

Health communication frequency and malaria control: A cross-sectional case study of malaria consortium in Kamwenge District, Uganda.

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Abstract

Background

Malaria remains a major public health concern in Uganda, and effective health communication is increasingly recognized as a critical tool for disease prevention and community engagement. This study examined the relationship between the frequency of health communication and malaria control outcomes in Kamwenge District, Uganda.

Methodology

A cross-sectional research design was employed, involving 192 respondents selected from the District Health Management Team and community beneficiaries across 13 sub-counties. Data were collected using structured questionnaires and analyzed using descriptive statistics, Pearson's correlation, and simple linear regression.

Results

Results showed an equal gender representation, with 96 males (50%) and 96 females (50%). Most respondents were aged 34-39 years (41.2%), predominantly Protestants (40.1%), and largely degree holders (55.2%). Private business was the most common economic activity (52.6%). Respondents strongly agreed that training workshops, radio programs, educational materials, and other communication initiatives significantly enhanced malaria prevention (Mean = 4.75; SD = 0.436). Pearson's correlation revealed a moderate positive and statistically significant relationship between frequency of health communication and malaria control ($r = 0.493$, $p = 0.000$). Regression results indicated that communication frequency accounted for 23.2% of the variance in malaria control outcomes (Adjusted $R^2 = 0.232$; $\beta = 0.493$, $p = 0.000$), confirming that increased exposure to health messages improves malaria prevention practices.

Conclusions

The correlation and regression results revealed that there was a significant positive relationship between the frequency of health communication and Malaria Control in Uganda.

Recommendations

In ensuring the impact of the frequency of health communication on malaria control, the use of radio should be emphasized in communicating malaria messages to them, most importantly when radio allows for the use of any language, including various mother tongues – Luganda, Lusoga, Hausa, Igbo, and so on.

Keywords: Health communication, Malaria control, Malaria Consortium, Kamwenge District, Uganda.

Submitted: October 01, 2025 **Accepted:** October 20, 2025 **Published:** October 30, 2025

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Background

Health communication plays a critical role in influencing community behavior and promoting disease prevention efforts. In the context of malaria control, frequent and consistent health communication initiatives help mobilize communities toward improved health practices and responsiveness to public health interventions. According to Gambo (2008), communication platforms, particularly the

mass media, function as key social institutions responsible for collecting, producing, and disseminating essential health information to the wider population. Their ability to reach diverse audiences underscores their strategic significance in shaping public awareness and action within any country. Given their wide coverage and influence, mass communication channels such as radio, television, and other media outlets are well-positioned to support malaria control efforts by educating citizens about transmission, symptoms,

prevention, and treatment. This is especially vital in developing nations like Uganda, where the burden of malaria and other preventable diseases, including typhoid fever, yellow fever, HIV/AIDS, tuberculosis, cholera, and diarrhea, continues to challenge public health systems and national development. Strengthening health communication frequency, therefore, remains essential in empowering communities with accurate knowledge, promoting preventive behaviors, and enhancing the overall effectiveness of malaria control programs. This study examined the relationship between the frequency of health communication and malaria control outcomes in Kamwenge District, Uganda.

Methodology

Research design

A cross-sectional survey design was used in the study. Cross-sectional designs are a simple and least costly alternative to use with larger area coverage (Sekaran, 2003). The cross-sectional survey design involved triangulation utilizing both quantitative and qualitative approaches at the same time to achieve a substantive review of the impact of health communication offered by Malaria Consortium on the effectiveness of malaria control in Uganda.

Study population

The study population comprised 400 subjects, who included Malaria Consortium staff, both communication officers and operational personnel at the head office, and those within the Ministry of Health Promotion and Education Unit, Kamwenge district -District Health Management team, and recipients of the Malaria Consortium health communication activities in Kamwenge District (*Malaria Consortium Uganda, Kamwenge District Report December 2024*).

Sample size selection

A representative sample of 196 respondents was selected from a population of 400. The selection of the sample size will be based on the sample size selection table by Krejcie and Morgan (1970), cited in Amin (2005). The sample size included Malaria Consortium staff, both communication officers and operational persons at the head office and those within the Ministry of Health Promotion and Education Unit, Kamwenge district, District Health Management team, and recipients of the Malaria Consortium health communication activities in Kamwenge District within the 13 sub-counties of the district, as indicated by Sekaran (2000).

