

Original Research Article

Perception of Mothers of children under five on malaria: A case of AhantaWest Municipality in Ghana.

ABSTRACT

Globally, Malaria **account** for about 80% of Out-Patient Department cases **which** Ghana is not an exception. Malaria poses a serious public health challenge, which impedes the development of any nation. Malaria is one of the causes of death of children under five. The purpose of the study was to examine the perception of mothers on the prevention and control of malaria and its effects on children under-five (5) years at the Agona Nkwanta Polyclinic, in the Western Region of Ghana. A descriptive cross-sectional design was used **for** to conveniently sample technique 345 respondents. Results found that had **good** perception **on** malaria. It was revealed that participants (n=345, 100.0%) with M = 2.0, SD = 0.00, were aware of the effects of malaria on their children. Based on the findings, it was recommended that nurses and other health practitioners should continue to provide up-to-date knowledge on causes, prevention **and** treatment practices to mothers on malaria **of** children under five.

KEYWORDS: malaria, Children under five, Perception

INTRODUCTION

Malaria is a preventable and curable disease that is transmitted to people of all ages (WHO, 2017). It is caused by the plasmodium species; plasmodium falciparum, plasmodium vivax, plasmodium malariae **and** plasmodium ovale **and** spread by the bites of an infectious female anopheles mosquito (Shah, Emina, Eckert, & Ye, 2015). The fifth, plasmodium knowlesi is spread from monkeys to humans (WHO, 2015). Occasionally it can be passed directly from one person to another by unscreened blood transfusion and accidental inoculation or across the placenta from an infected mother to the fetus (Noor, Mutheu, Tatem, Hay, & Snow, 2019). Malaria poses a serious public health challenge, which impedes the development of any nation. Globally, malaria has an estimated burden of 212 million clinical cases and 429,000 deaths (WHO, 2015). A significant proportion (92%) of reported deaths of malaria occurs in sub-Saharan Africa followed by **South** East Asia region (6%) and WHO Eastern Mediterranean region (2%). Plasmodium falciparum is the deadliest and most predominant plasmodium in

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Africa (WHO, 2013). Most of these countries contain an abundance of surface water which provides good breeding sites for mosquitos, presence of humid conditions which facilitate longevity of the adult mosquito (Maslove et al., 2019). Furthermore, poor quality houses that offer little protection from mosquito bites also facilitate interactions between mosquitos and humans (WHO, 2015).

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Reduction of these barriers would make global malaria elimination attainable. An individual's perception about a phenomenon influences the person's behaviour and attitude towards the phenomena (Ahorlu, Koram, Seakey & Weiss, 2019). This implies that the perception of mothers with children under five years about malaria potentially would influence their behaviour and attitude towards malaria when their children under five years are infected with malaria (Shah, Emina, Eckert, & Ye, 2015). For instance, the mother's perception about malaria would influence whether the mother would immediately seek medical care or not (Maslove et al., 2019). It is therefore important that the perception of mothers on the prevention and control of malaria and its effects on children under-five (5) years at the AgonaNkwanta Polyclinic, in the Western Region of Ghana is investigated.

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Definition

According to the WHO (2021), Malaria is spread by the bite of an infective female Anopheles mosquito. The disease can cause fever, chills, and flu-like illness. Malaria is a serious, notifiable infectious illness characterized by periodic chills, fever, sweating and splenomegaly. It is caused by a single cell protozoan parasite that belongs to the genus Plasmodium.

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Perception of Malaria

Of the 91 countries reporting indigenous malaria cases in 2016, 15 countries –all in Sub-Saharan Africa, except India–carried 80% of the global burden (WHO, 2017). Although, malaria case incidence has fallen globally since 2010, the rate of decline has stalled and even reversed in some regions since 2014 (WHO, 2017). Mortality rates have followed a similar pattern. The perception of malaria by individuals residing where it is endemic is vital and should essentially be the first step in curtailing it.

