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Individual factors contributing to the increased cases of malaria among children below five years in Arua regional referral hospital, Arua district. A cross-sectional study.

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ABSTRACT

Background

Malaria is a major public health problem in Uganda, especially among children under five years of age. This study aimed to identify individual-related factors contributing to the increased cases of malaria among children under five years old at Arua Regional Referral Hospital.

Methodology

The study employed a descriptive cross-sectional study with a purposive sampling technique, which was used to collect data from 50 respondents according to the specific objectives. The data was analysed by using Microsoft Word and Excel, then presented in tables and figures.

Results

The majority (72%) of the children were within the age group 0-2 years, whereas. More than half of the respondents (52%) were female. Individual related factors as follows, poor health seeking behavior as (35%) of the respondents resorted to home treatment when their children developed fever, low uptake of interior spraying as (84%) of the respondents had never done interior spraying and low utilization of mosquito nets among those who had access to them as (38%) of the respondents were not always sleeping under treated mosquito nets.

Conclusion

Poor health-seeking behaviours, low uptake of interior spraying, and low utilisation of mosquito nets among those who had access to them contributed to increased cases of malaria among children.

Recommendation

The Ministry of Health should consider targeted interventions in the malaria prevention programs and concentrate on areas with high prevalence, as this will help to maximise the use of the available resources so that malaria can be effectively eliminated.

Keywords: *Individual related factors, Increased cases of malaria, Children below five years, Arua regional referral hospital.*
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Background

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes (WHO,2015). Symptoms can be mild or life-threatening; mild symptoms are fever, chills, and headache, and severe symptoms include anaemia, fatigue, confusion, seizures, and difficulty in breathing (WHO, 2021). The World Malaria report indicates that globally, an estimated 241 million malaria cases occurred in 2020 in 85 malaria endemic countries (including the territory of French Guiana), increasing from 227 million in 2019, with most of this increase coming from countries in the African Region. Poor health-seeking behaviours like resorting to home treatment and low levels of employment have been found to contribute to increased cases of malaria among children below five years in children under 5 years (Mubangizi et al, 2022). The number of mosquito nets in a household is one of the determinants of the prevalence of malaria in children under 5 years (Edebuga et al,2022). Scholars suggest that use of anti-malarial drugs before the hospital visit, self-medication basis, and in appropriate empiric prescriptions are some of the individual-related determinants of malaria cases in children under five 5 years. The objective of the study was to find out the health facility-related factors contributing to the increased cases of malaria among children below five years in Arua regional referral hospital, Arua district.

Methodology

Study design

A quantitative descriptive cross-sectional study was undertaken. The design was used because it helped the

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researcher to collect quantitative data in the shortest time possible.

Study setting

The study was conducted in Arua regional referral hospital, which is located in the city of Arua, Arua district, West Nile sub-region, in the northern Region of Uganda. It is located approximately 496 kilometres by road, northwest of Kampala. The coordinates of Arua Regional Referral Hospital are:
03º01'10.0″N, 30º54'45.0″E. The study took one month, from June 2023 to July 2023. The hospital was established by the government of the Republic of Uganda and is under its full control to provide health services to the population of Arua District and the surrounding districts. The hospital is situated at approximately the centre of Arua city, and thousands seek medical care at the facility. The hospital has the following departments/clinics: OPD, eye clinic, Antenatal Clinic, dental, orthopaedic, accident and emergency, wards that include children's ward, maternity ward, gynaecology and obstetrics ward, medical ward, surgical ward, minor and major theatres, plus nutritional department.

Study population

The study population comprised children below five years, both male and female, who were at risk of being infected with malaria.

Sample size determination

The sample size was determined by using the Kish and Lisle (1967) formula, which states that;

$N=a^2bc/x^2$

Where N=desired sample size, **a=** standard normal deviation usually set at 1.96, which corresponds to 95% confidence level, **b=** proportion of survey population with particulars under investigation, and where its unknown 50% is used, **c=** probability that the researcher will get a certain amount of error. 50% is considered to cater to that.
X degree of accuracy, which ranged from 0.01-0.1

Therefore, it's; $(1.96)^2x0.52x0.52\div0.09^2$

=128 respondents

However, due to financial and time constraints, a sample of 50 respondents was used.

Sampling technique

A simple random sampling technique was employed to choose the participants for the study. This sampling technique gives all participants an equal chance of being selected in the study, and the participants were selected randomly by giving each participant a number that was chosen randomly.

Dependent variables.

The dependent variables in this study were individual-related factors.

Independent variables.

The independent variables for the study were the increased cases of malaria.

Data collection tool.

