VILLAGE HEALTH TEAMS AND INTEGRATED COMMUNITY CASE MANAGEMENT: KNOWLEDGE, ATTITUDES, PRACTICES AND ASSOCIATED FACTORS IN LWENGO DISTRICT, UGANDA

BY

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APPROVAL

I certify that this dissertation has been written under my guidance and supervision. I therefore approve it for submission.



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DECLARATION

I, **NIKURUNGI PROSSY**, registration number **23/U/24907/PS**, hereby declare that this dissertation is my original work, and it has never been presented in any higher institution of learning as a requirement for an award of Bachelor of Environmental Health Science or any other degree.



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DEDICATION

I dedicate this dissertation to my loving husband for the support rendered throughout the course and never giving up on me in this journey. May it be just the beginning of the many returns from your wonderful sacrifice and support.

I also dedicate this to my beloved parents and my mother-in-law for believing in me and pushing me this far. You have been an amazing support from the very start hence deserve this success.

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ACRONYMS AND ABBREVIATIONS

CHWs	:	Community Health Workers
DHO	:	District Health Offices
EPI	:	Extended Programme on Immunization
iCCM	:	Integrated Community Case Management
LMIC	:	Low-and Middle-income Countries
MakSPH	:	Makerere University School of Public Health
MoH	:	Ministry of Health
ORS	:	Oral Rehydration Salts
RDT	:	Rapid Diagnostic Tests
SSA	:	Sub-Saharan Africa
UBoS	:	Uganda Bureau of Statistics
UNICEF	:	United Nations Children's Fund
VHTs	:	Village Health Teams
WHO	:	World Health Organization

OPERATIONAL DEFINITIONS

Integrated Community Case Management - Is part of a wider community health worker strategy, in which CHWs provide lifesaving treatment for childhood killer diseases within 24 hours of the onset of symptoms. Trained CHWs are supported, equipped and supplied with commodities to provide curative and health promotion services within the community.

Extended Programme on Immunization - Is a global public health initiative launched by the WHO in 1974 to ensure that children everywhere have access to life-saving vaccines.

Malaria - Is a life-threatening disease caused by a parasite (Plasmodium) transmitted to humans through the bites of infected female Anopheles mosquitoes.

Diarrhea - Frequent, loose, or watery bowel movements i.e, three or more episodes per day or more than is normal for an individual.

Pneumonia – Is an infection in the lungs that inflames the air sacs, causing them to fill with fluid or pus.

Village Health Teams – groups of village members selected by their neighbors and friends to promote and support the kinds of decisions and conditions that lead to healthy living.

ABSTRACT

Background: Childhood illnesses such as malaria, diarrhoea, and pneumonia remain the leading causes of under-five mortality globally, with Sub-Saharan Africa bearing the highest burden. Uganda ranks among the top three countries in the region with the highest malaria prevalence, while pneumonia and diarrhoea also contribute significantly to child morbidity and mortality. To address these challenges, the Uganda Ministry of Health adopted the Integrated Community Case Management (iCCM) strategy, implemented through Village Health Teams (VHTs). Despite the critical role of VHTs, limited evidence exists on their knowledge, attitudes, practices, and adherence to iCCM guidelines in Lwengo District, Uganda.

Objective: This study, therefore, sought to assess the knowledge, attitudes, practices, and associated factors influencing VHTs in the management of malaria, diarrhoea, and pneumonia under the iCCM strategy in Lwengo District.

Methodology: This was a descriptive cross-sectional quantitative study conducted among 384 VHTs trained under the iCCM programme in Lwengo District. Using multi-stage cluster sampling, two counties were selected, followed by 5 sub-counties to represent rural and urban settings in the Lwengo district. Data was collected through face-to-face interviews using semi-structured questionnaires translated into Luganda and administered via Kobo Toolbox. Data was analysed using Stata 14.0, with descriptive statistics summarising findings and bivariate analysis exploring associations between socio-demographic and other factors and iCCM practices.

Results: The findings show that the majority of VHTs in Lwengo District were knowledgeable on iCCM (94.3%), had positive attitudes (86.7%), and reported good iCCM practices (97.9%). Furthermore, VHTs who received training were 8.02 times more likely to demonstrate good practices and those who were never married were 79% less likely to have good practices compared to their cohabiting counterparts.

Conclusion and Recommendations: Although knowledge, attitudes and practices were generally good, critical gaps remain in supply adequacy, incentives and training completeness. The Ministry of Health and health facilities should address these gaps to optimise the iCCM strategy and further reduce under-five mortality from malaria, diarrhoea and pneumonia in Lwengo District and similar settings across Uganda.

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

Global decrease in child mortality over the past decades has been recorded, but under-five mortality rates remain high (Liu *et al.*, 2016; UNICEF, 2019). Malaria, diarrhoea and pneumonia have continuously been the leading causes of death among children under five years (UNICEF, 2024). In 2018, these three were responsible for an estimated 1.6 million deaths, approximately a third of the global deaths among children under five years (Liu *et al.*, 2016). This has informed various strategies by international agencies to address these three diseases through both disease-specific and integrated approaches (WHO, 2013). However, the impact and progress have been unequally distributed and fluctuating, especially in Sub-Saharan Africa (SSA), Central and Southern Asia (UNICEF, 2019).

Sub-Saharan Africa continues to be the region with the highest under-five mortality rates, contributing to slightly more than half of all the global under-five mortalities (UNICEF, 2019). More than two-thirds of the mortalities due to pneumonia and diarrhoea are recorded from 15 countries, approximately two-thirds of which are SSA countries (IVAC, 2017). Similarly, for malaria in 2020, SSA contributed 96% to the global deaths due to malaria, 80% of which were among children aged under 5 years (WHO, 2021). Despite the continued efforts to curb this triple burden, malnutrition, lack of access to clean water, hygiene and sanitation and poor access to health care have been noted to be potential barriers (Simen-Kapeu *et al.*, 2021). Just like in other SSA countries, the trends of these diseases and their associated challenges are evident even in Uganda.

Uganda has been ranked third with the highest number of malaria cases within SSA, with prevalence fourfold higher in rural settings compared to urban settings (NMCD, UBOS and ICF, 2020). Together with pneumonia, malaria was ranked among the top three causes of under-five mortalities in Uganda (MoH, 2024a). Additionally, the prevalence of diarrhoea among children aged under five years was recorded at 19% (UBOS, 2023). Between October and December 2024, Katovu Health Centre III registered 46% of the children under five being positive for malaria and 48% having pneumonia. Most of these under-five deaths are attributed to poor living conditions and failure to access healthcare due to barriers like distance from health facilities and unavailability of services (Rutebemberwa *et al.*, 2016; Mulogo *et al.*, 2023).

Commendably, the Uganda Ministry of Health has put in place several interventions to reduce the burden of these three diseases among children. Some of the outstanding interventions are increased health education, the Extended Programme on Immunization (EPI) and access to other curative interventions. These are offered at the facility and community levels for malaria, diarrhoea and pneumonia (MoH, 2024b). At the community level, responsibility for extending curative and referral services to children aged under 5 years is entrusted to Community Health Workers (CHWs) through the Integrated Community Case Management (iCCM) strategy. These are also known as Village Health Teams (VHTs) in Uganda (Bagonza, Kibira and Rutebemberwa, 2014).

The knowledge, attitudes, and practices of VHTs on iCCM and associated factors are crucial in shaping and guiding the national health system management and health promotion in Uganda. However, there is limited evidence concerning these aspects among VHTs, especially concerning the iCCM. Therefore, this study provides information on the knowledge, attitudes and practices of VHTs and on iCCM and associated factors in Lwengo District to academia, policy makers, health practitioners and other stakeholders.

1.2 Background

Globally, malaria, diarrhoea and pneumonia are the leading causes of death among children under five years (UNICEF, 2024). This is highly driven by poverty, poor sanitation and hygiene and inadequate access to healthcare, especially in Low and Middle-income Countries (LMIC) many of which are in SSA (Simen-Kapeu *et al.*, 2021). Offering correct treatment in time to children is a very impactful intervention for reducing the mortality burden of these diseases. However, offering these services only at the facility level minimizes access to treatment within the recommended window of 24 hours due to associated geographical and financial barriers within communities (WHO, 2012; UNICEF, 2024). In pursuit of reducing deaths due to malaria, diarrhoea and pneumonia, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) proposed an Integrated Community Case Management (iCCM) strategy (WHO, 2012).

The iCCM aims at eliminating child care service delivery inequities in hard-to-reach, poor and underserved communities (Altaras *et al.*, 2017; MoH, 2024b). Under this programme, lay people are trained as CHWs to diagnose and treat malaria, pneumonia and diarrhoea in children. These also identify and refer very ill children with danger signs to higher facilities for

better management (Awor *et al.*, 2021). Integration strategies like iCCM, through programmatic experience, prove their effective contribution to achieving quality care and treatment for children within the communities (WHO, 2012). In addition to increasing treatment coverage and health care, iCCM also increases early care seeking and access to recommended treatment for children suffering from malaria, diarrhoea and pneumonia (Mekie *et al.*, 2024).

