Knowledge Levels on Malaria Control Strategies in Chainda Compound of Lusaka, Zambia.

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ABSTRACT

A clear understanding of the knowledge of a particular community can inform the design of health promotion and health education strategies. Research to clearly assess the level of knowledge on malaria control strategies has not been sufficiently done in some areas such as Chainda compound in Lusaka District. In this regard, descriptive cross-sectional research was conducted in Chainda compound. Quantitative data was collected using structured questionnaire covering 120 households while qualitative data was collected through focus group discussions (FGDs). Quantitative data were double entered using MS-Excel 2010. Data was then transferred to SPSS version 20 and STATA version 13 were used for statistical analysis and graphical presentations. Qualitative data was analysed using thematic approach. Findings revealed that Seven percent (7%) of respondents had medium knowledge about malaria prevention and control, (Mean score = 10.82 points, SD = 3.85). Respondents do recognize the threat posed by malaria as most 102(85.4%) agreed with the statement: I think that malaria is a serious and life-threatening disease. Sleeping under an ITN was the most 99(82.1%) prevalent method of malaria prevention and control followed by IRS 60(50.4%). Despite the high prevalence of ITNs, a FGD with CHWs revealed that many community members did not have ITNs. All the three FGDs conducted revealed that people are not being sensitized on IRS; as a result, some community members do not accept that their houses be sprayed. This research concludes that most people had fair knowledge about malaria prevention and control. Majority of respondents recognized malaria as a threat to their lives in the community. Among others, this research recommends that Ministry of health in their communication about malaria prevention and control should employ a combination of channels from the radio, posters at health centres and other community locations.

Keywords: Knowledge, Malaria, control strategies, Zambia.

INTRODUCTION

Malaria has been identified as one of the infectious communicable diseases of poverty in the world. In 2013 there was an estimated 198 million cases of malaria worldwide, with 3.3 billion people in the world at risk of infection (World Malaria Report, 2014). The burden was heaviest in sub-Saharan Africa, where an estimated 90% of all malaria deaths occurred. The high malaria burden in this region is exacerbated by poor social and economic conditions.

According to the World Malaria Report 2023 by the World Health Organization (WHO), there were an estimated 249 million malaria cases worldwide in 2022, resulting in approximately 608,000 deaths. The WHO African Region continues to bear the brunt of the global malaria burden, accounting for 94% of malaria cases (233 million) and 95% of malaria deaths (580,000). Children under 5 years old are particularly vulnerable, representing about 80% of all malaria deaths in the region. The report also highlights the impact of climate change on malaria transmission, noting that extreme weather events, such as flooding and heatwaves, can significantly increase malaria cases. For example, catastrophic flooding in Pakistan in 2022 led to a five-fold increase in malaria cases in the country (World Malaria report, 2023).

In Zambia, the national malaria parasite prevalence in 2012 was estimated at 15 percent and the prevalence of severe malaria was estimated at 7 percent among children under the age five (MoH, 2012). In 2023, Zambia's

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national malaria parasite prevalence was reported to be around 20% among children under five years old (Zambia National Malaria Elimination Centre (NMEC, 2023). On average, there are an estimated 20,000 cases of malaria per day in Zambia and each day, on average, four Zambians die from the disease (NMEC, 2023). This is a clear indication that though major achievements have been made in fighting malaria, the disease remains a significant cause of illness and death in Zambia, with one in five children under age five infected with malaria parasites, and other vulnerable population groups at risk (NMEC,2023).

In order to reduce the morbidity and mortality rates caused by malaria, Zambia, has adopted the WHO malaria control strategies. These strategies include prompt diagnosis and effective treatment; Integrated Vector Management, use of Long-Lasting Insecticide Treated Nets (LLINs), Indoor Residual Spraying (IRS), environmental management in targeted areas and intermittent preventive treatment in pregnancy (IPTp). (MOH, National Malaria Strategic Plan 2006-2010). The successful implementation of some of these malaria control strategies such as the ITNs could have contributed to a slight reduction in the malaria parasite prevalence among children under the age five years, from 16% seen in 2010 to 14.9% in 2012. (Zambia Malaria Indicator Survey, 2012). Evidence also shows that insecticide-treated nets (ITNs) continue to be among the most recognized and effective personal protection methods against mosquito bites, with recent studies reaffirming their significant role in reducing malaria incidence and mortality, particularly among children under five in rural Sub-Saharan Africa (Amulaga, 2025).

Different factors can hinder the success of control strategies and ultimately lead to a rise in malaria cases. These factors have been identified to include, resource constraints, increased potential for malaria transmission, vector or drug resistance and community levels of knowledge, their attitudes and practices (Oyindamola et al, 2010; Nyarko, 2011; Dike et al, 2011; Zeirdie et al.,2013). However, the impact of knowledge on the implementation success of any programme cannot be underestimated.

