

COMPARATIVE STUDY ON INCIDENCE OF MALARIAL INFECTION AMONG STUDENTS OF COLLEGES OF EDUCATION IN KATSINA STATE

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Abstract

This is a comparative study on incidence of malarial infection among students of colleges of education in Katsina State, using Descriptive survey research design. The population of the study was 21919 students with target population of 16,476 students and sample size was 379 students, using a multistage sampling technique. A self-developed questionnaire of four points modified Likert scale was used. A reliability index is 0.83, using split-half method. Chi-square and t-test were used to test the hypotheses at α level of 0.05. The findings of this study revealed that there was incidence of malarial infection among students 357 (94.20%), significant at ($p < 0.05$). No significant difference in the incidence of malarial infection based on gender and institutional status was observed ($p > 0.05$). In this context, it was recommended generally among others that students should avoid exposing themselves to mosquitoes.

Key words: *Comparative study, Incidence and malarial infection.*

Introduction

Malaria is a disease which is characterised by symptoms than signs, and it is contracted via mosquito bites among other diseases in which the vector can transmit. Malaria is a contagious disease induced by a pathogen called plasmodium, which actually invades the red blood cells (Malaria, 2010). Toby (2017), stated that the word 'malaria' originates from the Italian meaning 'bad air' – hence, the malaria related with marshes and swamps. It is not just infectious, thereby violating the orderliness and harmony of body system from performing its basic physiological functions, but it kills following its repeatedly occurrences and prevailing nature. Lora, Abanish, Mohamad, Mrigendra, Jordan, Blair, Katherine, Kojo, Neeru, and Davidson (2010), asserted that India is an endemic zone of malaria and it has become Indian most public health problem regarding its reoccurring pattern. It is estimated that 2-3 million malaria cases were reported annually nationwide in India, and 95 per cent of the country's population stands the chance of contracting the infection (Sokhey, 2003; Kumar, Vlecha, Jain, & Dash, 2007).

On this note, it is observed that malaria is a disease with high incidence that facilitates its prevailing wide spread among human populations. A study conducted in Kenyan by Sultana, Sheikh, Mahumud, Jahir, Islam and Sarker (2017), revealed that the likelihood of having malaria was higher among children aged 10-14 years and significant ($p < 0.05$). According to the findings of Adepeju (2017), who conducted his study in Akure, Ondo State, Nigeria among students of Federal University of Technology, there was 80.33 per cent incidence of malaria among participants, 53.3 per cent and 94.0 per cent prevalence for asymptomatic and symptomatic students respectively. A study conducted in Benin West Africa by Nahum, Erhart, Maye, Ahounou, Overcomer, Menten, Loen, Akogbeto, Coosemaro, Massougboji and D'Alessandro (2010), recorded 84 over 1000 incidence of malaria and its prevalence was estimated over 40 per cent in the two first studies and increased to 68.9 per cent in the third study. In a similar study carried out in Northwest, Ethiopia by Aschale, Mengist, Bitew, Kassie and Talie (2018), the prevalence of malaria was found to be 18.4 per cent. According to Yabobo and Zanda (2018), whose study was conducted in Tanzania among college students on malaria prevalence, there was 89.4 per cent prevalence of malaria history among students. *Center for Disease Control and Prevention* (2015), reported 11.8 per cent of malaria prevalence among infants in study across the globe.

Malaria in other words could be classified as both an endemic and a pandemic disease; it is also a regional and inter regional health challenge owing to its frequent and prevailing nature over time. The incidence of malaria as a disease is estimated to be low in the United States, for the fact that about 1,300 cases were confirmed and reported each year over the past 10 years (Yamini, 2012). But looking at the developing countries, United States Embassy in Nigeria (2011), reported that 216 million cases of malaria occurred in 2010, 81 per cent in the African region.

United States Embassy in Nigeria (2011), further reported that malaria is a major and significant public health challenge in Nigeria where cases of it are more pronounced, confirmed and recoded than any other country in the globe. In confirmation, Nigeria Federal Ministry of Health (2000), reported that "malaria is holoendemic in Nigeria with a population of about 140 million people out of whom 85 per cent of them are living in areas where they co-habit with mosquitoes that made malaria transmission significant. World malaria report indicated that Nigeria's malarial endemic was absolutely significant as the country accounts for one-fourth of all malaria cases in the 45 malaria-endemic countries in Africa (*WHO, 2000*).