Data was collected using a questionnaire, which was defined as a predetermined, written list of questions and typed in English, which were answered by the respondents without a supervisor or explanation by the interviewer; therefore, this helped the researcher to reduce the possibility of getting biasness from the respondents. As a structured type of questionnaire was designed to allow the respondents to write responses, they completed them in time. It further enabled the researcher to collect data from a large population in a short period of time.

Data collection procedure.

An introductory letter was obtained from the principal Kampala School of Health Sciences and it was taken to Arua regional referral hospital where the hospital director granted permission to proceed with the data collection at the facility and was required at every department where permission was granted to collect data from there. After the exercise, participants were thanked for their contribution to the study, and the researcher checked through the data filled in the questionnaires.

Pretesting of the questionnaire.

Before undertaking data collection, the questions were piloted on 10 respondents from the Ewuata community in order to identify problems with the data collection process and areas of improvement; hence, necessary modifications were made.

Data management procedure.

After the data was collected, it was checked for completeness and accuracy. The questionnaires that were filled out were completed before the respondents left the health facility. The questionnaires were locked in the cupboard and were accessed by the research team only.

Data analysis.

The data was analysed manually using A4 sheets and then fed into Microsoft Excel to generate bar graphs, tables, and pie charts for easy presentation.

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Ethical consideration.

The researcher introduced the topic and the purpose of the study to the respondents, then he/she signed the consent form before participating in the study. The respondents were assured of confidentiality as no names were to appear on the questionnaire. No participant was forced to participate in the study, and all study materials used during the interview were safely kept in a locked and key-locked cupboard.

RESULTS

Demographic data

Table 1. Shows the distribution of respondents according to demographic information. (N=50)

Description	Frequency (F)	Percentage (%)
Age		
0-2 years	36	72
3-5 years	14	28
Total	**50**	**100**
Sex		
Female	28	52
Male	22	48
Total	**50**	**100**
Education level		
Primary	25	50
Secondary	15	30
Tertiary	8.5	17
None	1.5	3
Total	**50**	**100**
Occupation		
Peasant farmer	26	52
Business	10.5	21
Civil servant	5	10
Student	4.5	9
Others	4	8
Total	**50**	**100**
Mothers of the children		
Yes	41.5	83
No	8.5	17
Total	**50**	**100**
Religion		
Catholic	20	40
Protestant	16.5	33
Muslim	9	18
Born again	4.5	9
Total	**50**	**100**

Table 1 shows that the majority (72%) of the children were within the age group 0-2 years, whereas 28% of the children were within the age group 3-5 years.

More than half of the respondents (52%) were female, whereas the minority (48) were male by sex.

Half of the respondents (50%) had attained primary school, whereas a minority (3%) had not attained any education level.

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More than half of the respondents (52%) were peasant farmers, whereas a minority (8%) were doing nothing.
The majority of the respondents (83%) were the mothers of those children, whereas a minority (17%) were not the mothers of the children.

Almost half of the respondents (40%) were catholic, whereas the least (9%) were born-again Christians.

Individual factors contributing to the increased cases of malaria among children aged below five years in Arua regional referral hospital, Arua district.

Figure 1: Shows the distribution of respondents according to how often they visited the hospital.