Consequently, programme implementers should be aware of this in order to strengthen the existing programme or inform new programmes with the appropriate knowledge. Some communities in Lusaka have, however in the recent past experienced a resurgence of malaria.

Zambia, through the National Malaria Control Programme, has continued to use the WHO recommended malaria preventive measures to reduce morbidity and mortality rates. These approaches are twofold; Diagnosis and treatment, and vector control. The former approach recommends parasitological confirmation by microscopy or use of rapid diagnostic tests (RDTs) in all patients suspected of malaria before treatment is started. While, Vector control includes two main approaches; insecticide treated nets (ITNs) such as the long-lasting insecticide nets (LLINs) and indoor residual spraying (IRS) (Cruzet 2006; Guyalt, 2004. These vector control strategies are sometimes complemented in certain locations by other methods such as larval control or environmental management.

In Haiti, a study by Keating et al., (2008) showed that the levels of knowledge about the role of mosquitoes in malaria transmission were about 68.1%. However, there was poor ITN ownership observed. It was clear from this study that people where highly knowledgeable and willing to participate in the utilisation of the ITNs.A study conducted in Laos showed that knowledge of ITN maintenance was a predictor both of ITN use by all family members and by the respondent. However, the measures of proper ITN maintenance were not translating into improved ITN related practices. This suggested that perhaps knowledge of ITN maintenance was an indicator of a persons' understanding of malaria prevention, rather than their likelihood of properly maintaining their ITN. Though the mechanism is not clear, based on these findings, education on proper ITN maintenance is likely to improve ITN utilisation practices. (Gedal, 2007). Similarly, a KAP study by Bamaga et al, (2014) indicated that although the respondents were aware of malaria, its mode of transmission and severity, their knowledge towards malaria prevention were poor. Thus only 7% and 2% of the study participants mentioned the importance of ITNs and IRS as methods of malaria prevention. This concorded with a low usage of ITNs (8%). In Nigeria, recent evidence shows that women with secondary education are significantly more likely to perceive malaria as a deadly disease in children compared to those with no education, highlighting the continued impact of maternal education on malaria knowledge (Tuki, 2024).Knowledge aspect was found to be one of the driver of the the majority of caregivers of febrile children under five in Tanzania who sought prompt treatment at nearby public health facilities, particularly when services were accessible and free of charge (Omary et al., 2025).

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In Mexico, respondents from a high-risk destination had significantly more accurate knowledge than those from low-risk destinations. The high knowledge observed in the risky group was associated with the high protection rates against malaria. Trend analyses showed a significant change over time in attitude towards more risk avoiding behaviour and towards high protection rates against malaria. This improvement reflected the continuous effort of health providers to create awareness (Genderen, 2012). In contrast, Hanian area of china, the rate of proper malaria prevention related to Knowledge was <50%. Factors leading to such results are that Hanian is hot and people do not like to sleep under an ITN, formal education of many mountain workers is low and they have an insufficient understanding of Knowledge regarding malaria prevention. The behavioural change communication intervention when introduced showed significant improvement in malaria related KAP (Chang-hua, 2014). Similarly, studies in Asia were respondents had good knowledge about malaria. The majority (93.9%) of the respondents knew using ITNs can help prevent malaria and 96.2% agreed to having IRS done at their residents.

The study further emphasised that one of the most important factors for preparing a successful malaria control program is evaluation of the knowledge, attitudes and practices of people living in a risky area to find ways to improve collaboration with the public health system. The findings showed a high level of illiteracy among respondents. This factor affected the success of malaria control programs; literacy level had a direct correlation with malaria control practices. There was a significant correlation between the education level of respondents and their interest in participating in malaria control programs as a volunteer. Education level also showed a significant role in using ITNs (Anh et al, 2005).

Krishna et al, (2015) in South Asia found that appropriate understanding and awareness of malaria are considered essential components before taking any informed action for the prevention and treatment of malaria. This study noted that the use of ITNs was relatively poor and limited among the participants. Insecticide treated nets were reasonably cost-effective and considered as an integral component of global malaria control initiatives to decrease malaria cases and malarial mortality, if properly used and maintained. Indoor residue spraying was the main approach for controlling vector in most parts of South Asia, but its effectiveness was an issue due to insecticide resistance. The study argued that the standard method of malaria control in South Asia was IRS, which became prohibitively expensive to implement. In contrast to the above, adherence to malaria prevention practices in Tanna, such as ITN appears to be a complex interaction between risk perception, intervention acceptability, socio-cultural factors and practical issues (Ahmed et al.,2009; Nowaha et al.,2021). Findings of the study had shown that the community motivation for malaria prevention practices such as ITN use had been maintained but was limited by cultural beliefs. In such contexts, health education initiatives that attempt to elicit participation only through increasing malaria knowledge and by encouraging individuals to take responsibility for their own health will be ultimately effective (Atkinson et al, 2010).

