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Research Article

Awareness And Attitude to Environmental Pollutants Among Osogbo Residents

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Abstract

This study was conducted to determine the awareness and attitude of the residents of Osogbo towards pollution. The study used a descriptive quantitative research design to assess the level of awareness of environmental pollution, their attitude towards pollution, their knowledge of common pollutants. Ethical approval was obtained from the Osun state health research ethical committee. Multi stage sampling was implored to choose a sample of four hundred and thirty (430) respondents to which questionnaire was served. Test for the hypothesis was presented as inferential statistics using Chi square, Pearson product moment correlation and Multiple linear regression run on SPSS version 20. The study shows significant high level of awareness, and positive attitude towards environmental pollutants among residents of Osogbo. Female respondents accounted for 61% (250). Many (65% (267)) of the respondents have tertiary education. Awareness of pollution is significant among the respondents ($X2 = 31.698$, df= 1 n= 410 p= 0.000), Attitude is also significant ($X2 = 36.828$, df=1, n=410 p= 0.000). Demographic characteristics if this population is implicated in significant level of awareness (F-Statistic is 22.726 at $p< 0.05$ levels) and attitude (F-Statistic is 32.5228 $p<0.05$) towards environmental pollution in Osogbo. There is high level of awareness and positive attitude towards pollutants in Osogbo residents. This can be due to sociodemographic variable like education and economic status. There should be progressive sensitization of people against the dangers of environmental pollution.

Keywords: pollutant; environment; attitude; awareness

Introduction

The status of the environment per time has an important influence on the biotic and abiotic elements of the environment, this is vital for health and man's living. If the environment is dangerous, then everything in the environment poses a risk. People, societal, national, and global events relating to the environment have a complex and a dynamic association operating concurrently. Environmental health responds in two ways, this includes environmental factors affecting human health and human activities affecting environmental quality (Orisakwe, 2017).

Pollutants can be grouped into biodegradable or non-persistent contaminants: - these pollutants can be broken down rapidly by the natural course e.g., Domestic waste, trash and manure; slowly degradable or persistent contaminants: - these relics in environment for a very extensive time, in unaffected condition up till few decades e.g., Pesticides, aerosol; and non-biodegradable contaminants: - these are contaminants that never gets degraded by any natural course. e.g., Toxic elements like lead, mercury, nuclear waste.

Contaminants includes Gases like Nitrogen oxide, Sulphur oxide, Carbon monoxide, Engineering waste Soot, smoke, tar, dust Metal waste Mercury, lead, zinc, nickel, cadmium. Chromium Acids, H2SO4, MNO3, Agri pesticides, Herbicides, fungicides, bactericides, weedicides, domestic waste refuse, rubbish Radioactive waste nuclear ash from nuclear reactors and E-waste from IT sector (https://www.slideshare.net/Sudarshana26/evs-environmental-pollution).

These are categorized as air, water, soil, noise /sound, nuclear and e-waste pollution.

Electronics were developed to ease information and communication. The production, commercialization, use, recycle, and disposal of electrical and electronic equipment (EEEs) have amplified exponentially in the last 10 years (Orisakwe et.al., 2019). This hasty increase of new technologies makes EEEs archaic, oftentimes within days of purchase. Huge amounts of e-waste end up disposed in low-income countries, where second-hand materials come mixed with broken parts. Most of the electric devices used in Africa have second hand value and reach their half-life soon after they are brought in and go obsolete, contributing to the rapid increase of e-waste in Africa (Orisakwe et al., 2019).

There is inadequacy of empirical data on the awareness and attitude of environmental pollution in this part of the developing nations and this need to be documented as this inform the policy makers to develop appropriate measures that curb the trend. Hence, this study, intend to assess the awareness and attitude of environmental pollution on the health of individuals living in Osogbo, Osun State.

Aims And Objectives

This study seeks

1. To assess the level of awareness environmental pollution among residents of Osogbo
2. To determine the attitude towards environmental pollution among residents of Osogbo

Research Questions

1. What is the level of awareness of environmental pollution among residents of Osogbo?
2. What are the attitudes towards environmental pollution among residents of Osogbo?

Methodology

Study Design

This study employed cross sectional design a quantitative descriptive research design to assess the awareness and attitude of pollution and the health outcomes that results from pollution among people living in Osogbo. This design was used because it helps to gather quantifiable information that can be used for statistical inferential analysis about the population. Located in the South Western part of Nigeria, Osun is bounded to the North by kwara States, to the East by Ondo and Ekiti State while to the West by Oyo state and to the South is Ogun state. There are 30 local government areas in the state with Osogbo being the state Capital.