The Ministry of Health (MoH) Uganda adopted this strategy through the CHW structure linked to established government health facilities for health promotion, disease prevention and reduction (MoH, 2024b). The VHTs are equipped with low-cost medicines and a test i.e; antibiotics (pneumonia), antimalarials (malaria), Oral Rehydration Solution (ORS) and Zinc tablets (Diarrhea) and a Rapid Diagnostic Test (RDT) (WHO, 2012). The VHTs should test for diagnosis before dispensing these appropriate, safe and effective medicines for malaria, diarrhoea and pneumonia within 24 hours (WHO, 2012; MoH, 2024b).

However, little is documented on the knowledge, attitudes, and practices of VHTs on iCCM and associated factors in Uganda. Therefore, this study aims to collect data and explore these aspects in Lwengo District.

CHAPTER TWO: LITERATURE REVIEW

2.1 Proportion of VHTs with adequate iCCM knowledge and the most common gaps

Various studies have been conducted among LMICs to assess the knowledge of CHWs on management of malaria, diarrhoea and pneumonia which are the pivot of iCCM. A study conducted in Burkina Faso found that the majority of the CHWs are very knowledgeable about the symptoms of malaria, diarrhoea and pneumonia, but are inadequate when it comes to complications. From those interviewed, 89.1% knew fever as a symptom of malaria, slightly higher than those from a study conducted in Cameroon (Chi, Nyasa and Jane-Francis, 2023), 91.3 % knew liquid stool as one for diarrhoea and 78.7% knew cough as a symptom of pneumonia. However, when it came to complications, majority knew about some and hardly knew about others, especially the rare ones (Ouedraogo *et al.*, 2025). In contrast, results from another study conducted in Ethiopia show that there is low knowledge of symptoms of pneumonia (35.7%) and diarrhoea (61.5%) among CHWs (Daka, Wordofa and Woldie, 2023).

From a study conducted in eastern Uganda, the level of knowledge of the management of malaria was higher among CHWs offering dual case management (64.5%) compared to their counterparts doing dual management of malaria (63.4%) (Kalyango *et al.*, 2012). On the contrary, compared with another study in Cameroon, slightly more than half of the CHWs had adequate knowledge (52.5%) on malaria management and prevention (Chi, Nyasa and Jane-Francis, 2023). This study also indicates that most CHWs (57.5%) lacked adequate knowledge of diarrhoea management and prevention, thus highlighting the need for enhanced CHW training on case management. In contrast, the majority of the CHWs from Abim, Uganda (73.8%) were very knowledgeable about pneumonia detection following a test of counting allowable breaths compared to a mock video (Ojoro, Kisakye and Musoke, 2021), which is in concordance with findings from eastern Uganda (Kalyango *et al.*, 2012).

In pursuit of improving the knowledge of assessment and management of the diseases under iCCM, findings from a study in Nigeria show that training and capacity building have a positive impact on the management of malaria (90%), diarrhoea (83%) and Acute Respiratory Tract Infections such as pneumonia (79%) (Abua *et al.*, 2020).

These findings show that the levels of knowledge vary across countries and localities, where some are highly knowledgeable, whereas as not. This, therefore, necessitates the need to carry

out this study to assess the knowledge levels of the VHTs in Lwengo district concerning iCCM of malaria, diarrhoea and pneumonia.

2.2 Attitudes toward iCCM and overall acceptability among VHTs

The attitudes of VHTs are significant determinants of the implementation and success of the iCCM strategy. A study conducted in Abim, Uganda, showed that community trust highly motivated the VHTs, hence, influencing good performance (Ojoro, Kisakye and Musoke, 2021). The depreciated community trust could be attributed to the inadequate supplies and continuous stockouts of the medicines from the VHTs' tool pack (Ouedraogo *et al.*, 2025). Without community trust, the confidence of VHTs in delivering iCCM services deteriorates, hence the need for increased community involvement, health education, training and support supervision for the VHTs (Strachan *et al.*, 2012).

Whereas VHTs are trained by the government for implementation of the iCCM strategy, they are not formally recognised within the government structure like other health workers, which minimizes funding and incentives for their work (Tusiime, 2024). However, these VHTs have been fundamental in the management of malaria, diarrhoea and pneumonia, and the reduction of related mortalities (Christopher *et al.*, 2011). Furthermore, some VHTs have been assigned responsibilities beyond their level and training due to the shortage of qualified medical personnel (WHO and GHWA, 2013). This, therefore, demotivates many of the VHTs, which might hinder the successful implementation of iCCM (Owek *et al.*, 2017).

The attitudes of VHTs towards iCCM fluctuate, dependent on the different factors within their communities, structures and necessary knowledge. However, we cannot base on these to similarly conclude for Lwengo district, hence the need to conduct this study to assess the attitudes of VHTs concerning iCCM in Lwengo district.

2.3 Practices of VHTs under the iCCM of malaria, diarrhoea and pneumonia

During delivery of these iCCM services, CHW practices must be consistent with national guidelines to ensure efficiency, especially in managing these diseases. As shown by findings from a study in Burkina Faso, the majority of CHWs offered oral treatment for malaria, diarrhoea and pneumonia (77%) and confirmed malaria cases using RDT (81.4%) (Ouedraogo *et al.*, 2025). This is further supported by another study conducted in Uganda, where over 90% (97%) of the VHTs could accurately read RDTs and largely adhere to the protocol for

performing RDTs (Miller *et al.*, 2021). On the contrary, another study from Ethiopia found low adherence to the guidelines where CHWs assessed some symptoms and left out others, putting the children at risk of misdiagnosis (Daka, Wordofa and Woldie, 2023). In addition, most CHWs missed out on checking the expiry date of equipment in the procedure where it is used (Miller *et al.*, 2021).

The CHWs play an integral role in early detection of malaria, diarrhoea and pneumonia, especially by the known symptoms of the diseases (Winch *et al.*, 2005). Following early detection, they manage most cases, offering referral for those who present with danger signs. From Southwestern Uganda, a study showed that 78% of children who presented with high fever were referred to higher-level facilities (Matte *et al.*, 2024). Based on the stated criteria, minimal VHTs in central Uganda had a good performance, noting that community support, supervision and availability of drugs significantly improved the performance of VHTs (Bagonza, Kibira and Rutebemberwa, 2014).

Noting that VHTs have inconsistent adherence to guidelines in their practice under the iCCM, many in Uganda have also been shown to have poor performance. However, due to variation in conditions and locations, there is a need to conduct this research among VHTs of Lwengo district to assess their practices.

2.4 Factors associated with iCCM practices among VHTs

The level of practices of VHTs when it comes to iCCM is greatly dependent on several factors, both individual and surrounding. Findings from a study conducted in Kisumu, Kenya, found that CHWs over 40 years of age were most likely to offer better performance compared to their counterparts of younger age (Kawakatsu *et al.*, 2012). These hardly vary with findings from Dhaka urban slums, where active CHWs were slightly older compared to inactive ones (Alam, Tasneem and Oliveras, 2012). However, other studies showed that age between 30 – 40 years are the most ideal for CHWs to deliver optimally compared to much younger or older persons (Crispin *et al.*, 2012). This is partially attributed to how fast they can execute tasks like RDTs, as informed by findings from a study in Zambia (Chipukuma, 2017).

Furthermore, high education status among CHWs has been attributed to a high performance level, even though dropouts are more engaged in this kind of service delivery (Kok, 2015). From studies conducted in Kenya, the impact of high education status was evident in good

record keeping and proper utilisation of job aids, together with proper service delivery to all clients (Crispin *et al.*, 2012). In addition to these, other factors such as experience and gender were also noted to have a significant influence on the performance of CHWs in some instances (Alam, Tasneem and Oliveras, 2012; Crispin *et al.*, 2012).

On the other hand, the workload exposed to CHWs in their day-to-day operations highly impacts their motivation and quality of services from the CHWs within their communities. This has been linked to the high number of tasks assigned to them (Li *et al.*, 2014; Majee *et al.*, 2020) and the long distances they cover in both follow-up and reception of necessities for their work from the health facilities or collection points (Namazzi *et al.*, 2017). However, political solidarity, desire to serve their communities and training opportunities were noted to motivate the CHW as evidenced by a study conducted in Rwanda (Schurer *et al.*, 2020). Another study conducted in Eastern Uganda shows that factors such as community support and confidence, availability of necessities and good relationships with formal health workers also motivate CHWs to deliver in line with the iCCM project's set objectives (Kalyango *et al.*, 2012).

In all this, however, little is known about the knowledge, attitudes, practices and associated factors among VHTs concerning iCCM and management of malaria, diarrhoea and pneumonia in Lwengo District, hence the purpose of this research.

CHAPTER THREE: PROBLEM STATEMENT, JUSTIFICATION, CONCEPTUAL FRAMEWORK AND NARRATIVE

3.1 Problem Statement

Malaria, diarrhoea and pneumonia are some of the leading causes of mortality among children aged under five years in Uganda (Bagenda *et al.*, 2022). A significant proportion of these deaths is recorded from rural and hard-to-reach areas, of which Lwengo happens to be one (Batura *et al.*, 2022). In an attempt to minimize this burden, the MoH adopted the iCCM approach to provide proven, accessible, and affordable services for the management of malaria, diarrhoea, and pneumonia through CHWs, also known nationally as VHTs in Uganda (MoH, 2024b). However, findings on the level of knowledge of these VHTs concerning iCCM, specifically in Lwengo District, are hardly documented in the scientific literature. Various studies have confirmed the relevance of VHT knowledge on iCCM components, such as assessment, management, danger signs, and referral, in reducing under-five mortality and promoting overall child health (Job *et al.*, 2023; Ouedraogo *et al.*, 2025).