In Kenya, the knowledge on malaria transmission was absent or incorrect but many occupants were aggressively trying to avoid being bitten by the mosquitoes. The research findings from the sampled households showed some form of protection. However, the data collected did not mean that people were knowledgeable about malaria transmission or necessarily acting to prevent malaria. It was simply that individuals were avoiding mosquito contact. Individuals avoided being bitten, regardless of their knowledge of the transmission mechanism (Macintyre et al, 2002). In Ghana, recent findings indicate that malaria is still commonly misunderstood, with some individuals attributing it to factors such as poor sanitation, excessive sun exposure, and consumption of certain foods, reflecting persistent misconceptions despite public health efforts (Wilmot et al., 2023)

In view of reducing malaria cases, Okwa et al. (2012) conducted research in Lagos Nigeria on knowledge, attitudes and practices of malaria in selected areas. The use of ITNs was found to be uncommon. Knowledge on malaria was lower in the uneducated when compared to the educated subjects. A common explanation is that less educated people have less knowledge and flexibility while educated people have more knowledge (Talem et al., 2020). The results of this study showed the need for continued health education.

Research conducted in Uganda on community knowledge and perceptions about indoor residual spraying for malaria prevention, which showed 61.4% of respondents, had heard about IRS. Regarding knowledge on the exact part of the house to be sprayed with the insecticide, about 74% mentioned the different surfaces of the inner walls and 24.3% did not know. Knowledge on the importance of IRS was high (92.4%) of the respondents

mentioned that it helps to kill mosquitoes. The IRS frequency and timing (day or night) was also assessed from the respondents who had heard about IRS, 15.6% reported that IRS would be conducted after three months and 73.4% did not know the frequency. Regarding the time of spraying about 25.5% reported that spraying was done during the day and 61.9% did not know the time. (Ediau et al, 2013).

Similar results were obtained by Mazigo et al in Tanzania with regard to knowledge about IRS.

According to this study, only half of the respondents reported they had heard about IRS campaigns from radio programs and government campaigns. About 86% of the participants accepted their house to be sprayed with the insecticide. The perceived benefit of accepting IRS was to kill mosquitoes and only 17% mentioned protection against malaria. The study revealed poor knowledge on the prevention strategies among respondents and this was found to have implications for the planning of successful of the malaria control programs. Recommendations made were that public health education interventions should always be designed to cover the existing knowledge and implemented for a sufficient length of time for effectiveness (Mazigo et al, 2010).

A study about effect of IRS on incidence of malaria in Kaoma district, Zambia. In this study, 252 respondents were targeted at household level of which there was 100% response rate. The findings in the study at household levels were that the majority of respondents had attended school (83.33 %) and that there was an association between Knowledge of the use for IRS and school attendance. With level of knowledge being high it was expected that the majority fully comprehended the importance of the IRS program. An evaluation of ITN and IRS revealed that more household (57%) that did not have ITNs were sprayed than (43%) those that did own ITNs. Even though no association was found between acceptance of IRS by household to ITN ownership and the number of ITN owned, therefore, ITN did not influence household to accept or reject IRS. Those households that owned ITNs were equally as likely to have their houses sprayed as those that did not have ITNs (Phiri et al, 2015). This tallies well with the recommendation by Ministry of Health Zambia that high knowledge levels are important in the IRS program as it leads to high acceptance of the program and eventual effectiveness in reducing incidence of malaria in the community (MoH, 2011).

A study in Chongwe District found that most mothers and caretakers of children under five demonstrated substantial knowledge, positive attitudes, and appropriate practices regarding the home management of fever due to malariaan outcome attributed to effective health education initiatives at local health centers (Chinyama, 2013).

Statement of the Problem

Despite rapid upscale of insecticide-treated nets (ITNs) and indoor residual spraying (IRS), malaria remains a major source of morbidity and mortality in Zambia (Jumbam et al., 2020). Some communities in Lusaka such as Chainda Compound have begun to see a resurgence of malaria cases in non-travelled persons (According to Chainda clinic records**)**. Annually, Chainda clinic reports an average of 1600 under-5 cases of malaria and 1633 cases for those aged 5 and above (2012-2015). This is an indication of local malaria transmission and a worrying factor that needs urgent address to avoid an epidemic seen in years before. Although various factors can contribute to a rise in malaria transmission in a community where control strategies are being implemented, the levels of knowledge of the affected community are known to play an important role in the success of a program (Munzhedziet al., 2021). This research aimed at assessing the knowledge level of the community with regards to malaria control strategies being implemented in Chainda compound.

