

Perceptions and Attitudes of Community Health Promoters Towards Utilization of Electronic Community Health Information System in Management of Malaria in Nyalenda B Ward, Kisumu County, Kenya

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ABSTRACT

Digital health technologies are increasingly recognized as important tools for strengthening primary healthcare systems and advancing Universal Health Coverage (UHC). In Kenya, the Ministry of Health introduced the electronic Community Health Information System (eCHIS) to support Community Health Promoters (CHPs) in delivering and reporting community-based health services. However, evidence on its utilization in malaria-endemic settings remains limited. This study assessed the perceptions and attitudes of Community Health Promoters towards utilization of eCHIS in malaria management in Nyalenda B Ward, Kisumu County. An analytical cross-sectional mixed-methods study was conducted among 66 CHPs. Quantitative data were collected using semi-structured questionnaires and analyzed using descriptive statistics while qualitative data were collected through focus group discussions and key informant interviews and analyzed thematically. Overall, 63.6% of CHPs demonstrated high eCHIS utilization. Most respondents agreed that eCHIS improved management of community health activities (93.9%), made work easier (93.9%), enhanced community trust (81.8%), increased satisfaction (87.9%), and motivated continued use (86.4%). Qualitative findings showed that CHPs perceived eCHIS as useful for reducing paperwork, improving efficiency, strengthening community trust, and enhancing service delivery despite initial challenges in adapting to smartphone-based reporting. The study concludes that Community Health Promoters had positive perceptions and attitudes towards eCHIS utilization, demonstrating strong acceptance of the system for malaria management. Maintaining positive user experiences through continuous engagement and support may promote sustained utilization of eCHIS in community-based malaria management.

Keywords: Electronic Community Health Information System, Community Health Promoters, Malaria Management, Perceptions and Attitudes, Digital Health

INTRODUCTION

Digital health technologies have become an important strategy for strengthening health systems globally through improved data management, communication, service delivery, and decision-making (Borges do Nascimento et al., 2023). The World Health Organization's Global Strategy on Digital Health 2020–2025 emphasizes the integration of digital technologies into health systems to improve efficiency, quality of care, and access to health services, particularly in low- and middle-income countries (WHO, 2025).

In Kenya, the Ministry of Health introduced the Electronic Community Health Information System (eCHIS) as part of the Community Health Digitization Strategy 2020–2025 to strengthen community-level data collection, reporting, and utilization (MOH Kenya, 2021). The system was designed to address persistent challenges associated with paper-based reporting systems, including poor-quality data, delayed reporting, fragmented records, inadequate follow-up mechanisms, and limited visibility of community health information for decision-making (MoH Kenya, 2021). Through smartphone-based applications, eCHIS enables Community

Health Promoters (CHPs) to register households, document service delivery, submit reports electronically, and access decision-support tools that support routine community health services (Living Goods, 2023). Community Health Promoters are a critical component of primary healthcare and play a significant role in health promotion, disease prevention, disease surveillance, referral services, and reporting of health information at the household level (Kanyaru et al., 2026). In malaria-endemic settings, CHPs contribute to Community Case Management of malaria (CCMm), an approach recommended for improving access to timely diagnosis and treatment among populations with limited access to health facilities (Marita et al., 2022a). Through CCMm, trained CHPs provide malaria health education, perform malaria rapid diagnostic tests, treat uncomplicated malaria cases, refer severe cases, and report community-level malaria data.(Marita et al., 2022a)

Evidence from several countries suggests that digital community health information systems improve reporting efficiency, data quality, service delivery, and accountability among frontline health workers (Marita et al., 2022b). Digital tools also provide job aids that guide health workers through standardized workflows, improve adherence to clinical protocols, facilitate follow-up of clients, and reduce reliance on multiple paper-based tools (Living Goods, 2023).

The Technology Acceptance Model proposes that perceived usefulness and perceived ease of use influence technology acceptance and utilization (Davis, 1989), while the Diffusion of Innovation Theory explains how innovations are adopted and integrated into practice over time among different categories of users. These theories provide a useful framework for understanding factors influencing eCHIS utilization among CHPs.(Guo & Huang, 2024). Studies have shown that health workers are more likely to adopt and utilize digital health systems when they perceive them as useful, easy to use, and capable of improving their work performance(Chraish et al., 2025)

Previous studies have shown that user perceptions and attitudes, age, educational level, digital literacy, training, and motivation can influence the adoption and utilization of digital health technologies (Tegegne et al., 2023).