Malaria as a most frequent and recurring infection is associated with several adverse effects, complications, irritabilities or health implications such as general body pain, nausea, vomiting, headache, dis-orientation and host of others

in each episode. Symptoms of malaria could be vomiting, fever, headache and others (*Malaria, 2010*). Yamini (2012), opined that the prodromal stage of malarial infection comes with the following symptoms: irritability, and drowsiness, with poor appetite and trouble sleeping – these effects are usually followed by chills, then a fever with rapid breathing. WHO (2016), reported that malaria comes up with fever, chills and fluk-like illness. Malarial infection kills about 3,000 children every day; one child in every 30 seconds in one minute (*United Nations Children's Fund (UNICEF) (2007)*). It further reported that it kills over one million persons annually. Meanwhile, there were 655,000 malaria deaths in 2010, 91 per cent in which is in the Africa Region based on WHO analysis (*United States Embassy in Nigeria, 2011*). The 11 per cent of maternal mortality in Nigeria is attributed to malarial infection, while the most vulnerable are children and pregnant women in rural Ethiopia leading to maternal anaemia in pregnancy (UNICEF, 2007; Deressa & Ali, 2009; *United States Embassy in Nigeria, 2011*).

Learning environment is an ideal state free from diseases or infections. It is free from an environmental disease such as malaria. However, Nigeria's learning environments are breeding space for malaria. Hence, the incidence and prevalence of malaria among students are high and alarming and Nigerian government and other stakeholders were relatively doing less to reduce the incidence of malaria among students of higher learning (*Centers for Disease Control and Prevention, 2012*). It is presumed that Katsina Sate region is not left behind neither students of colleges of education in the state are exempted from the incidence of malaria. Situations have been observed where students of higher education in Katsina State visit their school clinics and other health centres often due to cases related to malaria infection. It is against this background that this study investigated comparative study on incidence of malarial infection among students of colleges of education in Katsina State.

Hypotheses

H₀₁. There is no significant incidence of malarial infection among students of Colleges of Education in Katsina State.

H₀₂. There is no significant difference in the incidence of malarial infection between male and female students of Colleges of Education in Katsina.

H₀₃. There is no significant difference in the incidence of malarial infection between Federal and State Colleges of Education in Katsina State.

Methodology

Descriptive survey research design was used in this study. The population of the study was 21919 comprising the pre NCE to NCE III students pursuing Nigeria Certificate in Education (NCE) as at 14th August, 2017 in Federal College of Education Katsina State and Isa Kaita College of Education, Dutsin-Ma, Katsina State. Meanwhile, NCE I-III students from both institutions formed the target population which was 16,476 students. In this study, a multistage sampling technique was used.

Stage 1. Cluster sampling technique was used to group the area of the study into two groups namely: Northern Katsina as group 1 and Southern Katsina as group 2.

Stage 2. Availability sampling technique was used to pick Federal College of Education, Katsina and Isa Kaita College of Education Dutsin-Ma, the only available colleges of education in group 1 and 2.

Stage 3. Purposive sampling technique was used to exclude all pre-NCE students from this study and included all NCE I-III students that are directly pursuing 'Nigeria Certificate in Education' (NCE).

Stage 4. Proportionate stratified random sampling technique was used to obtain sample size from population of each group above looking at sample size of 379 as a guide. At this, 2.3 per cent was used proportionately across the two strata. Summation of the sample size obtained from the two groups will lead to 379 sample size or tally with the sample size which was established for this study.

Stage 5. Systematic sampling technique was used. This gives an opportunity to assign or give all the students in each group serial number from the beginning to end. The participants in this study were selected at intervals of 43 following the serial numbers in the population. (See Table 1).

A four-point Likert scale, self-developed questionnaire named Questionnaire on Incidence of Malarial Infection (Q-IMI) was used for data collection. The questionnaire contained two sections; 'A and B'. Section A sought information on demographic of the respondents while section B sought information on incidence of malaria. Twelve lecturers (nine males and three females) were trained as research-assistants who administered the copies of questionnaire forms to students and collected the duly filled copies within the period of three weeks and two days. Both face and content validation of the instrument were done by two lecturers from Department of Physical and Health Education, Faculty of Education, Bayero, University, Kano and one medical doctor from Federal University, Dutsin-Ma Clinic. Split-half method was used to determine the reliability of the instrument, using Spearman-Brown Prophecy Formula and reliability index of 0.83 was obtained. Frequency and percentage counts were used to describe

incidence of among participants. Meanwhile, Chi-square and t-test were used to test the hypotheses at α level of 0.05, using SPSS 20.0 version.

