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Secondary School Students' Exposure to Health Science Education and their Awareness of Malaria Preventive Measures in Owerri Education Zone I of Imo State, Nigeria

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Abstract

This study examined the extent to which Health Science Education helps in creating awareness of malaria preventive measures among Secondary School Students in Owerri Education Zone I of Imo State. A survey research design was adopted for the study. Two research questions and two hypotheses guided the study. A sample size of 399 Health Education students was selected as the sample size using Taro Yamane formula and Cluster random sampling technique. The instrument for data collection is a rating scale made by the researcher titled "Health Education and Malaria Preventive Measures Rating Scale" (HEMPMRS). A reliability coefficient of 0.86 was obtained for the HEMPMRS using Cronbach's alpha statistic. The research questions were answered using mean scores and standard deviation while the hypotheses were tested using the one sample t-test and independent samples t-test. Findings showed that exposure to Health Science Education helps students to a high extent to be aware of malaria preventive measures and there is a significant difference in the responses of students on their awareness of malaria preventive measures based on their location. Based on the findings, the researchers recommended that Health Science Education Teachers should be consistent in their teaching about malaria

preventive measures so as to sustain students' awareness about the disease and that topics like Malaria Prevention should be taught with the influence of location in mind i.e more emphasis should be laid in the teaching of malaria prevention in rural schools.

Keywords: Health Science Education, Malaria, Preventive measures, Owerri Education Zone 1

Introduction

Education is the process of living through a continuous reconstruction of experiences. It is a process of development from infancy to maturity, the process by which an individual adapts himself gradually in various ways of his physical, social and spiritual environment (Bjorklund, 2020). In a narrower sense, education is confined to school and University instructions. Education starts when the child enters the institution and ends when he leaves after completing a particular course of study. In man's education, knowledge of how to take control and proper care of health invariably comes to play, hence the continuous emphasis on health science education.

Since the 1950s, schools have been a focal setting for health promotion and health education with the aim of teaching young people about health and its determinants, so as to empower them to develop the skills to resist unhealthy lifestyles (Madsen and Simovska, 2017). During the 1990s, the WHO, working jointly with the various organizations in each country, developed the health promoting schools' initiatives, which involve a multi-factorial approach that covers teaching health knowledge and skills in the classroom, in order to change social and physical environment of the school, promote healthy development of school-going children and the communities in which they live and learn (Samdal and Rowling, 2018). The school health promotion initiatives were developed based on a medical model that seeks to prevent certain diseases or health problems and to address all the major public health problems that most adolescents are battling with in the 21st Century, namely; drug and alcohol abuse, smoking, unhealthy eating, lack of physical activity, obesity, unwanted pregnancy, sexually transmitted infections and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV and/or AIDS) as well as injuries among the adolescent population (Kwatubana and Kheswa, 2019; Nzenwa and Nzenwa, 2023). Overtime, attention has been transferred to malaria prevalence. This is as a result of malaria endemicity in developing countries (Nzenwa and Okeke, 2025).

Malaria is a killer disease caused by the female anopheles mosquito. Not only do mosquitoes cause itching and discomfort wherever they go, but they can also carry and transmit harmful diseases. With dangers of Malaria, Zika virus, West Nile and more, having mosquitoes around can be very detrimental to human wellbeing. Mosquitoes exist across the world, with the exception of Antarctica. More than 3,000 mosquito species have been identified in both the Arctic and subtropics. Over 1,000,000 deaths have been estimated annually as a result of

malaria disease which is transmitted by female *anopheles* mosquitoes. More so, 30,000 deaths occur every year due to yellow fever disease transmitted by *Aedes aegypti* and 600 million people living in endemic areas with 200,000 estimated to be already infected. The mosquito species which bite indiscriminately also play a part in transmitting zoonotic diseases from animal reservoirs to human hosts. Invariably, vector control problems differ from country to country and may also vary even in different areas of the same country (WHO, 2016).