According to the 2006 national population census, Osun state has an estimated population of 3.4 million. A 2016 estimate states that the population has rose to about 4.7 million.

The sample size for this study is 430 respondents. A multi stage random sampling was used to stratify Osogbo into fifteen (15) political wards as mentioned above. Twelve are highly dense, two are medium dense and one is low dense in terms of populations. Five (5) wards were selected at random; they include Ataoja A and B; Baba kekere, Ekerin and Ataoja E. Then Systematic random sampling was employed to choose subjects to populate the 430 targets.

The 2022 population of the study was projected using the formula below

$P_t=A\ (1+R)^{n}$

P_t= Estimated Population at t years later

A= Initial Population

n= Number of years

R= Yearly growth rate = 3.2% from Macrotrends (2022)

S/N	WARD	2006 CENSUS	PROJECTED 2022
1	Ataoja B and A***	22,342	39,982
2	Ataoja E.***	21,825	37,103
3	Baba kekere*	2,959	5,031
4	Ekerin **	13,150	22,355
Total		60,276	102,471

NPC (2006), Computation, 2022 key-*** - High density; **- Medium Density; *- Low Density

Table 1: Population of Target

A total of four hundred and thirty (430) questionnaires were distributed in all the five words randomly. The number of respondents per ward was estimated using the Projected population/ Total projected population X 430

S/N	WARD	2022 Projected Population	No of questionnaire
1	Ataoja B and A	39,982	165
2	Ataoja E.	37,103	155
3	Baba kekere	5,031	20
4	Ekerin	22,355	90
Total		102,471	430

Table 2: Questionnaire distribution

The instrument that was used for the study is structured self-developed questionnaire. All the retrieved questionnaires were assessed for completeness, errors and lost data. Coding of the questionnaires was be done before data entry on version 20 of the Statistical Package for Social Science (SPSS). Descriptive (mean, frequency and percentages) and inferential statistical techniques were used for data analysis. The demography of the respondents was reported as a descriptive statistic while inferential statistics of Chi square, Pearson correlation and multiple linear regression were used to explain the differences and relationship between the variable.

Results

Socio-demographic Characteristics n=410

Item	Frequency	Percentage (%)
Gender		
Male	160	39%
Female	250	61%
Age of respondents		
15—25	60	14.6%
26 —35	150	36.6%
36 —45	100	24.4%

46 —55	59	14.4%
56 —65	31	7.6%
66 and above	10	2.4%
Marital Status		
Married	132	32.2%
Single	278	67.8%
Educational Level		
No formal education	35	8.5%
Primary School	51	12.4%
Secondary School	57	14%
Diploma/ N.C. E	87	21.2%
Degree	89	21.7%
Masters	68	16.6%
Ph. D	23	5.6%
Religious Belief		
Islam	211	51.5%
Christianity	161	39.3%
Traditional	35	8.5%
Others,	3	0.7%
Employment Status		
Permanent & pensionable	165	40.2%
Contract	45	10.9%
Casual	70	17.0%
Retired	63	15.3%
Unemployed	67	16.3%
Economic Status		
High income (50 million per year)	10	2.4%
Medium income (5- 15 million per year)	80	19.5%
Low income (500,000- 2 million per year)	219	53.4%
Poor (< 300,000 naira per year)	101	24.6%
Residential Status		
Old resident (5- 1 years and above)	241	58.7%
New resident (2 years – 4 years)	113	27.5%
Visitor (< 6 months)	56	13.6%
Ethnicity		
Yoruba	331	80.7%
Hausa	41	10%
Igbo	32	7.8%
Others, specify	6	1.5%
Family Size		
Nuclear	345	84.1%
Extended	65	15.8%

Table 3: Frequency Distribution for Socio-Demographic Characteristics of the Sample

The results from this study showed that female respondents accounted for 61% (250) of the total sample size and people between the ages of 26 and 45 years formed more than 50% of the respondents with a percentage of 36.6% and 24.6% respectively. A total of 278 (67%) of the respondents were single, 65% (267) had above secondary school educations; while 211(51.5%) were Muslims and 165(40.2%) were in permanent jobs in both public and private sectors. Of the 410 respondents, 219(53.4%) were low-income earners while only 2.4% (10) were high income earners. More half of the respondents were old residents 241(58.8%), 331(80.7%) were Yoruba and 345(84.1%) were living in a nuclear Family setting.

