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# Effectiveness of Community Health Promoters' Health Education Programs in Increasing Adoption of Malaria Preventive Practices in Nyakach Sub-County, Kenya

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***Abstract:*** *The Kenyan government spends an estimated 12.4 billion shillings annually on malaria control measures, including the deployment of Community Health Promoters (CHPs). CHPs are tasked with conducting malaria surveillance, offering treatment through community case management (CCMm), and delivering health education on prevention. Despite these efforts, lake endemic areas such as Nyakach Sub-County continue to record malaria prevalence as high as 25.5%, above the national average of 17.1%. This study sought to examine the effectiveness of community health promoters' education programs in increasing adoption of Malaria preventive practices among community members in Nyakach Sub-County. Guided by Andersen's behavioral model, the study adopted a cross-sectional, mixed-methods design, combining quantitative and qualitative approaches to ensure robust triangulation of results. A household survey of 384 respondents sampled using proportional cluster sampling, provided the quantitative data, while qualitative insights were drawn from focus group discussions with 36 CHPs and interviews with 5 public health officers (PHOs). Household-level data was analyzed using descriptive statistics, Pearson correlations, regression, and ANOVA to measure the effectiveness of CHP health education programs on increasing adoption of malaria preventive practices, while qualitative data was thematically analyzed to complement the quantitative findings. The findings reveal a positive correlation between number of health education sessions attended and the adoption of preventive practices (r = 785), meaning the more education sessions attended, the higher the adoption rate. The $R^2 = 0.615$ depicts a 61.5% prediction rate of the adoption of malaria prevention mechanisms. The study concludes that CHP-led health education significantly improves adoption of malaria preventive practices, with qualitative findings showing sustained community behavior change through repeated sessions. The study recommends institutionalizing frequent education sessions, tailoring messages to suit literacy levels, leveraging peer reinforcement, and integrating education with material support to overcome economic barriers. The study demonstrates that CHP health education programs can be effective in increasing adoption of malaria preventive practices, thereby contributing to the reduction of malaria prevalence in endemic regions.*

***Key words:*** *Community Health Promoters, Health Education Programs, Malaria Preventive Practices, Malaria Surveillance, Andersen's Behavioral Model*

## 1.1 Background of the Study

Community Health Promoters (CHPs) play a crucial role in controlling malaria and managing its effects. In Kenya, CHPs utilize strategies such as active surveillance, case management, and health education to combat malaria (Ministry of Health [MOH], 2022). Literature continues to show however that despite

numerous interventions, malaria remains a heavy burden on healthcare structures, economies, and communities, in particular in emerging nations (WHO, 2021; WHO, 2022; WHO, 2023). According to the World Malaria (2024) cases of malaria in the world in 2023 reached 263 million and resulted in 597,000 deaths. This is an upward rise of approximately 11 million occurrences reported in 2022 and approximately the same number of deaths.

In Kenya, despite substantial investments in malaria control programs, including Kenya's National Malaria Strategy (2021-2025), the disease remains a leading cause of morbidity and mortality in lake-endemic regions such as Nyakach Sub-County (MOH Kenya, 2023). Although CHPs are instrumental in health education, high malaria prevalence persists in the area, suggesting gaps in implementation of CHP led health programs (Cohen et al., 2022). Addressing these challenges is essential for achieving sustained malaria reduction in high-burden settings. Health education is a critical component of malaria control, directly influencing preventive behaviors such as the consistent use of insecticide-treated nets (ITNs), adherence to indoor residual spraying (IRS), and timely healthcare-seeking (WHO, 2023). CHPs play a pivotal role in driving these efforts through community awareness campaigns, which have been shown to increase knowledge and adoption rates of malaria interventions (Keven et al., 2022). However, persistent knowledge gaps, cultural beliefs, and misconceptions particularly regarding malaria transmission and treatment efficacy continue to hinder intervention uptake (Ansong et al., 2022).

This study therefore sought to evaluate whether the contributions of CHP led health programs are effective in increasing the adoption of malaria preventive practices and provide recommendations to enhance their role in reducing malaria prevalence. By addressing these gaps this research seeks to identify and valorize feasible community-led malaria control strategies as practiced on the ground. These strategies will, hopefully inform public health professionals on the most effective mitigation measures of malaria, besides adding to body of knowledge in monitoring and evaluation by producing evidence-based data that can inform resource allocation in malaria mitigation strategies.

