Factors Influencing Caregivers' Health Seeking Behavior for Malaria Treatment of Children Under 5 Years in Busia Municipality, Uganda

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Research

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Abstract

Background: Malaria remains a serious cause of under-five mortality and morbidity worldwide and Uganda inclusive. This burden can be minimized by promptly seeking health care. In Uganda, however, studies around malaria health-seeking behaviors for under-five children in the most malaria prevalent areas are very few. This study aimed at determining the factors influencing caregivers' health-seeking behavior for malaria treatment of children under five years in Busia Municipality, Uganda.

Methods: A cross-sectional research design was used with a structured questionnaire to collect data. Data were analyzed using SPSS Version 22 to establish relationships between the variables.

Results: The results showed that the current health-seeking behaviors of the caregivers of under-five children in Busia municipality are associated with caregiver education level ($p=0.008$), the health worker's behavior towards the client ($p=0.015$), the severity of fever ($p<0.001$), the severity of last malaria episode ($p<0.001$), waiting time ($p=0.001$), the quality of health services ($p=0.001$) and age of caregiver ($p<0.001$). Traditional medicine and home remedies are the most utilized means of malaria management in under-five children in Busia Municipality.

Conclusions: Caregivers need to be sensitized about the proper health-seeking behaviors for the management of malaria in children under-five years through radio shows, television, community engagement meetings among others to enhance the knowledge and understanding of communities about the recommended malaria treatment-seeking practices. There is a need to continuously train medical workers on client engagement skills to promote a good relationship with patients and encourage their return.

Background

According to the latest World Health Organization malaria report [1], there were 229 million cases of malaria in 2019 compared to 228 million cases in 2018. In the same report, the estimated number of malaria deaths worldwide was observed to increase, standing at 409, 000 deaths in 2019 and 411, 000 deaths in 2018. Children under 5 years of age were the most affected by malaria in 2019, accounting for 67% (274, 000) of the malaria deaths worldwide. These malaria data indicate a worrying trend of cases and deaths due to malaria, especially amongst children under five years of age [2].

According to WHO, the African region has a disproportionately high malaria burden. In 2019, the region was home to 94% of the global malaria cases and deaths [2]. In 2015, Uganda had the fourth-highest malaria prevalence globally and the third-highest malaria prevalence in Sub-Saharan Africa [3]. Malaria accounts for over 34% of outpatient visits and 28% of hospital admissions in Uganda, with nearly 100% of the population at risk of acquiring the disease every year [4]. In under-five Ugandan children, malaria is the foremost cause of mortality with approximately 80,000 children dying annually [5]. Children with severe plasmodia falciparum may develop severe anemia, respiratory distress, metabolic acidosis, cerebral malaria, convulsions, and ultimately death [4] [6]. During pregnancy, malaria has been linked to

gestational anemia which is associated with abortion [16]. These adverse effects can be prevented if malaria is treated promptly in approved medical facilities within 24 hours of the appearance of the first symptoms.

Unfortunately, there is reported poor health-seeking behavior by caregivers for their children as far as malaria infection is concerned. Since 2015, hospital admissions have remained almost constant within the country at 60% of the confirmed laboratory diseases [11]. The poor health-seeking behaviors related to malaria infection have been largely attributed to the low caregiver education, low economic status of the family members [14], low knowledge on malaria, low perceived malaria severity, increased belief in traditional care [17], negative experiences with the healthcare facilities [8], and unavailability of the required health services in the nearby health facilities [9]. Given these factors, more than 60% of all suspected malaria cases are treated outside the formal health sector, making the projected number of malaria cases to be as high as 60million per annum [5]. Usually, caregivers first resort to self-medication, use of traditional medicine like herbs, and informal facilities [6].