Table 1: Sample size and selection

Category	Target Population	Sample Size	Percentage	Sampling Technique
Ministry of Health Promotion and Education Unit	10	10	5.1%	Purposive sampling
Malaria Consortium communication officers	2	2	1%	Purposive sampling
Malaria Consortium operational personnel	2	2	1%	Purposive sampling
Kamwenge district -District Health Management team	70	33	16.7%	Stratified Sampling
Kamwenge district Local Councillors	16	16	8.2%	Purposive sampling
Kamwenge District Malaria Consortium Recipients	300	133	68%	Simple random sampling
Total	400	196	100	

Sampling techniques and procedure

The study employed simple random sampling for selecting the Kamwenge district Malaria Consortium Recipients in the various sub-counties of the district where the malaria project was carried out. This was done by choosing randomly and entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process.

Purposive sampling was used to select the Ministry of Health Promotion and Education Unit, Malaria Consortium communication officers, and Malaria Consortium operation personnel who were knowledgeable on how health communication affected malaria control in the district, and these participated as key informants.

Data collection methods

Primary data was collected using questionnaires, guided interviews, and face-to-face interviews.

Questionnaire survey

A structured questionnaire was developed and administered to the respondents to extract information on their opinions on the effect of health communication on the control of malaria in Uganda, focusing on Kamwenge district.

Interviews

Interviews can be unstructured or structured, and conducted either face-to-face or by telephone, or online. Interviewing involves face-to-face encounters and requires maximum cooperation between the researcher and the respondent if reliable information is to be obtained.

In-depth interviews with key informants (KIs) were conducted amongst 30 respondents to generate findings that will be directly used in the report.

Data collection instruments

The researcher set data collection instruments, namely questionnaires and an interview guide.

Questionnaire

The study used two sets of questionnaires, namely self-administered and researcher-administered questionnaires, as data collection instruments for respondents. A self-administered questionnaire will be designed on a Likert scale that was used to collect data from respondents who can write and read well.

Table 2: Content validity index results

Variable	Anchor	CVI
situation analysis of the health communication environment	5 point	0.88
Health Communication messaging	5 point	0.83
Nature of Health Communication channels and approaches	5 point	0.88
frequency of health communication	5 point	0.80

Source: Expert Judgments

Table 2 shows that situation analysis of the health communication environment yielded a CVI of 0.88, Health Communication messaging yielded a CVI of 0.83, and the nature of health communication channels and approaches yielded a CVI of 0.88, while performance of frequency of health communication yielded a CVI of 0.80. Since all

Interview guide

An interview guide with a pre-determined set of open-ended questions was followed and used during the interview to cover the variables under study. The instrument will be followed by the researcher to ask questions, prompting responses from KIs who were mainly Malaria Consortium staff, both communication officers and operational persons at the head office, and those within the Ministry of Health Promotion and Education Unit.

Validity and reliability of the research instruments

Validity

In order to test and improve the validity of the data collection instruments, the researcher provided the instruments to the respondents, who looked at the items and checked on language clarity, relevance, content comprehensiveness, and length of the questionnaire. In addition, the validity of the instruments was tested to determine whether research measures what it intended to measure and to approximate the truthfulness of the results using the Content Validity Index (CVI) using expert judgment of the Research Supervisor, taking only variable scoring above 0.70 accepted for Social Sciences (Amin, 2005). The results of the CVI are shown in Table 3.2 below. The CVI was measured using the formula:

$$CVI = \frac{\text{Number of items declared valid}}{\text{Total number of items}}$$

variables yielded a CVI above 0.70, it is accepted for the social sciences.

Reliability

The reliability of the instrument was tested to determine its consistency, or the degree to which it measured the same way each time it was used under the same conditions with the same subjects. This was done by pilot-testing the questionnaire on a sample of 10 subjects in the Malaria Consortium staff, both communication officers and operation persons at the head office, and those within the Ministry of Health Promotion and Education Unit, Kamwenge district -District Health Management team and

recipients of the Malaria Consortium health communication activities in Kamwenge District and adjustments were made to enhance its reliability. These 10 subjects were not part of the 196 respondents in the sample. The internal consistency (reliability) of the instrument was measured using Cronbach's alpha coefficient, taking only variables with an alpha coefficient value of more than 0.70 accepted for social research (Amin, 2005), generated from SPSS.