The VHT attitude towards health promotion approaches, such as iCCM, also plays a significant role in ensuring the success of this strategy (Mbonye *et al.*, 2020). This necessitates understanding the perceived motivation, workload, usefulness and the trust of the communities in the VHTs and iCCM as assigned by the government. However, little is known about the attitudes of VHTs towards the iCCM strategy in Lwengo district. The government of Uganda, through the MoH, introduced standard guidelines for the practice of the iCCM by VHTs. This offers clear procedures on the signs to look out for and criteria for assessment of malaria, diarrhoea and pneumonia (MoH, 2024b). These guidelines further give insight into the management of cases and those set for referral to higher health facilities for management. However, there is minimal information about the experience and adherence of VHTs in Lwengo district to the set iCCM practice guidelines.

Without assessing the level of knowledge, attitudes and practices of VHTs under iCCM and associated factors, the efficacy of this strategy remains unknown. This therefore leaves any possible gaps unattended to prolonging Uganda's goal of ending mortality of under-fives due to malaria, diarrhoea and pneumonia. Henceforth, this study aims to assess the knowledge, attitudes, practices and associated factors towards iCCM in Lwengo District.

3.2 Justification

This study assessed the knowledge, attitudes, practices and factors associated with iCCM in Lwengo district. The findings from this study could be used to inform local, regional and national health authorities concerning iCCM and child health in general. This could guide the district and MoH in planning for specific and appropriate interventions to improve service delivery through this strategy. This can not only support health service delivery in Lwengo but also serve as a benchmark for other districts with similar characteristics in Uganda and beyond.

These findings could also guide policymakers while putting in place evidence-based guidelines and policies for improved health, both at the district and national levels. The findings could also inform other researchers doing further research in line with malaria, diarrhoea, pneumonia and child health in general. This therefore was a great step forward in closing the knowledge gap concerning VHTs and iCCM of this triple burden of disease among children under 5.

3.3 Conceptual Framework

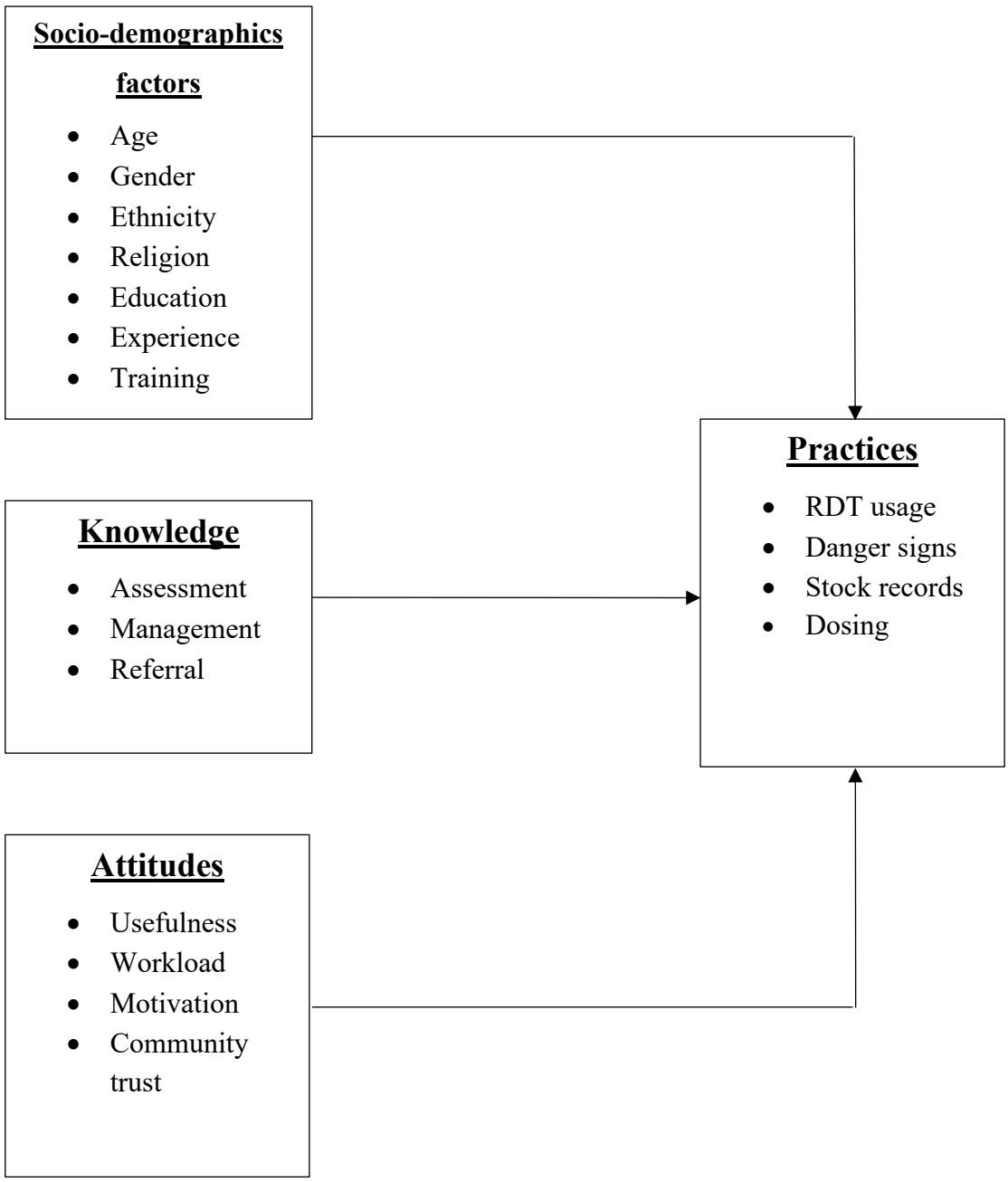


Figure 1: Conceptual Framework showing the relationship between the independent (Social demographics, knowledge and attitudes) and dependent (practices) variables.

3.4 Narrative

The conceptual framework shows the interconnectedness of the various variables to be assessed by this study. The independent variables, such as social demographic factors, knowledge and attitudes, determine the outcome or dependent variables (practices). Social demographics such as age, gender, religion, iCCM training, experience and education directly influence attitudes (perceived usefulness, workload, motivation and community trust), knowledge (assessment, management and referral of malaria, diarrhoea and pneumonia cases) and practices (use of recommended equipment like RDTs, danger sign identification, stock records keeping and dose administration) of the VHTs.

CHAPTER FOUR: RESEARCH QUESTIONS AND OBJECTIVES

4.1 Research Questions

1. What is the proportion of VHTs with adequate iCCM knowledge on assessment, management and referral of malaria, diarrhoea and pneumonia cases in Lwengo district?
2. What are the VHT attitudes towards iCCM of malaria, diarrhoea and pneumonia in Lwengo district?
3. What are the VHTs' iCCM practices in the management of malaria, diarrhoea and pneumonia in Lwengo district?
4. What are the factors associated with VHT iCCM practices for management of malaria, diarrhoea and pneumonia in Lwengo district?

4.2 General objective

The overall aim of this study is to assess the VHT knowledge, attitudes, and practices towards iCCM and associated factors in Lwengo district.

4.3 Specific objectives

1. To assess the level of knowledge among VHTs on iCCM of malaria, diarrhoea and pneumonia cases in Lwengo district.
2. To assess the VHT attitudes towards iCCM of malaria, diarrhoea and pneumonia in Lwengo district.
3. To determine the iCCM practices among VHTs in the management of malaria, diarrhoea and pneumonia in Lwengo district.
4. To assess the factors associated with VHT iCCM practices for management of malaria, diarrhoea and pneumonia in Lwengo district.

CHAPTER FIVE: METHODOLOGY

5.1 Study Area

The study was conducted in Lwengo District in Central Uganda. Lwengo is located approximately 45km west of Masaka City within the greater Masaka sub-region at 0^0 24' S, 31^0 25' E (Figure 2). It is bordered by Sembabule to the North, Bukomansimbi to the northeast, Rakai to the South and Lyantonde to the West. This district covers 914.7 km^2 (353.2 square miles) and is home to a population of 325,263 (UBOS, 2024). The area experiences a tropical climate, and despite being in the broader Buganda region, its main inhabitants are a mix of local and migrant populations. However, Luganda remains the most commonly used language.