Malaria affects productivity and adds to the already high costs of care at the household and national levels. Also, malaria has a noteworthy deleterious impact on Uganda's economy due to the loss of productivity from decreased school attendance and sickness. Infection from malaria is reported to cost a family more than 2% of their annual revenues [10]. Overall, Uganda's GDP is highly affected and will continue being affected unless a permanent solution to malaria infection is found. As such, several measures have been put in place to deal with the malaria-related burden. Uganda accepted the Roll Back Malaria (RBM) and foresaw the enhancement of control practices as a basis to attain the regional targets for malaria control. The RBM initiative emphasized admittance to the most appropriate treatment for malaria within 24 hours of onset by both under-five children and pregnant women [6]. Additionally, Uganda's efforts against malaria were recently guided by the 6-year Uganda malaria reduction strategic plan for 2014–2020. Through this plan, the ministry of health targeted reducing malaria morbidity to 30 cases per 1,000 by 2020 [6] through a rapid and synchronized nationwide scale-up of cost-effective interventions to achieve universal coverage of malaria prevention and treatment.

Despite the existence of this plan and the RBM initiative, anecdotal evidence showed a surge in malaria cases in Uganda by over one million between June and August 2019, with some border districts like Busia being highly affected [10]. Therefore, the purpose of this study was to identify the factors influencing caregivers' health-seeking behavior for malaria treatment of children under five years in Busia district, Uganda. The following objectives guided this study;

- To establish the caregiver characteristics influencing their health-seeking behavior for malaria treatment in children under five years in Busia municipality.
- To determine the health system factors influencing caregivers' health-seeking behavior for the treatment of malaria in children under five years in Busia municipality.
- To identify the treatment-seeking patterns for malaria in children under five years in Busia municipality, so as to make appropriate recommendations.

Methods

This was a cross sectional study design in Busia Municipality, Uganda. 236 primary caregivers responsible and caring for at least one child aged 5 years and below participated in this study. These caregivers permanently stay in Busia municipality. The sample size was randomly determined using

$$n = \frac{Z^2 pq D}{d^2}$$

$$d^2 = [7].$$

Where:

n = desired sample size if target population > 10,000

Z = the standard normal deviation (1.96) and it corresponds to a 95% confidence level.

P = proportion in the target population estimated to have the characteristics being measured

$$q = 1 - p$$

D = design effect- usually 1 where there are no replications

d = the level of statistical significance (0.05)

The child to the selected caregivers had ever suffered from fever within the last 6 months. The fever had been confirmed by a qualified health professional as malaria-related. Caregivers below 18 years were excluded from this study. Data was collected using a structured researcher administered questionnaire and analyzed using SPSS version 22. Logistic regression was conducted to establish whether the independent variables predicted the observations on the dependent variables. To ensure data reliability, the research tool was pre-tested on 24 participants outside Busia district. Also, data collectors were trained and orientated about the correct use of the research tool.

Results

Table 1 shows the caregiver characteristics as described below. In this table, most of the respondents (41.5%) were in the age group between 26–35 while the lowest was 14.0% for 46 years or more. 28.0% of respondents were between 18-25 years while 16.5% lie between 36 and 45 years. Table 1 below also indicates that 53% of the caregivers are female while 47.0% are male. Most of the respondents (51.3%) have a secondary level of education, followed by 25.8% who have a primary level of education. 14.8% are uneducated while only 5.9% have achieved a tertiary level education. 2.1% of the respondents reported that they had technical skills through various training in areas like tailoring, handicrafts. And only 5.9% of them had attained a tertiary level education. 42.8% of caregivers of under-five children are married, followed by 32.6% who are cohabiting, 13.6% are single, 8.1% are separated/divorced while 3.0% are widows/widowers. 28.4% of the caregivers of under-five children had first heard of malaria through health

care providers, followed by 26.3% from television, 23.3% had heard from the radio, 18.6% from family members while the lowest at 3.4% had heard of malaria from newspapers. 79.2% of the caregivers of under-five children are aware that fever/high temperature is a sign and symptom of malaria. 68.2% know that loss of appetite is a sign and symptom of malaria while only 25% do know that convulsions can be a sign of malaria. 36.9% of the respondents stated that cough is a sign and symptom of malaria which is a misconception while 27.5% indicated that bloody diarrhea is a sign of malaria which is a misconception as well.