Research Question 1: What is the level of awareness of environmental pollution among residents of Osogbo?

S/N	Items	Yes	No
1.	Environmental pollution involves beautification of the environment with flowers and other ornamental items.	76(18.5%)	334(81.5%)
2.	It is the introduction into the environment of foreign objects that are dangerous to our health.	271(66.0%)	139(33.9%)
3.	Environmental pollution includes amongst other, air, water, soil, nuclear pollution.	349(85.1%)	61(14.8%)
4.	Environmental pollution causes disturbance in the society.	320(78.0%)	90(21.9%)
5.	Overcrowding can worsen pollution.	298 (72.6%)	112(27.3%)
6.	Environmental pollution cannot cause death of living organism.	137(33.4%)	273(66.6%)
7.	Environmental pollution can result due climate change.	275(67.1%)	135(32.9%)
8.	Indiscriminate waste disposal can result in pollution.	265(64.6%)	145(35.4%)
9.	Some of our activities results into pollution.	262(63.9%)	148(36.1%)
10.	Locating your houses close to construction and beside the road predisposes you to pollution.	229(55.9%)	181(44.1%)

11.	Sitting beside cigarette smoker is a source of pollution.	340 (82.9%)	70(17.1%)
12.	Urbanization can contribute to water pollution.	50(12.2%)	360(87.8%)
13.	Smog, are you conversant with the term?	300(73.2%)	110(26.8%)
14.	Acid rain results from air pollution.	230(56.1%)	180(43.9%)

Table 4: Assessment of the Level of Awareness of Environmental Pollution Among Respondents

From table 4: 334(81.5%) of the respondents disagreed that environmental pollution involves beautification of the environment with flowers and other ornamental items and 76 (18.5%) agreed that pollution involves beautification of the environment. Also, 137(33.4%) and 273(66.6%) respectively agreed and disagree that environmental pollution cannot cause death. It is also evident from the table that more than half of the respondents -229(55.9%) are aware that locating a home near construction sites or beside that road predisposes one to pollution. 230(56.1%) are aware that Acid rain is linked to Air pollution while 180(43.9) are not aware.

Research Question 2: What is the attitude of Osogbo residents towards environmental pollution?

S/N	Items	SA	A	D	SD
1.	Water can be polluted.	200(48.7%)	90(21.9%)	45(10.9%)	75(18.3%)
2.	Rivers and other water bodies in my community are not polluted.	14(3.4%)	20(4.9%)	191(45.5%)	185(45.1%)
3.	Waste water should be disposed into rivers.	17(4.1%)	30(7.3%)	183(44.6%)	180(43.9%)
4.	There are no solutions to toxic dumping in our oceans.	80(19.5%)	63(15.3%)	156(38.0%)	111(27.0%)
5.	Government has a lot to do regarding water pollution.	191(46.5%)	185(45.1%)	10(2.4%)	24(5.8%)
6.	The Community has a lot to do regarding water pollution.	192(46.8%)	185(45.1%)	10(2.4%)	23(5.6%)
7.	Blocking water drainage cannot cause water pollution.	45(10.9%)	28(6.8%)	207(50.4%)	130(31.7%)
8.	Industrialization contributes to water pollution	123(30.0%)	109(26.5%)	99(24.1%)	79(19.2%)
9.	Deforestation contributes to water pollution.	59 (14.3%)	69(16.8%)	143(34.8%)	132(32.1%)
10.	Septic tanks should not be sited close to wells or other water source	190(46.3%)	180(43.9%)	15(3.6%)	25(6.0%)
11.	Disinfecting your water source is important.	205(50.0%)	97(23.6%)	28(6.8%)	80(19.5%)
12.	I often use firewood/charcoal to cook.	123(30.0%)	100(24.3%)	95(23.1%)	95(23.1%)
13.	I often use burning as my means of waste disposal	118(28.7%)	102(24.8%)	106(25.8%)	84(20.4%)
14.	I consume smoked fish	150(36.5%)	160(39.0%)	55(13.4%)	45(10.9%)
15.	Industries contribute to air pollution in my area	200(48.7%)	90(21.9%)	45(10.9%)	75(18.2%)
16.	Particulate matters don't cause any discomfort in me	80(19.5%)	65(15.8%)	125(30.4%)	140(34.2%)
17.	Government is not doing enough towards managing road-not-worthy cars for plying our roads.	175(42.6%)	190(46.3%)	26(6.3%)	19(4.6%)
18.	I often use face mask when am passing through air polluted area.	17(4.1%)	30(7.3%)	183(44.6%)	180(43.9%)
19.	I spend long hours in traffic daily	119(29.0%)	101(24.6%)	105(25.6%)	85(20.7%)
20.	I often smoke or stay with smokers	40(9.7%)	24(5.8%)	161(39.2%)	185(45.1%)
21.	I work at construction sites	20(4.8%)	14(3.4%)	185(45.1%)	191(46.5%)
22.	I use insecticide in my home regularly.	38(9.2%)	185(45.1%)	17 (4.1%)	170(41.6%)
23.	I use a generating set to provide power supply	86(20.9%)	70(17.0%)	149(36.3%)	105(25.6%)
24.	I will prefer an electrical car to a gasoline car	10(2.4%)	185(45.1%)	191(46.5%)	24(5.8%)
25.	Night life within my area does not disturb me	14(3.4%)	20(4.8%)	191(46.5%)	185(45.1%)
26	Closeness of my house to the main road isn't a source of discomfort to me	65(15.8%)	80(19.5%)	133(32.4%)	125(30.4%)
27.	I am not affected by vehicular traffic	86(20.9%)	70(17.0%)	149(36.3%)	105(25.6%)
28.	Industrial activities disturb me	191(46.5%)	185(45.1%)	10(2.4%)	24(5.8%)
29.	Activities of establishments around me worsens noise pollution.	10(2.4%)	23(5.6%)	192(46.8%)	185(45.1%)
30.	The planning of the state allows for easy noise pollution	207(50.4%)	95(23.1%)	80(19.5%)	28(6.8%)
31.	I use noise proof materials within my living and working area	59(14.3%)	69(16.8%)	143(34.8%)	132(32.1%)
32.	I can study where there is social activity going on.	123(30.0%)	109(26.5%)	99(24.1%)	79(19.2%)
33.	There are actions that should be taken by governments to deal with noise pollution.	190(46.3%)	180(43.9%)	15(3.6%)	25(6.0%)
34.	Noise is most prominent during the day time	205(50.0%)	97(23.6%)	28(6.8%)	80(19.5%)
35.	I use personal protective devices when am exposed to high level sound	80(19.5%)	125(30.4%)	65(15.8%)	133(32.4%)
36.	My land is not polluted	153(37.3%)	135(32.9%)	55(13.4%)	60(14.6%)