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Paulander and colleagues interviewed 1652 mothers in Tigray, a predominantly rural community in Ethiopia, where it was revealed that 92.7% were able to mention at least one malaria symptom while 65.3% could mention three or more symptoms. Majority (74.7%) of the

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women believed malaria is a preventable disease, out of which 82.3% were aware of environmental management, 46.2% insecticide treated net, 15.6% indoor residual spraying and 15.6% chemoprophylaxis. About 65.9% believed malaria could lead to death while almost all women (92.7%) believed malaria could be cured. Despite the low educational level in this community (90.6% had just about a single year of schooling), there was a relatively good perception about malaria in this rural community, but their source of perception was not revealed (Yakasai et al, 2015).

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Four hundred (400) families and mothers/caretakers with children under five years were selected and represented urban, peri-urban and rural settings in Tamale, Northern Region, Ghana. More than 90% of respondents identified malaria by the presence of fever while 57.5% used fever as a cardinal sign. 91% sought early treatment in the urban and peri-urban settings while 85% did so in rural settings. 55% of participants administered the correct doses daily but only 17% of them knew the side effect of antimalarial medications used. Almost all participants were aware of about transmission of malaria, when to repeat the drug dose and the usage of paracetamol to reduce body temperature (Mukaila et al, 2013)

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Atenchong and Ozims (2014) proved that perception of the use of mosquitos' bed nets as a preventive measure against malaria had no significant effect on actual use of the net. A sample 364 pregnant women and mothers/caretakers of under- five children were questioned. Over 80% of the population had one form of a mosquito net at home. Upon observation, only 27.7% of the net could be seen in homes of which 11.1% were hung appropriately. Another study done by Erhun and colleagues in the Yoruba population of south-west of Nigeria for example, less than 10% of the population associated mosquito bites with malaria. Instead, 'too much work' (17.7%), 'staying for too long under the sun' (12.6%), 'drinking bad/dirty water' (5.3%) were most often believed to be the cause of malaria. In addition, convulsion and anemia were not seen as complications of malaria and most infant mortality are not linked to malaria, whatsoever. Most cases are treated at home or with traditional healers as first line of action. Perception of mothers/caretakers regarding malaria can be said to be related with level of education, geographical area one resides, the type of community and a previous history of malaria in the family.

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Singh, Musa, Singh and Ebere (2014) conducted a study to ascertain families' perception of malaria in some selected villages in Nigeria using a descriptive cross-sectional design. Two

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hundred household were randomly selected and interviewed using **standardized** questionnaire. It was found that Knowledge of the role of mosquitoes in malaria transmission (11.8%) and **cause** of malaria (9.6%) was observed to be low among the study population. Comprehensive knowledge about malaria prevention measures was high (90%), but not **reflecting** in their practice (16%). They have good knowledge of mosquito **behaviour** (breeding areas (64.5%), resting places (70%) **and** biting time (81%). In another study, Ojong, Iheanacho, Akpan and Nlumanze (2013) focused on the knowledge and practice of malaria prevention among pregnant women attending secondary health care **facility** in Calabar, Cross River State. The study adopted a descriptive design and systematic sampling technique was used to get two hundred respondents representing 50% of the target population. Data collected were analyzed using descriptive and inferential statistics. The instrument has a reliability co-efficient of 0.70 using a test – retest reliability. The findings revealed that 83.9% of respondents had good knowledge of malaria prevention and 69% **practised** malaria prevention strategies. There was a significant relationship between knowledge and practice of malaria prevention when the calculated r-value of 0.62 was compared with **tabulated** r-value of .138. Despite the above, the result also showed that 16.1% **respondents** had poor knowledge and 31% did not **practise** malaria prevention strategies.

In Tanzania, Munisi, Nyundo **and** Mpondo (2019) conducted a study to determine the levels of understanding, and attitudes, as well as socio-cultural aspects of malaria prevention and treatment-seeking **behaviours** among suspected malaria patients. This study was a **hospital based** cross-sectional study, in which patients attending Tumbi Referral Hospital with symptoms and signs that warrant inclusion of suspicion of malaria, were recruited. A pre-tested semi-structured questionnaire was used to collect participants' demographic characteristics, as well as information on their knowledge, attitudes, and practices towards malaria infection. Data were **analysed** using Stata Version 12.1. A total of 295 respondents of which 179 (60.68%) were females were used for the study. Seventy-nine (26.8%) patients reported having malaria in the previous 28 days, with 57 (72.2%) being laboratory confirmed. A total of 277 (93.90%) **were** aware of malaria, and 264 (95.31%) knew that it is transmitted by mosquito. About half of the respondents either agreed 63 (22.74%) or strongly agreed 62 (22.38%) that malaria can be transmitted like the common cold. It is therefore important to look into the perceptions of mothers of children under five on malaria in the Ahanta West Municipality.