Table 3: Reliability results

Variable	Anchor	Cronbach's Alpha coefficient
situation analysis of the health communication environment	5 point	0.85
Health Communication messaging	5 point	0.81
Nature of Health Communication channels and approaches	5 point	0.83
frequency of health communication	5 point	0.77

Source: Primary data

Table 3 shows that situation analysis of the health communication environment yielded a Cronbach's alpha value of 0.85, Health Communication messaging yielded a Cronbach's alpha value of 0.81, nature of Health Communication channels and approaches yielded a Cronbach's alpha of 0.83, while frequency of health communication yielded a Cronbach's alpha of 0.77. Since all variables yielded alpha values above 0.70, accepted for social research (Amin, 2005), it was concluded that the instrument was consistent in measuring the effect of health communication on the control of malaria in Uganda, focusing on Kamwenge district.

Data analysis

Data analysis is the process of bringing order, structure, and meaning to the mass of information gathered (Mugenda & Mugenda, 1999). Data collected from the field will be sorted, coded by assigning themes to the study variables, and later will be entered into a computer using statistical software (SPSS) to enable analysis.

Quantitative data analysis

The analysis of quantitative data encompasses calculations such as averages, totals, and comparisons to totals of responses expected. The process of data analysis involved editing, examining the collected raw data to detect errors and omissions, and correcting where necessary. The first editing was done in the field, and the scrutiny of the completed questionnaire was conducted. It was done on a daily basis after the interviews and at times on the spot. After fieldwork, central editing was also done to review and edit when all

questionnaires had been completed and returned to the researcher. Corrections for wrong entries and omissions were then made. After central editing, questionnaires were then brought back to where computer data entry was done into a statistical package for social scientists (SPSS) software version 17.0.

A statistical software, SPSS, was used to capture data, perform data analysis, and manage. Tables were generated, and these were then exported from SPSS into a Word document, and interpretation was done. In addition, the researcher described or summarized data using descriptive statistics. Obtained measures of central tendency (mean, mode, and median) as well as measures of dispersion (standard deviation). The final outputs and selected summary tables were transferred into the main report, findings presented, interpreted, and conclusions deduced. In order to find out the degree, direction, and strength of association between the study variables, the researcher conducted Pearson correlations. To confirm the correlation results and establish the effect of the independent variables on the dependent variable, a regression analysis was done.

Qualitative data analysis

Organized and prepared the qualitative data for analysis by sorting and arranging the data into various themes as it was reflected in the key informant guide, while ensuring that the themes reflected the study objectives and questions. All the data was obtained to obtain a general understanding of the information collected, coded the responses, generated themes for analysis, and interpreted the meaning of the data. The qualitative data helped to supplement the data that had been generated quantitatively.

Ethical consideration

Upon approval of the research proposal by Team University School of Postgraduate Studies and Research, an introductory letter was obtained to seek permission to conduct the study from the local leaders and the District Health Office before conducting the study. The free and informed consent of each participant was obtained at the start of the study. The following were explained to the respondents: 1) the purpose of the study, 2) what participation in the study would involve, 3) how

confidentiality and anonymity were maintained, 4) the right to refuse to participate in the study or to withdraw from the study without any penalty, and 5) the benefits and risks of participating in the study. Study participants were required to undergo any invasive procedures.

Results

Response rate

The study took an inquiry into the response rate of the respondents in the study.

Table 4: Response rate of distributed questionnaires

	Frequency	Percent	Cumulative Percent
Response	192	97.5	97.5
Non-response	4	2.0	100.0
Total	196	100.0	

Source: primary data.

Ten (10) key informants were interviewed among the Malaria Consortium staff, both communication officers and operational personnel at the head office and those within the Ministry of Health Promotion and Education Unit, while 196 questionnaires were distributed to the Kamwenge district -District Health Management team and recipients of the Malaria Consortium health communication activities in Kamwenge District within the 13 sub-counties of the district. The results show that out of the one hundred and ninety-six (196) questionnaires distributed to the respondents, only 192 (one hundred and ninety-two) questionnaires were returned.