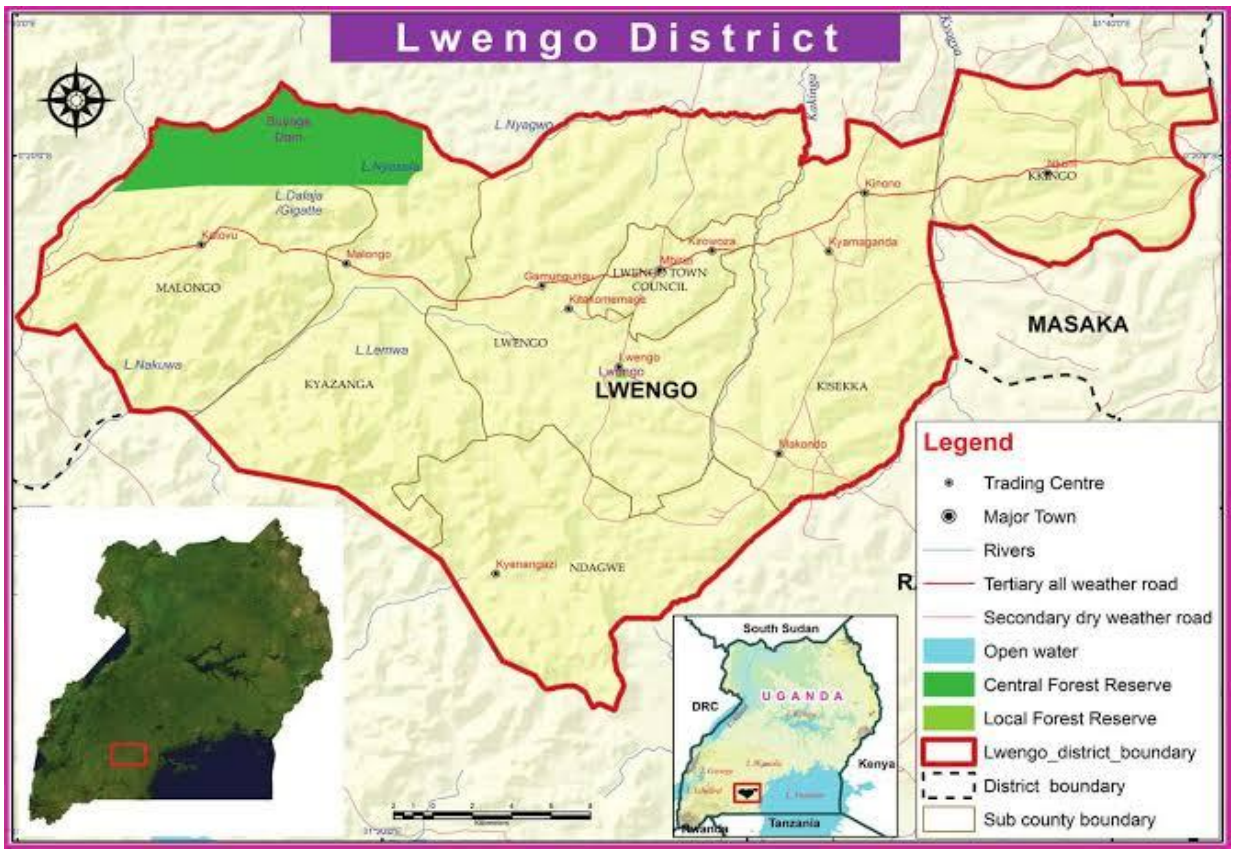


Figure 2: A Map of Lwengo District

5.2 Study Design

This was a descriptive cross-sectional study that utilized quantitative methods of data collection.

5.3 Study Population

The study population was the VHTs trained under the iCCM government strategy within Lwengo District.

5.4 Selection Criteria

5.4.1 Inclusion Criteria

All VHTs of the selected villages in Lwengo District at the time of conducting the study consented to participate in the interview.

5.4.2 Exclusion Criteria

All eligible VHTs within the selected villages who were absent or unwilling to participate in the study.

5.5 Sample Size

The Kish Leslie formula for cross-sectional studies was used to calculate the sample sizes within a 95% confidence interval (Z) (Leslie, 2005).

$$n = \frac{z^2 p(1-p)}{e^2}$$

Where;

n = sample size estimate of VHTs

Z = standard deviation at 95% confidence interval corresponding to 1.96

e = precision acceptable sampling error, which is assumed to be 5% (0.05)

p = proportion of VHTs that had knowledge on childhood malaria management estimated at 52.5% (Chi, Nyasa and Jane-Francis, 2023)

q = 100% - p

$$n = \frac{z^2 p(1-p)}{e^2}$$

$$n = \frac{1.96^2 \times 0.525 \times (1 - 0.525)}{0.05^2}$$

$$n = 383.1996$$

$$n = 384$$

5.6 Sampling procedure

Using multi-stage cluster sampling, the district was categorised as it is by the local government. First was at the county level, where 2 counties were randomly selected from the district's 3 politically recognised counties. Five sub-counties were then randomly selected to represent the district. The district has a total of 10 sub-counties/town councils and the list of these was drafted. Using simple random sampling, the 5 sub-counties/town councils were manually selected. All VHTs from villages in the sampled sub-counties were interviewed as participants in this study.

A list of all VHTs from the selected sub-counties/town councils was generated and guided the interviews to ensure that all VHTs sampled were interviewed unless one declined to take part in the study.

5.7 Data Collection Methods and Procedure

Face-to-face questionnaires translated to Luganda were administered by the research assistant with training in either social work or public health-related training for the collection of quantitative data. Experienced research assistants were hired and further trained by the principal investigator in line with this specific study before the data collection exercise. The questionnaire was translated to Luganda since it is the most commonly spoken language within Lwengo District.

5.8 Data Collection Tools

A semi-structured questionnaire was used for data collection. It was designed and uploaded on a mobile device using Kobo toolbox which was filled by the research assistants upon interaction with the respondents. The questions included in the questionnaire were guided by previous studies on knowledge, attitudes, practices and experiences of VHTs with iCCM. The questionnaire was composed of 5 major sections assessing demographic factors (age, gender,

education background and marital status), knowledge (assessment, management and referral), attitudes (community trust and supply), practices (RDT use, expiry date and storage) and mediating factors (training, support and experience)

5.9 Quality Control

The questionnaire was translated into Luganda and pre-tested among 25 VHTs from Bukomansimbi, a neighboring district with similar characteristics, before its deployment to ensure reliability, validity and quality of the tool at the time of its use. Responses from this pre-test were used to adjust the questionnaire, though not included in the final results for analysis. The data collection process was supervised by the Principal Investigator to ensure consistency.

5.10 Study Variables

The study quantitatively assessed both the independent and dependent variables. The independent variables included socio-demographic factors (age, gender, educational background, ethnicity, and religion), knowledge (assessment, management and referral of malaria, pneumonia and diarrhoea cases) and attitudes (community trust, motivation, perceived usefulness and workload) towards iCCM.

The dependent variable was practices which included; identification of danger signs, maintenance of stock records, use of diagnostic equipment, correct determination of medication dosage and adherence to iCCM guidelines.

5.11 Data Management and Analysis

Stata 14.0 (Stata Corp, Texas, USA) software was used to clean and analyse the quantitative data collected with the Kobo toolbox to ensure completeness and consistency of the data. Descriptive statistics such as frequencies, percentages, standard deviations, means and graphs were used to conduct univariate analysis and to summarise the data. Any interview that had missing data was deleted to ensure quality and complete analysis of the study data.

Upon data collection, records of the submitted interviews were uploaded to a Kobo Toolbox system that was only accessed by the Principal Investigator to minimize unauthorized access and interference with the data for reasons other than those in line with the objectives of this study. A copy was downloaded and stored and a password-protected hard drive for backup.

The interviews used unique identifiers assigned to each of the VHT respondent and not their names for confidentiality.

Knowledge was assessed in 6 close-ended (yes/no) questions; every participant who responded with "true" to each question was considered to be knowledgeable. The scores of these responses (true = 1, false = 0) were calculated with a maximum score of 6 for each participant. If the respondent scored > 3, one was considered to be knowledgeable, and those who scored ≤ 3 were considered not knowledgeable.

Attitudes were assessed in 8 close-ended questions, each with 5 options i.e. strongly agree (1), agree (2), Neutral (3), disagree (4), and strongly disagree (5). The maximum score for each participant was 40. Any participant with a score ≤ 20 was considered to have a positive attitude and one with a score > 20 was considered to have a negative attitude.

Practices were assessed in 7 close-ended questions with (yes = 1, no = 0). Every participant had a maximum score of 7 and every participant who responded with yes was considered to have good practice. Any study participant who scored ≥ 5 was considered to have proper practice and one with < 5 was considered to have improper practice.

Bivariate analysis was done to assess if there are any associations between the dependent (knowledge, attitudes and practices) and independent variables (demographic and mediating factors). This was done using chi-square and logistic regression tests.

5.12 Ethical Considerations

Permission to conduct the study was sought from Makerere University School of Public Health (MakSPH) and administrative clearance was obtained from Lwengo District Health Offices (DHO). The participants were also briefed on the purpose of the research, thoroughly given informed consent and signed a written consent form affirming their acceptance to voluntarily participate in the study.

5.13 Dissemination of Results

The findings will be submitted to MakSPH in partial fulfillment of a bachelor's degree in Environmental Health Science. They will also be shared with Lwengo District to guide the management and improvement of the iCCM strategy through VHTs. The findings will also be published in research journals for the access and information of other research studies.

CHAPTER SIX: RESULTS

6.1 Social demographics and iCCM-related variables

The largest group of respondents were aged 25–44 years, 48.7% (187/384), with a mean age of 44.5 years; most were female, 60.4% (232/384) and married, 63.5% (244/384). Approximately half of the respondents had acquired a secondary level of education, 48.9% (188/384) and most respondents, 98.7% (379/384) reported having dependents or children. Almost all, 95.6% (367/384) respondents had received iCCM training and the majority, 85.8% (315/384) of these were trained for less than a month. Most respondents, 93.2% (358/384) reported having served as VHTs for over a year (Table 1).

