

## Environmental Factors as Determinants of Student's Health Status in a Tertiary Institution in Ekiti State

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### Abstract

This study was carried out to examine the influence of environmental factors on the health status of students in a tertiary institution in Ado-Ekiti. Ex-post facto design was adopted in this study. 120 undergraduates (57 males and 63 females), randomly selected from six hostels of residence in Ekiti State University, Ado-Ekiti constituted the sample for this study. Self-developed questionnaire containing items to assess the environmental condition and health status of students was used for data collection. Data were analysed using frequency counts, percentages, mean, percentile and multiple linear regression. A total of 61.7% of the students had fair health status. Few (21.7%) of the hostels assessed had high level of sanitation, 63.3% had moderate level of access to water while only 22.5% had good quality water supply. Access to water was a significant determinant of students' health status ( $\beta = .388, p < 0.05$ ). Hostel sanitation ( $\beta = .105, P > 0.05$ ) and quality of water ( $\beta = .108, P > 0.05$ ) were not significant determinants of students' health status. Regular access to good quality water and good hostel sanitation contributed positively to the health status of students. Therefore, hostel providers should always ensure good environmental conditions for tertiary institution students so as to enhance their health status.

**Keywords:** Environmental factors, health status, students' hostel, access to water

### Introduction

The public health importance of the environmental conditions of educational institutions as well as places of residence of students in such institutions cannot be over-emphasized. Poor environmental conditions such as air pollution, poor refuse disposal, contaminated water and poor environmental hygiene can trigger respiratory tract infections, cause diarrhoea diseases, cause typhoid and cause transmission of communicable diseases among students (World Health Organization (WHO), 2018). The environment where students learn and live impact greatly on their health and this can make or mar their health status. Hence, efforts must be made at ensuring hygienic learning and living environment for students.

Maintaining a healthy learning environment may not be a matter of concern to students in higher institution as this is often catered for by the management of such institutions. However, issues relating to ensuring a healthy hostel environment, which is the closest environment of students in tertiary institutions calls for concern as many of these hostels are not properly managed and have poor environmental

conditions.

The health risks posed by environmental factors such as improper refuse disposal, poor sanitation, unsafe water supply and air pollution are enormous and many health problems and even death have been attributed to these preventable environmental factors (WHO, 2017)). To satisfy the physiological and psychological needs of students in tertiary institutions who live far away from home, and protect them against infections and accidents, good hygiene in their learning and living environment must be maintained (The Open University, 2019).

To ascertain the environmental condition of a place, environmental indicators are essential. Environmental indicators are simple measures that provide information about the state of an environment. These include: means of refuse disposal, source of water, quality of water and sanitation among others. It has been observed that many of the hostels in tertiary institutions do not have healthy means of refuse disposal, regular and clean water supply and are in poor hygienic condition thereby posing serious threats to the health of the students. There has

been a lot of reports on cases of infectious diseases, outbreak, contraction of water-borne diseases, general ill health and even death among tertiary institution students which has commonly been attributed to poor environmental conditions

Previous researches have reported the influence of environmental sanitation and access to good quality water on health. The findings of Amoran, Onwumbe, Salami & Mautin (2014) show a positive correlation between good environmental sanitation and health. Their findings revealed that households who regularly clean their home surroundings have reduced occurrence of malaria. Similarly, The World Bank Development Economic Project (TWBDEP) Group, (2010), reporting the findings of previous studies, stated that improved water and sanitation reduced the health risk related to water-borne diseases and that this is also likely to reduce the burden of diseases related to other health issues.

Access to water is another environmental factor that has been reported to influence health status. According to Zhang (2011), access to water has an indirect influence on health. Zhang noted that access to water reduces the time, energy and effort required to get water for use thereby helping people to save time and energy for other productive ventures that impact their health. Regular supply of water in hostels of residence of tertiary institution students will go a long way in enhancing personal and hostel hygiene thereby impacting health positively. In addition, regular access to water in hostels will reduce the agitation and anxiety involved in the search for portable water and save students the time and energy required to undergo academic rigors.