However, Table 1 results also indicate that there are misconceptions such as bloody diarrhea and cough being signs and symptoms of malaria in under-five children. The highest percentage of caregivers at 35.2% believe that malaria is caused by mosquito bites, 23.3% believe it is caused by cold or changing weather, followed by 14.8% who believe that it is due to other causes. 11.9% believe that malaria is caused by drinking dirty water, 10.2% believe it is caused by eating dirty food while the lowest (4.7%) believe it is caused by birds.

Majority of respondents (44.1%) decried the quality of health services in Busia municipal council rating them as poor, followed by 30.9% who rated them as fair, 16.1% as good while 8.9% rated them as excellent. These results are not exciting and point out that most caregivers of under-five children are dissatisfied with health system quality in Busia municipal council. Many caregivers at 35.2% stated that the physical accessibility of health facilities is fair, followed by 28.4% who rated it as poor, 23.3% rated it as good while 13.1% rated it as excellent. This shows that health facilities in the Busia district are generally inaccessible physically. Most of caregivers (38.6%) stated that the waiting times at the health facilities are fair, followed by 30.1% who rated it as poor, 21.6% rated it as good while 9.7% rated it as excellent.

Table 1
Caregiver characteristics

Characteristics	N=236(%)
Caregiver Age	
18-25 Years	66 (28.0)
26-35 Years	98(41.5)
36-45 years	39(16.5)
46 and above	33(14.0)
Sex	
Male	111(47.0)
Female	125(53.0)
Level of education	
Primary	61(25.8)
Secondary	121(51.3)
Tertiary	14(5.9)
None	35(14.8)
Others	5(2.1)
Marital status	
Single/never been married	32(13.6)
Married	101(42.8)
Separated	19(8.1)
Widowed	7(3.0)
Cohabiting	77(32.6)
Occupation	
Student	54(22.9)
Unemployed	71(30.1)
Paid employee	62(26.3)
Self employed	49(20.8)
First source of information about malaria	
Health care provider	67 (28.4)

Characteristics	N=236(%)
Radio	55(23.3)
Television	62(26.3)
Newspapers	8 (3.4)
Family member	44(18.6)
Signs and symptoms of malaria in U5 children (multiple responses)	
Fever/high temperature	187(79.2)
Loss of appetite	161(68.2)
Cough	87(36.9)
Bloody diarrhea	65(27.5)
Convulsions	59(25.0)
Cause of malaria	
Cold or changing weather	55(23.3)
Drinking dirty water	28(11.9)
Mosquito bites	83(35.2)
Eating bad food	24(10.2)
Birds	11(4.7)
Others	35(14.8)

Findings in Table 2 indicate a significant association ($p=0.008$) between caregiver's level of education and treatment-seeking behavior for malaria treatment. These results also indicate that 64.3% of caregivers with a tertiary level of education took their under-five child to a formal health facility, 21.5% of caregivers with secondary education took the under-five child to a formal health facility for treatment and 27.9% of caregivers with a primary level of education took their under-five child to a formal health facility. There is a significant association ($p<.001$) between caregiver's age and treatment-seeking behavior for malaria treatment. Additionally, Table 2 results indicate that 60% of caregivers within 36-45 years sought malaria treatment of their under-five child in a formal health facility while only 28.8% of caregivers between 18-25 years sought treatment in a formal health facility.

Table 2
Bivariate Associations between caregiver characteristics and behavioral outcome

Characteristics	Type of treatment obtained			P-value
	Home Treat or Traditional medicine	Drug Shop or Pharmacy	Formal Facility	
Sex				
Male	36 (32.4%)	30(27.0%)	45 (40.6%)	0.771
Female	40 (32%)	33 (26.4%)	52(41.6%)	
Education				
Primary	31 (50.8%)	13(21.3%)	17 (27.9%)	0.008
Secondary	61 (50.4%)	34 (28.1%)	26 (21.5%)	
Tertiary	0 (0%)	5 (35.7%)	9 (64.3%)	
None/Other	19(47.5%)	10(25%)	11(27.5%)	
Occupation				
Student	23 (42.6%)	12 (22.2%)	19 (35.2%)	0.065
Unemployed	36 (50.7%)	15 (21.1%)	20 (28.2%)	
Paid employee	16 (25.8%)	27 (43.5%)	19 (30.7%)	
Self-employed	18 (36.7%)	19(38.8%)	12(24.5%)	
Marital status				
Single	12 (37.5%)	10 (31.25%)	10 (31.25%)	0.665
Married	44 (43.6%)	36 (35.6%)	21 (20.8%)	
Separated/divorced	7 (36.8%)	5 (26.4%)	7 (36.8%)	
Widow/widower	2 (28.6%)	3 (42.8%)	2 (28.6%)	
Cohabiting	29(37.7%)	25 (32.5%)	23(29.8%)	