Table 1: Social demographics and iCCM-related variables of VHT respondents in Lwengo District

Variable	Frequency (N = 384)	Percentage (%)
Age (Complete years)	*Mean (SD) = 44.5 (10.4)*	
< 25	5	1.3
25 – 44	187	48.7
45 – 65	175	45.6
> 65	17	4.4
Gender		
Male	152	39.6
Female	232	60.4
Marital Status		
Married	244	63.5
Cohabiting	96	25.0
Divorced	15	3.9
Widowed	26	6.8
Never Married	3	0.8
Education Background		
No education	1	0.3
Primary	180	46.9
Secondary	188	48.9

Tertiary	15	3.9
Having dependants/children		
Yes	379	98.7
No	5	1.3
Received iCCM training	367	95.6
Duration of training (*n* = *367*)		
< 1 month	315	85.8
1 month	52	14.2
Period served as VHT		
< 6 months	14	3.7
6 ≤ 12 months	12	3.1
>12 months	358	93.2

6.2 Knowledge of VHT respondents on iCCM in Lwengo District.

The study assessed knowledge of VHTs on iCCM in Lwengo District. From the study results, overall, the majority of respondents were knowledgeable on iCCM (94.3%) (Figure 3), with 80.0% (307/384) knowing the diseases managed under the iCCM strategy. Most of the respondents knew that performing RDT was necessary before treating malaria, 95.0% (365/384) and that ORS and zinc tablets are recommended treatments for diarrhoea, 98.7% (379/384). Furthermore, 96.1% (369/384) knew that fast breathing qualifies pneumonia diagnosis in children aged under 5 years, while 95.3% (366/384) knew that convulsion is a danger sign as per the MoH guidelines on iCCM. On the other hand, very few, 16.9% (65/384) of respondents said children presenting with danger signs should still be managed by VHTs (Table 2).

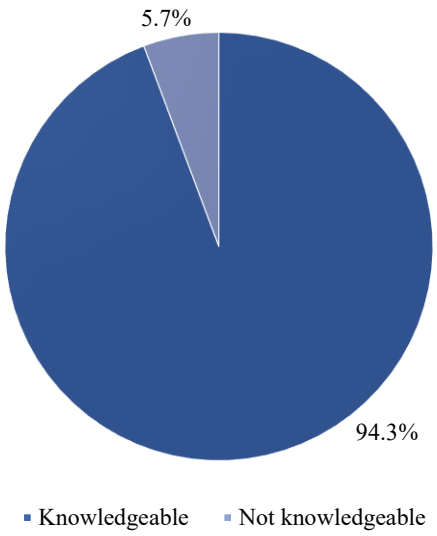


Figure 3: A figure showing overall knowledge of VHT respondents on iCCM in Lwengo District

Table 2: Respondents' (VHTs) knowledge towards iCCM in Lwengo District

Variable	**Attributes**	**Frequency (N = 384)**	**Percentage (%)**
Know diseases managed under iCCM	Yes	307	80.0
	No	77	20.0
Performing a Rapid Diagnostic Test (RDT) is a required step to confirm malaria	Yes	365	95.0
	No	19	5.0
Oral Rehydration Salts (ORS) and Zinc tablets are recommended treatment for diarrhoea	Yes	379	98.7
	No	5	1.3
Fast breathing qualifies pneumonia diagnosis among children aged under 5 years	Yes	369	96.1
	No	15	3.9
Convulsion is a danger sign of malaria as per the iCCM guidelines.	Yes	366	95.3
	No	18	4.7
It is recommended that children who present with danger signs should still be managed by the VHT	Yes	65	16.9
	No	319	83.1

6.3 Attitudes of VHT respondents towards iCCM in Lwengo District

The study also assessed the VHTs' attitudes towards iCCM in Lwengo district. Overall, findings show that most respondents (86.7%) had positive attitudes towards iCCM, (Figure 4), with 97.4% (374/384) agreeing or strongly agreeing that iCCM is a very effective strategy for reducing child deaths in their community. Additionally, the majority, 98.0% (376/384), of the respondents were confident in their ability to diagnose and treat malaria, diarrhoea and pneumonia, while more than half, 62% (238/384), reported being satisfied with the non-financial incentives they receive in their work as VHTs. Furthermore, more than three-quarters, 82.9% (318/384), agreed or strongly agreed that they received adequate support from the health facility staff to perform their duties and almost all respondents, 95.5% (366/384) believed that the community trusted their ability to assess and treat their children. However, less than a third of the respondents, 28.4% (106/384), agreed or strongly agreed that their supplies and medicines were adequate for their work (Table 3).

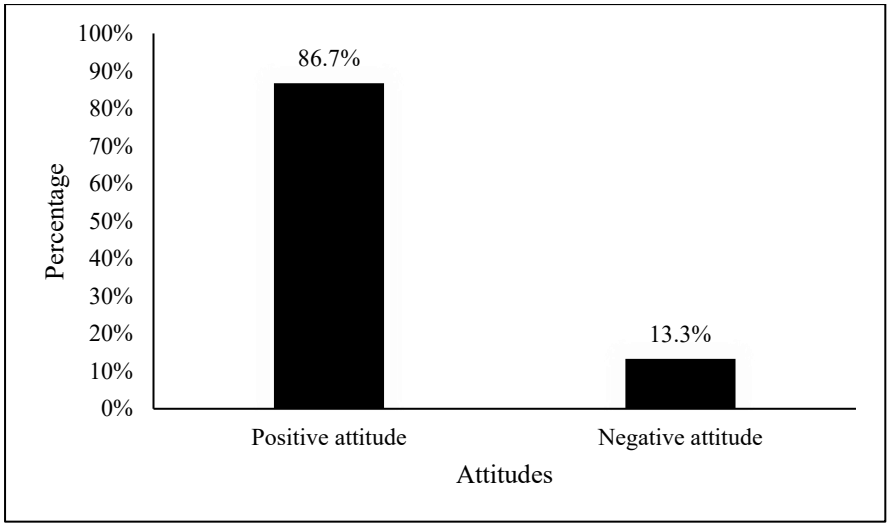


Figure 4: A figure showing the overall attitude of VHT respondents on iCCM in Lwengo District

Table 3: Respondents' (VHTs) attitudes towards iCCM in Lwengo District

	Frequency (Percentage)				
Variable	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**

iCCM is a very effective strategy for reducing child deaths in my community	299 (77.9%)	75 (19.5%)	3 (0.8%)	2 (0.5%)	5 (1.3%)
I am confident of my ability to diagnose and treat malaria, diarrhoea and pneumonia	254 (66.2%)	122 (31.8%)	2 (0.5%)	2 (0.5%)	4 (1.0%)
The iCCM responsibilities add a lot of work to my current duties as a VHT	257 (66.9%)	114 (29.7%)	4 (1.0%)	5 (1.3%)	4 (1.0%)
I feel adequately supported by the local health facility staff to perform my iCCM responsibilities	178 (46.4%)	140 (36.5%)	6 (1.6%)	28 (7.3%)	32 (8.3%)
I am satisfied with the non-financial incentives that I receive in my iCCM work	119 (31.0%)	119 (31.0%)	8 (2.1%)	47 (12.2%)	91 (23.7%)
Community members trust my ability to assess and treat their children as a VHT	282 (73.4%)	85 (22.1%)	5 (1.3%)	7 (1.8%)	5 (1.3%)
The supplies and medicines provided are sufficient for my work	43 (11.2%)	66 (17.2%)	8 (2.1%)	129 (33.6%)	138 (35.9%)
I receive adequate supervision and support from the health facility	155 (40.4%)	170 (44.3%)	11 (2.9%)	32 (8.3%)	16 (4.2%)

6.4 Practices of VHT respondents concerning iCCM in Lwengo District

On assessing the practices of VHTs concerning iCCM in Lwengo district, this study found that the majority of the respondents (97.9%) reported proper iCCM practices (Figure 5), with 97.4% (374/384) of them reporting consistent use of RDTs to diagnose before offering treatment to their patients. Slightly less than these, 95.6% (367/384) reported to consistently do breath-counting to assess pneumonia before deciding the next course of action and 95.8% (368/384)

reported always offering full dosage to their patients. Equal proportions, 98.4% (378/384) of respondents reported recording patients' information in the register and referring children presenting with danger signs to higher-level facilities. However, slightly more than three-quarters, 78.9% (303/384) of the respondents reported checking the expiry dates of RDTs always (Table 4).