### 1.2 Problem Statement

In Nyakach Sub-county, situated within the Lake Victoria malaria-endemic region, the malaria prevalence rate stands at 25.5%, surpassing the national average of 17.1% (KNBS et al., 2022). In response, the Kenyan government has deployed CHPs to implement health education programs focused on promoting malaria prevention strategies, aimed at alleviating this burden (Sunguya et al., 2017; Monroe et al., 2022). Despite the established role of CHPs in malaria reduction efforts in Nyakach, the region continues to experience alarmingly high prevalence rates. This reality prompted the Ministry of Health to critically evaluate the effectiveness of CHPs education programs in addressing malaria within the community (Ministry of Health, 2022). The disparity between the reported efficacy of CHPs and the troubling malaria statistics indicates a potential misalignment of health strategies and policies in Nyakach, indexing the need for empirical data to effectively guide interventions in the region (KMIS, 2020). Furthermore, the scarcity of specific quantitative data pertaining to Nyakach Sub-County limits the ability to ascertain whether the initiatives undertaken by CHPs yield significant reductions in malaria cases, revealing a crucial gap in our current understanding. This study seeks to address this empirical gap by assessing the effectiveness of CHPs' health education programs in increasing adoption of malaria preventive practices in Nyakach Sub-County, Kenya.

### 1.3 Study Objective

The study's main objective was to assess the effectiveness of CHPs' health education programs in increasing adoption of malaria preventive practices among community members in Nyakach Sub-County, Kenya. To facilitate the achievement of this objective, the study adopted a conceptual framework with effectiveness of health education as the main predictor of malaria mitigation (Fig. 1).

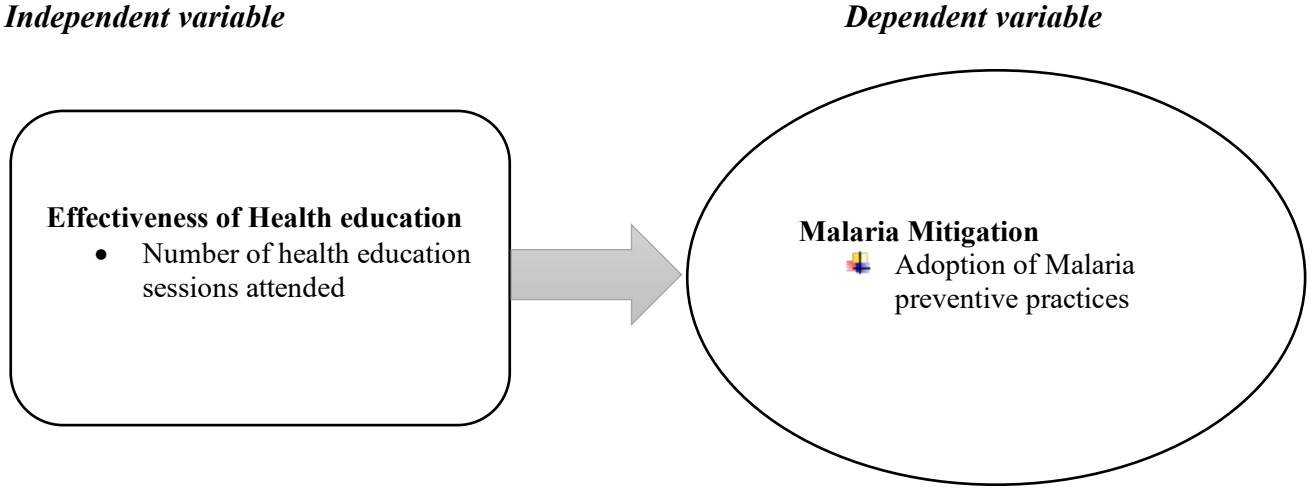


**Figure 1:** *Conceptual Framework*
**Source:** *Researcher, 2024*

### 1.5 Literature Review

The study adopted the Andersen's Behavioral Model (ABM) of health services use as the main analytical framework. Originally formulated by Ronald M. Andersen in the 1960s, ABM provides a comprehensive theoretical framework for examining the influence healthcare accessibility and utilization (Andersen, 1968; Andersen & Newman, 1973). This model is particularly pertinent in the realm of Community Health Workers (CHWs), including Community Health Promoters (CHPs), as it highlights the interplay between individual, societal, and systemic determinants that influence healthcare-seeking behavior. The model organizes the determinants of healthcare utilization into three principal domains: predisposing factors, enabling factors, and need factors. Andersen (1995) describes predisposing factors as individual characteristics such as age, gender, education, and cultural beliefs that shape individuals' attitudes toward healthcare services. Gelberg et al. (2000) classify enabling factors as logistical and structural resources that either facilitate or impede access to healthcare; these include healthcare infrastructure, provider availability, and financial capacity. Furthermore, Aday and Andersen (1974) identify need factors as both perceived and evaluated health needs that drive individuals to pursue medical care.

