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Air Pollution and Perceived Health Threat on the Students' In Off-Campus Accommodation in Tertiary Institutions in Edo State

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Abstract

This study specifically examined the causes of air and the perceived health threat of air pollution on the students' health in off-campus residential accommodation. Descriptive survey research design was employed for this study. The population for the study was 200 students each from the federal and state institutions making a total of 400 students' selected using accidental sampling technique. A self-organized questionnaire was used to collect the data for this study. The questionnaire was validated by experts and the reliability of the instrument was subjected to the use of test re-retest reliability procedures at correlation coefficient of 0.87 which was deemed high. The administration of the questionnaire was successful with the help of 3 trained research assistants. Findings showed that majority of the respondents agreed that many variables were the causes of air pollution and that there were perceived health threat on the students' health as a result of air pollution. And that air pollution would significantly influence the students' health in off-campus accommodation. It was recommended that Government should put in place policies that will prevent there should be no building of factories and industries near residential areas to prevent hazards.

Keywords: Air pollution; Perceived health threat; Students; Off-campus accommodation; Tertiary institutions

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Introduction

Pollution is both a social and a human problem. Environmental pollution is as old as man is both social and human problems. Pollution constitutes the major menaces to the environment and the worth of health of the people [1]. The ill-health of humans caused by environmental pollution is on the increase which called for serious attention of both domestic and international organizations [2] However, Actions from individuals and communities may require changes in their behaviours which may be forced to modify their exposure to pollution either negatively or positively [3]. According to Adimekwe, (2013), the healthy survival of man to a very large extent depends on value of the environment where he lives. Air pollution is the impurity of the indoor or outdoor atmosphere by any chemical, physical, or biological agent that changes the natural features of the air. Some air pollutions are from natural causes but most are caused by human beings and can influence every aspect of our lives (genv. org 2022).

Seven causes of air pollution was identified as (a) the burning of fossil fuels, (b) agricultural activities (c)wastes in landfills (d) exhaust from factories and industries (e) mining operations (f) fishing fleets and (g) forest fires (genv.org 2022). While ten main causes of air pollution are also cited as (a) Industrial emission, (b) indoor air pollution, (c) Wildfires, (d)burning of fossil fuels, (e) open burning of garbage waste, (f) microbial decaying process, (g) construction and demolition, (h) transportation, (i)agricultural activities and (j) use of chemical and synthetic products. The above causes of pollution in the environment have serious daily health threats on individuals (http;//www.aqi.in 2019). Air pollution is a chief health infirmity and the prominent environmental risk factor that can be root of non-communicable ailments globally [4].

Any disruption of the healthy living in the environment may be hazardous to the health of the people [5] Ogundele (2004) indicated that cough, asthma, tuberculosis, constriction of the chest, nausea, cancer and irritation of mucous membrane have a link with atmospheric air pollution. Pollution is the accumulation of toxins in the environment that adversely affects humans and organisms [5] Air pollution can cause harm to animals, trees, plants, crops and even water sources in the environment and can

causes problem with the aircraft because it decreases visibility. It can also be responsible for damaging natural water supplies to humans for the use of drinking, which can make water to be polluted and unhealthy for human beings to consume [6]

Polluted air when breathed in, can show signs as burning eyes and nose, it can even prompt respiratory issues in those that have asthma. Chemicals found in the polluted environments such as vinyl chloride and benzene, when air in form of oxygen is breadth can be very poisonous causing lung injuries, birth defects and cancer [7]. According to Blacksmith Institute/Green Cross Switzerland (2013), majority of world population is threatened by pollution. WHO (2012) stated that one in every seven deaths were caused by pollution related cases. Chronic illness, neurological damage, lowering of life expectancy from lungs, throat and thyroid cancers and a range of disease might weaken a person in irreversible damage as a result of pollution. Air pollution can be caused by the car emission, chemicals from factories, dust, pollens and mold spores suspended in atmosphere and water by the contamination of water bodies [8].

The following are the numerous sources of air pollution from (i) emission from Traffic, (ii) discharge from Power plants, (iii) Industrial plants and factories and odours from (iv) dead animals and smelling or rotten things. Processing plants used in industries and factories for the production of goods frequently release significant quantities of pollution into the air which are harmful to health and wellbeing of the people (Howel et al., 2003). Air pollution is an environmental problem with significant negative impacts on public health of the societies. Environmental air pollution has been widely recognized to have adverse epidemiological, physical and mental health outcome (WHO, 2013). Air quality plays important roles in individual and community health at large. Poor quality air has attributed to threats capable of affecting one's health and well-being. Human exposures to hazardous agents in the air contribute a lot to human's illness, disability, and death worldwide [9].

