Faculty of Natural and Applied Sciences Journal of Mathematics and Science Education
Print ISSN: 2814-0885 e-ISSN: 2814-0931
www.fnasjournals.com
Volume 6; Issue 4; May 2025; Page No. 66-71.

Health Science Education and Students' Awareness of Malaria Predisposing Factors in Owerri Education Zone I

Nzenwa, D.U., & Okeke, F.N.
Department of Life Science Education, Imo State University, Owerri, Nigeria

***Corresponding author email:** nzenwadu@gmail.com

Abstract
The role of health science education in creating awareness of malaria predisposing factors among secondary school students in Owerri Education Zone I of Imo State Nigeria was examined using survey design. A survey research design was adopted for the study. Two research questions and two hypotheses guided the study. A sample size of 399 Health Science Education students was selected as the sample size in line with Taro Yamane formula and cluster random sampling technique. Rating scale titled "Health Science Education and Malaria Predisposing Factors Awareness Rating Scale" (HSEMPFARS) designed by the researcher was used for data collection. Using Cronbach alpha statistics, the HSEMPFARS' dependability coefficient was 0.86. Mean scores and standard deviation were used to answer the research questions, and the one sample t-test and independent samples t-test were used to evaluate the hypothesis. Findings showed that exposure to health science education helps students to a high extent to be aware of malaria predisposing factors and preventive measures; no significant difference was observed in the responses of students on their awareness of predisposing factors based on gender. In light of these findings, the researcher recommended that Health science education instructors should be consistent in their teaching about malaria predisposing factors and awareness as this would help sustain continuous students' awareness about the disease and that topics like malaria in health education should not be taught with special reference to a particular gender since both male and female students have similar levels of malaria predisposing factors awareness through health science education.

Keywords: Health Science Education, Malaria, Predisposing factors

Introduction

Health Science Education is an age-long concept. The origin of Health Education can be traced back to the ancient Greeks in the 4^{th} -6^{th} Century BC. The Greeks were the first to recognize, at least in part, that environmental factors and dietary choices contributed to sickness and that supernatural forces had no control over an individual's health. Health Education traced back to the Greeks, became a course of study and profession which educates the people about health, areas within this profession include social, physical, emotional, sexual, intellectual and spiritual health and environmental health. Health Education as a science promotes the health and prevention of diseases and infections (Melissa, 2021). Learning from a variety of sources, such as biology, psychology, medicine, ecology, and many more, is the main goal of health education. The information gained from these and other disciplines is then applied to improve health, fend off illnesses, and possibly even treat a person's condition. The teaching of health education has since ages, become an important part of school curriculum.

One of the most effective tactics used by many developing countries to avert serious health emergencies and social issues is the implementation of school health programs. Schools are regarded as one of the most important institutions for giving children the necessary education and experiences to help them learn better methods to manage their health and grow up to be healthy, productive adults (Nzenwa & Nzenwa, 2023).

In recent times, various forms of epidemics have ravaged the African society. One of the major epidemics is Malaria. This disease is ravaging and kills thousands of individuals monthly, especially children and young adults. One of the most significant "emerging or resurgent" infectious illnesses is malaria. The World Health Organization's 2016 World Malaria Report states that mosquito-borne infections are a major contributor to suffering, mortality, poverty, and underdevelopment worldwide. This has necessitated the need for students to be exposed to malaria literacy in secondary schools. Secondary schools cannot achieve their primary mission of exposing students to health education if students are not healthy and physically fit, mentally sound and socially

Cite this article as:
Nzenwa, D. U., & Okeke, F. N. (2025). Health science education and students' awareness of malaria predisposing factors in Owerri Education Zone I. *FNAS Journal of Mathematics and Science Education, 6*(4), 66-71

amiable. Students who are sick as a result of mosquito infection, are unlikely to learn well. Education reforms are bound to be of limited effectiveness unless students are exposed to health education and indicators of malaria predisposing factors (Joro, 2018).

In order to achieve massive awareness and literacy levels of malaria predisposing factors among students in secondary school, it is necessary to incorporate malaria teachings into the health education curriculum. Despite this, the educational system makes an effort to guarantee that pupils are adequately prepared for health education and promotion during their time in school, yet, in reality, nothing significant seems to have been done as students continue to contract environmental and insect-vector related illnesses like malaria due to the highly adaptable nature of the vector and parasites involved. To add to this neglect and inadequacy, most often, rather than coming from within the educational system, calls for health education to be taught in schools come from outside of it. Pirahmadi, Zakeri, and Raeisi (2017) submitted that if this continues to be the case, how then can the problem of malaria predisposing factors and malaria infection which happens to have a prevalence of 80% of both asymptomatic and symptomatic malaria among students in our secondary schools today be tackled?