By employing this model, policymakers and public health practitioners can formulate targeted interventions that effectively address barriers to healthcare access, especially in underserved communities. This framework not only aids in the identification of barriers but also facilitates the development of strategies that promote equitable healthcare delivery. Applying this model to the role of Community Health Promoters (CHPs) health education programs in malaria prevention deepens our understanding of how various factors influence community perceptions of malaria prevention.

Predisposing factors shape these perceptions, enabling factors determine the reach and effectiveness of CHPs, and need factors influence the demand for malaria-related healthcare interventions. By enhancing these enabling factors such as improving training and resources for CHPs the effectiveness of malaria surveillance, case management, and health education can be greatly improved. This model provides a focused framework for evaluating and optimizing the impact of CHPs in reducing malaria prevalence in Nyakach Sub-County.

Empirically, creating health awareness is necessary in curbing malaria as it enhances peoples' understanding and promotes healthy habits that aid in minimizing the prevalence of the disease. Esse et al. (2008) assert that health education is essential in advancing desirable health-seeking behaviors. Similarly, health education boosts knowledge of preventative actions, which are needed for the efficient control of malaria. Health education allows citizens to acquire knowledge they need to safeguard themselves and check disease spread by providing them with information about malaria prevention and control. Likewise, Moh et al. (2022) observed that public education is a vital factor in allowing society embrace preventative action against malaria. By undertaking preventive approaches and adopting educated choices, communities can minimize the burden of malaria (Owek et al., 2017; Ishizumi et al., 2021). In the same vein, Nekesa et al (2022) research revealed human behavior plays a notable function in curbing Malaria in endemic zones. Outcome of the study highlighted that innovative behavior shifts strategies that are needed to ascertain people establish habits to minimize Malaria cases. These are sleeping under treated nets plus draining stagnant water. Findings of the study further alluded that positive behaviors must be consistently emphasized through health education for people to sustain them.

In recent years, China has made impressive strides toward the eradication of malaria. Research was done by Tang et al. (2016) to evaluate the level of public awareness about malaria at the moment. Using a standardized questionnaire, 1,321 people from nine malaria-endemic areas were questioned. Outcomes depicted that 51.6% of the responders knew enough about malaria. At least one method of malaria prevention was known to 74.9% of survey participants, and 85.2% said they would seek medical attention if they became sick with the disease. The study concluded that there is a constant need to raise public knowledge about malaria. Health education initiatives should target at-risk communities and emphasize fundamental information about malaria. To continue eradicating malaria, health education should ensure that even the dispersed villages are included in the system (Tang et al., 2016).

In Nigeria, Olorunfemi et al. (2013) examined how health education interventions affected malaria prevention among rural nursing moms. CHPs routinely educating nursing mothers minimizes the risk of malaria for mother and child (Olorunfemi et al., 2013). The study showed that most African cultures promote mosquito breeding. Poverty prevents at-risk people from using malaria-fighting technologies. Community-based treatments may enhance health significantly. When neighborhood CHPs target these behavioral and cultural patterns, the improvements are very considerable (Olorunfemi et al., 2013).

Abdulahi and Abubakar (2019) examined the challenges linked to malaria eradication in Sub-Saharan Africa. Researchers concluded that environmental factors, including inadequate sanitation and hygiene practices, overgrown vegetation, and inadequate waste management, significantly contribute to more malaria incidence and prevalence. Social dimensions like poor sanitation and hygiene in a community are understood by CHPs at community level. In Kenya, CHPs carry out frequent household follow up visits to assess and educate citizens on proper sanitation and hygiene. Moreover, in-cooperating CHPs

to carry out health education in communities prevents occurrence of Malaria (Madagascar Malaria Control Program, 2019).