Kisumu County was among the first counties in Kenya to pilot and scale up eCHIS implementation and has achieved substantial digitization of community health services (Living Goods, 2023). Nyalenda B Ward, an informal settlement within Kisumu County, experiences a high burden of malaria and has implemented both community case management of malaria and eCHIS. Despite substantial investments in digital health, limited evidence exists on the perceptions and attitudes of Community Health Promoters towards eCHIS utilization in malaria management within Nyalenda B Ward. Understanding CHPs' perceptions and attitudes is important for informing strategies to enhance acceptance, promote sustained utilization, and strengthen community-based malaria services.

METHODS STUDY AREA

The study was conducted in Nyalenda B ward; Kisumu County, Kenya. The ward covers an area of 6.1 KM² and has a population of 47,683(KNBS, 2019).

Study design

Analytical cross-sectional study design with a mixed methods approach was used.

Study Population

Nyalenda B ward has a total of 8 Community Health Units (CHUs) with a total of 85 CHPs, among which 66 are utilizing digital tools in the management of malaria.

Sample size determination and sampling procedure

The study used a saturated sample of all the 66 CHPs who have been trained on CCMm. Moreover, Key informants including were purposively selected. The CHPs were randomly picked for inclusion in FGDs participation.

Sampling procedure

An updated list of all CHPs trained in community case management of malaria in Nyalenda B Ward was obtained from the Community Health Assistant and the Kisumu County health records to serve as the sampling frame. A census approach was then used for the quantitative component: whereby all 66 eligible CHPs were invited to participate and approached sequentially at their CHU meetings or during scheduled visits. A written informed consent was obtained before administration of the questionnaire. For the qualitative component, purposive sampling was applied to select key informants, including the program coordinators, eCHIS technical support staff, and Community Health Assistants based on their roles and knowledge of eCHIS implementation. The FGDs used purposive and convenience selection of CHPs to ensure diversity by CHU, gender, and experience with eCHIS. A total of 9 FGDs of 6 participants each was held.

Pretesting

The questionnaire was pretested in Market Milimani Ward and revised accordingly

Data collection tools and procedure

Quantitative data collection

Quantitative data were collected using a structured interviewer-administered questionnaire among all 65 Community Health Promoters trained in community case management of malaria in Nyalenda B Ward. The socio-demographic section captured information such as age, sex, education level, and years of experience as a CHP. The perceptions and attitudes section assessed perceived usefulness, ease of use, motivation, satisfaction, and community trust in the use of eCHIS. The technological factors section assessed system usability, network reliability, charging accessibility, availability of technical support, and device-related challenges. The organizational factors section assessed training adequacy, supervision, mentorship, policy support, and availability of resources required for eCHIS utilization.

Data collection was conducted through face-to-face interviews to ensure completeness of responses and to provide clarification where necessary. The questionnaires were administered in a private setting to promote confidentiality and encourage honest responses. Completed questionnaires were checked daily for completeness and consistency before data entry and analysis

Qualitative Data collection

Qualitative data were collected to provide an in-depth understanding of the experiences, perceptions, and contextual factors influencing utilization of eCHIS among Community Health Promoters. A qualitative approach was employed to complement the quantitative findings and to explore issues that could not be adequately captured through structured questionnaires.

Data were collected through nine Focus Group Discussions (FGDs) conducted among CHPs and eight Key Informant Interviews (KIIs) conducted with Community Health Assistants (CHAs), program coordinators, and eCHIS technical support personnel. Participants for the qualitative component were purposively selected based on their experience and involvement in implementation and supervision of eCHIS.

With participants' consent, discussions were audio-recorded to ensure accurate capture of information. Field notes were also taken to document non-verbal cues, observations, and contextual information that could enrich interpretation of the findings.