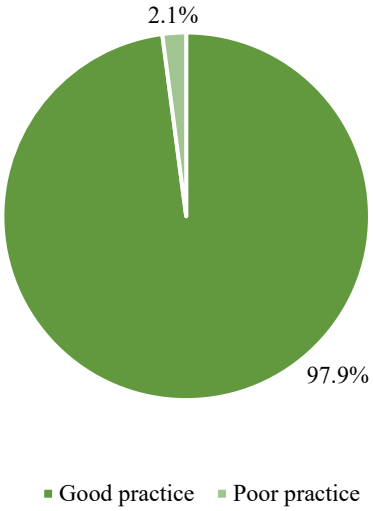


Figure 5: A figure showing the overall practice of VHTs on iCCM in Lwengo District

Table 4: Respondents' (VHTs) iCCM practices in Lwengo District

Variable	**Attributes**	**Frequency (N = 384)**	**Percentage (%)**
Always use a Rapid Diagnostic Test (RDT) to confirm malaria before offering treatment	Yes	374	97.4
	No	10	2.6
Always check the expiry date of the RDT	Yes	303	78.9
	No	81	21.1
Always do breath-counting to assess children for pneumonia before deciding on the course of action	Yes	367	95.6
	No	17	4.4
Always record patients' information in the register	Yes	378	98.4
	No	6	1.6
Always refer children with danger signs to higher-level facilities	Yes	378	98.4
	No	6	1.6
	Yes	368	95.8

Always offer my patients the full dosage upon diagnosis	No	16	4.2
Always submit my quarterly report to the health facility	Yes	383	99.7
	No	1	0.3

6.5 Integrated Community Case Management (iCCM) practices of the VHTs in Lwengo District and associated factors.

The study found that VHT respondents who were never married were 79% less likely to have good iCCM practices than their cohabiting counterparts (95% CI: 0.01, 0.478; p-value = 0.015). Furthermore, VHT respondents who received iCCM training were 8 times more likely to report good practices than those who were not trained (95% CI: 1.49, 43.11; p-value = 0.015). In addition, those who received their training for less than one month were 7.7 times more likely to have good iCCM practices than those who did not train (95% CI: 1.39, 42.93; p-value = 0.019).

Table 5: Association between socio-demographic factors and other factors with iCCM practices among VHT respondents in Lwengo District

Variable	**iCCM Practices**		**cOR (95% CI)**	**p-value**
	Good practices (n = 376)	**Poor practices (n = 8)**		
Gender				
Male	148 (97.4%)	4 (2.6%)	0.65 (0.16, 2.64)	0.546
Female	228 (98.3%)	4 (1.7%)	1.00	
Marital Status				
Married	239 (98%)	5 (2%)	0.50 (0.09, 4.36)	0.533
Cohabiting	95 (99%)	1 (1%)	1.00	
Divorced	14 (93.3%)	1 (6.7%)	0.67 (0.21, 2.49)	0.497
Widowed	26 (100%)	0 (0%)	-	-
Never married	2 (66.7%)	1 (33.3%)	0.21 (0.01, 0.478)	0.015*
Received iCCM training				

Yes	361 (98.4%)	6 (1.6%)	8.02 (1.49, 43.11)	0.015*
No	15 (88.2%)	2 (11.8%)	1.00	
Duration of iCCM training				
Never	16 (88.9%)	2 (11.1%)	1.00	
< 1 month	309 (98.4%)	5 (1.6%)	7.725 (1.39, 42.93)	0.019*
One month	51 (98.1%)	1 (1.9%)	8.02(0.54, 75.01)	0.141
Attitudes				
Positive attitudes	326 (97.9%)	7 (2.1%)	0.93 (0.11, 7.73)	0.948
Negative attitudes	50 (98%)	1 (2%)	1.00	

CHAPTER SEVEN: DISCUSSION

7.1 Knowledge of VHTs on iCCM in Lwengo District

The high knowledge levels among VHT respondents likely reflect that the majority of the VHTs know the conditions they address, how they present and how to treat them. This could be attributed to capacity building sessions offered by the health facility supervisors during their quarterly reporting meetings. These enable them to have renewed knowledge concerning diagnosis and treatment of the conditions under the iCCM. This might also imply that VHTs in Lwengo district receive appropriate support from their supervisors from the health facilities, which better equips them for service. Although very few studies have reported a composite score of overall knowledge of VHTs on iCCM, several other studies have assessed the individual components of knowledge on iCCM.

From the study findings, most respondents knew that fast breathing qualified pneumonia diagnosis among children under 5 years. This is similar to findings from a qualitative study in Mpigi, where all the VHTs had good knowledge of the signs and symptoms of pneumonia (Nanyumba and Mucunguzi, 2014). This could be attributed to the training recommended for VHTs before they start extending this service to the communities. It might as well be attributed to their experience in their work as VHTs, ensuring that important information is retained in their minds as they extend the service to children under 5 years in their communities. This therefore implies that there are lower risks of missed pneumonia diagnoses in Lwengo district, hence increasing the probability of identifying and treating such cases.

Findings from the study further show that almost all respondents knew that ORS and zinc are the recommended treatment for diarrhoea among children under 5 years. This, however, varies with findings from a study conducted in Imo State, Nigeria, where healthcare workers, including CHWs, had moderate knowledge of ORS and Zinc as treatment for diarrhoea (Ogugu and Chiejina, 2021). This variation could be attributed to the difference in geographical location and efforts put into ensuring adequate knowledge among VHTs on the medicines recommended for each disease in the iCCM strategy. This therefore might imply that VHTs in Lwengo district clearly know the appropriate treatment for diarrhoea among children aged below 5 years, hence minimal chances of offering them wrong treatment.

The study findings also show that most VHTs knew that convulsions are a danger sign of malaria. These findings are similar to those from another study conducted in the Karamoja region, where all the VHTs knew that vomiting and convulsions were danger signs of malaria (Malaria Consortium *et al.*, 2018). In addition, similar to findings from this study, the VHTs in the Karamoja region knew that children presenting with danger signs should immediately be referred to the nearest health facility for appropriate care. These can be attributed to the training accorded to VHTs reinforced with refresher trainings, regular supervision and availability of good linkage with the health facilities (Abua *et al.*, 2020). This therefore means that VHTs know the risk of attempting to manage cases presenting with danger signs hence the need to refer them accordingly upon identifying them.

7.2 Attitudes of VHTs on iCCM in Lwengo District

Findings from this study show that most of the VHT respondents from Lwengo had a positive attitude towards iCCM. Even then, the attitude levels among the respondents were lower compared to the knowledge levels of the same respondents. This could be attributed to regular stockouts and limited diagnostics for the VHTs to perform their work, which then biases them concerning the iCCM strategy. This implies that knowledge alone might not be adequate to sustain motivation and consistency in VHT service in the implementation of the iCCM strategy in Lwengo District. However, there is shortage of literature to support or challenge the findings from this study, which poses a research gap for further studies to explore.

The study findings show that more than three-quarters of the VHT respondents believed they received adequate support from the health facility to execute their duties. This is important because activities such as refresher training and regular supervision that ought to boost the effectiveness of VHTs in iCCM are rendered regularly, hence their positive attitude towards the support provided. The health facilities should therefore continue engaging VHTs in their capacity building as their immediate supervisors to maintain or further boost their attitudes towards the iCCM strategy. However, a study conducted in Wakiso and Mukono found that less than half (43.9%) of the VHTs believed they received enough or almost enough support from the local health center (Mays *et al.*, 2017). This variation may be a result of differences in geographical location and implementation strategies employed in the other districts.

Findings from this study also show that more than half of the respondents said their supplies were inadequate for their work. This tallies with findings from a study conducted in northern

Uganda, where more than half of the VHTs claimed to have last received essential medicines for their practice over 6 months before the study (Kimbugwe *et al.*, 2014). This is also backed by findings from a systematic study among low and middle-income countries (LMICs) where CHWs reported significantly higher rates of stockouts (28.93% [CI 95%: 28.79–29.07] vs 9.17% [CI 95%: 8.64–9.70] compared to health centres to which they are affiliated (Olaniran *et al.*, 2022). This could mean that higher priority is given to the health facilities where the VHTs refer than to them, even when they serve as the first-line caregivers for children under the age of 5. This therefore fails the purpose of the iCCM strategy, delaying access to care and increasing the length of queues of patients at the health facilities.

The findings from the study also showed that almost all respondents believed that the community trusted in their ability to assess and treat their children. This is similar to findings from Wakiso district, where the majority of the community members trusted and preferred VHT care services to those from their health facility (private and public) counterparts (Altaras *et al.*, 2017). This is further backed by findings from Northern Uganda, where almost all caregivers (97.5%) would consider taking their children back to the VHTs whenever they fell sick (Job *et al.*, 2023). This could be due to the patients' recovery when they receive care from VHTs with good care and follow-up until they have fully recovered. It could also be partly attributed to the fact that VHTs only offer tablets without injections, which are often considered to have adverse side effects. This finding might imply that the communities have embraced and utilized the services offered by VHTs in Lwengo district. This therefore ensures timely access to medical attention for conditions such as malaria, diarrhoea and pneumonia in Lwengo district without the need for traveling long distances to health facilities.

7.3 Practices of VHTs concerning iCCM in Lwengo District

The study findings show that the majority of the VHT respondents had good iCCM practices. This tallies with the findings from another study conducted in Kampala, Uganda, where the majority of the VHTs had an overall good performance in line with iCCM (Bagonza, Kibira and Rutebemberwa, 2014). This, however, differs from the findings from another study conducted in Nyanza, Kenya, where CHWs had a poor performance, evident through lack of report submission in the last six months (20%) (Kawakatsu *et al.*, 2015). This might be as a result of the managerial and supportive interventions put in place by the government of Uganda to ensure efficacy of the iCCM strategy. The findings may imply that the iCCM strategy in

Lwengo District is functioning relatively effectively at the implementation level, with VHTs largely adhering to recommended guidelines for diagnosis, treatment, referral, and reporting. This is important because proper VHT practices are essential for ensuring timely and appropriate management of childhood illnesses such as malaria, diarrhoea, and pneumonia within rural communities like Lwengo.