From the foregoing, there are several gaps in existing literature pertaining to Community Health Promoters (CHPs) work in awareness creation as a means to reduce malaria cases. Specifically, there exists a necessity for additional investigation regarding the efficacy and enduring viability of CHP led health education interventions in enhancing communal knowledge and fostering preventive behaviors. Furthermore, insufficient research remains concerning the influence of health education on modifying behaviors and its subsequent implications for the prevalence of malaria. Gaining insight into the various determinants that impact behavioral modification, as well as identifying the obstacles and enablers that affect the acceptance and continuity of preventive measures, would hold significant academic merit. Furthermore, it is imperative to allocate greater emphasis on effects of environmental elements on the occurrence and prevalence of malaria. Community health promoters (CHPs) can reduce social determinants that cause malaria and therefore should be studied to curb high incidence of malaria prevalence in Nyakach Sub-County, located in Kisumu County.

### 1.6 Research Methodology

***Research design:*** This research employed a cross-sectional design. It was applicable to determine prevalence of expected results within a certain cohort. This technique allowed researcher to analyze different characteristics and perform investigations at the same instant into the link between numerous variables and the desired results.

***Study Area:*** The research was performed in Nyakach Sub-County, an administrative unit of Kisumu County. Nyakach, a rural setting possesses diverse cosmopolitan populace. It consists five wards and inhabited by 150,319 people (KNBS, 2019). Nyakach is neighbor to Homa Bay, Nyamira and Kericho Counties. Fishing is the dominant activity for livelihood. Major community is Luo and plus other tribes that is Kalenjin, Luhya and Gusii. The administrative wards are West Nyakach, Central Nyakach, North Nyakach, South West Nyakach and South East Nyakach. This study involved all the wards.

***Sample size determination for quantitative design*:** Entire households in Nyakach formed the target population. In the 2019 national census, 35,553 households with an overall population of 150,319 citizens were recorded. The need to target this population was because they are located in an endemic region. To ascertain statistical robustness and generalizability, it was necessary sample size for quantitative aspect to be adequately large alongside exemplifying target population. Pursuant to Mugenda and Mugenda (1999), determining a sample size of 384 is adequate if the population surpasses 10,000. It is regarded suitable to realize a 95% confidence level and 5% precision. Study population for this particular investigation comprises 35,553 households located within Nyakach Sub County. Mugenda & Mugenda (1999) sample size formula was used to select 384 households in Nyakach Sub-County for this study.

***Sampling methods and respondent selection:*** To pick a representative sample from target population, cluster sampling was utilized. The measuring unit was the household. Cluster sampling is convenient to use in studying large, geographically diverse populations. This technique is time and cost-efficient for Nyakach's dissimilar population. It would otherwise be hectic and costly to survey the entire five clusters. Size of sample for each cluster was proportional to cluster's population size.

*Table 1: Distribution of the sample across clusters*

| Cluster | Number of households | Sample size |
|---|---|---|
| **North Nyakach** | 8,263 | 83 |
| **Central Nyakach** | 4,492 | 53 |
| **West Nyakach** | 12,434 | 98 |
| **South East Nyakach** | 6,628 | 86 |
| **South West Nyakach** | 3,736 | 64 |
| **Total** | **35,553** | **384** |

**Source:** ***Field data, 2025***

Per cluster, families sampled were proportionately spread out depending on sum of households in a ward. Families seen per ward were randomly picked at random. Simple random technique allowed every household to have a similar possibility of being picked. Every household had an enumerator interview the family head. In instances where he/she was unavailable, partner to the head or other mature person in the family was interviewed. If adults of a chosen family were absent or refused to participate, the nearest family was seen. Households were pointed out through random walk technique established by UNICEF/WHO (Zeller, 2000). A ward's center became the commencing place, established by community guides assistance. By twirling a pen, the household closest to the tip was chosen first. Subsequent households came after the chosen direction. Enumerators utilized skip trend to pick adjacent household. The trend of skipping was arrived at by sharing entire households by the sample size.

***Qualitative sampling and selection of respondents:*** The researcher used purposeful sampling to identify CHPs and PHOs to participate in the study. The method helped the researcher select CHPs and PHOs who were actively engaged in Malaria education programs in Nyakach Sub County. Nyakach has a total of 390 CHPs (Nyakach Sub County Health Workers Records, 2023). This number formed the sampling frame. The CHPs were categorized by ward. From each ward, the researcher used an inclusion criterion to select 8 CHPs for each ward as a respondent in the focus group discussion. The inclusion criteria were that the CHP had been in active service in the last 12 months, there was documented engagement in malaria activities during the preceding quarter, and availability during the data collection period. Applying these criteria within each ward led to the selection 8 CHPs for each of five FGDs (n = 40). This size and structure are consistent with qualitative guidance that thematic saturation is commonly achieved with 4–6 FGDs of 6–8 participants (Krueger & Casey, 2015). Each ward has a PHO who supervises all the CHPs in the ward. The PHOs in each of the five wards was a key informant who provided information on supervisory perspectives and triangulate FGD and survey findings.