Type of treatment obtained				
Caregiver's age				
18-25 Years	19 (28.8%)	28 (42.4%)	19 (28.8%)	< .001
26-35 Years	31 (31.6%)	35 (35.7%)	32 (32.7%)	
36-45 years	7 (17.9%)	9 (23.1%)	23(60%)	
46 and above	7 (21.2%)	9 (27.3%)	17 (51.5%)	
First source of information about malaria				
Health care provider	11 (16.4%)	23(34.3%)	33 (49.3%)	0.241
Radio	13 (23.6%)	21 (38.2%)	21 38.2%)	
Television	14 (22.6%)	25 (40.3%)	23 (37.1%)	
Newspapers	2(25%)	3(37.5%)	3(37.5%)	
Family member	15(34.1%)	12(27.3%)	17(38.6%)	
Signs and symptoms of malaria in U5 children (multiple responses)				
Fever/high temperature	44(23.5%)	59(31.6%)	84(44.9%)	0.415
Loss of appetite	36 (22.4%)	48 (29.8%)	77(47.8%)	
Cough	26 (29.9%)	28 (32.2%)	33 (37.9%)	
Bloody diarrhea	18 (27.7%)	19(29.2%)	28(43.1%)	
Convulsions	15(25.4%)	21(35.6%)	23(40%)	
Cause of malaria				
Cold or changing weather	12(21.8%)	22(40%)	21(38.2%)	0.619
Drinking dirty water	11 (39.3%)	9 (32.1%)	8(28.6%)	
Mosquito bites	21 (25.3%)	28 (33.7%)	34 (41%)	
Eating bad food	8 (33.3%)	7(29.2%)	9(37.5%)	
Birds	2(18.2%)	5(45.5%)	4(36.4%)	
Others	13(37.1%)	11(31.4%)	11(31.4%)	

Findings in Table 3 indicate that the severity of the last malaria episode is found to have a significant ($p=0.001$) influence on health-seeking behavior for malaria treatment in the under-five child. These results also indicate that for children with very severe malaria, 65.3% of them were taken to a formal health facility, while 33.3% of those with mild illness, and 17.9% of those with very mild illness attended a formal healthcare facility respectively. These findings in Table 3 also show that whether a blood test was conducted to confirm malaria in the under-five child or not and whether the severity of malaria influenced the decision to seek medical assistance were statistically significant at $p=0.031$ and $p=0.001$ respectively.

Table 3
Bivariate Associations between treatment seeking patterns and behavioral outcome

Type of treatment obtained				
Characteristics	Home Treat or Traditional medicine	Drug Shop or Pharmacy	Formal Facility	P- value
Form of action taken when a child gets malaria				
No action	4 (100%)	0(0%)	0 (0%)	0.221
Traditional medicine (e.g “Halulu” i.e quinine)	33(36.3%)	25(27.5%)	33 (36.3%)	
Prayer	12 (38.7%)	12 (38.7%)	7 (22.6%)	
Home remedies	29(43.9%)	10(15.2%)	27(40.9%)	
Western medicine (ACTs like Coartem)	7(15.9%)	18(40.9%)	19(43.2%)	