Malaria endemicity is most times based on locations. Rural agrarian communities in malaria – endemic areas tend to be most at risk for malaria infection, particularly in the presence of intensive irrigation, which provides an ideal breeding ground for the *Anopheles* mosquito, the vector responsible for malaria transmission (Tefera, 2022).

In the light of malaria incidence in Nigeria, there is need to lay strong emphasis on how to prevent this disease at the grass root. However, the researcher sought to find out whether the health education program in secondary schools offer students the best knowledge needed to tackle malaria. It is on this premise that the awareness of malaria preventive measures among students exposed to health science education programs is studied using location (urban and rural) as a moderating variable.

Objectives of the study

The study was guided by two objectives which included, to:

1. Find out the extent to which exposure to health science education helps students to be aware of malaria preventive measures in Owerri Education Zone 1.
2. Determine the extent to which exposure to health science education helps students to be aware of malaria preventive measures based on their location in Owerri Education Zone 1

Research questions

Two research questions guided the study as follows:

1. To what extent does exposure to health science education help students to be aware of malaria preventive measures in public secondary schools in Owerri Education Zone 1?
2. To what extent does exposure to health science education help students to be aware of malaria preventive measures in public secondary schools in Owerri Education Zone I based on their location?

Hypotheses

Ho_1: The mean rating score of students (in public secondary schools) on extent to which health science education helps in awareness of malaria preventive measures in Owerri Education Zone 1 is not significantly greater than the criterion mean of 2.5

Ho_2: There is no significant difference in the mean rating score of students in urban and rural public secondary schools in Owerri Education Zone 1 on extent to which health education helps their awareness of malaria preventive measures.

Methods

A survey research design was adopted for the study. The population comprised a total number of 2,644 students in 4 public secondary schools located in 2 Local Government Areas out of the 5 LGAs in Owerri Education Zone I, Imo State from which a sample size of 399 students was selected. The sample size was determined using Taro Yamane formula and selected using cluster random sampling technique. Two Local Government Areas were purposively selected for the study (they were purposively selected to accommodate one LGA in the urban area and one LGA in the rural area). From the two (Mbaitoli and Ikeduru) LGAs, 4 schools were also randomly selected (2 schools from each LGA). The sample size was made up of 254 students in the urban areas and 145 students in the rural areas. The instrument for data collection is a rating scale made by the researchers titled "Health Science Education and Malaria Preventive Measures Rating Scale" (HSEMPMRS). The rating scale is made up of 10 items designed in a four-point Likert Scale format of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). The instrument was validated by three specialists, two from Health Science Education and one from Educational Measurement and Evaluation. A reliability coefficient of 0.86 was obtained for the HSEMPMRS using Cronbach's alpha statistics. The research questions were answered using Mean scores and standard deviation while the hypotheses were tested using the one samples t-test and independent samples t-test at 0.05 level of significance where p-value of <.05 led to rejection of null hypothesis and vice versa.

Table 1: Extent to which exposure to Health Science Education helps students to be aware of malaria preventive measures

S/N	Health science education helps my awareness of the following methods of guarding against malaria:	VHE	HE	LE	VLE	Mean	SD	Remark
1.	Mowing of bushes	155	200	44	0	2.69	0.66	High extent
2.	Effluent Management	111	177	89	22	2.85	0.87	High extent
3.	No standing water	222	133	44	0	2.83	0.70	High extent
4.	Regular fumigation of the environment.	89	133	133	44	2.93	0.97	High extent
5.	Monthly environmental sanitation.	0	200	199	0	2.76	0.51	High extent
6.	Proper waste disposal	133	222	22	22	2.75	0.78	High extent
7.	Environmental health education programs.	89	244	44	22	2.86	0.76	High extent
8	enlighten students on the health implications of mosquito breeding indicators in their environment	67	222	22	88	3.51	0.12	High extent
9	Monthly awards for the neatest school	0	44	177	178	2.43	0.68	Low extent
10	Proper drainage network	155	200	44	0	2.83	0.66	High extent
	Mean of item means					**2.84**		