***Data collection:*** The study collected numeric data at household level and triangulated it with qualitative interviews. On the study objective, health education, the study recorded the number of malaria education sessions attended in the last three months and directly observed adoption of preventive practices at the home using a checklist. Qualitatively, the study held five focus group discussions with CHPs and conducted key informant interviews with all five ward Public Health Officers. These interviews explored surveillance workflows, stock-outs of CCMm kits, and barriers to household adoption of preventive practices. The qualitative data was used to triangulate the household survey findings and to explain gaps where quantitative patterns are unclear.

***Data analysis and presentation:*** Quantitative data were coded, cleaned, and entered into SPSS for statistical analysis. Descriptive statistics, including means, standard deviations, counts, and proportions, were used to summarize the data and provide an overview of household characteristics and key study variables. Inferential analysis was then applied to test the study variables. Qualitative data from focus group discussions with CHPs and key informant interviews with ward PHOs were transcribed verbatim and analyzed thematically.

## 1.7 Study Findings

### *Response Rate*

There was 100% return rate of questionnaires that were administered. This response rate was possible since the researcher and enumerators sought feedback from responders.

### *Proportion of households with children under 5 years*

An analysis of respondents regarding children under the age of five revealed that each household has an average of two children in this age group, as shown in Table 2. Research conducted by Sarfo et al. (2023) indicated that children under five account for over two-thirds of malaria fatalities in sub-Saharan Africa. Consequently, households in Nyakach sub-county contain individuals who are particularly vulnerable to malaria outbreaks.

*Table 1: Children under five years*

| Children Under 5 Years | | |
|---|---|---|
| N | Valid | 384 |
| | Missing | 0 |
| Mean | | 2.01 |
| Median | | 2.00 |
| Std. Deviation | | 1.446 |
| Range | | 4 |
| Minimum | | 0 |
| Maximum | | 4 |

**Source:** *Field data, 2025*

### *Occupation of responders*

An analysis of the respondents' occupations shows that farming is the dominant occupation. Central Nyakach ward has the highest number of farmers at 9.38% as illustrated in Figure 2