Theory

The illustration below shows the relationship between the dependent and independent variables. It shows the factors that affect adoption of malaria preventive practices. These factors include socio-demographic characteristics, the community's knowledge about malaria and their attitudes towards malaria prevention and control. Several research studies have shown that high knowledge about malaria among a community enables practice of preventive and control strategies (Hlongwana et al., 2009; Ahmed et al., 2009). Other studies have also associated gender, age, education and poverty level, to practices towards malaria prevention and control (Appiah-Darkwah & Badu-Nyarko, 2011). Perceptions, threat and susceptibility are believed to have an

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influence on practices adopted by the community to prevent and control malaria (Appiah-Darkwah & Badu-Nyarko, 2011).

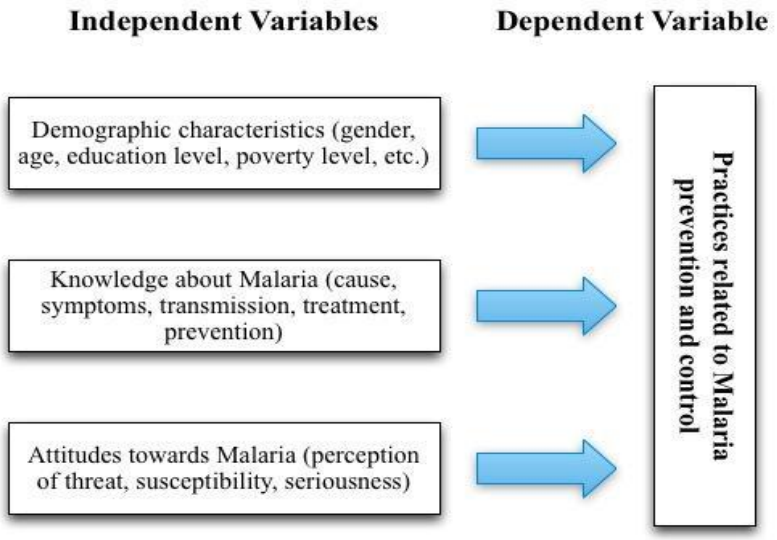

Figure 1.1: Conceptual framework indicating factors relating to Malaria prevention and control.

METHODOLOGY

Research Design

A descriptive study design was used. This design helped to capture various dimensions of information from the target population such as Knowledge in relation to IRS and ITN utilisation. This design enabled the researcher to obtain a descriptive account of events to provide baseline data for further research.

Study Population

The study population involved households in Chainda compound. The inclusion criterion was that all the respondents needed to be 18years and above, access health services at Chainda clinic and residents who might have been residing there for the last 12 months.

Sample Selection

A cluster sampling method was used for the study. Each cluster was represented by a zone. The study identified five zones in Chainda compound and at least 24 households were selected from each zone using simple random method. In each zone all the houses were numbered and placed into a box and the 24 households were selected using the blindfold method. Respondents from each household were selected conveniently. The global position system (GPS) codes for these households were captured and recorded using a GPS machine.

Sample Size

The sample size (n) was determined using the estimation of a proportion with a specified precision formular.

$$n = \frac{Z^2 \, x \, 4 \, P(1-P)}{d^2}$$

Where:

•The expected population proportion, p

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•The desired width of the confidence interval (d)

•The confidence level, Z

An estimate of the prevalence of malaria in Lusaka is 0.02 (2%). Using the width of 95%, confidence interval 0.05 and an accuracy of ±0.05.

$$n=\frac{1.96^2 x 4 x 0.02\ (1-0.02)}{0.05^2}$$

n = 120

Validity, Reliability and trustworthiness

Validity was ensured by covering all important variables under the study in the research questionnaire. Questions were clearly constructed with clear instructions and explanations. The same questions were asked to each respondent in the sequence with translations to vernacular language when necessary to ensure respondents understood the questions. To guarantee **reliability,** the researcher used experts to review the instruments before going ahead to administer it. Making questions simple, concise and brief further ensured reliability by exposing the subjects to the research questionnaire once. Trustworthiness was based on four principles as outlined by Creswell (2015). These principles are: **Credibility**: This was achieved through prolonged engagement with partciapnts, and triangulation to ensure the findings are credible. **Transferability**: This involved providing enough descriptive data about the research context and the assumptions that were central to the research, so that others can determine if the findings are applicable in other contexts. **Dependability**: This involved an audit trail, where the researcher documented the research process in detail to allow for replication and verification. **Confirmability**: This was done by ensuring that the findings are shaped by the participants and not researcher bias, often through techniques like member checks and peer debriefing.

