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FACTORS RESPONSIBLE FOR PREVALENCE OF MALARIA IN IGABI LOCAL GOVERNMENT AREA OF KADUNA STATE

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ABSTRACT

The purpose of this research was to determine factors that contributed to the prevalence of malaria in Kaduna state's igabi local government area. The research was guided by three objectives and research quoestions. A standardized 25-item questionnaire with a 4-point opinions rating scale was developed by the researcher and used to collect data. The questionnaire was content validated by experts and Cronbach alpha was utilized to determine the tool's internal consistency, which was found to be 0.72. The research data was collected from a sample of 200 respondents who were all members of the population in the study area using Purposive sampling method. Percentage was used to analysed the obtained data. The study found that the population has malaria infections; the source information was median. Based on these findings it was concluded that residents of Igabi were aware of the factors responsible for malaria infection and these revel of awareness could be strengthened by erect drains to minimize

Introduction:

Malaria is a prominent cause of death in tropical African nations, especially among under-5-year-olds and pregnant women with 3.3 billion individuals were at danger of developing the illness globally (Ahmed, et al., 2009; World Health Organization, WHO, 2010). Malaria is a poverty-causing illness in Africa (Roscoe, 2018). 44 nations with heavy malaria transmission grew 1.3% less each year than countries without high malaria levels, according to a recent economic review of 150 countries. A 10% malaria decrease was linked to 0.3% faster economic growth, according to the research. Malaria decreases a country's production through reducing investment and tourism

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water logging. It was recommended that the local government Primary Health Authority should organize malarial prevention/control seminar for the people.

Keywords: Malaria, environmental factors, prevalence, health care

(Guyatt & Snow, 2004; Gallup & Sachs, 2011).

Malaria causes 60% of outpatient visits, 30% of toddler fatalities, 25% of infant deaths, and 11% of maternal deaths in Nigeria (Noland, et al., 2014). Similar to anemia, malaria leads to low birth weight, stillbirths, abortions, and other pregnancy-related problems (Federal Ministry of Health Abuja, 2015). Malaria costs 132 billion Naira yearly in treatment, prevention, and lost person-hours (World Health Organization, 2012). Plasmodium parasite causes severe, life-threatening malaria. Infected female anopheles mosquitoes transmit the disease. Environmental elements and vector and human behavior promote malaria transmission (Boutin, 2015). Early diagnosis, rapid effective medication, and malaria prevention by reducing human-vector interaction are proven ways to minimize morbidity and death (World Health Organization, 2007). Perceptions regarding malaria sickness, especially household vulnerability and disease severity, are crucial for preventive and treatment decisions (Radey, 2011). The causes, mechanisms of transmission, and human choice and decision-making on prevention and control differ by community and family. Many reports from Africa provide malaria knowledge, attitudes, and practices. These reports concluded that misconceptions about malaria exist and that malaria control is unsatisfactory (Laver, et al., 2011; Obol, et al., 2011). It is against this background that there a need to arose for a study on factors responsible for the prevalence of malaria among residents of Igabi, Rigachikun & Rigasa area of Kaduna state, Nigeria.

STATEMENT OF THE PROBLEM

Malaria is a leading cause of death in Sub-Saharan Africa. It is one of Nigeria's major health issues, especially among young children and pregnant women (WHO/UNICEF, 2004). Anopheles mosquitos may lay their eggs in densely populated areas, anything that can hold water, such as water-logged areas, exposed water containers, and potholes. The researcher has discovered high

malaria rates in igabi, Rigachikun, and Rigasa. This is because the majority of patients visited the Maternal and Child Health clinic, Rigachikun Hospital, and the pediatric emergency department during the researcher's clinical posting of Malaria cases have been reported at the University of Maiduguri. Continuous malaria infection can result in clinical outcomes such as severe anemia, cerebral malaria, coma, and drug-resistant parasites, whose spread in the country has hampered the control strategy of rapid detection, proper treatment, and avoided fatalities. Against this backdrop it was necessary to find out the environmental factors responsible for its prevalence in Igabi Local Government Area of Kaduna State

OBJECTIVES OF THE STUDY

The objective of this study was to determine environmental factor responsible for prevalence of malaria in Igabi LGA on Kaduna State. The specific objectives were to:

i. Access the knowledge level of malaria among people of Igabi LGA
ii. Ascertain the environmental factors responsible for the prevalence of malaria of Igabi LGA
iii. Identify methods adopted towards the prevention of malaria among people of Igabi LGA.