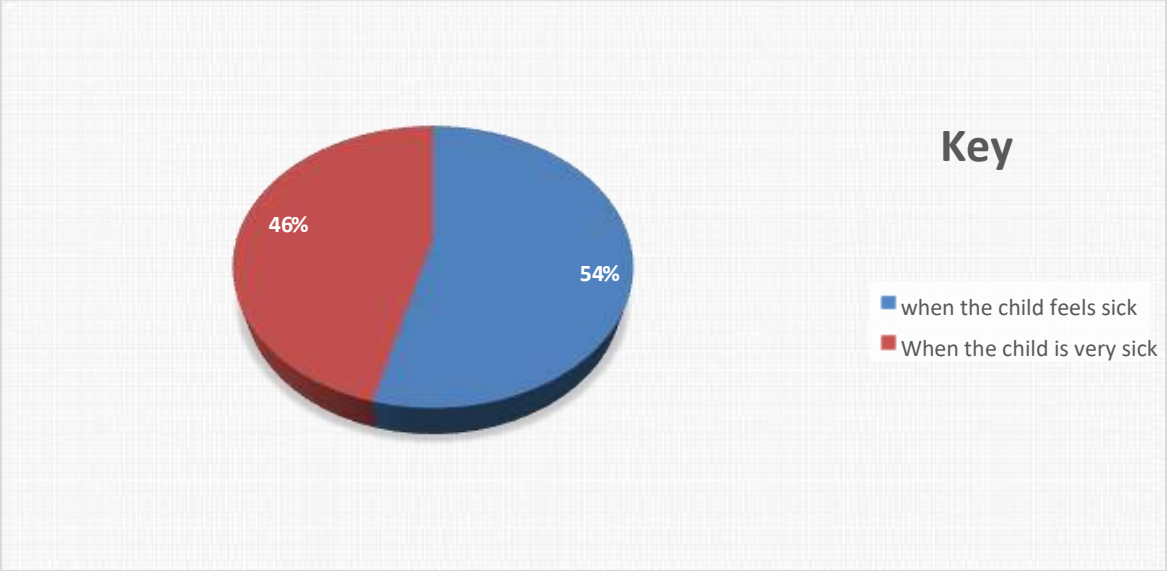

Figure 1, more than half of respondents (54%) took their children to the hospital whenever they were very sick, whereas the rest (46%) of the respondents took their children to the hospital immediately.

Figure 2: Shows the distribution of the respondents according to where they preferred treating their children.

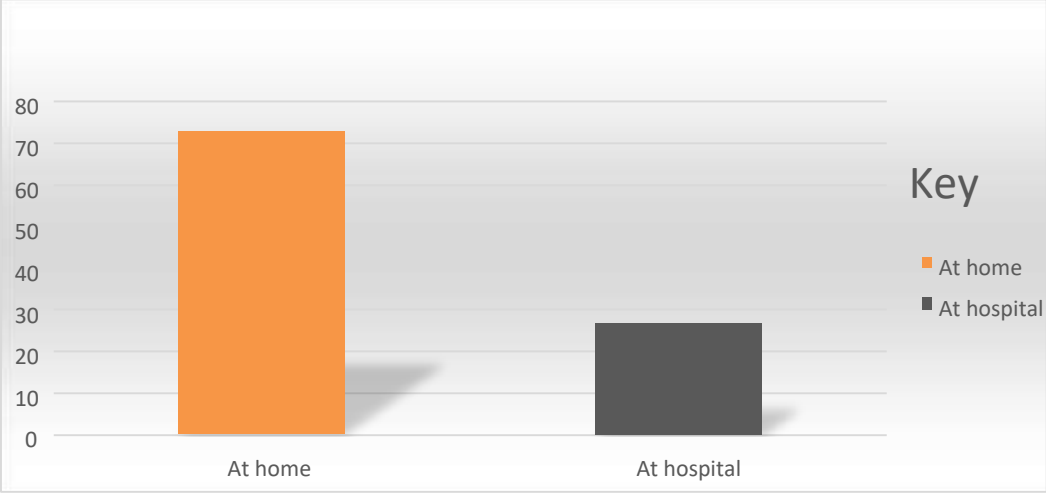

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Figure 2, most of the respondents (73%) preferred treating their children at the hospital, whereas the least (27%) preferred treating at home.

Table 2: Shows the distribution of the respondents according to whether they had used interior spray as a measure to prevent malaria.

Responds	Frequency (F)	Percentage (%)
Yes	8	16
No	42	84
Total	**50**	**100**

Table 2: The majority of the respondents (84%) had not sprayed their houses, whereas a minority (16%) had sprayed their houses.

Figure 3: Shows the distribution of respondents according to whether they used to close their windows at 6:00 pm or at night.

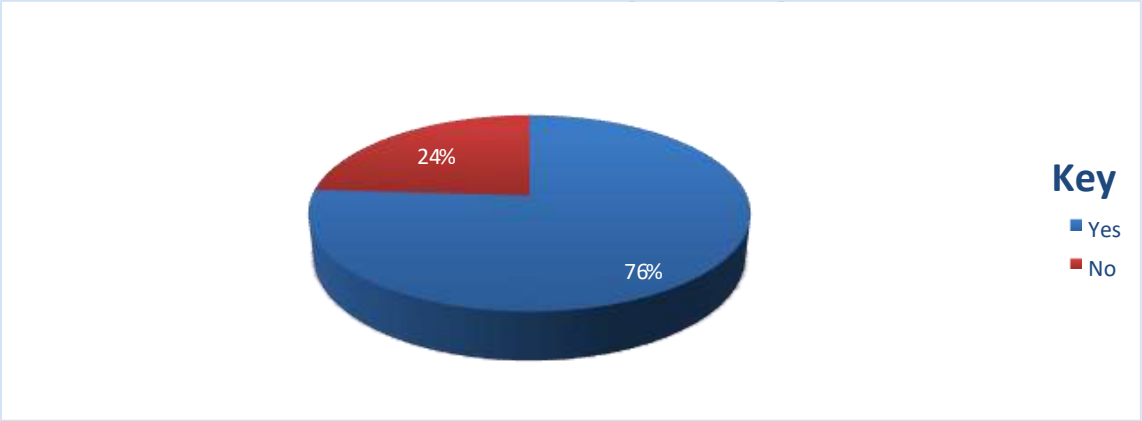

Figure 3, the majority (76%) of the respondents used to close their windows at 6:00 pm or night, whereas a minority (24%) never used to close their windows.