Furthermore, findings from this study show that the majority of the respondents reported consistent use of RDTs before offering treatment to their patients. These findings are similar to those from a study conducted in Burkina Faso, Nigeria and Uganda, where most CHWs consistently used RDTs to test and adhered to the results for treatment (Singlovic *et al.*, 2016). This can be attributed to appropriate training and regular supervision of the VHTs. These equip the VHTs with the set guidelines and good practices for quality service delivery to the children under 5 years in their communities. The findings are important because they might reflect that VHTs in Lwengo District are largely adhering to recommended malaria diagnosis procedures under the iCCM strategy. Consistent use of RDTs is important because it improves accurate diagnosis of malaria, reduces unnecessary use of antimalarial drugs, and minimizes the risk of mismanagement of non-malarial febrile illnesses.

The findings from the study also show that almost all respondents referred patients with danger signs to higher-level health facilities. These findings are similar to those from another study conducted in the Democratic Republic of Congo, where all cases of malaria danger signs registered by health workers, including CHWs, were referred to higher health facilities (Okitawutshu *et al.*, 2021). A similar study was conducted in rural Southwestern Uganda to assess the management of danger signs among children under 5 years. From this study, slightly over three-quarters of the recorded danger signs (78%) were successfully referred to higher-level health facilities (Matte *et al.*, 2024). The high level of referrals for patients who present with danger signs could be due to the VHTs' good knowledge of the severity of outcomes from delayed or poor management of patients with danger signs. This might imply that VHTs in Lwengo District are appropriately recognizing the limits of community-level management and adhering to referral guidelines under the iCCM strategy. Proper referral practices are essential for ensuring continuity of care and timely access to advanced treatment for severe childhood illnesses that cannot be adequately managed at the community level.

7.4 Integrated Community Case Management (iCCM) practices of the VHTs in Lwengo District and associated factors

Following bivariate analysis, the study findings show that VHTs who received training were more likely to report good iCCM practices. These findings are similar to those from another study conducted in Rongo sub-county, Kenya, where high performance of CHWs was attributed to factors such as continuous training, supervision and regular payments (Rogers *et al.*, 2023). In addition, a systematic study found that the association of training with VHT performance varies across different localities and demographics (Abdel-All *et al.*, 2017). The significant relationship observed in these study findings may be due to guideline enforcement, in which VHTs are required to undergo training before assuming their responsibilities. Therefore, these findings imply that training is a critical determinant of quality iCCM service delivery among VHTs in Lwengo district. Adequate training may improve adherence to treatment procedures, appropriate use of diagnostics, recognition of danger signs, and timely referral of severely ill children aged under 5 years in Lwengo district.

Furthermore, the study found that training for less than a month was significantly associated with good practices. The VHTs who received training for the recommended period or slightly less were more likely to have good practices compared to their counterparts who did not receive any. This is supported by another study conducted in Ethiopia on human resource capacity, where adequate training of VHTs was more effective than not (Teklehaimanot and Teklehaimanot, 2013). Another Ethiopian study also supported the association, noting that pre-service training better equipped VHTs, enabling them to easily meet their community health demands (Tesema *et al.*, 2022). Training VHTs enables them to acquire adequate skills and knowledge for effective and quality health care in their community.

7.5 Study strengths and limitations of the study

The strengths of this study included the fact that the study was cross-sectional, capturing the information from the respondents as was at that time without need for follow-up. This minimized the risks of having participants withdraw along the way. It also used close ended questions which provided reliable numerical data which accurately represented the broader VHT community in Lwengo.

One of the limitations of this study is that data was collected from individual VHTs in selected sub-counties in Lwengo District without making any observations. Furthermore, the study was quantitative, hence it lacked a qualitative component to probe into the responses through other methods like focus group discussions. Other researchers, therefore, can employ observation and qualitative methods to generate more knowledge.

In addition, a cross-sectional study was conducted, hence the results reflect the conditions of findings as they were then when the data was collected. Finally, though the study analysed the factors associated with the practices of VHTs on iCCM in Lwengo District, it only explored up to the bivariate level of analysis.

CHAPTER EIGHT: CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

This study assessed the knowledge, attitudes, practices and associated factors of VHTs towards the iCCM of malaria, diarrhoea and pneumonia in Lwengo District. VHTs demonstrated high knowledge (94.3%), largely positive attitudes (86.7%) and good practices (97.9%), indicating that the iCCM strategy is functioning effectively at the community level. Training emerged as the strongest determinant of good practice. However, the study identified persistent gaps in commodity supply, non-financial incentives and routine checking of RDT expiry dates. These gaps, if unaddressed, threaten the sustainability of community-level case management. Strengthening supply chains, incentives and supervision is therefore essential to consolidate the gains of iCCM and further reduce under-five mortality in Lwengo District and comparable rural settings in Uganda.

8.2 Recommendations

8.2.1 Recommendations to the MoH

1. The MoH should ensure regular and adequate stocking of medicines and other necessary equipment among VHTs to ensure consistent and easy service delivery.
2. The MoH should standardise a minimum one-month structured pre-service iCCM training, given evidence that any training markedly improves practice.
3. The MoH should frequently provide non-financial incentives to the VHTs like umbrellas, raincoats, gumboots, t-shirts and others, to support them in effectively offering healthcare.
4. The MoH should finance and conduct refresher training of VHTs every six (6) months to ensure that they are equipped with updated knowledge on the diagnostic and treatment guidelines.

8.2.2 Recommendations to the Health Facilities

1. Health facility staff, as the immediate supervisors, should ensure monthly supervision of the VHTs to ensure that they uphold the set iCCM guidelines for effective service delivery.
2. Health facility staff should conduct quarterly capacity building of VHTs, especially when they convene to deliver reports. This will better equip them for service in the community.

3. Health facilities should reinforce, during monthly supervision, the routine checking of RDT and drug expiry dates by VHTs.

8.2.3. Recommendations to researchers

1. Future studies should incorporate observation and qualitative methods, and extend analysis to multivariable level.

References

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APPENDICES

Appendix 1: Consent Form

My name is **NIKURUNGI PROSSY**, a student at Makerere University School of Public Health pursuing a Bachelor's degree in Environmental Health Science. I am conducting a study aimed at assessing the knowledge, attitudes, and practices of VHTs on iCCM and associated factors in Lwengo District. The information gathered is intended for academic purposes only and it will be kept confidential. I therefore request to obtain informed consent from you as an act of ethical protocol in this study.

There are no associated risks in taking part in this study; the questions asked are direct forward, though some may cause emotional discomfort. There are no direct benefits to you for participating in the study, but the study findings will be used to design appropriate interventions that will lead to better implementation for improved health in Lwengo District.

During the interview, you are required to respond to questions about assessment and management of malaria, diarrhoea and pneumonia and it will cost you about 20 to 30 minutes to complete the entire interview.

You will not have to incur any other extra costs on top of the time given to us. Your participation will not attract any compensation in the form of money or refreshments during the course of the interview and there will be no reimbursement of any form. Participation in the study is completely voluntary; you can withdraw at any time as you desire without penalty and refusing to participate in the study will not affect you in any way.

If you have questions or concerns about this study, do not hesitate to reach out to me at 0787197544. For any questions concerning your rights, feel free to contact the study supervisors from Makerere University School of Public Health, Dr. Phyllis Awor on 0753651573 / pawor@musph.ac.ug or Mr. Jimmy Osuret on 0774166753/ josuret@musph.ac.ug

Signature of respondent……. Date…….

Signature of interviewer……Date……..……

Translated Consent Form

Amannya gange nze **NIKURUNGI PROSSY**, omuyizi mu Makerere University School of Public Health nga nsoma diguli mu busawo bw'ebyobulamu. Nkola okunoonyereza okugenderera okwekenneenya okumanya, endowooza, n'enkola za ba VHT ku iCCM n'ensonga ezikwatagana nabyo mu Disitulikiti y'e Lwengo. Ebikunganyibbwa bigendereddwamu kusoma kwokka era bijja kukuumibwa nga bya kyaama. N'olwekyo nsaba okufuna okukkiriza okuva gy'oli ng'ekikolwa ekimu ku birungamya okunoonyereza kuno.

Tewali bulabe bwonna bukwatagana mu kwetaba mu kunoonyereza kuno; ebibuuzo ebibuuzibwa biba birambike bulungi, wadde ng'ebimu biyinza okuleeta enkyukakyuka mu nneewulira. Tewali migaso gya butereevu gy'oli olw'okwetaba mu kunoonyereza, naye ebizuuliddwa mu kunoonyereza bijja kukozesebwa okukola enteekateeka ezijja okukuleetera okussa mu nkola obulungi olw'okutumbula ebyobulamu mu Disitulikiti y'e Lwengo. Mu kiseera ky'okubuuza ebibuuzo, olina okuddamu ebibuuzo ebikwata ku kwekenneenya n'okuddukanya omusujja, ekiddukano n'ekifuba era kijja kukutwalira eddakiika nga 20 ku 30 okumaliriza yintaviyu yonna.