Data on Table 1 revealed the mean rating scores of the respondents on the extent to which exposure to health science education helps students to be aware of malaria preventive measures in public secondary schools in Owerri Education Zone 1.
All the items except item 9 have their mean response scores above 2.50 which is the criterion mean. Item 9 has mean score of 2.43, indicating that majority of the students do not agree that exposure to health science education makes them aware of use of monthly incentives to maintain neat areas as a method of preventing malaria. The mean of item means is given as 2.84 which is also greater than the criterion mean. This generally implies that the extent to which exposure to health science education helps students to be aware of malaria preventive measures is high.

Ho_1: The mean rating score of students (in public secondary schools) on awareness of malaria preventive measures in Owerri Education Zone 1 is not significantly greater than the criterion mean of 2.5

Table 2: One sample t-test analysis of significant difference in the mean responses of students on awareness of malaria preventive measures through health science education.

Variable	N	Observed Ẍ	Criterion Ẍ	df	SD	t_{cal}	A	Dec
Awareness of malaria preventive measures	399	2.84	2.50	398	3.25	4.99	0.00	Ho_2 is rejected

***n= sample size, x= mean, df = degree of freedom, SD = standard deviation, t_{cal}= calculated t statistic,* α= p-value**

Data on table 2 showed the result of the one sample t-test on hypothesis 1. The mean score of the students is given as 2.84 which is greater than the criterion mean of 2.50. The t-calculated value is given as 4.99 with an associated p-value of 0.00. Since the p-value is less than 0.05, the null hypothesis is rejected and it is concluded that the mean scores of students on the extent to which exposure to health science education helps in students' awareness of malaria preventive measures is significantly greater than 2.5

Table 3: Extent of awareness of malaria preventive measures based on location

S/N	The following are malaria preventive measures:	Urban mean	S.D	Remark	Rural mean	S.D	Remark
1.	Mowing of bushes	2.88	0.92	High extent	2.50	1.02	High extent
2.	Effluent Management	2.81	0.79	High extent	2.89	0.80	High extent
3.	No standing water	2.87	0.78	High extent	2.80	0.76	High extent
4.	Regular fumigation of the environment.	3.00	0.70	High extent	2.87	1.07	High extent

S/N	The following are malaria preventive measures:	Urban mean	S.D	Remark	Rural mean	S.D	Remark
5.	Monthly environmental sanitation.	3.23	1.06	High extent	2.30	1.09	Low extent
6	Proper waste disposal.	3.00	0.76	High extent	2.50	0.78	High extent
7	Environmental health education programs.	2.90	0.12	High extent	2.83	0.70	High extent
8	enlighten students on the health implications of mosquito breeding indicators in their environment	3.72	0.66	High extent	3.30	1.06	High extent
9	Monthly awards for the neatest school by the government.	2.66	0.68	High extent	2.20	0.76	Low extent
10	Proper drainage network	3.37	0.73	High extent	2.30	0.12	Low extent
	Item mean of means	**3.13**			**2.65**		

Data on table 3 revealed the mean rating scores of the respondents on the extent to which exposure to health science education helps students to be aware of malaria preventive measures based on location. The mean responses of the students in urban location on all the items are above the criterion mean of 2.50 with a cumulative mean of 3.13. This implies that majority of the urban students agree to a high extent that health science education helps them to be aware of malaria preventive measures.

On the other hand, students in the rural areas, the mean responses of the rural students on all the items except items 9 and 10 are above the criterion mean of 2.50 with a cumulative mean of 2.65. This also implies that majority of the rural students agree to a high extent that health science education helps them to be aware of malaria preventive measures. However, the varying cumulative means of urban and rural students show that their responses on the extent to which health education helps in awareness of malaria predisposing factors do differ slightly

HO_2: There is no significant difference in the mean rating score of urban and rural students in public secondary schools in Owerri Education Zone 1 on awareness of malaria preventive measures based on location.