Table 1: The distribution of Colleges of Education in Katsina State with their population and sample size

Group	Name of institution	Population	Sample size
1.	Federal College of Education, Katsina.	10,120	233
2.	Isa Kaita College of Education, Dutsin-Ma.	6,356	146
	Total	16,476	379

Results

The results of this study are inferentially organised and presented in 2 to 4.

Table 2: Summary of chi-square test on incidence of malarial infection among students of Colleges of Education, Katsina State

Malarial incidence	Observed N	Expected N	X ²	df	p-value
Low incidence of malaria	22	189.5	296.108	1	.001
High incidence of malaria	357	189.5			
Total	379				

$X^2=3.841$, $df=1$, ($p<0.05$).

Table 2 shows that the number of low incidence of malaria observed was 22 representing 5.80 per cent and the number of high incidence of malaria observed was 357 representing 94.20 per cent. It also shows that the p-value is less than α level set in this study ($p=0.001<0.05$). The null hypothesis which stated that there is no significant incidence of malarial infection among students of Colleges of Education in Katsina State is rejected. Hence, there was significant incidence of malarial infection among students of Colleges of Education in Katsina State.

Table 3: Summary of t-test analysis on difference in the incidence of malarial infection between male and female students of Colleges of Education, Katsina State

Gender	N	Mean	Std. dev.	Std. error mean	t	df	p-value
Male	279	1.94	.246	.015	-.898	377	.370
Female	100	1.96	.197	.020			
Total	379						

$t=-1.960$, $df=377$, ($p>0.05$).

Table 3 shows that the mean value of male students is less than that of the female students ($1.94 < 1.96$). It also shows that the p-value is actually greater than the alpha level ($p = 0.370 > 0.05$). The null hypothesis which stated that there is no significant difference in the incidence of malarial infection between male and female students of Colleges of Education in Katsina is retained (accepted). Hence, there was no significant difference in the incidence of malarial infection between male and female students of Colleges of Education in Katsina State.

Table 4 Summary of t-test on difference in the incidence of malarial infection between Federal and State Colleges of Education, Katsina State

Institutional status	N	Mean	Std. dev.	Std. error mean	t	df	p-value
Federal college of education	233	1.93	.261	.017	-1.570	377	0.117
State college of education	146	1.97	.182	.015			
Total	379						

$t = 1.960$, $df = 377$, ($p < 0.05$).

Table 4 shows that the mean value of Federal College of Education is less than State College of Education ($1.97 > 1.93$). It equally shows that the p-value is greater than the α level ($p = 0.117 > 0.05$). In this regard, the null hypothesis which stated that there is no significant difference in the incidence of malarial infection between Federal and State Colleges of Education in Katsina State is accepted. Hence, there was no significant difference in the incidence of malarial infection between Federal and State Colleges of Education in Katsina State ($p > 0.05$).

Discussion

The finding of this study shows that there was significant incidence of malarial infection among students of Colleges of Education in Katsina State ($p < 0.05$). This finding is congruent with the finding of Okwa, Bello and Olundegun (2011), which revealed that there was significant incidence of malaria among students of Lagos State University and Adeniran Ogunsanya College of Education within the past one year ($p < 0.05$). The result of this study is also in line with Ezugbo-Nwobi, Obiukwu, Umeanato and Egbuche (2011), whose finding revealed that out of 800 students examined, 512 (64.00%) were infected with malaria parasite. This is of course significant. It is equally in line with the finding of Adeyemo, Okpala, Nwakaego and Oritsegbuben (2014), which revealed that there was significant prevalence rate of malaria among students of the University of Benin, Edo State, Nigeria. It also agrees with the finding of Adeyemo, Makinde, Chukwuka and Onyana (2013), which revealed that the incidence of malaria among students who visited the school medical centre was on the increase.