RESEARCH QUESTIONS

The following research questions were formulated to guide this research.

i. What is the knowledge level of malaria among people in Igabi LGA?
ii. What are the perceived environmental factors responsible for the prevalence of malaria among people in Igabi LGA?
iii. What are the methods adopted towards the prevention of malaria among people of Igabi LGA?

REVIEW OF RELATED EMPIRICAL STUDIES

In the 1970s, 9,750,000 people died each year from malaria in tropical African countries (Epidi, 2008). In temperate areas, P. vivax is a bigger cause of malaria than P. falciparum. West African relapsing fever is caused by Plasmodium ovale, not Plasmodium vivax. Plasmodium vivax needs Duffy blood group receptors,

which are not found in a lot of Africans, especially in West Africa (WHO, 2020). Africa is where 90% of malaria deaths happen (Omortor & Atubi; 2007). It kills the most babies, pregnant women, and older people in Africa (Greenwood and Mutabingwa, 2005). Highlands with low temperatures are at risk (Ebi, 2005). The severe effects of malaria make people more vulnerable to climate change, which makes it harder for them to adapt. Changes in temperature and rainfall are likely to make more malaria-carrying mosquitoes (Githeko et al., 2000).

Vectors, parasites, environment, and humans cause malaria. Malaria epidemics affect people who don't have strong immune systems. This puts a lot of stress on hospitals and raises the number of deaths. It's not clear what pandemic malaria will do to the economy (Anumudu, et al., 2006). Even though malaria is a big problem, not much is known about what drives the economy in places where it is common (Age, malaria awareness, education, and household size affect malaria incidence).

Asenso-Okyere, (1994) did a study on malaria in Kojo Ashong, Barekese, Barelma, and Oyereko. He found that malnutrition, mosquitoes, extreme heat, drinking, flies, tiredness, dirty surroundings, unsafe water, bad air, and lack of good hygiene are the main causes. Malaria causes a yellow eyeball, chills, shivering, headaches, a bitter taste in the mouth, weakness, and urine that is yellow.

Some places in Africa get flooded because people break pipes on purpose to get water for drinking or informal economic activities like car washing and farming (Brook, 2008). Malaria is spread by the car washes in Nigeria (Oyeyemi et al, 2019). Broken pipes in Africa cause water to pool, which makes it easy for mosquitoes to breed. Nkomo et al. (2006) say that floods may help malaria carriers spread in dry areas. Malaria changes could put highlands at risk (Eikenberry and Gumel, 2018).

In urbanized part of Kenya, Anopheles species liked temporary water areas better than permanent water areas during the wet season, but dams and swamps during the dry season (Terretta, 2004). Malaria is common in Africa because of dams, places that are dirty, and car washes (WHO, 2002). In a community, 23.6/100 people get malaria every year. Conway said that during the rainy season, people in towns with bad drainage are more likely to get malaria. The Konton Karfe watershed basin is in a high-risk area for malaria in Nigeria

(Ifatimehin et al; 2014). Ifatimehin et al. (2014) found that dirty places made people more likely to get malaria. WHO says that 70% less malaria occurs in places that are clean.

Malaria is spread in Nigerian cities by the growth of slums and shanty towns, which create pools of standing water where mosquitoes can breed because the area isn't clean (Ifatimehin, et al; 2014). Due to cleanliness and fumigation programs, Eritrea, Komoros Island, and certain Southern African states have minimal malaria rates (Leadership Newspaper, 2010). Malaria may be spreading from Lake Victoria's lowlands to the highlands because of climate change and poverty (Magrath, 2008).

Malaria is common in Africa. In Uganda, 99% of people knew about it in 2001, according to Net Mark. In 2001, CMS found that 99% of people in Mukono, Jinja, and Arua knew about HIV/AIDS. Kilian (2003) found that people's knowledge of malaria and how they treated it had improved in western Uganda. The Home-Based Management of Malaria/Fever (HEM) baseline (2001) and follow-up (2003) surveys and the PS (2003) melting survey found the same thing (Zbigniew, 2009). By 2001, 80–90% of people in the community knew what caused malaria, up from 40–50% in the early 1990s.

According to Okello (2011), 92% of people who answered the survey in five places knew that insects cause malaria, but only 21% knew that was all there was to it. CMS found that 77.6% of people in three different places knew that mosquitoes spread malaria.