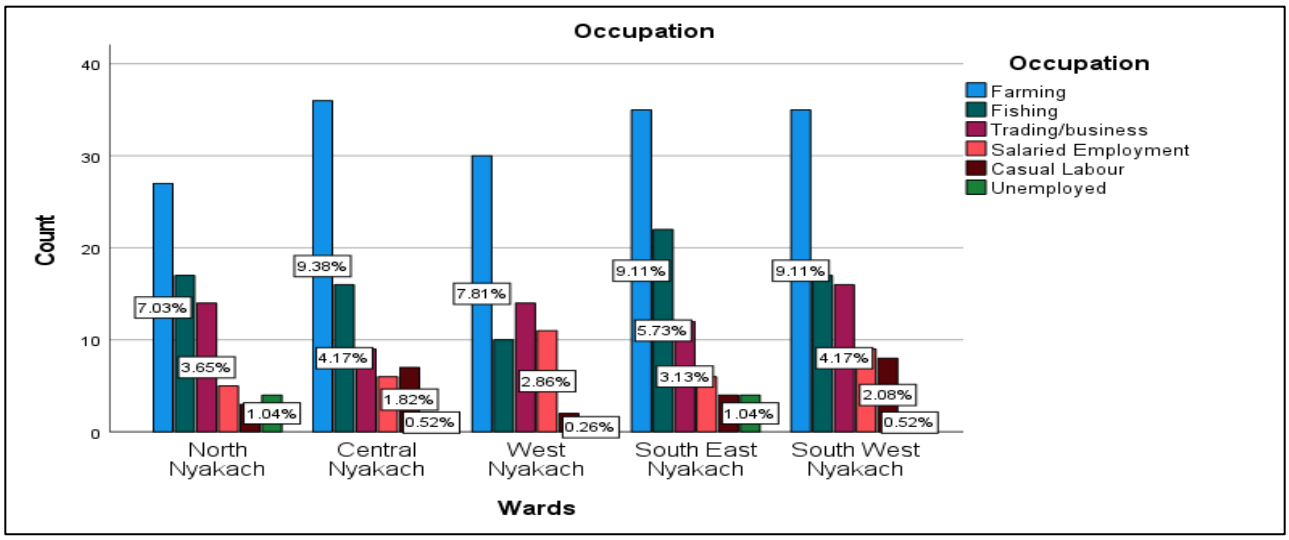


***Figure 2:*** *Respondents' occupation*
***Source:*** *Field data, 2025*

The data indicate that while farming constitutes the primary occupation among respondents, the majority engage in subsistence farming. This trend suggests that the agricultural activities undertaken by these individuals primarily serve to fulfil household food needs. As a result, investments in additional resources aimed at malaria prevention such as treated mosquito nets or insecticides are likely deprioritized due to limited financial means. Consequently, the efficacy of malaria prevention practices within these households may be compromised, raising concerns about their overall health and well-being in the context of financial stability.

### *Respondent's highest education level*

According to Sharma et al. (2003), education levels significantly influence malaria prevention efforts. A higher level of education is associated with a better understanding of malaria, underscoring the importance of literacy in preventive measures. Table 3 illustrates that the majority of respondents, at 40.9%, attained only a primary level of education. A Chi-square test conducted as in Table 3 to assess the relationship between education levels and the wards within the sub-county revealed no significant relationship. This indicates that the level of education is independent of the wards in the region. Consequently, the findings suggest that the influence of education on malaria prevention in this area is not dependent on the wards, as they share similar predisposing factors regarding education levels.

*Table 2: Respondents' educational level*

| | Wards | | | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North Nyakach | | Central Nyakach | | West Nyakach | | South East Nyakach | | South West Nyakach | | | |
| | N | % | N | % | N | % | N | % | N | % | N | % |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Education Level | None | 14 | 20.0% | 15 | 19.7% | 5 | 7.4% | 14 | 16.9% | 14 | 16.1% | 62 | 16.1% |
| | Primary Level | 26 | 37.1% | 27 | 35.5% | 22 | 32.4% | 42 | 50.6% | 40 | 46.0% | 157 | 40.9% |
| | Secondary level | 23 | 32.9% | 24 | 31.6% | 33 | 48.5% | 16 | 19.3% | 23 | 26.4% | 119 | 31.0% |
| | Tertiary Level | 7 | 10.0% | 10 | 13.2% | 8 | 11.8% | 11 | 13.3% | 10 | 11.5% | 46 | 12.0% |
| Total | | 70 | 100.0% | 76 | 100.0% | 68 | 100.0% | 83 | 100.0% | 87 | 100.0% | 384 | 100.0% |

**Source:** *Field data, 2025*

*Table 4: Level of education Chi-Square tests*

| Chi-Square Tests | Value | Df | Asymptotic Significance (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 20.530[a] | 12 | .058 |
| Likelihood Ratio | 20.861 | 12 | .052 |
| Linear-by-Linear Association | .126 | 1 | .722 |
| N of Valid Cases | 384 | | |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.15.

**Source:** *Field data, 2025*

***Duration of stay in the community***

The length of residency in a particular community impacts the level of knowledge regarding key issues affecting that community, such as malaria. It was noted that most participants had resided in the study area for over five years, concluding that the information they provided was sufficient and reliable. A central tendency analysis conducted on the duration of stay among respondents revealed a mean of 25.35 years, with a standard deviation of 14.02. This indicates that most respondents have lived in Nyakach sub-county for more than 25 years, suggesting they possess ample knowledge to offer valuable insights on the subject matter.

***CHPs' role in health education programs in increasing malaria prevention knowledge among community members***

This section provides findings on the effect of health education on malaria availed by community health promoters. It is noted that health education is invaluable in confronting malaria because it increases community understanding and encourages healthy habits that help to lower the prevalence of the disease. The benefits of health education in encouraging proper health-seeking conduct and improving knowledge of preventative measures, both of which are essential for the efficient control of malaria, are stressed by Esse et al (2008).

***Health education received from community health promoters***

As shown in Table 4.19, 16.9% (n=65) of respondents had not engaged with community health promoters (CHPs) or had household members do not attend an education. The descriptive revealed a mean of 1.67, depicting an average of at least two education sessions per household in the last three months (Table 5). This highlights that a considerable number of respondents, or individuals within their households, attended malaria education sessions led by CHPs. Consequently, this knowledge should be integrated into malaria reduction strategies, such as preventative practices.