37.	I use pesticides	118(28.7%)	102(24.8%)	106(25.8%)	84(20.4%)
38.	I re-use household plastics	150(36.5%)	160(39.0%)	55(13.4%)	45(10.9%)
39.	I prefer foil to plastics in parking my food	200(48.7%)	90(21.9%)	45(10.9%)	75(18.2%)
40.	Organic fertilizers are safer than Mineral fertilizers	133(32.4%)	125(30.8%)	65(15.8%)	80(19.5%)
41.	Soil pollution can result in/or worsen natural disaster.	175(42.6%)	190(46.3)	26(6.3%)	19(4.6%)
42.	Soil pollution can be prevented/controlled?	180(43.9%)	183(44.6%)	30(7.3%)	17(4.1%)
43.	My activities pollute the soil	119(46.5%)	101(24.6%)	105(25.6%)	85(20.7%)
44	I dispose refuse and waste by burning at dumpsite	161(39.2%)	185(45.1%)	40(9.7%)	24(5.8%)
45.	I make compost manure from food waste	20(4.8%)	14(3.4%)	185(45.1%)	191(46.5%)
46.	I plant trees to protect the soil	38(9.2%)	17(4.1%)	185(45.1%)	170(41.4%)
47.	I am aware of the term "E-Waste or Electronic waste "	65(15.8)	80(19.5%)	133(32.4%)	125(30.8%)
48.	Africa is a dump site for used electronics.	118(28.7%)	102(24.8%)	106(25.8%)	84(20.4)
49.	I buy used (No testing) electronics.	190(46.3%)	180(43.9%)	15(3.6%)	25(6.0%)
50.	I dispose phone plastic into water and into refuse bin	205(50%)	97(23.6%)	28(6.8%)	80(19.5%)
51.	I don't take spoilt electronic devices for repairs	133(32.4%)	125(30.4%)	65(15.8%)	80(19.5%)
52.	The government is proactive towards reducing this type of pollution	20(4.8%)	14(3.4%)	185(45.1%)	191(46.5%)
53.	Nothing is being done to mitigate the incidence and prevalence of e waste.	180(43.9%)	190(46.3%)	23(5.6%)	17(4.1%)
54.	There is a link between E waste and other pollution types?	119(46.5%)	101(24.6%)	105(25.6%)	85(20.7%)
55.	I resell used TV, radio set and other gadgets to scavengers	191(46.5%)	185(45.1%)	10(2.4%)	24(5.8%)
56.	I frequently visit mining sites	14(3.4%)	20(4.8%)	191(46.5%)	185(45.1%)
57.	I have had an X-ray diagnosis before.	65(15.8%)	80(19.5%)	133(32.4%)	125(30.5%)
58.	I am aware of nuclear reactor used by countries to produce electricity and also as a weapon of mass destruction.	119(29.0%)	101(24.6%)	105(25.6%)	85(20.7%)
59.	Nigeria should also use nuclear energy.	191(46.5%)	185(45.1%)	10(2.4%)	24(5.8%)
60.	There are agents in my environment that emit radiation?	10(2.4%)	23(5.5%)	192(46.8%)	185(45.1%)
61.	I protect children and other vulnerable from radiation	207(50.8%)	95(23.1%)	80(19.5%)	28(6.8%)