Therefore, 192 respondents who had completed and returned the questionnaires, together with the ten (10) key informants interviewed, comprised the total number of respondents used for testing the hypothesis of the study. This gave a response rate of 97.5%, which, according to Mugenda and Mugenda (2010:83), is a very good response rate. This implied that nearly all the respondents who were selected to take part in the study actually participated in the study.

Demographical characteristics

Table 5: Gender of the respondents

			Category		Total
			District Health Management team	Malaria control Recipients	
Gender	Male	Count	22	74	96
		Row %	(22) 23%	(74) 77%	100
	Female	Count	21	75	96
		Row %	(21) 21.39	(75) 78.61	100
Total		Count	43	149	192
		Row %	22.4%	77.6%	100%

Source: Primary data

From the results in Table 5, out of the 192 respondents, 96 (50%) were male, while on the other hand, 96 (50%) of the total population were also females. Furthermore, the results reveal that (21) 21.39% were District Health Management

team and (75) 78.61 were recipients of the Malaria Consortium health communication activities in Kamwenge District within the 13 sub-counties of the district, whereas, for the female respondents,

(22) 23% were District Health Management team, and (74) 77% were recipients of the Malaria Consortium health communication activities in Kamwenge District for the male respondents. From the results, there was a relatively even representation of the genders among the respondents.

Table 6: Age group and category of the respondents

		Respondent Category		Total	
		District Health Management team	Malaria Recipients control		
Age Group	18-24 yrs	Count	7	7	
		Row %	100	100	
		Column %	2.63	1.84	
	25-29 yrs	Count	15	27	42
		Row %	35.71	64.29	100
		Column %	13.04	10.15	11.02
	30-34 yrs	Count	23	39	62
		Row %	37.10	62.90	100
		Column %	20	14.66	16.27
	34-39 yrs	Count	51	106	157
		Row %	32.48	67.52	100
		Column %	44.35	39.85	41.21
Over 40 yrs	Count	26	87	113	
	Row %	23.01	76.99	100	
	Column %	22.61	32.71	29.66	
Total		Count	58	134	
		Row %	30.18	69.82	
		Column %	100	100	

Source: Primary data

According to the results in table 6, 7 (1.84%) of the respondents belonged to the 18-24 years age group, 42 (11.02%) belonged to the 25-29 years age group, (62) 16.27% belonged to the 30-34 years age group, 157 (41.21%) belonged to the 34-39 years age group and (113) 29.66% belonged to the 40 years and above age group. Additionally, 58 (30.18%) of the respondents were District Health Management team, and 134 (69.82%) were recipients of the Malaria Consortium health communication activities in Kamwenge District within the 13 sub-counties of the district. From the findings, the majority of the

respondents belonged to the 34-39 years age group. Therefore, "the opinions expressed in the questionnaire could well reflect the attitudes and perceptions of middle-aged and younger respondents. This again indicates that the sample somewhat reflects the composition of young and vibrant generations, and it also implied that malaria mainly affects more of young people in the age range of 18-35 years, thus most of these respondents had been recipients of the Malaria Consortium health communication activities in Kamwenge District within the 13 sub counties of the district in the malaria control project.

Table 7: Religious affiliation of the respondents

Religious affiliation	Frequency	% age	Cumulative %
Catholic	47	24.5	24.5
Protestant	77	40.1	64.6
Moslem	37	19.3	83.9
Pentecostal	6	3.1	87
Others	25	13	100
Total	192	100	

Source: Primary data

According to the results in table 7, 37 (19.3%) of the respondents were Moslems, 47 (24.5%) of the respondents were Catholics, 25 (13%) of the respondents were in the category of others who were not mentioned in the research, 6 (3.1%) of the respondents were Pentecostal and lastly 77(40.1%) of the respondents were Protestants. From the

results, the majority of the respondents were Protestants amongst respondents that included the District Health Management team and recipients of the Malaria Consortium health communication activities in Kamwenge District within the 13 sub-counties of the district.

