
Kabarak University,

Dear Salome,

RE: PROFILING THE PERFORMANCE OF COMMUNITY HEALTH VOLUNTEERS IN HEALTH SERVICE DELIVERY DURING THE COVID-19 PANDEMIC IN NAKURU COUNTY

This is to inform you that ***KUREC*** has reviewed and approved your above research proposal. Your application approval number is ***KUREC-050423.*** The approval period is ***4/04/2023 – 4/04/ 2024.***

This approval is subject to compliance with the following requirements:

i. All researchers shall obtain an introduction letter to NACOSTI from the relevant head of institutions (Institute of postgraduate, School dean or Directorate of research)
ii. The researcher shall further obtain a RESEARCH PERMIT from NACOSTI before commencement of data collection & submit a copy of the permit to KUREC.
iii. Only approved documents including (informed consents, study instruments, MTA Material Transfer Agreement) will be used
iv. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KUREC***:
v. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KUREC*** within 72 hours of notification;
vi. Any changes, anticipated or otherwise that may increase the risk(s) or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KUREC*** within 72 hours;
vii. Clearance for export of biological specimens must be obtained from relevant institutions and submit a copy of the permit to KUREC;
viii. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal and;
ix. Submission of an executive summary report within 90 days upon completion of the study to ***KUREC***

Sincerely,

KABARAK UNIVERSITY
INSTITUTIONAL RESEARCH ETHICS COMMITTEE

Prof. Jackson Kitetu PhD.
KUREC-Chairman

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

Appendix VI: NACOSTI Reserach Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **181666**

Date of Issue: **29/April/2023**

RESEARCH LICENSE

This is to Certify that Dr.. Salome Nyambura Gachathi of Kabarak University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: Profiling the Performance of Community Health Volunteers in Health Service Delivery During the COVID 19 Pandemic in Nakuru County for the period ending : 29/April/2024.

License No: **NACOSTI/P/23/25444**

181666

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix VII: Nakuru County Health Sciences Research Authorization

DEPARTMENT OF HEALTH SERVICES
NAKURU COUNTY

NAKURU COUNTY
COUNTY OF UNLIMITED OPPORTUNITIES

Email: cohealth.nakuru@gmail.com

DEPARTMENT OF HEALTH SERVICES
P.O. BOX 2060 – 20100
NAKURU

REF: NCG/CDPH/RES/VOL.1/2023/680

10th May, 2023

To
The Sub County Team Leads:
(Att: Sub County Community Strategy Focal Person)
Nakuru East, Nakuru West, Nakuru North, Naivasha

RE: RESEARCH AUTHORISATION

This is to inform you that **Dr. Salome Nyambura Gachathi** who is a student at Kabarak University has been granted authority to conduct research in your community.

This research is for academic purpose and the title is "***Profiling the performance of Community Health workers in health service delivery during the COVID-19 pandemic in Nakuru County.***

This approval is subject to adherence to the study protocol and the prevailing research regulations.

Please accord her the necessary support.

COUNTY DIRECTOR
PUBLIC HEALTH & SANITATION
NAKURU COUNTY
P.O. Box 2060-20100,
NAKURU

ELIZABETH KIPTOO
Ag. COUNTY DIRECTOR, PUBLIC HEALTH
NAKURU

C.C:

- County Community Strategy Focal Person
- Dr. Salome Nyambura Gachathi
  Kabarak University

Appendix VIII: Evidence of Conference Participation

KABARAK UNIVERSITY

Certificate of Participation

Awarded to

SALOME GACHATHI

For successfully participating in the 13th Annual Kabarak University International Research Conference held from 22nd -23rd June 2023 and presented a paper entitled ***"The Performance of Community Health Volunteers in Health Service Delivery During the Covid-19 Pandemic in Nakuru County."***

Conference Theme

Linking Industry and Academia to Strenghten Healthcare Delivery and Health Inniovations.

Dr. Pamela Kimeto Tinge'i
Dean, School of Medicine & Health Sciences

Dr. Phillip Nyawere
Ag.Director - Research, Innovation and Outreach

Kabarak University Moral Code

As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord.

(1 Peter 3:15)

Kabarak University is ISO 9001:2015 Certified

Appendix IX: List of Publication

JOURNAL OF CLINICAL CARE AND MEDICAL ADVANCEMENT

https://doi.org/10.58460/jcma.v2i1.68

ORIGINAL ARTICLE

Open Access

MJM BIOLABS

Performance of Community Health Volunteers in the Delivery of Healthcare Services During the Covid-19 Pandemic in Nakuru, Kenya: A Cross-Sectional Analysis

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[2]Department of Biomedical Sciences, School of Medicine and Health Sciences, Kabarak University
[3]Department of Public Health & Sanitation, County Government of Nakuru

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

ABSTRACT

In many parts of the world, including Kenya, there is a critical shortage of trained healthcare workers. In response to this, the World Health Organization (WHO) has advocated for the utilization of volunteer community members to provide essential health services within their communities. While Community Health Volunteers (CHVs) in Kenya have demonstrated positive contributions to community health, there is a dearth of data on their performance during pandemics such as COVID-19.

We assessed the performance of CHWs during the COVID-19 pandemic in Nakuru County.

This was a cross-sectional descriptive study with mixed methods approach. Purposive sampling was utilized to select the study sites and random sampling to sample 260 CHV participants. A standardized data collection schedule was used to collect data on key community health indicators from the District Health Information System 2 (DHIS2) in each sub-county which was used to compare CHVs' performance before and during COVID-19. A structured questionnaire was filled out by CHVs to address the study objectives. Data was subjected to an Analysis of variance (ANOVA) test to determine differences in the periods at α=0.05.

The CHVs' routine community services significantly improved during COVID-19. There were significant differences in Maternal and Neonatal Health (MNH) services groups as determined by the Analysis of variance test ($F(2, 33) = 26.341$, $p < .001$), child services groups as determined by Analysis of variance test ($F(2, 33) = 15.042$, $p < .001$), CHVs' care of persons with known chronic conditions services groups as determined by Analysis of variance test ($F(2, 33) = 39.799$, $p < .001$) and significant difference in CHVs' care of geriatrics services groups as determined by Analysis of variance test ($F(2, 33) = 24.778$, $p < .001$).

Pre- and Post-pandemic policies should promote CHV service utilization and consider training, proper reporting of their indicators and continuous monitoring and evaluation (M&E). New service provision methodologies such as the application of technology should be integrated into the CHVs services.

Key words – *Trained health workers, Community Health Workers, Community health strengthening, Community Health Volunteers, Disease Emergencies*