In the light of malaria incidence in Nigeria, there is need to lay strong emphasis on how to prevent this disease among the grass root. The researcher sought to find out whether the health education program in secondary schools offer students the best knowledge needed to tackle malaria.

Due to their socially established roles in their families and communities, males and females are more or less susceptible to malaria. Women may be more susceptible to contracting malaria because of their traditional responsibilities, such as preparing the evening meal outside or rising before the sun to get the house ready for the day. Men who work outside in forestry, fishing, mining, agriculture, or ranching may be more susceptible to malaria if they do so during periods when the disease is most prevalent (Tefera, 2022). Hence the need to check the difference in the malaria predisposing factors awareness of both males and females.
The researcher therefore investigated awareness of malaria predisposing factors among Public Secondary School students based on their exposure to health education with gender as a moderating variable.

Objectives of the study
The study is guided by two objectives which include to:

1. determine the degree to which health education exposure aids students in public secondary schools in Owerri Education Zone 1 in understanding the risk factors for malaria.
2. determine the degree to which health education exposure aids students in having proper awareness malaria predisposing factors based on gender in Owerri Education Zone 1

Research questions
The following research questions aided this study:

1. To what extent does health education exposure aids students in public secondary schools in Owerri Education Zone 1 in understanding the risk factors for malaria?
2. To what extent does health education exposure aids students in having proper awareness malaria predisposing factors based on gender in Owerri Education Zone 1?

Hypotheses
Ho_1: The mean rating score of students (in public secondary schools) on awareness of malaria predisposing factors in Owerri Education Zone 1 is not significantly greater than the criterion mean of 2.5
Ho_2: The mean rating score of male and female students in Owerri Education Zone 1 public secondary schools regarding their awareness of the factors that predispose them to malaria does not differ significantly based on their gender.

Methods
This study adopted survey research design. The population was made up of a total number of 2,644 students in 2 Local Government Areas of Owerri Education Zone I, from which a sample size of 399 students was selected. Taro Yamane formula was deployed in determining sample size and was selected using cluster random sampling technique. The two LGAs were randomly selected for the study from which 4 public secondary schools were also randomly selected (2 schools from each LGA). The sample size was made up of 181 males and 218 females. The "Health Education and Malaria predisposing factors Awareness Rating Scale" (HEMPFARS), a rating scale created by the researcher, serves as the data gathering tool. Ten elements total—Very High Extent (VHE), High

Cite this article as:
Nzenwa, D. U., & Okeke, F. N. (2025). Health science education and students' awareness of malaria predisposing factors in Owerri Education Zone I. *FNAS Journal of Mathematics and Science Education, 6*(4), 66-71

Extent (HE), Low Extent (LE), and Very Low Extent (VLE)—are included in the rating scale, which uses a four-point Likert scale. Three experts—two from Health Education and one from Educational Measurement and Evaluation—validated the tool. A reliability coefficient of 0.86 was obtained for the HEMPFARS using Cronbach alpha statistics. Mean scores and standard deviation were used to answer the research questions, and the one samples t-test and independent samples t-test were used to test the hypotheses at the 0.05 level of significance, where a p-value of less than 1.05 resulted in the rejection of the null hypothesis and vice versa.

Results

Table 1: Degree to which health education exposure aids students to understand the predisposing factors of malaria

S/N	Health education helps my awareness of the following malaria predisposing factors:	VHE	HE	LE	VLE	Mean	SD	Remark
1.	Organic matter	36	218	145	0	2.72	0.63	High extent
2.	Cans and other containers	181	181	36	1	3.36	0.65	High extent
3.	Pots and bushes	36	218	73	72	2.54	0.91	High extent
4.	Still water bodies	109	181	73	36	2.90	0.92	High extent
5.	Improper disposal of wastes	36	254	109	0	2.81	0.58	High extent
6.	Effluent disposal	73	218	108	0	2.90	0.68	High extent
7.	Drainages around the school	181	181	18	19	3.36	0.65	High extent
8.	Larval habitats	181	218	0	0	3.45	0.68	High extent
9.	Soiled clothes/grimy tableware	0	73	145	181	1.72	0.76	Low extent
10.	Wastewater spill	36	290	73	0	2.90	0.52	High extent
	Mean of item means					**2.86**		

Data on Table 1 reveal the mean rating scores of the respondents on the degree to which health science education exposure aids students to understand the predisposing factors of malaria. All the items except item 9 have their mean response scores above 2.50 which is the criterion mean. Item 9 has a mean score of 1.72 indicating that majority of the students do not agree that exposure to health science education makes them aware of soiled clothes/grimy tableware as a predisposing factor to malaria. The standard deviation scores are low which shows homogeneity of the responses across items. The item mean of means is given as 2.86 which is also greater than the criterion mean. This generally implies that the degree to which health science education exposure aids students to understand the predisposing factors of malaria is high.