Tools for data collection

The researcher collected data using a structured questionnaire and focus group discussions guide. The randomly selected respondents were involved in the survey. The surveyor went through the instructions and followed the questions strictly to avoid bias in questioning. The questionnaire was used because it enabled the researcher to gather responses in an objective and standardized way. Three focus group discussions (FGDs) comprising of 5 participants each were conducted with members of the community health workers. FGDs were used to collect data which could not be captured from structured questionnaire. This helped to draw upon participants' experiences and reactions towards indoor residue spraying and insecticide treated nets.

Data Analysis

Quantitative data were double entered using MS-Excel 2010. Data was then transferred to SPSS version 20 and STATA version 13 were used for statistical analysis and graphical presentations. Qualitative interview data was analysed using thematic approach. The researcher submerged into the data by reading the texts several times to try to elucidate the general meaning of units or substantive statements that really said something. From these interpretations, meaning units and codes were then developed (Lingard, 2019. General categories (or themes) were first developed from the data, which were then broken down into more explicit codes. To do this, line-by-line analysis of transcripts was used to develop codes, which were then built up into categories/themes (Creswell, 2015).

Ethical consideration

Before embarking on this research, clearance and approval was sought from the Ministry of Health (MOH) as well as ERES converge ethical committee. The study also sought authorization from the district and community leaders. At an individual level, verbal and signed consent was received from each participant before data collection.

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FINDINGS

Socio-Demographics Characteristics.

Table 4.3: Distribution of Respondents by Household Size

Household sizeoi	Six or more	55	45.83	45.83
	Four or five	37	30.83	76.67
	Three	13	10.83	87.5
	Two	8	6.67	94.17
	One	4	3.33	97.5
	Missing values	2	1.66	100
	Total	120	100	

Table 4.3 shows that the majority of the respondents that were targed came from large families.

Table 4.4: Distribution of Respondents by Education Level

Education Level	Primary education completed	32	26.67	26.67
	Primary education not completed	26	21.67	48.33
	Secondary level completed	21	17.5	65.83
	Secondary level not completed	30	25	90.83
	College/institution	3	2.5	93.33
	University	1	0.83	94.17
	Never attended school	6	5	99.17
	Missing values	1	0.83	100
	Total	120	100	

Table 4:4 shows that the majority of the respondents that were engaged in the study had low education background. The majority of the respondents could not even research the secondary level of Education.

Table 4.5: Distribution of Respondents by Source of Income

Source of Income	Formal employment	57	47.5	47.5
	Trading, commerce, selling	26	21.67	69.17
	Agriculture, livestock, forestry, fishery	6	5	74.17
	Craft/creative workers	7	5.83	80

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	Industry	4	3.33	83.33
	Casual or wage labour	13	10.83	94.17
	Support from friends/family	2	1.67	95.83
	Support from institutions	1	0.83	96.67
	Missing values	4	3.33	100
	Total	120	100	

Table 4.5 shows that formal employment accounted for 57 (47.5%) respondents, which is understandable given the urban nature of the site.

Knowledge about malaria

Respondents answered a number of questions to gauge their knowledge about malaria. They ranged from basic information about malaria to sources of information, signs and symptoms as well as transmission and prevention of malaria. The number of correct responses on knowledge (and their percentage of total respondents) is summarised in Table 4.6.

Table 4.6: Performance of respondents on malaria knowledge.

Have you ever heard about malaria?	114	95
Which vector can transmit malaria?	113	94.17
Malaria can be transmitted to humans by?	109	90.83
Knowledge about signs and symptoms of malaria		
Is high temperature a symptom of malaria?	84	70
Is loss of energy a symptom of malaria?	30	25
Is vomiting a symptom of malaria?	84	70
Is Sweating a symptom of malaria?	16	13.33
Is headache a symptom of malaria?	64	53.33
Are body pains a symptom of malaria?	62	51.67
Is itching a symptom of malaria?	20	16.67
Is loss of appetite a symptom of malaria?	68	56.67
Is dizziness a symptom of malaria?	26	21.67
Knowledge about prevention and control of malaria		
Sleeping under Insecticide Treated bed Nets	96	80
Wearing long sleeved clothes	25	20.83

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Making fire and smoke	16	13.33
Spraying target or doom at night	42	35
Indoor residual spraying	59	49.17
Cleaning dark corners	20	16.67

Overal knowledge score

An overall knowledge score was calculated by adding up the scores for each respondent across all questions. There were 73 (60.83%) of respondents with high knowledge about malaria, eight (6.67%) had medium knowledge, while 39 (32.5%) had low knowledge about malaria. The mean knowledge score for all respondents was 10.82 (SD = 3.85). Distribution of knowledge about malaria by respondents in Chainda Compound is highlighted in Table 4.