Quality of water is another environmental factor that is worthy of note. Findings of previous researches have shown an association between quality of water and health status. Rahut, Ali, Chhetri, Behera & Jena (2016) reported that having access to safe drinking water was associated with fewer occurrences of stomach disorders, skin diseases and less expenditure on medicine. Water quality affects peoples' health directly through microbial contents and toxic elements in drinking water (Zhang, 2011). It is

therefore important to make provision for potable water in households and students' hostels of residence as this is essential for the promotion and protection of their health.

Environmental health according to WHO (2018) and cited by National Association of School Nurses (2018), involves the assessment and control of environmental factors that have the potential of endangering human health and it is targeted towards preventing diseases and creating a health-supportive environment. Based on this awareness, this study was conducted to assess the environmental conditions of students' hostels in Ekiti State University, Ado-Ekiti in terms sanitation, access to water and quality of water supply and to examine how these factors influence the health status of the students. To the best of the knowledge of this researcher, there has not been any research conducted to examine how hostel sanitation, access to water and quality of water supply influence the health status of students in this institution. This research was therefore conducted to fill this gap.

#### Research Questions

Seven research questions were raised in this study. These include:

1. What is the level of sanitation of student's hostels in Ekiti State University?
2. What is the level of accessibility to water in student's hostels in Ekiti State University?
3. What is the quality of water supply in student's hostels in Ekiti State University?
4. What is the health status of students in Ekiti State University?
5. What are the commonly reported health problems among students of Ekiti State University?
6. How much of the total variance in students' health status is accounted for by the predictor variables?
7. How much of the variance in students' health status is accounted for by each of the predictor variables?

### Methodology

Descriptive research design was adopted in this quantitative study. The population for this study consisted of all students in Ekiti State University Ado-Ekiti, who reside either within the school-provided hostels or hostels within the vicinity of the institution. The study consisted of 120 students selected from six hostels (one school-owned and five private owned) in Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria. Ekiti State University does not have much provision for students' hostel. Hence, most of the students live off-campus. In selecting respondents for this study, the available clusters of hostels within the vicinity of the institution were first identified. These include school-owned hostels, private-owned hostels in Iworoko, private-owned hostels in Osekita, private-owned hostels in phase two, private-owned hostels in school gate and private-owned hostels in Satellite Town making a total of six clusters. Ten hostels were randomly selected in each of the private-owned hostels using proportionate sampling technique while all the two school-owned hostels were selected using total enumeration technique. Two students were selected randomly from each of the selected private hostels but 20 students were selected in the school hostels (due to the fact that there are only 2 school-provided hostels) to constitute the respondents for this study. The instrument for data collection is questionnaire designed by the researcher having five sections. The first section elicited information on the demographic attributes of the respondents. Section B contained 8 items to assess hostel sanitation practices. Items 1-4 of this section were multiple choice items while items 5-8 were based on a 4-point rating scale of 'Never, 1-2 times a week, 3-5 times a week and Everyday'. Section C

contained 4 multiple choice items for assessing the sources, frequency of water supply and quality of the water in the hostels. Section D had only one multiple choice item on refuse disposal method while Section E had 5 items for assessing the health status of the students. The items in this section had a 4-point rating scale of "Never (4), <3 times a month (3), 3-4times a month (2) and >4 times a month (1)". Six research assistants administered the questionnaire to students who consented to participate in the study and on-the-spot collection was done. The instrument was collected, coded and analyzed using SPSS for windows version 23. Data analysis was done using frequency counts, percentages, mean, percentile and multiple linear regression. Statistical significance was set at  $P < 0.05$ .

### Results

120 respondents participated in this study. Fifty seven (47.5%) of the respondents were male and 99 (82.5%) were living in private-owned hostels.

**Research Question 1: What is the level of sanitation of students' hostels in Ekiti State University?**

To answer research question 1, scores of items relating to hostel sanitation practices were summed up and converted to percentile. Low level of sanitation was obtained by using scores between the 0<sup>th</sup> and 49<sup>th</sup> percentile (scores between 11 and 20). Moderate level was obtained by using the scores between the 50<sup>th</sup> and 75<sup>th</sup> percentile (scores between 21 and 23) while high level of sanitation was obtained by using scores between 76<sup>th</sup> and 99<sup>th</sup> percentile (scores between 24 and 27). The descriptive analysis is presented in Table 1 below.