Data Analysis and Presentation

Quantitative Data Analysis and Presentation

Quantitative data were collected using structured questionnaires administered through Kobo Toolbox, which enabled real-time data capture and minimized data entry errors. Upon completion of data collection, the dataset was exported to Microsoft Excel for preliminary cleaning. Data cleaning involved checking for completeness,

consistency, missing values, duplicate entries, and outliers. The cleaned dataset was subsequently imported into Stata version 18 for statistical analysis.

Data analysis was conducted according to the study objectives. Variables were coded and recoded appropriately, and composite measures were generated where necessary. Utilization of eCHIS was computed from indicators assessing frequency of use, completeness of data entry, and timeliness of reporting. The composite utilization score was categorized into high and low utilization and used as the dependent variable in subsequent analyses.

Variables analyzed under this objective included perceived usefulness of eCHIS in malaria management, perceived ease of work, community trust in eCHIS-supported services, satisfaction with eCHIS, and motivation to use the system. Descriptive statistics, including frequencies and percentages, were generated to summarize responses. The quantitative findings were presented using frequency tables.

Qualitative data were obtained through FGDs and KIIs. Audio recordings were transcribed verbatim and cross-checked against field notes to ensure accuracy and completeness. The transcripts were reviewed repeatedly to facilitate familiarization with the data before analysis.

The cleaned transcripts were imported into Dedoose software for coding and management of qualitative data. An inductive thematic analysis approach was employed, allowing themes to emerge from participants' experiences and perspectives.

Ethical considerations

To ensure the study was conducted within ethical standards, the Maseno University Ethical Review Committee (MUERC) reviewed and provided approval. License from NACOTSI, permit from Ministry of Health, Sub-County Medical Officer of Health, and the Sub-County Public Health Officer were also sought. Before taking part in the study, participants were informed on the objectives and nature of the study. The participants were informed that participation in the study is voluntary and they are free to withdraw at any point without having to give reasons for their decision and without any consequences for their withdrawal in case they decide to do so. Moreover, the participation of respondents was subject to their own consent.

RESULTS

Summary of Variable Characteristics

A total of 66 Community Health Promoters participated in the study. The majority were female (77.3%, $n=51$), resulting in a male-to-female ratio of approximately 1:3.4. The mean age of respondents was 41.8 years ($SD = 8.1$), with most respondents aged between 40 and 49 years (40.9%) and 30 and 39 years (39.4%). Regarding education, the majority of respondents had attained post-primary education (60.6%), comprising secondary (48.5%) and tertiary (12.1%) education levels. Most respondents (75.8%) had worked as CHPs for more than five years, with a mean duration of work of 5.3 years ($SD = 1.4$).

Table 1: Socio-Demographic Characteristics of Respondents (N =66)

Variable	Category	Frequency (n)	Percentage (%)
Sex	Male	15	22.73
	Female	51	77.27
Education Level	Primary	26	39.39
	Secondary	32	48.48
	Tertiary	8	12.12
Age Category (Years)	20–29	5	7.58
	30–39	26	39.39

	40–49	27	40.91
	50–59	8	12.12
Duration of Work as CHP	≤2 Years	5	7.58
	3–5 Years	11	16.67
	>5 Years	50	75.76

Age (Mean ± SD): 41.8 ± 8.05 years

Years Worked (Mean ± SD): 5.3 ± 1.4 years

Perceptions and Attitudes towards eCHIS utilization

Quantitative Findings

The majority of respondents expressed positive perceptions towards eCHIS. Nearly all respondents (93.9%) agreed or strongly agreed that eCHIS improves management of community health activities, while a similar proportion (93.9%) agreed or strongly agreed that the system makes their work easier. Community trust was also high, with 81.8% reporting that community members always or most of the time trusted information captured using eCHIS. In addition, 87.9% reported being satisfied or very satisfied with eCHIS, while 86.4% agreed or strongly agreed that they were motivated to continue using the system. A small proportion of respondents expressed neutral or negative views, indicating that although acceptance was high, some concerns remained.