Adeneye (2007) says that 84% of the people he talked to in Kampala knew that mosquitoes spread malaria. MoH/WHO/BASICS II found that 91.1% of caregivers in nine Ugandan communities knew how malaria spread (Batega, 2004). Kilian et al. (2003) said that there were big gains in knowledge in western Uganda. Most of the caregivers in Kampala knew that malaria is caused by mosquitoes, but they also gave other reasons. When female anopheles mosquitoes bite sick people, they inject them with plasmodium sporozoa (IREM, 2007).

Most people who answered know that malaria causes fever, vomiting, loss of appetite, and restlessness. GTZ/UM/MOH thought that families had malaria symptoms if they had fever with a headache or pain, but not if they had general weakness or felt dizzy. In Fort portal (an urban area of Kabarole), 59.1% of households knew the signs of malaria, while only 43.1% of households in the

countryside did (Batega, 2004). Kilian et al. (2003) found that people there understood the signs of malaria better. In Kampala, 89% of caregivers could tell that a person had malaria by how hot they were. Near the city of Kampala, 84% of those who answered the survey said they had fever, sweating, or vomiting (Kamaranzi, 2010). Leku (2000) in Metu sub-county, Moyo district, says that a hot body is one of the two most common signs of malaria. The other two are vomiting (27%) and other symptoms (23%).

How people think about malaria affects their health and what they do to avoid it. Some research shows that more children under the age of 5 die of malaria than adults. Studies show that most people think it is possible to stop malaria. Positive attitudes help people change the way they act. In Mpigi, 87.5% of people knew that malaria could be stopped (Rissa, 2000). A study found that 72% of Moyo residents thought it was possible to stop malaria (Leku, 2000). Rissa (2000) found that 98% of people in three Ugandan districts thought malaria could kill. Qualitative studies (Mangeni, 2003, Mufubenga, 2004) show that pregnant women often get malaria. According to Leku (2000), 56% of Moyo respondents said malaria was a problem only during certain times of the year. According to Bakika (1994), 87.6% of people who took part in a CMS survey in 2001 said that there were a lot of mosquitoes during the rainy season. Ario (2007) and Leku (2000) found the same thing in Tororo and Moyo. 60% of the people who answered the survey in Mpigi thought malaria was seasonal.

A survey shows that most mothers choose western medicine (James et al., 2019). In every study, home therapy that is not part of the established health system is preferred. Home treatment medicines can be bought at provisionals, dukas, and pharmacies (Adome et al., 1996). Most cases of malaria are treated outside of official health systems by shopkeepers (38%), pharmacies (41%) and private clinics (41%). MoH/RBM WHO's 2001 baseline survey found that 7.3% of caregivers of children under 5 years old went to get help within 24 hours. For those who did, the first step was self-medication (47.6%), while only 24.9% went to a health facility (Lutalo, S.K.K, et al., 2000). Kizito et al. (2012) say that malaria can be treated at home. 40% of the people who answered the survey in Kampala said they would take their kids to the clinic, treat them themselves at home (36%), or go to a pharmacy shop (23%).

WHO, UNICEF, and MOH found in 2003 that anti-malaria was bought for home treatment and self-medication in Apac, Rukungiri, and Kampala. 67% of people in Apag treated themselves at home or on their own, while only 61% did so in Kampala and Rukungiri. In Mpigi, where Batega did his research in 2004, he found that 90% of the women treated malaria with both traditional and modern medicine.

A look at how people get care shows that treatment tends to follow a hierarchy, with home care being the most common, followed by health institutions and hospitals with admissions facilities. Studies show that most Nigerians cure malaria at home. Because they don't have enough money for a formal medical consultation or treatment, they don't think the malaria attack is that bad, they are far from a health facility, they have drugs and herbs at home, it's easier for caretakers, who are usually women, to treat themselves at home, traditional herbs are easy to use, they believe in how to prepare them, and they help other people in the house get better. At home, they were given CQ, SP, painkillers (paracetamol and aspirin), herbs, and antibiotics (Whyte, 1992). There are limits to home-based combination therapy (Jelovac & Armstrong, 2011).

In the second stage of treatment, private clinics, pharmacies, health centers, and traditional healers are used. Most of the time, this second stage or level of therapy is used when home care doesn't work or when the illness gets worse. Private clinics are better than public health centers because: i. They always have the medicines you need, ii. You get better care faster, iii. The service providers pay more attention to each client, and iv. People who work in health care are nicer.

Distance to source of treatment/drugs, expectations that drugs will be cheap, advice from friends and family, history of relationship with drug source (e.g., rate of successful treatment with drugs bought from that source), presence of good provider at source, quick service, steady availability of drugs, and sometimes presence of qualified providers (Batega, 2004). Luunniale and Rajais said consumers desire friendly service and convenience (1996). Even though government institutions were cheap and had qualified staff, they were only open during limited hours, drugs weren't always available, and the staff wasn't always nice.