Type of treatment obtained				
Was a blood test conducted to confirm the malaria infection?				
Yes	9(9.5%)	22(23.2%)	64(67.4%)	0.031
No	45(27%)	74(52.5%)	22(15.6%)	
Which individual assisted you in recognizing that this child was ill				
Spouse	12(36.4%)	13(39.4%)	8(24.2%)	0.549
Doctor	7(24.1%)	8(27.6%)	14(48.3%)	
Nurse	13(25.5%)	21(41.2%)	17(33.3%)	
Drug shop personnel	12(26.7%)	18(40%)	15(33.3%)	
Traditional healer	15(55.6%)	6(22.2%)	6(22.2%)	0.231
Pharmacist	3(17.6%)	6(35.3%)	8(47.1%)	
Others (please specify)	10(29.4%)	6(17.6%)	18(52.9%)	
When was the very first action started when the fever was noticed?				
No action was started	4(80%)	0(0%)	1(20%)	0.433
Immediately (within 6 hrs)	27(27.6%)	39(39.8%)	32(32.7%)	
Same day (within 24 hrs)	18(32.1%)	14(25%)	24(42.9%)	
Next day (2nd day or after 24 hrs)	16(31.4%)	17(33.3%)	18(35.3%)	
More than 2 days later	2(13.3%)	3(20%)	10(66.7%)	0.433
Others (please specify)	5(45.5%)	2(18.2%)	4(36.4%)	
The severity of the last episode				
Very mild	14 (50%)	9 (32.1%)	5(17.9%)	<.001
Mild	21 (43.8%)	11 (22.9%)	16 (33.3%)	
Severe	9 (9.9%)	23 (25.3%)	59(64.8%)	<.001
Very severe	3(4.3%)	21(30.4%)	45(65.3%)	
Did the severity of the fever influence you in seeking medical assistance?				
Yes	51 (32.1%)	44 (27.7%)	64(40.3%)	<.001
No	25 (32.5%)	30 (40%)	22 (28.6%)	

Type of treatment obtained				
Does the level of malaria in the community influence you in seeking medical assistance				0.961
Yes	48 (39.7%)	36 (29.8%)	37(30.6%)	
	30 (26.1%)	36 (31.3%)	49(42.6%)	
No				

Table 4 findings show that the waiting times for health care services are found to have a significant influence ($p=0.001$) on health-seeking behavior for malaria treatment in the under-five child. These findings also indicate that for caregivers who rated the waiting time as good, fair, and poor, 49.1%, 21.9%, and 18.3% of them respectively sought treatment in a formal health facility. Health worker behavior ($p=0.015$) and quality of health services ($p=0.001$) were also found to be significantly associated with caregivers' health-seeking behavior for malaria treatment in the under-five child at the bivariate level.

Table 4
Bivariate Associations between health system factors and behavioral outcome

Type of treatment obtained				
Characteristics	Home Treat or Traditional medicine	Drug Shop or Pharmacy	Formal Facility	P- value
Quality of health services				
Poor	59 (50%)	35 (29.7%)	24 (20.3%)	0.001
Fair	31 (42.5%)	19 (26%)	23 (31.5%)	
Good	11 (28.9%)	8 (21.1%)	19 (50%)	
Excellent	5(23.8%)	12(57.1%)	4(19.1%)	
Physical distance				0.071
Poor	21 (31.3%)	25 (37.4%)	21 (31.3%)	
Fair	38 (45.8%)	23 (27.7%)	22(26.5%)	
Good	14(25.5%)	16(29.1%)	25(45.4%)	
Excellent	4(12.9%)	9(29%)	18 (58.1%)	
Waiting times	34 (47.9%)	24 (33.8%)	13 (18.3%)	<.001
Poor	44 (48.4%)	27 (29.7%)	20 (21.9%)	
Fair	17(33.3%)	9(17.6%)	25(49.1%)	
Good	5(21.7%)	10(43.5%)	8(34.8%)	
Excellent				
Health workers behavior				
Poor	15 (34.1%)	15 (34.1%)	14 (31.8%)	0.015
Fair	16 (32.7%)	17 (34.6%)	16 (32.7%)	
Good	17 (23%)	21 (28.4%)	36 (48.6%)	
Excellent	12(17.4%)	33(47.8%)	24 (34.8) %	