Tojja kusasula ssente zonna okwongerako ku budde obutuweereddwa. Okwetaba kwo tekujja kusikiriza kuliyirirwa kwonna mu ngeri ya ssente oba eby'okunywa mu kiseera ky'okuddamu ebibuuzo era tewajja kubaawo kuddizibwa ssente za ffoomu yonna. Okwetaba mu kunoonyereza kuno kwa kyeyagalire ddala; osobola okuvaamu essaawa yonna nga bw'oyagala awatali kibonerezo era okugaana okwetaba mu kunoonyereza tekijja kukukosa mu ngeri yonna.

Bw'oba olina ekibuuzo oba ekikweraliikiriza ku kunoonyereza kuno, tolwawo kuntuukirira ku 0787197544. Bw'oba olina ekibuuzo kyonna ekikwata ku ddembe lyo, wulira nga oli waddembe okutuukirira abakulira okusoma okuva mu Makerere University School of Public Health, Dr. Phyllis Awor ku ssimu 0753651573 / pawor@musph.ac.ug oba Jimmy Osuret ku 0774166753/ josuret@musph.ac.ug

Omukono gw'abuzibwa.....Ennaku z'omweezi……

Omukono gw'oyo abuuza ebibuuzo.....Olunaku.....

Appendix 2: Questionnaire

SECTION A: DEMOGRAPHIC FACTORS

1. Gender
    - Male
    - Female
2. Age in complete years

……..

3. Marital status
    - Married
    - Cohabiting
    - Divorced
    - Widowed
    - Never married/Single
4. Do you have any dependants/children?
    - Yes
    - No
5. Highest level of education attained.
    - None
    - Primary
    - Secondary
    - Tertiary

SECTION B: KNOWLEDGE ON ASSESSMENT, MANAGEMENT AND REFERRAL OF MALARIA, DIARRHEA AND PNEUMONIA UNDER iCCM

6. Which childhood illnesses are managed under iCCM?
    - Malaria
    - Diarrhea
    - Pneumonia
    - Others (Specify)

7. Performing a Rapid Diagnostic Test (RDT) is a required step to confirm malaria before treatment.
    - True
    - False
8. Oral Rehydration Salts (ORS) and Zinc tablets are recommended treatment for diarrhoea among children aged under 5 years.
    - True
    - False
9. Fast breathing qualifies pneumonia diagnosis among children aged under 5 years.
    - True
    - False
10. Convulsion is a danger sign of malaria as per the iCCM guidelines.
    - True
    - False
11. It is recommended that children who present with danger signs should still be managed at the VHT level.
    - True
    - False

SECTION C: VHT ATTITUDES TOWARDS iCCM

12. iCCM is a very effective strategy for reducing child deaths in my community.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
13. I am confident of my ability to diagnose and treat malaria, diarrhoea and pneumonia.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

14. The iCCM responsibilities add a lot of work to my current duties as a VHT

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

15. I feel adequately supported by the local health facility staff to perform my iCCM responsibilities.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

16. I am satisfied with the non-financial incentives that I receive in my iCCM work

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

17. Community members trust my ability to assess and treat their children as a VHT.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

18. The supplies and medicines provided are sufficient for my work.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

19. I receive adequate supervision and support from the health facility.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

SECTION D: iCCM PRACTICES AMONG VHTS

20. I always use a Rapid Diagnostic Test (RDT) to confirm malaria before offering treatment.
- Yes
- No

21. When testing for malaria, I always check the expiry date of the RDT.
- Yes
- No

22. I always do breath-counting to assess children for pneumonia before deciding on the course of action.
- Yes
- No

23. I always record patients' information in the register.
- Yes
- No

24. I always refer children with danger signs to higher-level facilities.
- Yes
- No

25. I always offer my patients the full dosage upon diagnosis.
- Yes
- No

26. I always submit my quarterly report to the health facility.
- Yes
- No

SECTION E: FACTORS ASSOCIATED WITH KNOWLEDGE, ATTITUDES AND PRACTICES OF VHTS TOWARDS iCCM

27. Have you received training in iCCM?

- Yes
- No

28. For how long was your VHT training in iCCM?

- < 1 month
- 1 month

29. How long ago was your most recent training?

- < 6 months
- 6 ≤ 12 months
- > 12 months

30. For how long have you served as a VHT?

- < 6 months
- 6 ≤ 12 months
- > 12 months

Translated Questionnaire

EKITUNDU A: ENSONGA EZ'ABANTU

1. Ekikula kyo
    - Musajja
    - Mukazi
2. Obukulu bwo mu myaka emijjuvu

.....

3. Embeera y'obufumbo
    - Mufumbo
    - Tubeera wamu
    - Twayawukanye
    - Nnamwandu
    - Sifumbirwangako

4. Oyinayo abantu/abaana bolabirira?
    - Yee
    - nedda
5. Omutendera gw'okusoma gwe wakomako.
    - Tewali
    - Pulayimale
    - Siniya
    - Ettendekero erya waggulu

EKITUNDU B: OKUMANYA KU KWEKEBEJJA, OKUJJANJABA N'OKWONGERAYO ABALWADDE B'OMUSUJJA, EKIDDUKANO N'EKIFUBA WANSI WA iCCM

6. Endwadde ki ez'abaana ezijjanjabibwa wansi wa iCCM?
    - Omusujja gw'ensiri
    - Embiro
    - Obulwadde bw'ekifuba
    - Ebirala (menya) .
7. Okukola Rapid Diagnostic Test (RDT) ddaala kyetaagisa okukakasa omusujja nga tonnagaba bujjanjabi.
    - Kituufu
    - Kikyaamu
8. Oral Rehydration Salts (ORS) ne Zinc tablets bilambikibwa okujjanjaba ekiddukano mu baana abali wansi w'emyaka.
    - Kituufu
    - Kikyaamu
9. Okussa okwamangu kulaga ekifuba mu baana abali wansi w'emyaka.
    - Kituufu
    - Kikyaamu
10. Okwesika kabonero ka bulabe eri omulwadde omusujja nga bwe kiri mu ndagiriro ya iCCM.
    - Kituufu
    - Kikyaamu

11. Kirungi abaana abalina obubonero obw’akabi balina okujjanjabibwa ku mutendera gwa VHT.
    - Kituufu
    - Kikyaamu

EKITUNDU C: ENDOWOOZA ZA BA VHT KU iCCM

12. iCCM nkola nnungi nnyo ey’okukendeeza ku kufa kw’abaana mu kitundu kyange.
    - Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
13. Ndi mugumu mu busobozi bwange okuzuula n’okujjanjaba omusujja, ekiddukano n’ekifuba.
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
14. Obuvunaanyizibwa bwa iCCM byongera omulimu munene ku mirimu gye nkola kati nga VHT
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
15. Mpulira nga mpagirwa ekimala okuva mu bakozi b’ebyobulamu mu kitundu okukola obuvunaanyizibwa bwange obwa iCCM.
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya

- Sikkiriziganyiza ddala

16. Ndi mumativu n’ebintu ebitali bya nsimbi bye nfuna mu mulimu gwange ogwa iCCM
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
17. Abantu b’omukitundu beesiga obusobozi bwange okwekenneenya n’okujjanjaba abaana baabwe nga VHT.
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
18. Ebikozesebwa n’eddagala ebimpeebwa bimala omulimu gwange.
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
19. Enteekateeka ya iCCM etegekeddwa bulungi mu kitundu kyange.
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala
20. Nfuna okulambulwa n’okuyambibwa okumala okuva mu kitongole ky’ebyobulamu.
    - • Nzikiriziganya nnyo
    - Nzikkiriza
    - Sisalawo
    - Sikkiriziganya
    - Sikkiriziganyiza ddala

EKITUNDU D: EMPEREZA YA BA VHT WANSI WA iCCM

21. Bulijjo nkozesa Rapid Diagnostic Test (RDT) okukakasa omusujja nga sinnawaayo bujjanjabi.
    - Yee
    - Nedda
22. Bwe mba nkebera omusujja, bulijjo nkebera olunaku RDT lw'eggwaako.
    - Yee
    - Nedda
23. Bulijjo mbala enzisa okwekenneenya abaana oba balina ekifuba nga sinnasalawo ku ngeri gye nnyinza okukolamu.
    - Yee
    - Nedda
24. Bulijjo mpandiika ebikwata ku balwadde mu kitabo.
    - Yee
    - Nedda
25. Bulijjo abaana abalina obubonero obw'akabi mbasindika mu bifo eby'awagulu.
    - Yee
    - Nedda
26. Bulijjo mpa abalwadde bange ddoozi enzijuvu nga bazuuliddwa.
    - Yee
    - Nedda
27. Bulijjo mpaayo lipoota yange eya buli luvannyuma lwa myezi esatu eri eddwaliro.
    - Yee
    - Nedda

EKITUNDU E: ENSONGA EZEKUUSA KU KUMANYA, ENDOWOOZA N'ENEYISA YA BA VHT KU iCCM

28. Wafuna okutendekebwa mu iCCM?
    - Yee
    - Nedda
29. Okutendekebwa kwo ga VHT ku mpeereza ya iCCM kwamala bbanga ki?
    - Wansi w'omwezi

- Omwezi gumu (1)

30. Okutendekebwa kwo okwasembyeyo kwaliwo bbanga ki?
    - Wansi w'emyezi 6
    - Emyezi 6 ku 12
    - Emyezi egisoba mu 12
31. Omaze bbanga ki ng'oweereza nga VHT?
    - Emyezi egikka wansi 6
    - Emyezi 6 ku 12
    - Emyezi egisoba mu 12