**Table 5: Education sessions attended**

| **Education sessions attended** | | |
|---|---|---|
| Number of sessions in the last 3 months | N | % |
| 0 | 65 | 16.9% |
| 1 | 120 | 31.3% |
| 2 | 113 | 29.4% |
| 3 | 61 | 15.9% |
| 4 | 17 | 4.4% |
| 5 | 4 | 1.0% |
| 6 | 3 | 0.8% |
| 7 | 1 | 0.3% |

***Source:*** *Field data, 2025*

*Table 6: Statistics of education sessions attended*

| **Statistics of education sessions attended** | | |
|---|---|---|
| N | Valid | 384 |
| | Missing | 0 |
| Mean | | 1.67 |
| Median | | 2.00 |
| Std. Deviation | | 1.227 |
| Variance | | 1.506 |
| Minimum | | 0 |
| Maximum | | 7 |

***Source:*** *Field data, 2025*

To further investigate the influence of the community health promoters' education on malaria reduction in the Nyakach sub-county, Pearson correlation was used to establish the strength and direction of the relationship between education sessions and adoption scores. As shown in Table 4.21, r = 785 depicts enough statistical evidence to justify a strong positive relationship between the number of education sessions and adoption rate.

*Table 7: Malaria prevention practice*

| **Correlations** | | | |
|---|---|---|---|
| | | Sessions attended | Adoption rate |
| Education sessions attended | Pearson Correlation | 1 | .785** |
| | Sig. (2-tailed) | | .000 |
| | Sum of Squares and Cross-products | 576.656 | 98.594 |
| | Covariance | 1.506 | .257 |
| | N | 384 | 384 |
| Adoption rate | Pearson Correlation | .785** | 1 |
| | Sig. (2-tailed) | .000 | |
| | Sum of Squares and Cross-products | 98.594 | 27.365 |
| | Covariance | .257 | .071 |
| | N | 384 | 384 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Source**: *Field data, 2025*

Adoption of malaria preventive measures within Nyakach sub-county was high, with only 1.8 % (n=7) of the respondents recording nil adoption of malaria preventive measures (Table 8).

**Table 8: Malaria preventive measures adoption rate**

| Adoption counts in the last 3 months | N | % |
|---|---|---|
| 0 | 7 | 1.8% |
| 1 | 25 | 6.5% |
| 2 | 32 | 8.3% |
| 3 | 41 | 10.7% |
| 4 | 65 | 16.9% |
| 5 | 63 | 16.4% |
| 6 | 46 | 12.0% |
| 7 | 63 | 16.4% |
| 8 | 42 | 10.9% |

***Source:*** *Field data, 2025*

***Simple linear regression between the number of education sessions and the rate of preventive measures adoption***

A simple linear regression was done to determine the strength of the relationship between the frequency of education sessions and the rate of adoption of malaria preventive measures.

*Table 9: Simple linear regression between the number of education sessions and the rate of adoption of malaria preventive measures*

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .785[a] | .616 | .615 | .165851 | .616 | 612.837 | 1 | 382 | .000 | 2.113 |

a. Predictors: (Constant), sessions_attended
b. Dependent Variable: adoption_rate

The analysis revealed a positive correlation (r = 785), where the more education sessions attended, the more the adoption rate. The $R^2 = 0.615$ depicts a 61.5% prediction rate of the adoption of malaria prevention mechanisms (Table 10). An analysis of variance (ANOVA), as shown in Table 9 (p-value = 0.00), provides statistical justification for a relationship between the adoption rate of malaria prevention practices and the frequency of education sessions attended.

**Table 10: Analysis of variance between the adoption rate and the education sessions attended**

**ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 16.857 | 1 | 16.857 | 612.837 | .000[b] |
| | Residual | 10.508 | 382 | .028 | | |
| | Total | 27.365 | 383 | | | |

a. Dependent Variable: adoption_rate
b. Predictors: (Constant), Sessions_attended

***Source:*** *Field data, 2025*

ANOVA was used to determine whether the overall model was statistically significant, and coefficient analysis was employed to interpret the expected change in adoption score for each additional education session attended. Table 11 illustrates a predictability model for the adoption rate in relation to the

frequency of education sessions attended in the form of y = 0.171x + 0.313 (where 'y' is the adoption rate and 'x' is the frequency of education sessions attended.