Table 8: Cross tabulation of education levels * Economic activity of the respondents

			Economic activity of the respondents			Total	
			Public servant	Private Business	Others		
education levels of the respondents	Certificate	Count	16	13	17	46	
		% of Total	8.3%	6.8%	8.9%	24.0%	
	diploma	Count	4	12	1	17	
		% of Total	2.1%	6.2%	.5%	8.9%	
	Degree	Count	13	68	25	106	
		% of Total	6.8%	35.4%	13.0%	55.2%	
	Others specify	Count	9	8	6	23	
		% of Total	4.7%	4.2%	3.1%	12.0%	
	Total		Count	42	101	49	192
			% of Total	21.9%	52.6%	25.5%	100.0%

Source: Primary data

According to the results in table 8, 16 (8.3%) of the respondents had certificate, 4 (2.1%) had diploma, 13 (6.8%) had degree and other categories not mentioned were 9 (4.7%) were in the category of Public servant; from those between 2- 3 years were 13 (6.8%) had certificate, 12 (6.2%) had diploma, 68 (35.4%) had degree and 8 (4.2%) were in other categories not mentioned; 17 (8.9%) of the respondents had certificate, 1 (0.5%) had diploma, 25 (13.0%) had degree and other categories not mentioned were

6 (3.1%) were in the category of Others which was not mentioned. From the findings, the majority of the respondents were degree holders. On the other hand, this implied that the majority of the respondents were in the Private Business as their economic activity.

The Relationship between the frequency of health communication and malaria control

Table 9: Descriptive results for the relationship between the frequency of health communication and malaria control

Relationship Between the frequency of health communication and malaria control	Mean	S.D
Malaria Consortium develops and implements interventions consisting of training workshops and dissemination of education materials, as well as the frequency of health communication on malaria control.	4.75	0.436
The health communication programmes by Malaria Consortium have made a great impact on people and allow them to control and prevent frequent malaria attacks in the district	4.62	0.568
There exists a significant relationship between the possibilities of listening to health-communication related programmes on the different channels and approaches, and the eventual reduction in the menace of malaria in the district	4.54	0.871
The degree to which the intensity (the degree of effects) of health programmes on communication-related programmes on the different channels and approaches significantly complements the efforts of Malaria Consortium and medical practitioners in the district in preventing and reducing malaria attacks among the people of the community	4.46	0.502
There is a significant relationship between the respondent's pattern (frequency of listening to health-related radio programmes) of listening to health programmes on the radio and their impact on preventing malaria in the district	1.92	0.960

The frequency of Health programmes complements the efforts of the medical practitioners in the district in preventing and reducing malaria attacks among the people of the Community	1.79	0.711
Most people in the district listen to health-related messages on the radio for the purpose of improving their health conditions, especially in relation to malaria and other diseases	3.96	1.180
Most people in the district believe in frequent preventive measures to reduce the menace of malaria in the community	3.92	0.868
There is a good perception among the district residents of the impact of health communication programmes on the different channels, like radio, vis-a-vis the improvement of their health condition	1.79	1.006

Source: Primary Data

Table 9 shows that respondents indicated that Malaria Consortium develops and implements interventions consisting of training workshops and dissemination of education materials as frequency of health communication on malaria control (Mean=4.75, Standard deviation=0.436) while they also indicated that The health communication programmes by Malaria Consortium have made a great impact on people and allows them to control and prevent frequent malaria attack in the district (Mean=4.62, Standard deviation=0.568). Similarly, the respondents agreed that there exists a significant relationship between the possibilities of listening to health- communication related programmes on the different channels and approaches and eventual reduction in the menace of malaria in the district (Mean=4.54, Standard deviation=0.871) while they also indicated that the degree at which the intensity (the degree of effects) of health programmes on communication related programmes on the different channels and approaches significantly complements the efforts of Malaria Consortium and medical practitioner in district in preventing and reducing malaria attack among the people of the community (Mean=4.46, Standard deviation=0.502). These findings suggested that the more they listen to health-related programmes on the radio, the more they are equipped with the required information in preventing malaria in the community. That is, more and more health-related programmes on the radio considerably facilitate the messages and efforts of medical practitioners on malaria attacks.

However, the respondents felt that there is no significant relationship between the respondent's pattern (frequency of listening to health-related radio programmes) of listening to health programmes on radio and its impact in preventing malaria in the district.

(Mean=1.92, Standard deviation=0.960) while they also disagreed that the frequency of Health programmes does not complement the efforts of the medical practitioners in the district in preventing and reducing malaria attacks among the people of the Community (Mean=1.79, Standard deviation=0.711). The respondents felt that most people in the district listen to health-related messages on the radio for the purpose of improving their health conditions, especially in relation to malaria and other diseases (Mean=3.96, Standard deviation=1.180), while they felt that most people in the district believe in frequent preventive measures in reducing the menace of malaria in the community (Mean=3.92, Standard deviation=0.868).