According to Health, United States (2006), air quality significantly affects the lives of people in terms of their health. Living in a polluted environment signifies a high level risk to individual. Data revealed that air pollution causes around seven million deaths a year globally. Air pollution causes swelling of the respiratory tract leading to coughing, mucus secretion, aggravation of asthma and chronic bronchitis and allowing people to be more prone to infections of the respiratory tract (Health, United States, 2006). According to Claeson et al. (2013), in a study, revealed that air pollution is associated with health risks of individuals. Howel et al. (2003), in a study on public views on the links between air pollution and health in Northeast England, revealed that a strong ink existed between air pollution and health of the public.

Figure 1 Image of cranberries (Vaccinium macrocarpon).

According to Adimekwe (2013), in a study revealed that air pollution is a major cause of ill health in a community. it is evident that there is strong fundamental links between specific diseases or health abnormality and air pollution that could result to chronic illnesses, such as allergies, asthma, and bronchitis. The above can be attributed to air pollution that could result to pollution exposure. According to European Public Health Alliance (2009), Blaxill (2004), Landrigan et al. (2002), Stein et al. (2002) Khan and Ghouri (2011), Brauer et al, (2007), Nel, (2005) Colls (2002) Woodruff et al, (2006), revealed that air pollution causes various diseases such as Cancer; neurobehavioral disorders; cardiovascular problems; premature death; asthma; irritation of eyes, nose, mouth and throat and reduced lung functioning and respiratory symptoms, respiratory disease, disruption of endocrine and reproductive and immune systems; and increased mortality among infants and older adults.

Air pollution is harmful to the health of the public causing several diseases and ill-health in people and the community. Despite the perceived harmful effects of air pollution, the public awareness about the effects is quiet scanty [9].

Statement of research problem

Good environmental condition is very important for health promotion and maintenance. It has been observed that residents (students inclusive) in many communities and streets are often exposed to environmental hazards particularly air contaminants. This circumstance seems to be having deleterious concerns on the residents, students inclusive. However, research on sources and perceived health threats as a result of air pollution on students' health status in off-campus accommodation are very scarce, hence, this study.

Purpose of the study

The purpose of this study was to examine the sources of air pollution and perceived health threats on the students in off-campus accommodation in tertiary institutions in Edo State

Research objectives

The objectives of this study were to

I. Determine the causes of air pollution around the students' off-campus accommodation residential areas in tertiary institutions in Edo State

II. Examine the perceived health threat of air pollution on the students' health in off-campus accommodation in tertiary institutions in Edo State

Research Hypothesis 1

Air pollution will not significantly influence negatively the students' health in off-campus accommodation in Federal and state tertiary institutions in Edo State.

Methodology

Descriptive survey research design was employed for this study. The population for this study was the tertiary institutions in Edo State comprising of federal and state universities, polytechnics, and colleges of education. The population respondents were the students in off-campus residential accommodations in Edo State. Two hundred respondents from the federal and state institutions making a total of 400 students were selected using accidental sampling technique. An adapted organized questionnaire by http://www.aqi.in,(2019), Howel et al., (2003) and genv.org (2022) were used to collect the data for this study. The questionnaire comprised to two sections. Section A contained information on personal data of the respondents, while Section B was used to gather information for the study. The questionnaire was subjected to face and content validity procedures. The face validity of the instrument was certified by experts, who analytically examined the instrument and the content validity used to ascertain the aptness of the items in the questionnaire. It was then deemed fit for administration. The reliability of the instrument was subjected to the use of test re-retest reliability procedures with a pilot study to determine the reliability of the instrument. The questionnaire was initially administered on 20 respondents (students} who were not among the respondents used for the study. After two weeks, the re-test was again given the respondents. The data collected from the two tests of the respondents were tested for reliability using Cronbach Coefficient alpha method. It yielded correlation coefficient of 0.87 which was deemed high, reliable and significant at 0.05 level (no = 20, r = 0.87, p <0.05). The administration of the questionnaire was carried out by the researcher with the 3 trained research assistants. The respondents were driven to be sincere in supplying information to achieve a reliable result. Through this process, all the copies of the questionnaire administered on the respondents were correctly filled and returned. Data were analyzed using appropriate descriptive and inferential statistics of (SPSS) Statistical Package for Social Sciences. The statistical method used was t-test (**Table 1**).