Research question

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What is the perception of mothers on malaria?

METHODS

Research Design

A descriptive study is a study in which the researcher observes the phenomenon as it occurs naturally without intervening. It observes the process and describes the outcome of the phenomenon (Stone, 2019). A cross-sectional study is a study in which participant are assessed at a single time. It allows the researcher to allow numerous things at once and does not involve manipulating variables (Creswell, 2013). The choice of study design allows the collection of data of the whole population at a single point in time to examine the relationship between variables. It is however susceptible to bias due to low response and misclassification due to recall bias.

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Study Population

The population of Ahanta West Municipal, according to the 2020 population and Housing Census, is 120,358. Nearly 60% of the population is rural. The average household size is 4.0 persons per household. Children constitute the largest proportion of the household members accounting for 39.2 % (GSS, 2020). Out-patient Department (OPD), Accident and Emergency (A&E) Unit as well as Child Welfare Clinic (CWC) of AgonaNkwanta Polyclinic were the constituted the areas for data collection for the study. The target population comprise all mothers/caretakers of children under five in the Ahanta West Municipality. The accessible population for this research comprised of all mothers with children under five years who seek medical care for their wards in the Agona Nkwanta Polyclinic. It was estimated at 990 children under five visit the facility per week according to the health records and information's data (AgonaNkwanta Polyclinic).

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Sampling Procedure

A convenience sampling was used to select 345 mothers who visit the facility for services. This includes Out-patient Department (OPD), Accident and Emergency (A&E) Unit as well as Child Welfare Clinic (CWC). The respondents were selected as and when they visit the facility. It is difficult to have the sample frame of the mothers with children under five years who would visit facilities. This is because mothers who gave birth at different facilities and even by traditional birth attendant may visit a particular health facility for RCH services. According to Creswell (2013) convenience sampling involves choosing the nearest or available individuals to

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serve as respondents and continuing the process until the required sample size has been obtained. When this sampling technique is employed all **it's** of study that the research accidentally comes across or in contact with during a certain period are considered. In all, an estimated sample size of 345 lactating mothers **were** selected for the study.

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Sample and Sample Size Determination

The sample size for a descriptive study should be large enough to a representation of the population. It is recommended that, for descriptive studies, 10% or above of the target population is enough for the entire study. Therefore, the researcher used the Slovins's formula to a sample out of the 990 of the estimated mothers with children under five years who visit the facility. Mathematically, the sample was calculated using the Slovins method for calculation

$$= \frac{N}{1 + N(e)^2}$$

Where; n= sample size

N= Total population

e = degree of error expected = (0.05)

k= Constant = 1

Total Population, N = 990

$$\begin{aligned} & \frac{990}{1 + 990(0.05)^2} \\ &= \frac{990}{1 + 990(0.0025)} \\ &= \frac{990}{1 + 2.475} \end{aligned}$$

n= 284.8

n= 285

Data Collection Tools

Data was collected from clients using questionnaires after the clients' consent has been sought. The questionnaire was structured in a way that ambiguity was minimized as much as possible. The questionnaire was based on the research questions formulated and consists of questions relating to respondents' demographic characteristics, perception on malaria prevention and control and its effects on children under- age five (5). A questionnaire made up of

two sections and was scaled as Yes/No except for section A was developed by the researcher for the study. Section A measured the demographic information of the participants. Section B measured the perception of the mothers and caretakers of children under five on malaria. Questionnaire has advantage over other tools because, questionnaire could be admitted to a large sample as compared to interview. Also, anonymity could be achieved with questionnaire than interview.