Njama, et al., (2003) found that poor countries were 2.5 times more likely than rich countries to have basic public health care (WHO, 2003). Bed nets with

insecticides and medicine to treat fevers are less likely to be in low-income homes (WHO, 2003). A Tanzanian study showed that more poor people than rich people had malaria (WHO, 2003). People with low incomes can't pay for preventive care or hospital services like lab tests, prescriptions, etc (Berman, 2004).

In Moyo (Leku, 2000), 66.9% of the Mpigl people knew how to avoid getting malaria. Most of the people who took part said that clearing out bushes and making drainage would be good ways to control vectors. Sprays, coils, ITNs, and PT were rarely talked about, but people knew a lot about traditional ways to stay safe. CMS found that 17% of rural Ugandans didn't know how to avoid getting malaria (Okello, 2001). 48.3% of people in cities said bed nets prevent malaria, while only 24.6% of people in rural areas said the same. 17.5% of people in cities and 20.1% of people in rural areas knew that cleanliness reduced vectors. 11.2% of rural respondents and 2.1% of urban respondents thought that good water could prevent malaria. Urban respondents preferred pesticide spray to prevent malaria.

In Kampala, barely 25% of respondents utilized bed nets (Njama, et al., 2003). (Njama et al., 2003). (Njama et al., 2003). DISH II (2002) found that environmental protections against malaria are well-known but rarely used. Mosquito nets were not used much in the Mpigi district, and conversations in focus groups suggested that clearing bush, getting rid of abandoned tins, and spraying the area in general would reduce the need for mosquito nets. People were afraid that mosquito coils could give them cancer or make their chests hurt. No one knew about ITNs. Long-term ITN use was harmful, according to experts (DISH II, 2002) (DISH II, 2002). The HBM follow-up research (Batega, 2004) found that people in the 9 places where they looked didn't know enough about effective ways to prevent malaria. For example, 62% of people named mosquito nets, but only 20% of caregivers specifically named ITNs as an effective way to prevent malaria. ITNs were used more in HBM districts (29%) than in non-HBM districts (20%). Bush removal (40%) and removing stagnant water around the residence (25%) also prevent malaria. "Clearing bush" was more common than using ITNs, but it had little effect on how malaria spread. Vector Control Cities have high malaria prevention expertise (Okello, 2001; Riisa, 2000; Net Mark, 2001 A) (Okello, 2001; Riisa, 2000; Net Mark, 2001A).

The Kampala City Council (KCC) looked at 400 homes in five parishes in 2002 and found that 45 percent of them had at least one net. In the same study (KCC, 2002), 11.5% of families had at least one treated net, and 47% of children slept under nets in homes with at least one net. This number was higher (90%) for homes with more than one net.

Batega (2004) found that in Arua, 29% of people used mosquito coils, 6.4% used bed nets, 1.8% used insecticides, and 47% didn't do anything to protect themselves. Lack of money to buy mosquito coils, bed nets, and insecticides, as well as not being able to read or write, make it hard to stop malaria.

According to a survey done by Net Mark in 2001, less than half of the people who have nets use them all year. Nets were used during the rainy season, when there were a lot of mosquitoes and the risk of malaria was high. People over 40 and kids under 5 were both part of the same study. PSI detected intermittent internet use in 2002-2003. Only 21% of rural net owners in 2002 and 29% of urban net owners in 2003 slept under them the night before the interview. This shows that nets are not always used.

An analysis of how people get care shows that treatment patterns tend to be hierarchical, with the most common type of therapy happening at home, the second most common happening at a health institution, and the third most common happening at hospitals and health units with admitting facilities. According to studies, most Nigerians can treat malaria at home. Because they don't have enough money for a formal medical consultation and treatment, they don't think the malaria attack is that bad, they are far from a health facility, they have drugs and herbs at home, it's easier for caretakers, who are usually women, to treat themselves at home, traditional herbs are easy to use, they believe in how to prepare them, and other people in the house support the treatment. At home, patients were given CQ, SP, paracetamol and aspirin for pain relief, herbs, and sometimes antibiotics (Whyte, 1992). Combination therapy at home isn't very effective (Jelovac & Armstrong, 2011).