The above table 1 showed the responses of the respondents on the demographic characteristics of this study.

Research Question 1:

What are the causes of air pollution around the students' off-campus accommodation residential areas in tertiary institutions in Edo State? (**Table 2**).

From Table 2 above, it was observed that the respondents identified the following as the causes of air pollution. A total of two hundred and eighty respondents (280 (70%) identified that Fumes from vehicles did cause air pollution. A total of 388 (97%) respondents agreed with Fumes from generators as a source of air pollution. while 250(62.5%) respondents stated that wildfires caused air pollution. In the same vein, 318(795%) respondents said causes of air pollution was open burning of garbage waste. A

Table 1. Demographic characteristics of respondents (students).

S/N	Variables	Frequency	Percentage
1	Tertiary Institution:	-400	-100%
	Gender		
	Male	212	53
	Female	188	47
2	Age		
	Below 21 years	180	45
	21-30	184	46
	31-40	36	9
	41 years and above	-	-
3	Religion		
	Muslim	86	21.5
	Christianity	258	64.5
	Traditional	24	6
	Others	32	8
	Total	400	100

Table 2. Descriptive analysis of the causes of air pollution around the students' off-campus accommodation residential areas in tertiary institutions in Edo state.

S/N	Causes of Air Pollution	A	D
1	Fumes from vehicles.	280(70%)	120(30%)
2	Fumes from Power generating plant.	110(27.5%)	290(72.5%)
3	Industrial and factories emission	85(21.25%)	315(78.75%)
4	Fumes from generators	388(97%)	12(3%)
5	Forest fires/Wildfires	250(62.5%)	150(37.5%)
6	Burning of fossil fuels	284(71%)	116(29%)
7	Open burning of garbage waste	318(79,5%)	82(20.5%)
8	Microbial decaying process.	246(61.5%)	154(38.5%)
9	Construction and demolition	88(22%)	312(78%)
10	Agricultural activities	42(10.5%)	358(89.5%)
11	Use of chemical and synthetic products	230(57.5%)	170(42.5%)
12	Dead animals around the environment	244(81%)	156(19%)
13	Carbon monoxide	318(79.5%)	82(20.5%)

Note: A=Agreed
D=Disagreed

total of 246(61.5%) respondents stated that Microbial decaying process can cause air pollution, while 230(57.5%) respondents specified that waste Use of chemical and synthetic products did cause air pollution, and in the vein, 244(81%) respondents indicated that dead animals around the environment can cause air pollution, and burning of fossil fuels causing air pollution with 284(71%) respondents and carbon monoxide with 318(79,5%) of respondents. From the above analysis of findings, it was observed that 8 out of the 12 causes of air pollution that the respondents identified were those that the respondents were familiar with [10-13].

Research Question 2

What are the perceived health threats of air pollution on the students' health status in off-campus accommodation in tertiary institutions in Edo State? (**Table 3**).

Table 3. Descriptive analysis of the perceived health threats of air pollution on the students' health in off-campus accommodation in tertiary institutions in Edo state.

S/N	ITEMS	A	D
1	Air pollution can cause increased cough and shortness of breath.	346 (86.6%)	54(13.5%)
2	Air pollution can cause irritation of mucous membrane of the eyes.	40(10%)	360(90%)
3	Air pollution can cause constriction of the chest.	248(62%)	152(38%)
4	Air pollution can cause nausea.	288(72%)	112(28%)
5	Air pollution can cause respiratory tract infection	340(85%)	60(15%)
6	Air pollution can cause cancer	172(43%)	228(57%)
7	Air pollution can cause damage to nerves, liver and Kidney	302(75.5%)	98(24.5%)
8	Air pollution can cause nasal passages, pharynx and lungs.	288(72%)	112(28%)

Table 4. T-test of air pollution will not significantly influence negatively the students' health in off-campus residential accommodation in federal and state tertiary institutions in Edo state.