The implications of this finding is that the students' academic performance will be affected due to frequent cases of malaria among them. Finding of a study conducted in Brazil by Sheila, Roberto, Tamam and Marcus (2009), revealed that general poor

academic achievement was detected in 194 (47.5%) students owing to malarial infection. Also, Fernando *et al.* (2003b), in their study in Sri-Lanka, observed that the impact of repeated malaria attack has significant effect on students' school or academic performance. Najera and Hempel (2006), in their study found out that absenteeism in the school was far above average at 70 per cent due to malaria cases among learners. Leighton and Foster (1993), who carried out a research in Kenya, found out that 11 per cent of primary school pupils and 4.3 per cent secondary school students were absent in the school for a good number days yearly due to malaria infection.

A study carried out by Holding and Snow (2001), suggested that malaria infection in childhood is presumed to have serious effects on general cognitive and behavioural development, which could be ranged from difficult to profound levels. Sheila *et al.* (2009), in their study on malaria and school performance found out that there is inseparable interrelationship which exists between malaria and impaired cognitive development in children especially the learners. Falciparum malaria at unpleasant degree (mostly cerebral malaria) focusing on neurological problems sequentially show some impairments in developing cognitive abilities after the immediate or sharp episode, at all terms (short and long-terms) (Meremikwu, Asindi, & Ezedinachi, 1997; Holding, Stevenson, Peshu, & Marsh, 1999; Boivin, 2002; Fernando, Gunawardena, Bandara, De-Silva, Carter, Mendis & Wickremasinghe, 2003a; Fernando, Wickremashinghe, Mendis & Wickremasinghe, 2003b; Kihara, Carter, & Newton, 2006; Boivin, Bangirana, Byarugada, Opoka, Idro, Jurek, & John, 2007).

The researcher of this study suggested that the finding is so because the area of study has vast land and there is no communal effort in fumigating the area. The result of the second hypothesis revealed that there was no significant difference in the incidence of malarial infection between male and female students of Colleges of Education in Katsina ($p > 0.05$). This finding is in agreement with the finding of Ezugbo-Nwobi *et al.* (2011), there was no significant difference existing between male and female students in the sex-related prevalence ($p > 0.05$). However, this result is not congruent with the finding of Adeyemo *et al.* (2013), which revealed that the number of male students who visited the university health centre for malaria infection treatments was significantly higher than the female students. The researcher suggested that this is so because the male and female students are in the same endemic malarial environment or zone and probably, no group had a special intervention in this regard.

The result of the third hypothesis revealed that there was no significant difference in the incidence of malarial infection between Federal and State Colleges of Education in Katsina State ($p > 0.05$). This finding is congruent with the finding of Okwa *et al.* (2011), that there was no significant difference in the incidence of malaria between Lagos State University (LASU) and Adeniran Ogunsanya College of Education (AOCOED) ($p > 0.05$). It also agrees with finding of Nimako, Ellis, Benno, Julius, Sylvester, Frank, Andreas Thomas and Jurgan (2015), that there was no significant difference in the malaria parasitic

rate between two district schools (42.0% in Adansi South verses 40.7% in Wa West) in Ghana.

The finding of this study disagrees with the finding of Kweku, Takramah, Kudza, Owusu, Takase, Tarkang and Martin (2017), that there was significant difference in the malaria prevalence/incidence between rural school and urban school in Hohoe Municipality of Ghana (42.5% vs. 25.2%; $p < 0.001$). The researcher attributed this finding to the geographical locations of both institutions as Federal College of Education and State College of Education are situated at the outskirts of the towns that bordered them which are rural areas by mere classification.

Conclusion

Malaria is a public health issue and its incidence is high and significant among participants, calling on governments and school authorities for a quarterly fumigation of the surroundings in which the students learn for better health and academic performance. Based on the outcome of the study, the following recommendations are made:

1. Students should avoid exposing themselves to mosquitoes bites but should use clothes and insecticidal treated-nets always in their individual apartments.
2. The students (both male and female) should improve on their means, approaches and methods of fighting against mosquito-bites in their respective apartments and institutions.
3. Both institutions should make the possession of quality insecticidal treated-net as one of the entry requirements especially the State College following its mean score. And it is conventional if both institutions can adopt the approach of boosting their existing clinics in treating diseases especially malaria.

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