Data collection Procedure

The data for this study was obtained from mothers/caretakers with children under five who visit the Agona Nkwanta Polyclinic. Thus, the study made use of primary data. An ethical clearance (DHRCIRB/019/02/22) were obtained from Dodowa Health Research Centre Institutional Review Board (DHRCIRB) respectively. With ethical clearance permission was sought from the authorities of Agona Nkwanta Polyclinic. Purpose of the study was explained to authorities for support and collaboration.

With approval from the authorities of the facilities, the in-charges of the various units selected for the study were briefed on the purpose and their permission and support were sought. Questionnaire was administered to mothers and caretakers with children under five as and when they visit the facility. The questionnaire comprises closed ended questions.

Before a responding to the question, each participant was briefed on the purpose of the study and was assured of confidentiality, anonymity and autonomy. Each participant was then made to sign the consent form. Those who refused to sign the consent form were excluded from the study. Also, the researcher ensured all, COVID-19 protocols were observed by ensuring that that each participant worn face mask, used hand sanitizer and observed social distance.

After the consent form has been signed, the question was admitted to the participant. Administration of the questionnaire was done by the researcher and the questionnaire was read out and content was explained to subject who could not read and write. The instrument was handed over to participant who could read and write to fill and submit. For those could not read and write, the researcher read and explained each item of the instrument to them and assist them to tick the appropriate portion. All completed questionnaire were sealed in an envelope for onward processing and analysis.

RESULTS

The purpose of this section sought to elicit responses from participants regarding their perception on malaria. Mean and standard deviations were used to analyse data and the results are presented in Table 1.

Table 1: Descriptive Statistics of perception on Malaria

Statement	Yes		No		Mean	SD
	Freq	(%)	Freq	(%)		
Ever heard of malaria	345	100.0	0	0	2.0	0.00
Where did you hear it from?						
1. Home/neighbours	117	33.9	228	66.1	1.3	0.47
2. Media (radio, television, newspapers)	117	33.9	228	66.1	1.3	0.41
3. Hospital	287	83.2	58	16.8	1.8	0.83
1. Health workers	117	33.9	228	66.1	1.3	0.52
4. Suffered it before	175	50.7	170	49.3	1.5	0.56
Have you received any health teaching or training on malaria?	254	73.6	91	26.4	1.7	0.65
How is malaria transmitted?						
1. By bite of a mosquito	345	100.0	0	0.0	2.0	0.00
2. Close contact with a malaria patient	60	17.4	285	82.6	1.1	0.43
3. Prolonged exposure to sunlight	60	17.4	285	82.6	1.1	0.44
4. Eating contaminated food	0	0	345	100.0	1.0	0.23
5. Exposure to extreme temperature	60	17.4	285	82.6	1.1	0.65
6. Supernatural;	60	17.4	285	82.6	1.1	0.67
Where do mosquitoes breed?						
1. Stagnant waters	288	83.5	57	16.5	1.8	0.88
2. Unclean environment	145	42.0	200	58.0	1.4	0.87
3. Uncovered clean water	58	16.8	287	83.2	1.1	0.65
4. Bushy areas	118	34.2	227	65.8	1.3	0.76

What are the symptoms of malaria? Please, select all that apply.

1. Fever	345	100.0	0	0.0	2.0	0.00
2. Vomiting	345	100.0	0	0.0	2.0	0.00
1. Headache	345	100.0	0	0.0	2.0	0.00
2. Diarrhea	318	92.2	27	7.8	1.9	0.92
3. Chills	318	92.2	27	7.8	1.9	0.92
4. Loss of appetite	318	92.2	27	7.8	1.9	0.92
5. Coughing	318	92.2	27	7.8	1.9	0.92
6. Body pains	262	75.9	83	24.1	1.7	0.92
Witch can cause malaria	60	17.4	285	82.6	1.1	0.74
Malaria can disappear without taking any medication	60	17.4	285	82.6	1.1	0.77
Malaria is not a dreadful disease anymore	91	26.4	254	73.6	1.2	0.64
One can be infected with malaria no matter what	228	66.1	117	33.9	1.6	0.66
Other diseases show similar symptoms as malaria	345	100.0	0	0.0	2.0	0.00
Malaria affects only those in the villages	0	0.0	345	100.0	1.0	0.63
Mean of means					1.76	
Mean of standard deviation						0.64