*Table 11: Adoption rate predictability model*

| **Coefficients[a]** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | 95.0% Confidence Interval for B | |
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | .313 | .014 | | 21.871 | .000 | .285 | .341 |
| | sessions_attended | .171 | .007 | .785 | 24.756 | .000 | .157 | .185 |

a. Dependent Variable: adoption_rate

**Source:** *Field data, 2025*

Qualitative data analysis from the focus group discussion confirmed what the quantitative data revealed. For example, it was reported that

> "*Community Health Promoters in Nyakach observed significant improvements in household health practices following repeated educational sessions. Residents began to properly hang and maintain mosquito nets, clean their surroundings, cover water containers, and reduce stagnant water, which were previously considered normal. The effectiveness of these practices increased with each session, as individuals not only adopted multiple prevention measures but also started to remind their neighbors about health practices. Consequently, areas with frequent education saw a greater commitment to health actions compared to those where teaching was infrequent." (FGD-CHP1, 2025).*

Analysis of the Public Health Officers (PHO) interview data confirms the same information as the focus group discussion on improvement in health practices with the frequent education sessions. Public health offices pointed out that

> *"Frequent educational sessions led by community health promoters (CHPs) have significantly improved public health practices in Nyakach. Residents are increasingly taking preventive measures against mosquitoes, such as hanging nets nightly, covering water containers, and maintaining cleaner surroundings. Over time, as households attend more sessions, they become more proactive, fixing holes in nets, installing screens, and eliminating standing water. Practical demonstrations enhance understanding and retention of these practices, resulting in visible changes within the community. Increased attendance correlates with better implementation of good health practices, highlighting the importance of repeated messaging and community engagement in promoting preventive actions" (PHOs-I1, 2025).*

The quantitative analysis demonstrated a strong and statistically significant relationship between the frequency of community health education sessions and the adoption of malaria prevention practices. As shown above, the Pearson correlation coefficient ($r = 0.785$, $p = 0.000 < 0.05$) confirmed a strong positive relationship, while the $R^2$ value of 0.615 indicated that 61.5% of the variation in adoption scores could be predicted by the number of education sessions attended. The regression model ($y = 0.171x + 0.313$) further highlighted that each additional education session attended increased the adoption score by 0.171 points. ANOVA results ($p = 0.000$) confirmed that the overall model was statistically significant. Adoption levels were generally high, with only 1.8% (n=7) of respondents reporting nil adoption of

malaria preventive measures, while the descriptive mean of 1.67 suggested that households attended at least two sessions within three months.

The qualitative findings triangulated these results by emphasizing how frequent education sessions by CHPs enhanced household practices. Focus group discussions revealed that repeated sessions led residents to consistently use mosquito nets, cover water containers, clean surroundings, and eliminate stagnant water, while also encouraging peer-to-peer reminders. Similarly, Public Health Officers confirmed that consistent education fostered proactive behaviors such as fixing damaged nets, installing screens, and improving hygiene practices. Together, these findings underscore that frequent and repeated community education is a key driver of malaria prevention adoption in Nyakach.

## 1.8 Conclusion

This study assessed the effectiveness of CHPs health education programs in increasing the adoption of malaria preventive practices in Nyakach Sub-County. The findings demonstrated a strong positive correlation ($r = 0.785$, $R^2 = 61.5\%$) between the number of education sessions attended and household adoption of preventive practices, with each additional session raising adoption scores by 0.171 points. Adoption levels were high, with more than 83% of households reporting four or more preventive practices, while qualitative evidence confirmed that repeated sessions reinforced behaviours such as consistent net use, environmental sanitation, and peer-to-peer reminders. The study therefore concludes that CHP-led health education programs are effective in increasing adoption of malaria preventive practices. These results affirm that CHP led health programs play a decisive role in reducing malaria prevalence in endemic regions.

## 1.9 Recommendations

Flowing from the above conclusion, the study recommends institutionalizing regular CHP-led malaria education sessions, as the analysis showed that each additional session increased adoption scores by 0.171 points and households attending more sessions consistently practiced more preventive measures. Similarly, the study recommends tailoring health education to literacy levels, noting that 40.9% of respondents had only primary education, and that PHOs emphasized the effectiveness of demonstrations. Therefore, education session should incorporate the use visual aids, local languages, and practical demonstrations. Another recommendation is to leverage peer-to-peer reinforcement, since focus group discussions revealed households not only adopted preventive practices but also reminded neighbors to hang nets, clean surroundings, and cover containers. Identifying and supporting malaria champions would strengthen this effect. Finally, the study recommends integrating health education with material and environmental support, as most respondents were subsistence farmers facing economic constraints. Including complementary measures such as net distribution, sanitation campaigns, and vector control drives essential to ensure sustained adoption of preventive practices.

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