Ho_1: The mean rating score of students (in public secondary schools) on awareness of malaria predisposing factors 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 predisposing factors through health science education.

Variable	n	Observed Ẍ	Criterion Ẍ	df	SD	t_{cal}	p-value	Decision
Awareness of malaria predisposing factors	399	2.86	2.50	398	1.80	6.18	0.00	Ho_1 is rejected

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

Data on Table 2 show the result of the one sample t-test on hypothesis 1. The observed grand mean score of the students is given as 2.86 which is greater than the criterion mean of 2.50. The t-Statistics/calculated value is given as 6.18 with a corresponding p-value of 0.00. The output is less than the stated significant value of 0.05. Therefore, the null hypothesis is rejected and it is agreed that the mean rating score of students (in public secondary schools) on awareness of malaria predisposing factors in Owerri Education Zone 1 is significantly greater than the criterion mean of 2.50.

Table 3: Extent of Awareness of Malaria Predisposing Factors based on Gender

S/N	The following are malaria Predisposing factors:	Male mean	S.D	Remark	Female mean	S.D	Remark
1.	Organic matter		0.52	High extent		0.60	High extent

Cite this article as:
Nzenwa, D. U., & Okeke, F. N. (2025). Health science education and students' awareness of malaria predisposing factors in Owerri Education Zone I. *FNAS Journal of Mathematics and Science Education, 6*(4), 66-71

		2.82			2.69		
2.	Cans and other containers			High extent			High extent
		3.40	0.74		3.30	0.72	
3.	Pots and bushes			High extent			High extent
		2.58	0.92		2.50	1.02	
4.	Still water bodies			High extent			High extent
		2.81	0.79		2.89	0.80	
5.	Improper disposal of wastes			High extent			High extent
		2.81	0.78		2.80	0.76	
6	Effluent disposal			High extent			High extent
		2.98	0.70		2.87	1.07	
7	Drainages around the school			High extent			High extent
		3.23	1.06		3.50	1.09	
8	Larval habitats			High extent			High extent
		3.45	0.71		3.40	0.73	
9	Soiled clothes/grimy tableware			Low extent			Low extent
		1.72	0.80		1.71	0.79	
10	Waste water spill			High extent			High extent
		2.90	0.77		2.90	0.99	
	Item mean of means	**2.87**			**2.85**		

The respondents' mean evaluation scores on the degree to which exposure to health science education aids students in understanding malaria risk factors by gender were displayed in Table 3. With a cumulative mean of 2.87, the male students' mean answers on all but item 9 are higher than the criterion mean of 2.50. This shows that majority of the male students agree to a high level that health science education enables them to be aware of malaria predisposing variables.

Likewise, with a cumulative mean of 2.85, the mean answers of the female students on all but item 9 are higher than the criterion mean of 2.50. This also implies that a good number of the female students agree to a high extent that health science education helps them to be aware of malaria predisposing factors. The similar cumulative means of both genders show that their extent of awareness of malaria predisposing factors do not differ.

HO_2: The mean rating score of male and female students in Owerri Education Zone 1 public secondary schools regarding their awareness of the factors that predispose them to malaria does not differ significantly based on their gender.

Table 4: Independent samples t-test of significant difference in the awareness of malaria predisposing factors based on gender of students

Gender	n	$\bar{X}$	S.D	df	t_{cal}	$p-value$	$Decision$
Male	181	2.87	2.28	397	0.53	0.61	Do not reject H_{02}
Female	218	2.85	1.72				

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

Table 4 displayed the results of the independent samples t-test, which revealed a significant difference between the mean replies of male and female students on how much exposure to health science education aids in their understanding of the risk factors for malaria. The p-value is 0.61, which is higher than the 0.05 level of significance, and the t-calculated value is 0.53, which is low. The null hypothesis is not disproved because the p-value is higher than 0.05. Thus, it can be said that there is no discernible gender-based variation in the mean rating score of students regarding their level of awareness of malaria risk factors.

Discussion

Findings from research question one show that majority of the health education students agreed that health education to a high extent helps them to be aware of the malaria predisposing factors. Invariably, this goes to show that the awareness of Health education students on malaria predisposing factors is high. The corresponding hypothesis revealed that the observed mean of the respondents is greater than the criterion mean. The reason for this finding may not be farfetched given the fact that Malaria is a widespread endemic disease in the tropical part of Africa and as such, much awareness about the disease has been made through various fronts and media, school curriculum health science education also inclusive. This result is consistent with that of Ngwu and Ekpiken-Ekaneme (2017), who examined the effect of health education on secondary school students' understanding of

Cite this article as:
Nzenwa, D. U., & Okeke, F. N. (2025). Health science education and students' awareness of malaria predisposing factors in Owerri Education Zone I. *FNAS Journal of Mathematics and Science Education, 6*(4), 66-71

diseases in Cross River State, Nigeria, and found a strong link between health education study and students' understanding of diseases that affect their health.