Source: Field Survey, (2022)

The table shows the descriptive statistics of the perceptions of mothers and caretakers of children under five on malaria. The results show that generally, the mothers and caretakers responded to the items on perception indicating that they have good perception about malaria. This is because the mean of means ($M = 1.76$, $SD = 0.64$) is greater than the cut-off points of 1.5. The results revealed that of the participants had ever heard of malaria ($M = 2.0$, $SD = 0.00$). That is all the participants have heard of malaria before ($n=345$, 100.0%). A greater proportion ($n=287$, 83.2%) heard it through the hospital ($M = 1.8$, $SD = 0.83$) whilst ($n=175$, 50.7%) heard it because they suffered it before ($M = 1.5$, $SD = 0.5$). Also, 254 respondents representing 73.6% mentioned that they had received training or teaching on malaria ($M= 1.7$, $SD = 0.65$). It was found that 288 respondents representing 83.5% indicated that malaria is acquired through mosquito bite ($M = 2.0$, $SD = 0.0$) and mosquitos bled in stagnant waters ($M = 1.8$, $SD = 0.88$).

All the participants (n=345, 100.0%) noted that fever (M= 2.0, SD = 0.00) and 262 (75.9%) mentioned that coughing (M = 1.9, SD = 0.92) are the main symptoms of malaria. All the participants (n=345, 100.0%) further indicated that other diseases show similar symptoms as malaria (M= 2.0, SD = 0.00).

Discussion

The purpose of research question one was to elicit responses from participants regarding their perception on malaria. The findings of the study suggest that participants involved in the study had good perception on malaria. It was found that participants ever heard of malaria and also indicated that malaria is transmitted through bite of a mosquito. This finding corroborates with findings of Terlouw et al., (2012) who conducted a study in the Indian and demonstrated that the malaria parasite could be transmitted from infected patient to mosquitoes. Today it is clear that malaria is a tropical disease caused by infection with a parasite of the genus plasmodium and is transmitted mainly to humans through the bite of an infected female Anopheles mosquito. He reported that mosquitoes transmit malaria and they must have been infected through a previous blood meal taken from an infected person. When a mosquito bites an infected person, a small amount of blood is taken in which contains microscopic malaria parasites. About a week later, when the mosquito takes its next blood meal, these parasites mix with the mosquito's saliva and are injected into the person being bitten. CDC (2017) noted that malaria parasite is found in the red blood cells of an infected person, malaria can be transmitted through blood transfusion, organ transplant, or the shared use of needles or syringes contaminated with blood.

The study was consistent with findings of WHO (2017) who conducted a study and reported that the knowledge of malaria by individuals residing where it is endemic is vital and should essentially be the first step in curtailing it. Paulander and colleagues (2009) interviewed 1652 mothers in Tigray, a predominantly rural community in Ethiopia, where it was revealed that 92.7% were able to mention at least one malaria symptom while 65.3% could mention three or more symptoms. Majority (74.7%) of the women believed malaria is a preventable disease, out of which 82.3% were aware of environmental management, 46.2% insecticide treated net, 15.6% indoor residual spraying and 15.6% chemoprophylaxis. About 65.9% believed malaria could lead to death while almost all women (92.7%) believed malaria could be cured. Despite the low educational level in this community (90.6% had just about a single year of schooling), there was a relatively good knowledge about malaria in this rural community, but their source of

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knowledge was not revealed 400 families and mothers/caretakers with children under five years were selected and represented urban, peri-urban and rural settings in Tamale, Northern Region, Ghana. More than 90% of respondents identified malaria by the presence of fever while 57.5% used fever as a cardinal sign. 91% sought early treatment in the urban and peri-urban settings while 85% did so in rural settings. 55% of participants administered the correct doses daily but only 17% of them knew the side effect of antimalarial medications used. Almost all participants were aware of about transmission of malaria, when to repeat the drug dose and the usage of paracetamol to reduce body temperature (Mukaila et al, 2013)

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Conclusion and Recommendation

Based on the findings drawn, it can be concluded that participants generally had good perception on malaria. Participants reported that they had ever heard of malaria and that malaria is transmitted through bite of a mosquito. Participants generally reported that children younger than five years should be protected the most against malaria in the sense that malaria is generally rated the problem of children under-five.