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make their chests hurt. No one knew about ITNs. Experts said that using ITNs for a long time was bad (DISH II, 2002). The HBM follow-up research (Batega, 2004) found that people in the 9 places where they looked didn't know enough about effective ways to prevent malaria. For example, 62% of people named mosquito nets, but only 20% of caregivers specifically named ITNs as an effective way to prevent malaria. ITNs were used more in HBM districts (29%) than in non-HBM districts (20%). Malaria can also be stopped by getting rid of bushes (40%) and any standing water around the house (25%). "Clearing bush" was more common than using ITNs, but it had little effect on how malaria spread. VECTOR CONTROL Cities know a lot about how to stop malaria (see Okello, 2001; Riisa, 2000; Net Mark, 2001 A).

Even though people in the community know a lot and have good attitudes, they choose noncommercial ways to stop malaria. Men hardly ever used IPT (Dawaki, et al., 2016). Rissa said that bush clearing (64%), getting rid of empty tins (53.7%), and taking chloroquine to prevent malaria (47.1%) were the most popular ways to stop the disease in the Mpigi district. (2000). 3.7% of the people who answered used mosquito nets, sprays, window screens, coils, or all of these. Leku says that 12% of homes in Metu sub-county in Mayo district used mosquito nets (2000).

METHODOLOGY

Cross-sectional survey design was employed for this study to assess the factors responsible for the prevalence of malaria among residents in the study area. The study area covers Igabi, Rigachikun and Rigasa all located in Kaduna State. The total population consisted of 430,753 people based on 2006 Nigerian Population Census. A sample size of 200 was chosen using purposive sampling method. The instrument used for data collection is a researcher-developed questionnaire complimented. The questionnaire is made up of two components. Section A contains the demographic profile of the respondents, such as Age, Sex, Marital status, Occupation, and Educational Qualification, while Section B consists of sub-units designed to make up different researchers' comments on the 29 questionnaire items. Knowledge about malaria was measured with 8 items, environment factors by 9 items while preventive methods by 3 items. All the items are of categorical nature. The questionnaire was subjected to both face and

content validates by three experts and the reliability was established using Cronbach Alpha which was found to be 0.72 out of the 200 copies of questionnaires distributed, 150 constituting 75% return rate were found suitable for analysis. Demographic profile on age records that majority of the respondents 57(38%) are between 35- 44 years, followed by 45(30%) between 25-30 years and the male 99(66%) tends to determine this study compared to 51(34%) females. Majority of the respondents 114(76%) are married. Occupation wise 69(46%) are civil servant while education qualification produced 33(22%) who had qur'anic education only with 27(18%) having secondary school education. Descriptive statistics of frequency and percentage were used to analysed the collected data.

Results

Research question one: What is the knowledge level of malaria among people in Igabi LGA?

Table 1: Knowledge level on Malaria prevention

Variables	Categories	Frequency	Percentage (%)
Have you ever heard of malaria infection?	Yes	120	80
	No	30	20
Total		**150**	**100**
Source of information on malaria	Through mass media	75	50
	Through friends	60	40
	During visit to the hospital	15	10
Total		**150**	**100**
History of previous malaria attack	Yes	121	80
	No	29	20
Total		**150**	**100**
Insect that transmits malaria	Grasshopper	0	0
	Housefly	80	53.3
	Mosquito	70	46.7
Total		**150**	**100**
Season of most malaria infection	Rainy season	120	80
	Harmattan season	12	8
	Dry season	3	2

	All season	15	10
Total		**150**	**100**
Route of malaria transmission	Mosquitoes bite	35	23.3
	Blood transmission	9	6
	Poor personal hygiene	48	32
	Poor environmental hygiene		
	All of the above	42	28
		16	10.7
Total		**150**	**100**
Is malaria a preventable disease	Yes	120	80
	No	30	20
Total		**150**	**100**

Source: field work, 2022

Data contained in table 1 reveal that knowledge level of the respondents in regards to many questionnaire items. On the items: have you ever heard of malaria infection? 120(80%) answered Yes while 30(20%) said No. On the source of information on malaria, 75(50%) affirmed through mass media, 60(40%) through friends while 15(10%) during visit to the hospital. On the history of previous malaria attack, 121(80%) said "Yes" while 29(20%) said "No" for the insect of malaria, a greater percentage 80(54%) of the respondent selected housefly as the insect that transmit malaria infection while 70(46%) selected mosquito as the insect that transmit malaria infection. As for the season of malaria, a greater percentage of 120(80%) of the respondents consider raining season as the season that malaria infection is common, 12(8%) consider harmattan season, 3(2%) consider dry season and 15(10%) consider all season. About route of malaria transmission, 35(24%) indicated mosquito bite, 9(6%) indicated blood transmission, 48(32%) indicated poor personal hygiene, 43(28%) indicated poor environmental hygiene and 16(10%) indicated all of the above. Lastly on awareness about malaria prevention in which a greater percentage 120(80%) indicated that it is preventable while 30(20%) indicated that it is not preventable.