Table 4.7: Distribution of malaria knowledge amongst respondents

High (Score = > 12)	73	60.83
Medium (Sore 9-11)	8	6.67
Low (Score < = 8)	39	32.5
Total	120	100
Minimum = 2	Mean = 10.82	
Maximum = 18	SD = 3.85	

Sources of information about malaria

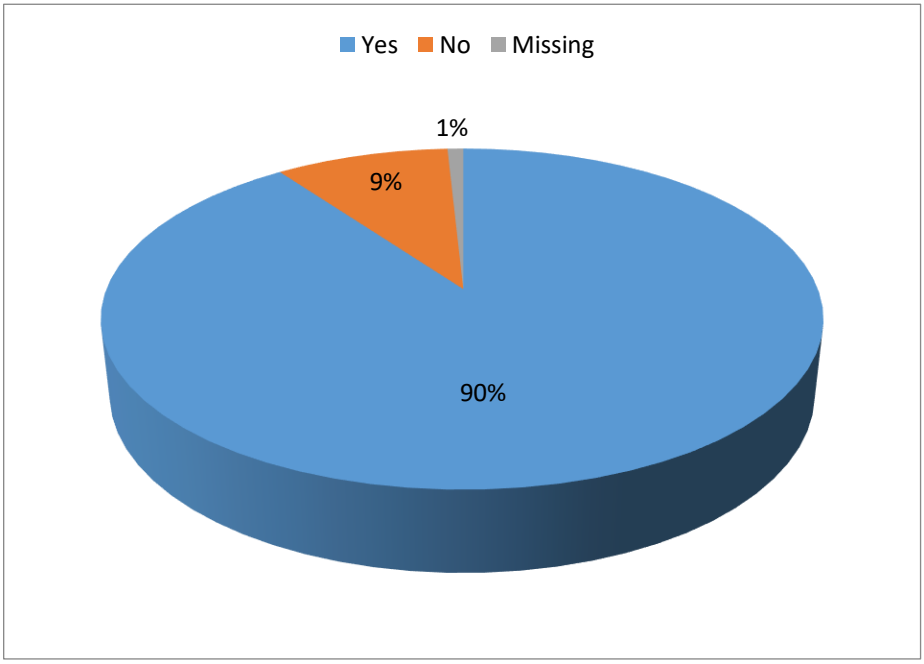

Figure 4.2: Respondents who reported receiving information about Malaria.

Amongst respondents, 108 (90%) of the respondents reported having received some information about malaria, while 11 (9%) reported not receiving any information as summarised in Figure 4.2.

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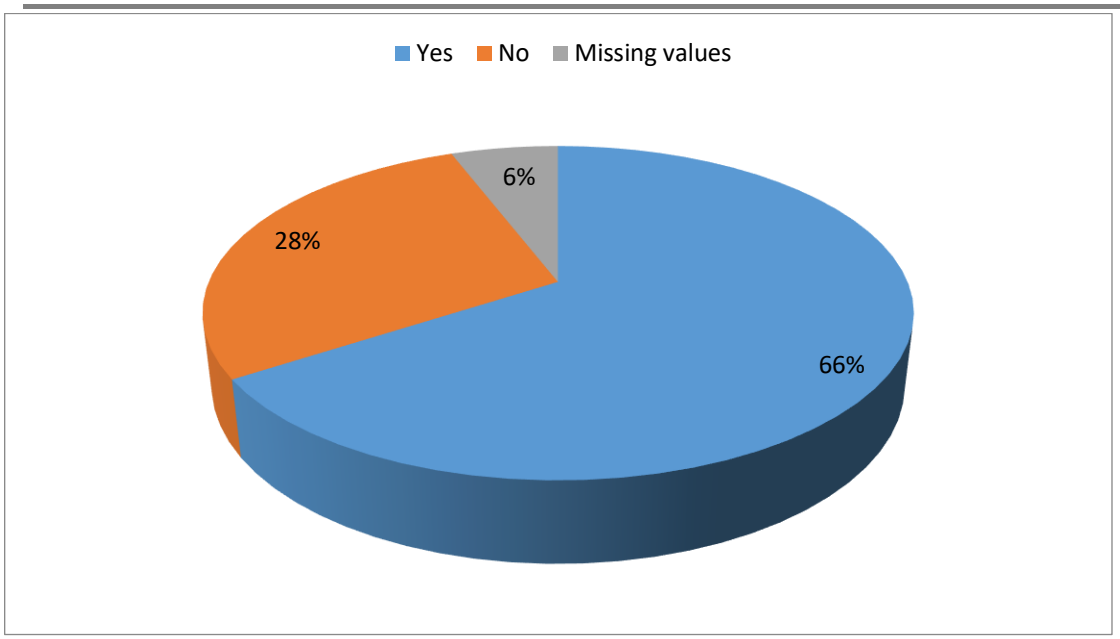

Figure 4.4: Proportion of respondents who reported having insufficient information about Malaria.