The respondents also felt that there is a good perception of the district residents on the impact of health communication programmes on the different channels like radio, vis-à-vis the improvement of their health condition (Mean 1.79, Standard deviation=1.006). This implied that

To establish the impact of frequency of health communication on malaria control and to establish the strength and the direction of the relationship between the two variables, Pearson's correlation coefficient analysis was undertaken at the 99% and 95% confidence limits, as shown in Table 10.

Table 10: Correlation matrix between frequency of health communication and malaria control

		Frequency of Health comm.	Malaria control
Frequency of health communication	Pearson Correlation	1.000	.493 **
	Sig. (2 -tailed)	.	.000
	N	192	192
Malaria Control	Pearson Correlation	.493 **	1.000
	Sig. (2 -tailed)	.000	.
	N	192	192

** . Correlation is significant at the 0.01 level (2 -tailed). $P \leq 0.05$

Source: Primary data

Table 10 shows Pearson's correlation coefficient $r = 0.493^{**}$ between the frequency of health communication and malaria control, suggesting that the two variables were related.

Pearson's correlation coefficient $r = 0.493^{**}$ and significance $p = 0.000$ show that there was a highly significant relationship between frequency of health communication and malaria control. This implied that the

efforts to frequently use health communication adequately will significantly contribute to malaria control in the district. A simple regression analysis was conducted to determine the effect of frequency of health communication on malaria control using ANOVA statistics of adjusted R^2 , t-values, Beta (β), significance, and standard error of the estimate, and the findings are shown in Table 11.

Table 11: The relationship between frequency of health communication and malaria control

ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.758	1	.758	5.556	.019 ^a
Residual	25.909	190	.136		
Total	26.667	191			

a. Predictors: (Constant), frequency of health communication

b. Dependent Variable: malaria control

The independent variable, frequency of health communication, was statistically significant in affecting malaria control, $F = 1.556 (<0.01)$, as shown in Table 11. This implies that there is a meaningful positive relationship

between the independent variable frequency of health communication and the dependent variable malaria control in Kamwenge district.

Table 12: Causal relationship between frequency of health communication and malaria control
 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.920	.108		8.538	.000
frequency of health communication	.227	.096	.169	2.357	.019

a. Dependent Variable: malaria control

The regressions result from Table 12 show that a unit change in frequency of health communication brings about a .920 change in malaria control in Kamwenge district.

Table 13: Regression model between frequency of health communication and malaria control

Model	Adjusted R Square	t-value	Std. Beta (β)	Sig	Std. Error of the Estimate
Frequency of health communication	0.232	4.740	0.493	0.000	0.52

Source: Primary data

Table 13 shows adjusted R² values of 0.232 between the frequency of health communication and malaria control, suggesting that the use of frequency of health communication in the district predicted 23.2% of the variance in malaria control. The adjusted R² = 0.232, t = 4.740, β = 0.493, and significance 0.000 suggested that the frequency of health communication was a significant

predictor of the variance in malaria control and efforts directed to strengthening the frequency of health communication systems through setting malaria control programmes. The study therefore accepted the hypothesis that: “*Frequency of health communication significantly improves malaria control.*” (Malaria Control).

Table 14: The minimum and maximum range and mean results of respondents' ratings on malaria control

Malaria Control	Min.	Max.	Mean
Malaria Consortium uses Intermittent Presumptive Treatment of malaria during pregnancy as a measure of malaria control in the district	1.00	5.00	4.52
Long Lasting Insecticide-treated Nets (LLIN) are given to Pregnant women & children under 5 years to sleep under as a measure of malaria control by Malaria Consortium	1.00	5.00	4.44
Malaria Consortium uses effective communication between the local and district levels on how to protect oneself from malaria using LLINs	1.00	5.00	3.56
Malaria Consortium conducts specific Malaria epidemic health education campaigns as a measure of malaria control	1.00	5.00	4.61
Malaria Consortium organizes regular press releases/conferences/articles for public information on malaria control as a measure of malaria control	1.00	5.00	3.60
Malaria Consortium reinforces health information systems for reporting and epidemic monitoring, preferably every week, as a measure of malaria control	1.00	5.00	2.08