Research Question Two: What are the perceived environmental factors responsible for the prevalence of malaria among people in Igabi LGA?

Table 2: Perceived environmental factors responsible for the prevalence of malaria among people in Igabi LGA?

Variables	Frequency	Percentage (%)
Inadequate drainage system	6	4
Poor environmental hygiene	69	46
Indiscriminate refuse disposal	39	26
Stagnant	15	10
All of the above	21	14
Total	**150**	**100**

Source: field work, 2022

The above table 2 indicated that majority of the respondents 69(46%) viewed poor environmental hygiene as the factor responsible for mosquito breeding in the area, 39(26%) viewed indiscriminate refuse disposal, 15(10%) viewed stagnant water, 6(4%) viewed inadequate drainage system and 21 (14%) viewed all of the above as the factor responsible for malaria breading in the area.

Research Question Three: What are the methods adopted towards the prevention of malaria among people of Igabi LGA?

Table 3: Methods adopted towards the prevention of malaria among people of Igabi LGA?

Variables	Categories	Frequency	Percentage (%)
Respondents' consideration on the most effective prevention	Use of insecticide	48	32
	Sleeping under net	30	20
	Use of drugs to prevent malaria	9	6
	Spraying of surrounding with chemical	24	16
	Wire netting of door, windows and verandahs	39	26
Possession of insecticide treated net (ITN)	Yes	51	34
	No	99	66

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Utilization of insecticide treated nets	Yes	30	20
	No	120	80
Respondents practice of preventive measures	Insecticide	72	66
	Bet net	30	12
	Wire netting of door, windows and verandahs	39	12
	Use of drugs to prevent malaria	6	5
	Spraying of surrounding with chemical	3	2
	Total	**150**	**100**

Source: field work, 2022

Table 3 above shows the methods adopted by the respondents to prevent malaria. 48(32%) of the respondents consider use of insecticide as the most effective method, 30(20%) consider bed net, 9(6%) consider use of drugs, 24(16%) consider spraying of surrounding with chemical and 39(76%) consider wire netting of doors windows and verandahs as the most effective method. As for the availability of ITN, majority of the respondents 99(66%) have no access to the ITNs and 51(34%) have access to ITNs. About the utilization of ITNs, a greater percentage of the respondents about 120(80%) were not utilizing the ITNs and only 30(20%) of the respondents were utilizing the ITNs and lastly about the practicing of the preventive measures. Majority of the respondents 72(48%) practice the use of insecticide, 30(20%) practice use of bed net, 39(26%) practice the use of wire netting of doors, windows and verandahs, 6(4%) practice the use the drugs and only 3(2%) practice spraying of surrounding with chemicals

CONCLUSION

Based on the findings of this study, it was concluded that Igabi, Rigachukum and Rigasa is a conducive environment for breeding of mosquito because the population are ignorant about causes of malaria. This is due to ignorance about the causes of malaria, lack of/or late visiting of hospital/health facilities, poverty and poor drainage systems/presence of water-logging areas which exacerbate malaria prevalence in the area evidenced by majority of the respondents having suffered malaria in the area.

RECOMMENDATION

Based on the findings of this study, the following recommendations were made:

- Residents of Igabi, Rigachukum, and Rigasa should practice more frequent environmental cleanliness and drain domestic liquid waste into proper drains to avoid water-logging.
- Religious and community leaders should be educated about environmental sanitation as it will reduce malaria cases.
- Health facilities should have enough staff to deliver malaria preventive and control education, local government & state should employ and deploy more staff to deliver modern malaria prevention
- Community participation should be encouraged as it promotes acceptance of new techniques and health-related concepts.
- The Metropolitan Council should fix damaged water pipes in Igabi, Rigachukum, and Rigasa and launch an awareness campaign on the causes of malaria through TV, Radio, and other media to avoid future complications.
- The government and NGOs should help the community by developing new drainage routes for sewage and stagnant water, providing incinerators, and establishing a maintenance committee to make it strong and well-organized.
- The government should give free or subsidized ITNs to the residents of Igabi, Rigachukum, and Rigasa, as well as free malaria prevention at all health institutions, to lessen the difficulty encountered by the least fortunate.