Despite several respondents 79 (66%) reporting having heard or received information about malaria, 34 (28%) felt that they did not have enough information related to malaria, indicating a need for more dissemination efforts as summarised in Figure 4.4.

Equally, **less knowledgeable** emerged as a theme from qualitative data. The study revealed basic understanding of malaria from the participants***:*** The participants associated mosquitoes with malaria.WP1 from FGD said: *Mosquitoes mostly enter the house in the evening and stay everywhere in the house.*

In terms of Treatment-seeking behaviours, **resistance to treatment** emerged as a theme. When asked to mention the trend in the context of treatment for malaria, Participants said that they usually receive coartem for free at the clinic, but cost varies if treatment is received from private practitioners. WP8 mentioned: *whenever we recognise signs of malaria, we seek treatment and we are usually given coartem and Panadol but we do not seek treatment immediately or within 24 hours instead, we give local herbs or painkillers like panadol from nearby drug shops and only go to health centre when symptoms persist.*

Under source of information about malaria***, Modern communication*** *emrged as theme under Sources of information:* During FGDs, participants confirmed the prominent role of radio as an information source, citing accessibility and portability as primary reasons. When probed on which particular health programmes they listened to, MP4 indicated: *We prefer CHWs because the CHWs are known to us and we can ask questions as we are listening to the radio.* WP1 stated: *as a community, we need to be informed about the radio station to be used for certain health programs and their timing so that we can tune in to the programme.*

In terms of Protective measures from malaria, ***varing methods*** emerged as a theme*:* When asked about what they do to protect themselves from malaria, participants MP10 mentioned: *We use ITNs, clear away bushes near their homes, drain away stagnant water to chase away mosquitoes.*

WP11 stated: *we close doors and windows in the evening, avoiding darkness in the house and drinking boiled water are other ways used to prevent malaria.*

Periodic IRS of houses and retreatment of mosquito nets were also suggested as the other ways to prevent malaria in communities. Although IRS was stated to be a good move to fight malaria but however mentioned that they are still ignorant about it and hear contradicting information from fellow community members. WP 2 mentioned: *the chemical used in IRS is too strong and has sometimes led to a sickness.*

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DISCUSSION

Income level: The study found that Chainda compound is classified as a low-income settlement where most people cannot afford good health. The study had shown that the poor tend to have worse malaria practices compared to the non-poor. Interventions to prevent and control malaria in Chainda compound could include poverty eradication projects and special adult programmes. The relationship between low income and practices is similar to findings of a study in Nigeria where results showed that malaria is higher in rural than urban areas. This may be associated with the high level of income in the rural areas. Poor people live in dwellings that are prone to mosquito proliferation (Oyindamola et al., 2010).

Education Level: The study conducted in Chainda has shown a significant association between levels of education and malaria practices. A few of respondents appeared to have completed secondary education 52(43.2%). This education attainment has an effect on understanding the malaria control strategies which in turn affects the community attitudes and practices. This calls for intensification and expansion of schools for raising the level of education among respondents. Evidence shows that educational attainment is associated with better malaria knowledge. For example, in Nigeria, higher levels of education were associated with improved knowledge and practice about the appropriate malaria prevention and control interventions (Dike et al, 2006). Expectedly, there is a significant relationship between belief in malaria myth and educational level. Respondents with lower educational qualification tend to believe more in malaria myths. This goes to show the importance of literacy in disease knowledge and management. Researchers in Ghana also identified a relationship between knowledge of the cause of malaria and educational status where 63% of those with tertiary education believed that malaria was caused by mosquito bite as against 45% of those with no formal education (Appiah-Darkwah and Badu-Nyarko, 2011). In the same study, a high proportion (50%) of those without formal education believed that malaria is caused by unclean environment. On the other hand, Agu and Nwojiji (2005) in their study did not find any statistical association between level of education and knowledge of the cause of malaria while a study in Ethiopia reported higher LLIN (Long-lasting insecticide nets) ownership among the illiterates (Woyessa et al, 2014).

Knowledge about malaria

Causes: Although the mosquitoes were recognised to be the main agents of malaria in this study, misconceptions such as exposure to unhygienic surroundings were widely perceived as a cause of malaria during the focus group discussion. In Ghana, recent findings indicate that malaria is still commonly misunderstood, with some individuals attributing it to factors such as poor sanitation, excessive sun exposure, and consumption of certain foods, reflecting persistent misconceptions despite public health efforts (Wilmot et al., 2023). While in Uganda, malaria is believed to be caused by poor diet and exposure to bad environmental conditions.