There is a promotion of proactive clinical case detection and management/referral as a measure of malaria control	1.00	5.00	2.73
There is a budget allotted for the malaria epidemic response control	1.00	5.00	3.67
Ensuring that all clinics and health facilities are operational and have sufficient drugs, equipment, and trained staff is one of the measures of malaria control in the district	1.00	5.00	3.57
Malaria Consortium ensures that the correct diagnosis and treatment are provided at all health facilities and at the community level	1.00	5.00	3.01
Malaria Consortium establishes treatment centers (temporary clinics or mobile clinics) where access is a problem or health facility coverage is low	1.00	5.00	2.34
There is a well-equipped active surveillance system for early detection of any epidemics, including malaria, working at prone district level	1.00	5.00	3.77

Source: primary data

In regard to the dependent Variable (Malaria Control), responses were as shown in Table 14. The results revealed that the respondents agreed that Long Lasting Insecticide treated Nets (LLIN) are given to Pregnant women & children under 5 years to sleep under as a measure of malaria control by Malaria Consortium at a (Mean 4.44); Malaria Consortium uses effective communication between the local and district level on how to protect myself from malaria using LLIN at a (Mean 3.56); Malaria Consortium organizes regular press releases/conferences/articles for public information on malaria control as a measure of malaria control at a (Mean 3.60). This implied that the respondents had an agreement on the above statements.

However, they disagreed that Malaria Consortium does not reinforce health information systems for reporting and epidemic monitoring, preferably every week as a measure of malaria control at a (Mean 2.08); There is promotion of proactive clinical case detection and management/referral as a measure of malaria control at a (Mean 2.73); Malaria Consortium establishes treatment centres (temporary clinics or mobile clinics) but access is not a problem or health facility coverage is not low at a (Mean 2.34); This implied that the respondents disagreed on the above statements.

On the other hand, the respondents were uncertain as to whether Malaria Consortium ensures that the correct diagnosis and treatment are provided at all health facilities and at the community level (Mean 3.01), respectively.

The respondents agreed as regards to whether there a budget allotted for malaria epidemic response control at a (Mean 3.67); Ensuring that all clinics and health facilities are operational and have sufficient drugs, equipment and trained staff is one of the measures of malaria control in the district at a (Mean 3.57); Malaria Consortium conducts specific Malaria epidemic health education campaigns a measure of malaria control at a (Mean 4.61); Malaria Consortium uses Intermittent Presumptive Treatment of malaria during pregnancy as a measure of malaria control in the district at a

(Mean 4.52) and lastly that there is a well-equipped active surveillance system for early detection of any epidemics including malaria working at prone district level at a (Mean 3.77), respectively. This implies that the post-epidemic assessment exercise is one vital step within the epidemic circle to identify success and failure of all interventions planned or unplanned, and ultimately consider if detection systems and control options have had an impact on the malaria burden. This important exercise is frequently neglected by implementing partners and the MOH. It means that good or bad lessons are not seriously taken on board and may be used to modify or strengthen existing interventions. Building on past lessons will improve the preparedness plan of action, articulate, and support provided by national and district partners.

It was further revealed by the key informants that malaria control levels in Uganda within Kamwenge District continue to be low despite efforts by the Malaria Consortium Uganda to put in place measures to improve malaria control (MoH Strategy Report, 2011-2014). As one of the respondents had to say that;

.....Early access by everybody to efficient drugs during a malaria epidemic is a key intervention to minimise the malaria burden. People at risk are non-immune, and existing cheap monotherapies, especially in Africa, are no longer fully effective. There is a need to shift to other policy options, such as combination therapies in endemic countries but also in prone countries, to perhaps set up specific approaches (MoH Strategy Reports, 2011/2007; 2007/2008).

It was further revealed by the MoH Strategy Reports (2011-2014) that states that to increase positive responses to the control of malaria in Uganda, including to the finger stick for anaemia and parasite testing, a series of community sensitization measures are undertaken. These include a general informational letter and accompanying flyer for districts and local communities. These include information

about the purpose of control of malaria, the procedures for control of malaria, and the importance of household participation in the control of malaria. A series of radio spots is developed in local languages and aired on both national and local community radio stations, with service areas matching the selected EAs. The radio spot contains a 45-second message from the Ministry of Health introducing the survey, describing the importance of doing finger sticks to determine parasitemia and anemia among children, and encouraging participation.