REFERENCE

Abioye, J. O. K., Abdullahi, D. K., Alalade, O. M., & Olokun, A. L. (2015). Incidence of malaria parasite in blood donors at Kwali General Hospital, FCT Abuja. *Journal of Emerging Trends in Engineering and Applied Sciences*, *6*(3), 212-216.

Adamu, A., Abdulkadir, B., & Mukhtar, G. L. Received: 8th Nov., 2016 Accepted: 23 Dec., 2016.

Adebayo, A. M., Akinyemi, O. O., & Cadmus, E. O. (2015). Knowledge of malaria prevention among pregnant women and female caregivers of under-five children in rural southwest Nigeria. *PeerJ*, *3*, e792.

Adebayo, A. M., Akinyemi, O. O., & Cadmus, E. O. (2015). Knowledge of malaria prevention among pregnant women and female caregivers of under-five children in rural southwest Nigeria. *PeerJ*, *3*, e792.

Adedotun, A. A., Salawu, O. T., O, A., & Odaibo, A. B. (2013). Plasmodial infection and haematological parameters in febrile patients in a hospital in Oyo town, South-western Nigeria. *Journal of public health and epidemiology*, *5*(3), 144-148.

Adeneye, A. K., Jegede, A. S., Mafe, M. A., & Nwokocha, E. E. (2007). A pilot study to evaluate malaria control strategies in Ogun State, Nigeria.

Al Awaidy, S. A., Bawikar, S., Al Busaidy, S., Baqiani, S., Al Abedani, I., Varghese, R., & Patel, M. M. (2009). Considerations for introduction of a rotavirus vaccine in Oman: rotavirus disease and economic burden. *The Journal of infectious diseases*, *200*(Supplement_1), S248-S253.

Asenso-Okyere, W. K. (1994). Socioeconomic factors in malaria control. In *World health forum 1994; 15 (3): 265-268*.

Batega, D. W. (2004). Knowledge attitudes and practices about malaria treatment and prevention in Uganda. *A literature review final report pdf USAID. Gov/pdf*.

Brooks, S. (2008). 'A Squatter in My Own Country!'Spatial Manifestations of Social Exclusion in a Jamaican Tourist Resort Town. In *New perspectives in Caribbean tourism* (pp. 175-199). Routledge.

Chowdhury, F. R., Ibrahim, Q. S. U., Bari, M. S., Alam, M. J., Dunachie, S. J., Rodriguez-Morales, A. J., & Patwary, M. I. (2018). The association between temperature, rainfall and humidity with common climate-sensitive infectious diseases in Bangladesh. *PloS one*, *13*(6), e0199579.

Dirontsho, M., Ntombi, N. B., Dare, K. O., Ronald, M. M., & Vincent, P. (2022). local knowledge of adaptive strategies against malaria endemicity in the okavango delta, botswana. *African Journal of Infectious Diseases*, *16*(2), 21.

Ebi, K. L., Hartman, J., Chan, N., Mcconnell, J., Schlesinger, M., & Weyant, J. (2005). Climate suitability for stable malaria transmission in Zimbabwe under different climate change scenarios. *Climatic Change*, *73*(3), 375-393.

Eikenberry, S. E., & Gumel, A. B. (2018). Mathematical modeling of climate change and malaria transmission dynamics: a historical review. *Journal of mathematical biology*, *77*(4), 857-933.

Exoo, C. F. (2009). *The pen and the sword: Press, war, and terror in the 21st century*. Sage Publications.

Githeko, A. K., Lindsay, S. W., Confalonieri, U. E., & Patz, J. A. (2000). Climate change and vector-borne diseases: a regional analysis. *Bulletin of the world health organization*, *78*(9), 1136-1147.

Greenwood, B., & Mutabingwa, T. (2002). Malaria in 2002. *Nature*, *415*(6872), 670.

Hasan, S., Ukkusuri, S., Gladwin, H., & Murray-Tuite, P. (2011). Behavioral model to understand household-level hurricane evacuation decision making. *Journal of Transportation Engineering*, *137*(5), 341-348.

Ifatimehin, O. O., Falola, O. O., & Odogbo, E. V. (2014). An analysis of the spatial distribution of Plasmodium sporozoites and effects of climatic correlates on malaria infection in Anyigba town, Nigeria. *Global Journal of Health Science*, *6*(1), 115.

Iloh, G. U. P., Orjji, U. N., & Amadi, A. N. (2013). Malaria morbidity among under-five Nigerian children: A study of its prevalence and health practices of primary care givers (mothers) in a resource-poor setting of a rural hospital in Eastern Nigeria. *European Journal of Preventive Medicine*, *1*(3), 50-57.