Transmission: Regarding knowledge about malaria, majority of respondents correctly associated mosquitoes with malaria transmission 109 (90.83%) and acknowledged that malaria can kill if it went untreated 102 (85.35%). Similar studies have proved that improved community knowledge of malaria and its source of transmission promote preventive and personal protection practices amongst the affected community (Ahorlu et al., 2006; Tatem et al., 2010). This is an opportunity any malaria prevention and control intervention can utilise. A study conducted by Mboera et al in 2010 has shown poor knowledge on malaria transmission. The majority of the respondents associated mosquito bites with malaria transmission, which is a common observation in malaria endemic areas where people suffer frequently from the disease. This has major implications for the planning of successful and sustainable control programs. However, in the study only few respondents mentioned a correct transmission route ("the bites of mosquito which has bitten a malarial patient").

Many respondents demonstrated a gap of knowledge on malaria transmission by stating that the bite of any mosquito could cause malaria. This observation was similar to the findings of Ahmed et al, 2009 in Bangladesh. Public health education interventions should always be designed to cover the existing knowledge and should be implemented for a sufficient length of time for it to be effective.

Treatment seeking behaviours: In this article, health facilities were the most common sources of malaria treatment in the study population. This observation aligns with recent findings in Tanzania, where the majority

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of caregivers of febrile children under five sought prompt treatment at nearby public health facilities, particularly when services were accessible and free of charge (Omary et al., 2025). Self treatment was also practiced by the study participants for treatment of malaria. This was consistent with findings of other studies in India and Bangladesh (Ahmed et al, 2009; Tyagi et al, 2005). Home treatment and the use of herbal/traditional remedies were found to be very low in this study. In a study of treatment seeking behaviour among women in Uganda, the use of local herbs and self treatment were found to be the first resort for malaria treatment, followed by seeking treatment from formal care (Nuwaha et al, 2001). In Kenya health facilities were initially used by 26% of persons with fever, with the majority first visiting the informal retail sector (Fawole, et al, 2001). The main factors influencing initial treatment seeking from health facilities include severity of the illness, cost of treatment, poor access to health facilities, long waiting time, dissatisfaction with performance and behaviour of health workers and unavailability of appropriate drugs (Dike et al 2006).

Control and prevention: Knowledge about malaria prevention was 99 (82.1%) amongst the respondents. They reported that malaria can be prevented through the use of ITNs. Insecticide-treated nets (ITNs) continue to be among the most recognized and effective personal protection methods against mosquito bites, with recent studies reaffirming their significant role in reducing malaria incidence and mortality, particularly among children under five in rural Sub-Saharan Africa (Amulaga, 2025). Similar results have been reported from Ghana (Cruz et al, 2006). Most of the households reported ITN ownership and the majority reported sleeping under an ITN. This was an encouraging observation that can be used to control malaria in the community).

In Nigeria, recent evidence shows that women with secondary education are significantly more likely to perceive malaria as a deadly disease in children compared to those with no education, highlighting the continued impact of maternal education on malaria knowledge (Tuki, 2024) . This is associated with the argument that less educated people have less knowledge and flexibility while educated people have more knowledge (Talem et al., 2020). The study results from Chainda have shown that half 61 (50.43%) of the respondents were knowledgeable about IRS and 77 (64.1%) sometimes participate.

According to the participants, the low knowledge levels affecting participation in the IRS programme was as a result of insufficient information. According to Zewdie. et al, (2013) an assessment of knowledge and utilisation of IRS in Ethiopia had shown that only 5.37% believe that malaria can be prevented using IRS. Community knowledge on malaria prevention and control is important and the effort is related to environmental management, personal protection or vector control.

CONCLUSION

This research aimed at assessing the knowledge level of the community with regards to malaria control strategies being implemented in Chainda compound. This research showed fair knowledge about malaria prevention and control. There was higher knowledge 96(80%) for ITN than IRS 59(49.17%). The cross tabulation had shown that there was a significant association between respondents' knowledge, attitude and practices. Therefore, interventions aimed at social and behaviour change should primarily target the gaps in knowledge on malaria. Specifically, on causes, transmission, treatment seeking behaviors and control measures.

Competing Interest

There is no competing interesting emanating from the researcher

RECOMMENDATIONS

Based on the findings of this research, the following issues should be considered to strengthen the ITNs and IRS prevention and control strategies against malaria amongst the residents of Chainda compound:

i) Stregnthening Collobration

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The Ministry of health should strengthen intersectoral collaboration with other ministries within the Zambian government such as ministry of Education as this will help educators from various learning institutions to educate learners on the importance of ITNs and IRS.

ii) Improved communication

Ministry of health in their communication about malaria prevention and control should employ a combination of channels from the radio, posters at health centres and other community locations.

Limitations Of the Study

1. There was potential for data bias due to the use of a Focus Group Discussion (FGD) guide.

2. The cross-sectional design prevented establishing causal reference.

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