Table 2: Perceptions and Attitudes Towards eCHIS Among Community Health Promoters (N= 66)

Statement	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)
eCHIS improves management of community health activities	41 (62.12)	21 (31.82)	3 (4.55)	1 (1.52)
eCHIS makes work easier	46 (69.70)	16 (24.24)	1 (1.52)	3 (4.55)
Community members trust information captured using eCHIS	45 (68.18)	9 (13.64)	10 (15.15)	2 (3.03)
Satisfaction with eCHIS	43 (65.15)	15 (22.73)	3 (4.55)	5 (7.58)
Motivation to use eCHIS	42 (63.64)	15 (22.73)	3 (4.55)	6 (9.09)

Qualitative Findings

Qualitative findings supported the quantitative results and demonstrated generally positive perceptions and attitudes towards eCHIS among Community Health Promoters. Participants described eCHIS as a useful system that had simplified reporting processes, improved efficiency, and reduced workload during routine community health activities. Many respondents reported that although there were initial fear and uncertainty when the system was introduced, most CHPs gradually embraced the technology after receiving training and gaining practical experience.

“They have fully embraced it... initially they were afraid, but now they appreciate it.” (KII 9)

Participants further explained that eCHIS had made their work easier by reducing paperwork and improving the efficiency of data collection and reporting. Most respondents perceived the system as beneficial in supporting community health service delivery and improving accountability.

“It has reduced the workload... now work is much easier.” (FGD 4)

However, some participants acknowledged that adapting to smartphone-based reporting was initially challenging, particularly among CHPs who had limited experience with digital technologies. Although these challenges reduced over time, they highlighted the learning curve experienced during implementation.

“At first it took time to understand how to use the phone.” (FGD 1)

The findings also revealed that eCHIS contributed to strengthening community trust. Participants reported that households generally had confidence in the information collected through the system and appreciated the improved accuracy and accountability associated with electronic reporting.

“Most caregivers trust us very much because we always do the right thing.” (FGD 2)

Despite these positive experiences, a few participants reported that some community members viewed electronic data collection as time-consuming, particularly during household visits where additional information was required.

“Some households see us as wasting their time.” (FGD 6)

Regarding continued utilization, respondents expressed strong motivation and willingness to continue using eCHIS despite occasional operational challenges. Participants emphasized that the benefits of the system outweighed the difficulties encountered during implementation.

“My attitude is very positive.” (FGD 2)

“As much as we are having challenges, I still recommend it.” (FGD 3)

Overall, qualitative findings demonstrated a strong consensus that eCHIS had improved efficiency, reduced workload, enhanced accountability, and strengthened community trust. Although some participants reported initial difficulties with smartphone use and occasional concerns from community members, these views were outweighed by overwhelmingly positive experiences regarding the usefulness and acceptability of the system.

Table 3: Qualitative Themes on Perceptions and Attitudes Towards eCHIS Among Community Health Promoters

Theme	Positive View	Contrasting View
Adoption and Acceptance of eCHIS	“They have fully embraced it... initially they were afraid, but now they appreciate it.” (KII 9)	“Some were afraid of handling smartphones when the program started.” (KII 9)
Improved Efficiency and Reduced Workload	“It has reduced the workload... now work is much easier.” (FGD 4)	“At first it took time to understand how to use the phone.” (FGD 1)
Community Perceptions and Trust	“Most caregivers trust us very much because we always do the right thing.” (FGD 2)	“Some households see us as wasting their time.” (FGD 6)
Positive Attitude Towards Continued Use	“My attitude is very positive.” (FGD 2)	“As much as we are having challenges, I still recommend it.” (FGD 3)

Integrated Findings for Objective One

Both quantitative and qualitative findings consistently demonstrated positive perceptions and attitudes towards eCHIS utilization among Community Health Promoters. Quantitative findings showed that more than four-fifths of respondents reported positive perceptions regarding usefulness, ease of work, community trust, satisfaction, and motivation to continue using eCHIS. These findings were corroborated by qualitative

evidence indicating widespread acceptance, improved efficiency, reduced workload, and enhanced confidence among CHPs.

DISCUSSION

Perceptions and attitudes of the CHPs on utilization of eCHIS in management of malaria

The study found that the CHPs had overwhelmingly positive perceptions and attitudes towards eCHIS utilization. More than 90% of respondents reported that eCHIS improved management of community health activities and made their work easier, while over 80% indicated that the system enhanced community trust, satisfaction, and motivation to perform their duties. Qualitative findings supported these results, with participants describing eCHIS as a useful tool that reduced workload, improved efficiency, and enhanced accountability in community health service delivery. This indicates strong acceptance of eCHIS among CHPs.