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The findings of this study have nursing implication in the area of education, practice and administration. In terms of education, health practitioners should continue provide adequate and up-to-date education to mothers of children under five. This would help them to adopt positive prevention and treatment practices for their children. The findings also implies that nurses ensure

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children under five with malaria are given the maximum attention. Based on the findings of the study, the following recommended that participants should keep up and even read more to have more knowledge on the malaria. This would help them to have an understanding on all relevant information regarding malaria.

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References

- Ahorlu, C. K., Koram, K.A., Seakey, A.K., & Weiss, M.G. (2019). Effectiveness of combined intermittent preventive treatment for children and timely home treatment for malaria control. *Malaria Journal*, 8, 292.
- Atenchong, J. O. & Ozims, T. U. (2014) Utilization of insecticide treated nets against malaria among pregnant women in Southern Nigeria. *International Journal of Research in Medical Science*, 5 (11), 23-31
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative and mixed methods approaches*. Thousand Oaks, California: Sage Publications
- Maslove et al. (2019). Barriers to the effective treatment and prevention of malaria in Africa: A systematic review of qualitative studies. *BMC International Health and Human Rights*, 9(1), 26-39
- Mukai, Z.M, et al (2016). Knowledge and skills of mothers/care givers of children under five years in communities with home-based management of malaria in Tamale, Northern Region, Ghana, 2013. *AIMS public health* 3(4), 923-932.
- Munisi, D. Z; Nyundo, A. A. & Mpondo, B. C. (2019) *Knowledge, attitude and practice towards malaria among symptomatic patients attending Tumbi Referral Hospital: A cross-sectional study*. PLoS ONE 14(8): e0220501.
- Noor, S., Mutheu, K., Tatem, A., Hay, W. & Snow, S. (2019). Prevention of malaria in Africa. *International Journal of Community Medicine and Public Health*; 2 (9), 345-50.
- Ojong, I. O; Iheanacho, L. O; Akpan, M. I. & Nlumanze, F. F. (2013). Knowledge and practice of malaria prevention among pregnant women attending secondary health facility in Calabar, Cross River State, Nigeria. *Hamdard Medicus*, 56 (3), 70 -77.

- Shah, Emina, Eckert, & Ye. (2015). Prompt Access to Effective Malaria Treatment Among Children under Five in sub-Saharan Africa: a multi-Country Analysis of National Household Survey Data. *Mal J*, 14(1), 329-341.
- Singh, R; Musa, J; Singh, S. &Ebere, U. V. (2014). Knowledge, Attitude and Practices on Malaria Among the Rural Communities in Aliero, Northern Nigeria. *J Family Med Prim Care*. 3(1): 39-44
- Stone, P. (2019). The logic of random selection. *Political Theory*, 37(3), 375-397. <https://doi.org/10.1177/0090591709332329>
- Terlouw et al., (2012). Malaria in children: Perception and control. *International Journal of Medicine and Biomedical Research*, 4 (3), 13-22.
- WHO& UNICEF (2015). World Malaria Report. Geneva: Retrieved from Geneva
- WHO. (2013). Test treat track Initiative. Retrieved from www.who.int/malaria/areas/test_treat_track/en/index.html/
- WHO. (2013). World Malaria Report 2013. Retrieved from Geneva, Switzerland:
- WHO. (2017). World Malaria Report 2016. Retrieved from Geneva:
- Yakasai, A. M., Hamza, M., Dalhat, M. M., Bello, M., Gadanya, M. A., Yaqub, Z. M., Hassan-Hanga, F. (2015). Adherence to Artemisinin-Based Combination Therapy for the Treatment of Uncomplicated Malaria: A Systematic Review and Meta-Analysis. *Journal of Tropical Medicine*, 2(8), 21-34.