Table 1: Level of Sanitation of Students' Hostels (n=120)

Level	Percentile	Frequency	Percentage
Low	0-49 <sup>th</sup>	42	35.0
Moderate	50-75 <sup>th</sup>	52	43.3
High	76-99 <sup>th</sup>	26	21.7

Table 1 shows that only 21.7% the hostels of residence have high level of sanitation

Research Question 2: What is the level of accessibility to water in students' hostels?

Research question 2 was answered by first summing up the scores of students' responses to items relating to access to water in the students' hostel and converted to percentile. Low level of access to water was obtained using scores between the 0<sup>th</sup> and 49<sup>th</sup> percentile (scores between 3 and 7). Moderate level was obtained by using the scores between the 50<sup>th</sup> and 75<sup>th</sup> percentile (8) while high level of access to water was obtained by using scores between the 76<sup>th</sup> and 99<sup>th</sup> percentile (scores above 8) The frequency distribution of level of accessibility to water in students' hostels is presented in Table 2 below.

Table 2: Level of Accessibility to Water in Students' Hostels (n=120)

Level	Percentile	Frequency	Percentage
Low	0-49 <sup>th</sup>	44	36.7
Moderate	50-75 <sup>th</sup>	76	63.3
High	76-99 <sup>th</sup>	-	-

Table 2 shows that majority of the students' hostels of residence (63.3%) have moderate level of access to water

Research Question 3: What is the quality of water in students' hostels?

Research question 3 was answered by summing up scores of items relating to quality of water supply and the mean score obtained converted to percentile. Poor quality was obtained using scores between the 0<sup>th</sup> and 49<sup>th</sup> percentile (scores between 3 and 4). Fair quality was obtained by using the scores between the 50<sup>th</sup> and 75<sup>th</sup> percentile (5) while good quality was obtained

by using scores between the 76<sup>th</sup> and 99<sup>th</sup> percentile (scores between 6 and 7). The frequency distribution of quality of water in students' hostels is presented in Table 3 below.

Table 3: Quality of Water in Students' Hostels (n=120)

Quality	Percentile	Frequency	Percentage
Poor	0-49 <sup>th</sup>	8	6.7
Fair	50-75 <sup>th</sup>	85	70.8
Good	76-99 <sup>th</sup>	27	22.5

Table 3 shows that only 22.5% of the students' hostels of residence have access to good quality water

Research Question 4: What is the health status of students in Ekiti State University?

Research question 4 was answered by first summing up the scores of students' responses to items relating to the frequency of occurrence of various health problems converted to percentile. Poor health status was obtained using scores between the 0<sup>th</sup> and 49<sup>th</sup> percentile (scores between 6 and 21). Fair health status was obtained by using the scores between the 50<sup>th</sup> and 75<sup>th</sup> percentile (scores between 22 and 24) while good health status was obtained by using scores between the 76<sup>th</sup> and 99<sup>th</sup> percentile (scores above 24). The frequency distribution of students' health status is presented in Table 4 below.

Table 4: Descriptive Analysis of Students' Health Status (n=120)

Quality	Percentile	Frequency	Percentage
Poor	0-49 <sup>th</sup>	46	38.3
Fair	50-75 <sup>th</sup>	74	61.7
Good	76-99 <sup>th</sup>	-	-

Table 4 shows that majority (61.7%) of the students are of fair health status

Research Question 5: What are the commonly reported health problems among students of Ekiti State University?

Table 5: Commonly Reported Health Problems among Students In Ekiti State University

Frequency of illness	Never (%)	=3ce/month (%)	3-4X/month (%)	>4X/month (%)	Mean ±SD
Vomiting	102 (85.0)	9 (7.5)	-	9 (7.5)	3.70 ±.82
Diarrhoea	107 (89.2)	7 (5.8)	-	6 (5.0)	3.79 ± .68
Malaria	57 (47.5)	56 (46.7)	1 (0.8)	6 (5.0)	3.37 ± .74
Stomach ache	74 (61.7)	31 (25.8)	3 (2.5)	12 (10.0)	3.39 ± .95
Typhoid	94 (78.3)	18 (15.0)	3 (2.5)	5 (4.2)	3.68 ± .72

Table 5 shows that health problems associated with diarrhoea is the most commonly reported (M=3.79, SD=.68) followed by vomiting (M=3.70, SD=.82). The least reported health problem is malaria (M=3.37, SD=.74).