Discussion

The above findings have largely contributed to meeting the three objectives of this study. The results of this study show a significant relationship between the caregivers' health-seeking behavior and their level

of education. These findings are similar to those of [12] who established that caregiver education is a serious predictor of treatment-seeking behavior. Caregivers with at least post-secondary school education are more likely to initiate treatment in the formal sector for their febrile children compared to the less educated respondents who mostly utilize avenues such as home treatment and traditional healers. Although the majority (79.2%) of the caregivers are aware of the common signs and symptoms of malaria in their children, a reasonable percentage of the caregivers do not know the exact symptoms of malaria. For example, 25% of the caregiver do know that convulsions can be a sign of malaria, 36.9% and 27.5% of the caregivers think cough and bloody diarrhea respectively are symptoms of malaria. These results indicate that misconceptions about malaria exist among caregivers and some caregivers are not even well informed.

The findings of this study expose the treatment-seeking patterns for malaria in the under-five child in developing countries like Uganda. Many caregivers do self-management of malaria at home using home remedies and herbs and might even consider seeking treatment from traditionalists before the health facilities. Most caregivers (38.6%) resort to traditional medicine when they realize that a child has a fever that is likely to be caused by malaria. Few (18.6%) caregivers use Western medicines like artemisinin-based combination therapy (ACT) as their first choice. Traditional medicines and home remedies are the commonly used means of malaria management in under-five children. Some of the traditional medicines used involve concoctions of medicinal plants locally known as “halulu” which is bitter due to the quinine content, “mulusa”, concoctions of moringa leaves among others. Home remedies also involve the use of packaged Aloe vera products or locally concocted ones.

Although the MOH, Uganda recommends solely seeking consultations in health facilities for any child found to be ill, these results indicate that these recommendations have largely not been honored by caregivers, hence, putting under-five children at great risk of complicated malaria and fatality. These findings agree with those of [15] who noted that the current behavior patterns in Africa indicate that a significant proportion of suspected malaria cases are self-treated at home or in informal health facilities where malaria diagnoses are rarely available. These findings are also similar to those of [13] who noted that home treatment is seen as a type of first aid for commonly experienced symptoms, such as fever. In Malawi and Tanzania, mothers prefer to first treat their febrile child with antipyretics, and further manage the fever with tepid sponging, and then seek antimalaria drugs if the fever persists. Similarly, in Nigeria, malaria is not considered life-threatening, and mothers seek care at higher-level facilities when self-treatment has failed [14]. This trial-and-error process acts as a home-based diagnosis. If the fever continues after the application of home-based fever reduction methods, then the caregiver presumes their child has a more severe case of malaria and seeks treatment in the formal sector.

WHO [2] recommends that febrile children are tested and treated appropriately with ACTs within 24-48 hours on symptom onset. Unfortunately, 59.7% of the caregivers of under-five children in this study indicated that no blood test was carried out before the initiation of antimalaria treatment for their children. This finding exposes the health system weakness that hinders appropriate malaria management. The initiation of malaria treatment in children without due procedures is a serious risk to

their health as it compromises the quality of treatment and can lead to mortality especially when the cause of the fever is from a disease other than malaria.

On the side of the caregivers, the majority of the children are taken to find treatment for malaria when severity has been recognized. The results of this study show that majority of the caregivers are reactive to malaria severity, hence, posing a serious challenge to the health of the under-five children. The caregivers go to the health facilities late when the disease has progressed to complicated levels. Additional evidence shows that severity is one of the strongest and most common predictors of seeking immediate care in the formal healthcare sector by caregivers. Caregivers are more likely to seek care in the formal sector if the child's illness is perceived to be severe [15].