Variable	N	Mean	std	df	T cal	T critic	Decision
Federal	200	5.341	1.573	1.423	42	0.102	Significant
State	200	6.512	1.323	0.102			

Table 3 showed the perceived health threats of air pollution on the students' health status in off-campus accommodation in tertiary institutions as it was identified by the respondents. A total number of 346 (86.6%), respondents perceived that air pollution can cause increased cough and shortness of breath, a total of 248(62%) respondents perceived that air pollution can cause constriction of the chest, while 288(72%) respondents perceived air pollution can cause nausea and also nasal passages, pharynx and lungs respectively. a total of 340(85%) respondents perceived that air pollution can cause respiratory tract infection while Air pollution can cause damage to nerves, liver and Kidney was also perceived by 302(75.5%) respondents. The above findings showed that majority of the respondents perceived that air pollution can cause various illnesses [14].

Hypothesis 1

Air pollution will not significantly influence negatively the students' health in off-campus residential accommodation in Federal and state tertiary institutions in Edo State (**Table 4**).

t-cal= 1.423, t-critic = 0.102 , P<0.05

Table 4 showed the results of the t-test analysis conducted to determine the significant influence negatively of air pollution on the health of students in off-campus residential accommodation in tertiary institutions in Edo State. The research was subjected to t-test analysis to determine the significant influence negatively of air pollution on the students' health in off-campus residential accommodation in tertiary institutions in Edo State. The table showed that the t-test value was t-cal= 1.423, t-critic = 0.102, P<0.05 alpha level of significance. Based on this result, the null hypothesis which stated that air pollution will not significantly influence negatively the students' health in off-campus residential accommodation in Federal and state tertiary institutions in Edo State was hereby rejected. On the basis of the above, air pollution would significantly influence negatively the students' health in off-campus residential accommodation in Federal and state tertiary institutions in Edo State [15].

Discussion of Findings

One of the findings of this study discovered that major causes of air pollution to be fumes from vehicles, Fumes from generators, wildfires, open burning of garbage waste, Microbial decaying process, Use of chemical and synthetic products, and dead animals around the environment. This is in line with http;//www.aqi.in (2019), that identified ten main causes of air pollution as (a) Industrial emission, (b) indoor air pollution, (c) Wildfires, (d) burning of fossil fuels, (e) open burning of garbage waste, (f) microbial decaying process, (g) construction and demolition, (h) transportation, (i)agricultural activities and (j) use of chemical and synthetic products. And similar to genv.org (2022), that stated the causes of air pollution in the environment to be the burning of fossil fuels, agricultural activities, wastes in landfills, exhaust from factories and industries, mining operations, fishing fleets and forest fires.

Another finding showed that the respondents identified numerous perceived health threats of air pollution on the students' health status such as increased cough and shortness of breath, constriction of the chest, nausea and also nasal passages, pharynx and lungs respectively. Respiratory tract infection, damage to nerves, liver and Kidney. In fact, the above fore-mentioned diseases are non-communicable diseases. This relates to the statement of Cobbold et al. (2022), who stated that air pollution is a major health infirmity and is the leading environmental risk factor that can cause non-communicable diseases globally. And comparable with Webber & Willett, (2010), that air pollution is harmful to the health of the public causing several diseases and ill-health in people and the community. This study is also similar to the study of Adimekwe (2013), that air pollution is a major cause of ill health in a community [16].

Further finding stated that air pollution would significantly influence negatively the students' health in off-campus residential accommodation in Federal and state tertiary institutions in Edo State. This study is in line with.W.H.O (2013) that air pollution is an environmental problem with significant negative impacts on

public health of the societies.

Conclusion

Based on the findings from this study, the research concluded that air pollution had perceived serious negative implications on health and wellbeing of students living in off-campus residential accommodation in tertiary institution in Edo State.

Recommendations

- Based on the findings and conclusion of the study, the following recommendations were made towards the improvement of the health of the students in any environment.
- Government and her agencies should put in place policies or measures that will prevent siting factories and industries in students' accommodation environment in order to prevent hazards.
- Building of industries and factories should be sited far away from residential areas for healthy living environment.
- Health talk on air purity should be organized often for the students in order to prevent them from polluted air as well as the danger associated with impure air.
- Government and her agencies should also enforce the environmental sanitation officers to always visit all areas to see that dead animals are not left around in the community/ society.

Ethical Consideration

Ethical consideration is of importance to this study and was well-maintained. The study was cleared by the Institute of Public Health at Obafemi Awolowo University, Ile-Ife, Nigeria, with the protocol number IPH/OAU/12/2319. Confidentiality of information was also ensured during statistical examination and discussion of outcomes as contained in the consent form, provided the ethical clearance for the study.

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