Research Question 6: How much of the total variance in students' health status is accounted for by the predictor variables?

To answer research question 6, items on students' health status in the questionnaire were summed up for each respondents and regressed against the sum of items for each of the predictor variables and analysed using multiple linear regression. The result is presented in Table 6

Table 6: Multiple Regression Analysis of Total Variance of Predictor Variables on Students' Health Status

Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Students' health status	.520	.270	.251	2.93609

Results presented in Table 4 show that adjusted R square value (coefficient of determination) which is the proportion of variance in students' health status that can be explained by the predictor variable, is .270. This implies that all

the predictor variables in this study accounted for 27% of the variance in students' health status. Research Question 7: How much of the variance in students' health status is accounted for by each of the predictor variables?

Table 7: Relative Contribution of Predictor Variables on Students' Health Status

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
Constant	10.825	1.857		5.828	.000
Access to Water	.934	.241	.399	3.881	.000
Hostel Sanitation	.107	.103	.105	1.030	.305
Quality of water	.329	.259	.108	1.270	.207

Table 4 shows the individual contribution of the predictor variables to students' health status. Water availability contributed the most ( $\beta=.399$ ;  $t= 3.88$ ;  $p>.05$ ). This is followed by hostel sanitation ( $\beta=.105$ ;  $t=1.03$ ;  $p > .05$ ). The variable with the least contribution is water quality ( $\beta=.108$ ;  $t=1.27$ ;  $p>.05$ ).

Discussion of Findings

The findings of this study indicate that only few of the hostels have good sanitation and access to

good quality water. This is likely the contributing factor to the occurrence of diarrhoea and typhoid commonly reported among respondents. This finding is in support of the findings of United Nations Children Emergency Fund (UNICEF), (2009) and the submission of Collaborative on Health and the Environment (CHE), (2019) that poor quality water is one of the contributory factors to the spread of microorganisms causing diarrhoea, cholera, dysentery, hepatitis A, and typhoid.

The findings of this study that majority of the students have fair health status, is likely to be as a result of the moderate level of sanitation and fair quality of water available to students in their hostels. To improve the students' health status and also to prevent future occurrence of diseases among them, it is important to improve the sanitation condition and accessibility to good quality water in the hostels. According to TWBDEP Group (2010), improved water and sanitation has the likelihood of reducing the burden of diseases that affect human health.

The findings of this study revealed that hostel sanitation had a positive influence on the students' health status. Good hostel sanitation was associated with good health status of students. This is in line with the findings of Amoran et al, (2014) where good environmental sanitation was reported to be associated with reduced occurrence of diseases. Good sanitation is associated with cleanliness of the environment which in turn is associated with reduced disease occurrence and good health status. Dirty environments on the other hand are good breeding grounds for disease-causing microorganisms which impact human health negatively.

Access to water supply in the hostel had a significant positive contribution on the health status of students in this study. Students who had regular access to water in the hostel had better health status than their counterparts with irregular access. Zhang (2011), submitted that access to water reduces the time, energy and effort required to get water for use thereby helping people to save time and energy for other productive ventures that impact their health.

The findings of this study show that quality of water available in the hostels also had positive influence on students' health status. Students with good quality water supply had better health status. This finding is in support of the findings of Rahut et al, (2016) which show that having access to safe drinking water was associated with reduced occurrence of stomach disorders and skin diseases. It also incur less expenditure on medicine. Good quality water has no taste, no colour and no toxic elements that can affect health negatively.

#### Conclusion

Good hostel sanitation and regular access to good quality water had significant positive contributions on health status of students in tertiary institutions.

#### Recommendations

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

1. Hostel providers in higher institutions should make provision for good quality water in the hostels so that students can have regular access to it thereby reducing the occurrence of water-borne diseases among them.
2. Hostel providers should make provisions for human and material resources for maintaining hygiene in the hostels.
3. Students residing in hostels should join forces with the hostel providers in maintaining cleanliness of their environment.

#### Limitations

The major limitation of this study is that the outcome of this study was based solely on respondents' self-report of their health status, hostel sanitation, and water condition which could have either been under or over reported.

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