The results of Mazloomy, Zare, and Feisal (2006), who examined the impact of health science instruction on high school students' knowledge, attitudes, and behaviors about brucellosis disease in Yazd, Iran, further confirm this. Their findings reported a strong correlation between exposure to health science education and students' awareness of brucellosis disease. Responses from their respondents also revealed that the students attributed their awareness of diseases to their exposure to health science education.

The results of the second research question indicate that the cumulative means of the two sexes on the degree to which health education raises students' awareness of the risk factors for malaria are comparable, implying that there is no difference in their answers. The matching hypothesis test verified that male and female students' answers about how much exposure to health education aids in their awareness of malaria risk factors did not differ significantly. The results of Oni and Tshitangano's (2017) study on learners' exposure to health education and promotion at schools in the Republic of South Africa's Limpopo Province provide support for this conclusion. They found no discernible difference between male and female students' health science education knowledge levels regarding basic killer diseases.

Also supporting this finding are the findings of Jayanthi, Senthilvel, and Priyanka (2017) who in their study on school health education programs and students' knowledge and practice of malaria preventive measures, recorded no significant difference in students' awareness of malaria based on their gender.

Conclusion

Awareness of malaria's predisposing factors through health education is a very essential step to reducing the prevalence of malaria to the barest minimum. By educating secondary school students on predisposing or risk factors such as stagnant water accumulation, inadequate use of protective measures, students can take proactive steps to safeguard their health. Health education fosters informed decision-making, promoting preventive behaviors and encouraging early treatment-seeking. A well-informed student is the cornerstone of malaria control efforts, as knowledge leads to action and ultimately saves lives. Through sustained health education, a resilient malaria free society can be achieved.

Recommendations

In line with the findings, the researchers recommend that:

1. Health science education teachers should be consistent in their teaching about malaria predisposing factors and awareness as this would help sustain continuous students' awareness about the disease.
2. Topics like malaria in health education should not be taught with special reference to a particular gender since both male and female students have similar levels of malaria predisposing factors awareness through health education.

References

Jayanthi, S., Senthilvel, V. & Priyanka, R (2017). A Study of the Effectiveness of School Health Education Programs on Selected Mosquito Borne Diseases: School Based Cross-Sectional Study. *Int. J Res Med Sci*., *5*(6), 2728-2733.

Joro, J. A. (2018). Influence of Knowledge of Environmental Sanitation on Health Practices of Senior Secondary School Students in Taraba State. Unpublished M.Ed. Thesis. Department of Physical and Health Education, Faculty of Education Ahmadu Bello University, Zaria, Nigeria.

Mazloomy, S., Zare, M. & Feisal, M. (2006). Effects of Health Education on Knowledge, Attitude and Practice of Female Teachers in Yazd Intermediate Schools on Breast Cancer. *J. of Birj and University of Med. Sci. 13*, 12-8.

Melissa, B. & Artem, C., (2021). Health Education History and Function, updated.

Ngwu, U.I., & Ekpiken-Ekaneme, R. (2017). Evaluating the Impact of Health Education on Health Knowledge: A Study of Secondary School Students in Cross River State, Nigeria. *International Journal of Humanities and Social Science: Insights and Transformations, 3* (1), 35-47.

Nzenwa, D.U. & Nzenwa, P.O. (2023). Predictors of Drug Abuse Among College Students in Owerri, Imo State, Nigeria. *Int. J. of Assess. And Evaluation in Edu*., *2*(1), 49-58.

Oni, H.T. & Tshitangano, T.G. (2017). Assessment of Learners' Exposure to Health Education and Promotion at School in the Limpopo Province of South Africa. African Journal of Primary Health Care and Family Medicine *8*(2), 1-5.

Pirahmadi, S., Zakeri, S. & Raeisi, A. (2017). Absence of Asymptomatic Malaria Infection in a Cross- Sectional Study in Iranshahr District. Iran Under Elimination Programmes. *Iran J. Parasitol*. *12*(1), 90-100.

Tefera, G. (2022). Prevalence of Malaria and Associated Factors Among Patients Attending at Hallaba Health Center, Southern Ethiopia. *Imm. and Infectious Diseases, 2*(3), 25-29.

World Health Organization (2016) Health Risks Associated with Stagnant Water(PDF)(Report). Recommendations for Occupational Health and Safety Following Disasters. Archived from the original (PDF) on November *27*, 2014.