Table 3: Shows the distribution of respondents according to whether they were sleeping under treated mosquito nets.

Responds	Frequency (F)	Percentage (%)
Yes	31	62
No	19	38
Total	**50**	**100**

Table 3 shows that the majority of the respondents (62%) had been sleeping under treated mosquito nets, whereas a minority (38%) had not been sleeping under the treated mosquito nets.

Table 4: Shows the distribution of respondents according to the different reasons they mentioned for not sleeping under treated mosquito nets.

Responds	Frequency (F)	Percentage (%)
I do not get access to the mosquito	28	56
I used it for protecting nursery beds	2	4
	1	2

It is not good to use it in our culture I do not know how to use it.	19	38
Total	**50**	**100%**

In Table 4, more than half (56%) of the respondents had not accessed mosquito nets, whereas a minority (2%) believed it was not good to use mosquito nets in their culture.

Discussion

From the study findings, more than half of the respondents (54%) reported home treatment as the action they take when their children develop a fever. This denotes that an average number of the caretakers possessed inadequate knowledge among themselves. This was inconsistent with a study that was done in Ethiopia, where 78.3% sought care from the formal health care system when their children developed a fever (Birhanu,2016).

The study revealed that more than half of the respondents (52%) were peasant farmers. This signifies that households had low-income levels and were most likely not to afford health care services, which increased the likelihood of behaviours adopting home-based treatment, hence paving the way to persistent illness. The study results were in line with a study in Ghana, where findings suggested that children/guardians who were farmers and traders were more likely to have malaria (OR=1.73 (95%. CI: 1.16-2.56) (Kweku, 2017).

In regards to interior spraying, the majority of the respondents (84%) had never done interior spraying. This could be attributed to the fact that a considerable number of caretakers were unemployed and therefore they could not afford to purchase interior spraying materials. The study results were inconsistent with those of a study in northern Uganda, where nearly 90% of children lived in households that reported being sprayed in the last 12 months (Steinhardt, 2013).

The study findings revealed that (26%) of the respondents did not close their windows before 6:00 pm or at night, whereas (74%) closed them. This was due to a lack of awareness about the benefits of closing windows and other methods of preventing mosquito bites, and also personal preference or habits that affect their willingness to close windows, such as enjoying fresh air and ventilation. The study results were in line with those in western Kenya, where the major reason given for screening doors, windows, and eaves was to prevent entry of mosquitoes (Ng'ang'a, 2019)

The study findings revealed that (38%) of the respondents reported that their children were not always sleeping under treated mosquito bed nets. Therefore, this implies that irregular use of ITNs increased children's chances of being exposed to malaria infections. The study revealed that most of the respondents (82%) said that malaria is high during the rainy season. This is because rainfall provides humidity conditions that favour the breeding of mosquitoes.

Conclusion

Poor health-seeking behaviour and low uptake of indoor spraying contributed to an increased number of cases of malaria among children below five years old.

Recommendations.

The Ministry of Health should consider targeted interventions in the malaria prevention programs and concentrate on areas with high prevalence, as this will help to maximise the use of the available resources so that malaria can be effectively eliminated.

The government of Uganda, through MOH, should make sure that enough funding is available to provide the required ITN programs and must prioritise their availability adequately to the population.

Limitations of the study.

The main study limitation was bias in answering the questions due to the social, cultural, and religious differences among the participants. Some participants found it hard to answer some of the questions, and therefore, some respondents intentionally or unintentionally did not give the right information. Some respondents were not cooperative and lacked general knowledge on the use of anti-malarial drugs and treated mosquito nets.

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List of abbreviations

WHO: World Health Organization
ITNs: Insecticide-Treated Mosquito Nets

MoH: Ministry of Health
OPD: Outpatient department

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The study was not funded

Conflict of interest
The author did not declare any conflict of interest

Data availability
Data is available upon request

Author contribution
James Lopia and Peter Okenyi collected data and drafted the manuscript of the study.
Alex Katwe supervised the study

Author biography
James Lopia Peter Okenyi is a student of a diploma in public health at Kampala School of Health Sciences.
Alex Katwe is a tutor at Kampala School of Health Sciences.

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