Table 4: Independent samples t-test of significant difference in the awareness of malaria preventive measures based on location of students

Location	n	$\bar{X}$	S.D	df	t_{cal}	t_{tab}	α	$Decision$
Urban	254	3.13	1.61	397	2.98	1.96	0.02	**Reject H_{04}**
Rural	145	2.65	0.95					

n= sample size, x= mean, df = degree of freedom, SD = standard deviation, t_{cal}= calculated t statistic, t_{tab}= tabulated t value

Data on Table 4 showed the result of the independent samples t-test of significant difference between the mean responses of students living in urban and rural areas on the extent to which their exposure to health science education helps them to be aware of malaria preventive measures. The t-calculated value is given as 2.98 with a corresponding p-value of 0.02 which is less than 0.05 level of significance. Since the p-value is less than the level of significance, the null hypothesis is therefore rejected. It is therefore concluded that there is a significant difference in the mean rating score of students on the extent to which health science education helps in awareness of malaria prevention measures based on location.

Discussion of findings

Findings from Research Question 1 show that majority of the health education students agree that health education to a high extent helps them to be aware of the malaria preventive measures. Invariably, this goes to show that the awareness of Health education students on malaria preventive measures is high. The corresponding hypothesis revealed a significantly greater mean than the criterion mean of 2.50. The reason for this finding could be attributed to the fact that no teaching about malaria could be complete without giving exposure on the best way to prevent the disease. As such, the best preventive measures for the disease are covered in the topic embedded in the health science education curriculum which health students are mandated to take. This finding is in tandem with the findings of Ngwu and Ekpiken-Ekaneme, (2017) who in their study on evaluating the impact of health education on knowledge of diseases among secondary school students in Cross River State, Nigeria, reported a strong correlation between studying health education and students' knowledge of diseases affecting their health.

The findings earlier stated are however debunked by the findings of Tairou *et al*. (2022) who in a study on Malaria prevention knowledge, attitudes, and practices (KAP) among adolescents living in an area of persistent transmission in Senegal, recorded that the knowledge of malaria predisposing factors among the adolescents in very poor (34.4%).

Findings from research Question 2 show that the cumulative means of students in urban and rural locations on the extent to which health education helps students to be aware of malaria preventive measures is different. The corresponding hypothesis tested confirmed that there a significant difference in the responses of urban and rural students on the extent to which exposure to health education helps them to be aware of malaria preventive measures. This finding is however debunked by the findings of Oni and Tshitangano (2017) who assessed Learners' exposure to health education and promotion at schools in the Limpopo Province, Republic of South Africa. They reported no difference in knowledge of the respondents on basic health diseases based on their location (urban and rural locations).

Conclusion

Malaria has continued to pose a global health challenge. However, through sustained health education on prevention awareness, the impact of malaria can be reduced significantly. Education of students on preventive measures such as insecticide-treated nets, indoor

spraying, proper drainage, cutting of bushes, swift medical intervention etcetera is essential in the fight against malaria. This serves as a wakeup call to health educators in secondary schools to continuously lay emphasis on ways to prevent malaria among the secondary school students. Through persistent teaching, continuous awareness is made and lifestyles are being shaped to push for a society where malaria is no longer a threat.

Limitations of the findings

The findings of this study were limited by the fact that the instruments were self-answered by the respondents which may be prone to biased answers.

Recommendations

Based on the findings, the researchers recommend that:

1. Health science education teachers should be consistent in their teaching about malaria preventive measures and awareness as this would help sustain continuous students' awareness about the disease.
2. Topics like malaria in health science education should be taught with special reference to the rural location since it was seen that the rural students had lower awareness of malaria preventive measures than their urban counterparts. This will improve rural awareness of malaria prevention.

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