Discussion of results

The Relationship between the frequency of health communication and malaria control

The findings were based on Pearson's correlation coefficient, which revealed that there was a positive and significant result between the frequency of health communication and malaria control, suggesting that the two variables were related. Pearson's correlation coefficient $r = 0.493^{**}$ and significance $p = 0.000$ show that there was a highly significant relationship between frequency of health communication and malaria control. This implied that the efforts to frequently use health communication adequately observed will significantly contribute to malaria control in the district. These findings were in confirmation with Roll Back Malaria (2003), which stressed that the role of communication in malaria control and management has long been acknowledged by various national and international agencies. This is later tagged frequency of Malaria health communication, for instance, Roll Back Malaria (2003) states that health communication needs to be fully integrated into the broad spectrum of malaria interventions and not seen as isolated intervention and resources, strategically designed communication can play an important role in scaling up prevention and control efforts at the individual/household, community, decentralised and national levels.

As equally noted by March & Kachor (2002), WHO & UNICEF (2003), communication efforts should be strategically designed from an audience perspective to address the social and contextual environment as well as individual behaviours and knowledge. The coordinated use of interpersonal communication, community mobilization, advocacy, and mass media has been effective in a variety of other public health agendas. Malaria communication should be integrated with other health education and communication efforts. Malaria control programmes need to balance malaria-focused and integrated communication approaches. For example, after initial introduction through focused strategic communications, malaria control in pregnancy should become an integral part of reproductive and maternal health communication. Likewise, information

and education about home management of malaria in children should become part of the integrated management of children's illness (IMCI) communication.

Conclusions

From the correlation and regression results, it was revealed that there was a significant positive relationship between frequency of health communication and Malaria Control in Uganda, whereby Pearson's correlation coefficient shows that there was a highly significant relationship between frequency of health communication and malaria control. This implied that the efforts to frequently use health communication adequately observed will significantly contribute to malaria control in the district.

Recommendations

Because malaria is associated with poverty where poverty itself is usually attributed to the grass roots people who occupy the larger proportion of the population and reside in the rural areas, in ensuring the impact of the frequency of health communication on malaria control, the use of radio should be emphasized in communicating malaria messages to them most importantly when radio allows for the use of any language including various mother tongues – luganda, lusoga, Hausa, Igbo and soon.

Emphatically, no other frequency of health communication on malaria control would best achieve this compared to radio because radio breaks literacy barrier, enjoys the widest reach, depends minimally on electricity, is very cheap and could be afforded appreciably by all and very portable and could be carried about (even those who drive all day long who have access to radio in their cars).

Acknowledgement

Whereas I may not be able to mention everybody by name, my thanks go to all those individuals who, in one way or another, contributed to the success of this study.

I am deeply indebted to my husband and children, who have successfully pressured me to complete this study. Without their contribution, the success of this study would have been impossible. I am deeply indebted to them.

Special thanks to the entire management and staff, colleagues at Team University, and Malaria Consortium in Uganda for providing an environment that encouraged the study and teamwork.

I specifically thank my supervisor, Dr. Ssendagi Muhamad, for his critiques, encouragement, and support while I undertook this study, which was full of challenges.

I am extremely grateful to all those respondents who willingly accepted to provide information that was critical for this study.

List of abbreviations

CMDS	Community Medicine Distributors
FGD	Focus Group Discussion
GDP	Gross Domestic Product
HBMF	Home-Based Management of Fever
HSSP	Health Sector Strategic Plan
HPEU	Health Promotion and Education Unit
IEC	Information, Education, and Communication
ITNs	Insecticide Treated Nets
IPTp	Intermittent Presumptive Treatment for Malaria during Pregnancy
MC	Malaria Consortium
RBM	Roll Back Malaria
SMART	Specific, Measurable, Appropriate, Realistic, and Time-Bound
UDHS	Uganda Demographic Health Survey
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Education Fund
WHO	World Health Organization

Source of funding

The study was not funded.

Conflict of interest

There is no conflict of interest.

Availability of data

Data used in this study are available upon request from the corresponding author.

Author's contribution

AT designed the study, conducted data collection, cleaned and analyzed data, and drafted the manuscript, and SM supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

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Burundi Publishing



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