These findings can be interpreted through the Technology Acceptance Model (TAM), which proposes that perceived usefulness and perceived ease of use are the primary determinants of technology acceptance and utilization (Davis, 1989). In the current study, CHPs perceived eCHIS as beneficial in supporting their daily work and simplifying reporting processes. The high levels of satisfaction and motivation reported by respondents suggest that eCHIS was not only accepted but also valued as an important tool for community health service delivery. The findings are consistent with evidence from other studies done in Kenya, where digital community health information systems have been associated with improved reporting efficiency, data quality, and accountability among frontline health workers (MoH Kenya, 2021). Similarly, Murithi et al. (2026) reported that positive perceptions regarding usefulness, ease of use, and improved work performance were important facilitators of digital health technology adoption among CHPs in Kenya (Muriithi et al., 2026). These findings suggest that when health workers perceive clear benefits from a technology, they are more likely to embrace and consistently utilize it.

Comparable findings have been reported across other African countries. In Ethiopia, Hailemariam et al. (2024) found that Health Extension Workers viewed eCHIS as improving service delivery, data management, and accountability, which contributed to increased acceptance of the system (Hailemariam et al., 2024; Tegegne et al., 2023). Likewise, studies conducted in Uganda and Tanzania reported that community health workers appreciated digital health platforms because they reduced paperwork, improved reporting timeliness, and facilitated access to health information (Kansiime et al., 2024). A systematic review of digital health interventions in low- and middle-income countries similarly concluded that perceived usefulness and ease of use remain among the strongest predictors of technology adoption among frontline health workers (Wang et al., 2025).

The qualitative findings provide further insight into these results. Participants consistently reported that eCHIS simplified documentation, reduced manual paperwork, and improved efficiency during household visits. Several respondents explained that although some CHPs initially experienced fear and uncertainty when transitioning from paper-based reporting to smartphone-based systems, continued training and practical experience gradually improved confidence and acceptance. These findings are consistent with observations by Schroeder et al. (2023), who noted that familiarity and continued exposure to digital technologies strengthen user confidence and long-term adoption (Schroeder et al., 2023).

The study also found high levels of community trust in information captured through eCHIS. Participants reported that households increasingly trusted electronically recorded information because it enhanced transparency and accountability. This finding is important because trust plays a critical role in community-based health programs. Increased trust may improve community cooperation, acceptance of health interventions, and adherence to health recommendations. Similar findings have been reported in Kenya's digital health programs, where electronic reporting systems strengthened accountability and confidence in community health services (Kanyaru et al., 2026).

Despite the overwhelmingly positive perceptions, a few contrasting views emerged from the qualitative findings. Some participants reported that certain households occasionally perceived data collection activities as

time-consuming, while others highlighted challenges associated with adapting to new technologies during the early stages of implementation. Similar concerns have been reported in other digital health programs across sub-Saharan Africa, where positive attitudes toward digital systems coexist with operational and implementation challenges (Walzer et al., 2025). Although these concerns were reported by a minority of participants, they highlight the importance of continuous user support and community engagement during digital health implementation.

Generally, the findings suggest that perceptions and attitudes are not a major barrier to eCHIS utilization in Nyalenda B Ward. The high levels of perceived usefulness, ease of use, satisfaction, motivation, and community trust demonstrate strong acceptance of the system among Community Health Promoters. Both quantitative and qualitative findings indicate that CHPs recognize the value of eCHIS in improving their work and supporting community health service delivery. Overall, the findings demonstrate that CHPs hold favourable perceptions and attitudes towards eCHIS, suggesting strong acceptance of the system for malaria management."

CONCLUSIONS

The study concludes that Community Health Promoters had generally positive perceptions and attitudes towards eCHIS utilization. Most respondents perceived eCHIS as useful in improving community health service delivery, making work easier, enhancing community trust, and increasing motivation and satisfaction. Qualitative findings further demonstrated strong acceptance and willingness to continue using the system.

These findings highlight the importance of sustaining positive user experiences and engagement to support continued acceptance of eCHIS among Community Health Promoters.

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