Even though finding treatment for a caregiver giver is influenced by caregiver factors, also health system factors have a role to play. The quality of health services as perceived by the caregivers significantly impacts their health-seeking behavior for the malaria treatment of their under-five child in a formal health facility. These findings agree with those of [8]. These authors noted that the quality of service that is provided in a formal health facility influences whether caregivers will bring their febrile child or not. Formal healthcare facilities are perceived as providing more services such as malaria testing as well as having trained and experienced doctors and personnel [15]. Negative experiences through long waiting times can have the opposite effects and dissuade caregivers from returning to a specific health facility [8]. Subsequently, health workers' behavior was found to be significantly associated with the caregivers' health-seeking behavior. Caregivers who rated the health worker behavior as excellent were 2.2 times more likely to take their under-five children to a formal health facility than those who rate them as poor. These findings conquer with findings from studies by [13] who noted that government facilities are often criticized for treating patients poorly, which can create negative experiences that can dissuade caregivers from seeking care from them in the future.

As evidenced in the findings of this study poor malaria treatment-seeking behaviors of the under-five children's caregivers are aggravated by caregiver education and age. These study findings indicated that caregivers of under-five children in Busia municipality are generally under-educated as only 5.9% of them have achieved a tertiary level of education. This low level of education significantly affects their decision to seek the recommended care for the malaria treatment of their under-five child. Additionally, caregivers who were older (36-45 years) had significant treatment-seeking behavior for malaria treatment ($p < .001$) compared to their younger counterparts.

This research was however limited by recall bias. Some of the analyses relied on the respondent's ability to recall details about health-seeking behavior for malaria treatment. Additionally, this study was limited by scope. This study was limited to the perceived "malaria", as reported by respondents and what health workers typically and presumptively diagnose as "malaria." It is concerned with what people perceive to be malaria illness episodes, as opposed to the actual prevalence of malaria as confirmed by clinical laboratory tests. This approach was ideal for the study area that lacked reliable malaria diagnostic facilities that are also consistent with the WHO presumptive diagnosis and treatment guidelines [2].

Conclusions

Quality of health services, age of caregiver, health worker behavior, and severity of the malaria illness are some of the factors that influence caregivers' health-seeking behavior for malaria treatment in under-five children in Busia Municipality, Uganda. Although some caregivers have some knowledge of the symptoms of malaria, some others are poorly informed about these symptoms. Some caregivers misunderstand the true symptoms of malaria. These findings have revealed that many caregivers do self-management of malaria at home using home remedies and herbs. The utilization of recommended facilities like government hospitals, private hospitals where testing can be done first before initiation of treatment is limited in Busia municipal council. Traditional medicine and home remedies are the common first choice over formal health facilities for malaria management in under-five children by the caregivers. Hence, putting under-five children at great risk of developing complicated malaria.

Therefore, the following recommendations are suggested for Busia Municipality and the areas with a similar challenge, especially in Uganda. The MOH, Uganda should increase the number of health care workers in rural districts like Busia so as to boost the health workforce and reduce waiting time. More health facilities to decongest the available ones should be constructed within Busia and the remote parts of Uganda to provide health services closer to the people. There is a need to continuously train medical workers on client engagement skills so as to promote a good relationship with patients and encourage their return. Malaria sensitization projects to equip communities with key messages about the recommended procedures for managing malaria in under-five children should be initiated in the Busia Municipality. Sensitization on radios, TVs, community dialogue is key to encouraging the prompt seeking of treatment in formal health facilities rather than the current laxity and reactivity to illness severity by the caregivers. Lastly, further studies applying different research techniques like focused group discussions to involve respondents in discussions are recommended to generate detailed information that would help improve malaria treatment-seeking practices.

Declarations

Ethics approval and consent to participate

All participants consented to participate in this study by appending their signatures on the hardcopy consent form. Administrative and ethical approval was obtained from Clarke International University Research Eligibility Committee. Also, clearance to collect data was obtained from the Town Clerk, Busia municipal council. The researchers ensured confidentiality, anonymity, and privacy during the study through the aggregation of findings and coding of data.

Consent for publication

Not applicable

Availability of data and materials

The data used in this study can only be accessed on request.

Competing interests

The authors declare that have no competing interests as far as this study and publication are concerned

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Authors' contributions

DOB and CA have been involved in this study from its conception. DOB was a student under the supervision of CA. Therefore, all the content and data in this manuscript were gathered, written, and analyzed by DOB and critiqued and guided by CA.

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