Jager, C. D., Kruger, T., & Tosh, C. (2019). Research, innovation and education towards malaria elimination: Improving quality of life in Africa. In *Handbook of Quality of Life in African Societies* (pp. 179-200). Springer, Cham.

Kasule, J. S. (2011). *Factors Influencing the Performance of the Health Management Information System in Health Facilities in Hoima District* (Doctoral dissertation, International Health Sciences University).

Kasule, J. S. (2011). *Factors Influencing the Performance of the Health Management Information System in Health Facilities in Hoima District* (Doctoral dissertation, International Health Sciences University).

Lacroix, A., Vidal, N., Keita, A. K., Thaurignac, G., Esteban, A., De Nys, H., ... & Peeters, M. (2020). Wide diversity of Coronaviruses in frugivorous and insectivorous bat species: A pilot study in Guinea, West Africa. *Viruses*, *12*(8), 855.

Lee, C. T., Katz, R., Eaneff, S., Mahar, M., & Ojo, O. (2020). Action-based costing for national action plans for health security: accelerating progress toward the International Health Regulations (2005). *Health security*, *18*(S1), S-53.

Magrath, J. (2008). Turning up the heat: Climate change and poverty in Uganda. *Oxfam Policy and Practice: Agriculture, Food and Land*, *8*(3), 96-125.

McCord, G. C. (2011). *Essays on malaria, environment and society*. Columbia University.

McKenna, J. J., & McDade, T. (2005). Why babies should never sleep alone: A review of the co-sleeping controversy in relation to SIDS, bedsharing and breast feeding. *Paediatric respiratory reviews*, *6*(2), 134-152.

Mutabingwa, T. K., Muze, K., Ord, R., Briceño, M., Greenwood, B. M., Drakeley, C., & Whitty, C. J. (2009). Randomized trial of artesunate+ amodiaquine, sulfadoxine-pyrimethamine+ amodiaquine, chlorproguanal-dapsone and SP for malaria in pregnancy in Tanzania. *PLos one*, *4*(4), e5138.

Nkomo, J. C., Nyong, A. O., & Kulindwa, K. (2006). The impacts of climate change in Africa. *Final draft submitted to the Stern Review on the Economics of Climate Change*, *51*.

Okello, S. A. (2011). *Species abundance, composition and colonization behaviour of Malaria vectors in a semi-arid ecosystem of Baringo District, Kenya* (Doctoral dissertation, Kenyatta University).

Oyeyemi, A. L., Aliyu, S. U., Sa'ad, F., Rufa'i, A. A., Jajere, A. R. M., & Oyeyemi, A. Y. (2019). Association between adolescent motherhood and maternal and child health indices in Maiduguri, Nigeria: a community-based cross-sectional study. *BMJ open*, *9*(3), e024017.

Roscoe, J. N., Lery, B., & Chambers, J. E. (2018). Understanding child protection decisions involving parents with mental illness and substance abuse. *Child abuse & neglect*, *81*, 235-248.

Smith, K. L., Verma, N., Blackford, A. L., Lehman, J., Westbrook, K., Lim, D., ... & Stearns, V. (2022). Association of treatment-emergent symptoms identified by patient-reported outcomes with adjuvant endocrine therapy discontinuation. *NPJ breast cancer*, *8*(1), 1-13.

Terretta, M. (2004). *The fabrication of the postcolonial state of Cameroon: Village nationalism and the UPC's fight for nation, 1948–1971*. The University of Wisconsin-Madison.

Williams, C. K., & Zervos, O. H. (1996). Frankish Corinth: 1995. *Hesperia: The Journal of the American School of Classical Studies at Athens*, *65*(1), 1-55.

Woolf, A., Wright, R., Amarasiriwardena, C., & Bellinger, D. (2002). A child with chronic manganese exposure from drinking water. *Environmental health perspectives*, *110*(6), 613-616.

World Health Organization. (2004). *Maternal mortality in 2000: estimates developed by WHO, UNICEF and UNFPA*. World Health Organization.

World Health Organization. (2008). *World health statistics 2008*. World Health Organization.

World Health Organization. (2010). *World health statistics 2010*. World Health Organization.

Zhou, G., Munga, S., Minakawa, N., Githeko, A. K., & Yan, G. (2007). Spatial relationship between adult malaria vector abundance and environmental factors in western Kenya highlands. *The American journal of tropical medicine and hygiene*, *77*(1), 29-35.