Note: SA=Strongly Agree, A= Agree, D=Disagree and SD= Strongly Disagree

Table 5: Attitude towards Environmental Pollution among Residents of Osogbo

Table 4. assessed the level of awareness of pollution among residents. The numbers represent the various responses for different questions asked and their percentages as it compares to the total sample. From the table, 47(11.4%) agree and 363(88.5%) disagree that waste water should be disposed into rivers. Again, 337(82.1%) and 73(17.7%) respectively disagree and agree that blocking water drainage cannot cause water pollution. More than half 370(90.2%) of the respondents agree that septic tanks shouldn't be sited near wells and other water sources. Also from the table, 40(9.7%) strongly agree, 24(5.8%) agree, 161(39.2%) disagree and 185(45.1%) strongly disagree that they often smoke or stay with smokers. 223(54.3%) of the respondents use insecticide while 187(45.6%) don't use. 130(31.7%) used and 280(68.3%) did not use noise proof materials within their living and working area. Very few of the respondents-34(8.2%) are ok with the night life in their area, they agree that the sounds are a music to them. Of the 410(100%) respondents for this study, 310(75.6%) of the respondent re-use house hold plastics. 363(88.5%) respondents said soil pollution can be prevented/controlled. 145(35.4%) of the respondents are aware of the term E-waste; 220 (53.7%) say there is a link between E waste and other types of pollution, and 377(91.9%) say they are no agents in their environment that emit radiation. 73.9% (302) of the respondents protect children and other vulnerable from radiation.

Hypotheses Testing

$H0_1$: There is no significant awareness of environmental pollution among residents of Osogbo.

Variables	Observed N	Expected N	Residual	Df	Chi-Square	Prob
Agreed	262	205.0	57.0	1	31.698[a]	0.0001
Disagreed	148	205.0	-57.0			
Total	410					

(n=410; df=1; Chi-Square=31.698; table value=3.841)

Table 6: Chi-Square goodness of fit Summary on awareness of environment pollution among residents of Osogbo

Table 6 shows that there is significant awareness of environmental pollution amongst the respondents. Responses from the questionnaire on the tested Chi-square (X^2) calculated is 31.698 at 0.0001 level of significance, which is greater than the table value of 3.841 at 0.05 level of significance ($p>0.05$); therefore, the null hypothesis was rejected.

$H0_2$: There is no significance in the attitude towards environment pollution among residents of Osogbo.

Variables	Observed N	Expected N	Residual	Df	Chi-Square	Prob

Agreed	290	205.0	85.0	1	36.8267[a]	0.00001
Disagreed	120	205.0	-85.0			
Total	410					

(n=410; df=1; Chi-Square=36.8267[a]; table value=3.841)

Table 7: Chi-Square goodness of fit Summary on attitude towards environment pollutants among residents of Osogbo

Table 7 shows that there is significant good attitude towards environmental pollution amongst the respondents. Responses from the questionnaire on the tested Chi-square (X^2) calculated is 36.826 at 0.00001 level of significance, which is greater than the table value of 3.841 at 0.05 level of significance ($p>0.05$); therefore, the null hypothesis was rejected.

Discussion

The result shows a significant level of awareness among these respondents could be as a result of their educational background, and the period they have spent in their communities. The result of this study corroborates the study of Adejuwon, Adekitan and Oladunmoye (2018), where the authors found that 81% of the participants were aware of the water bodies. The result shows that 81.5% of the respondents are aware of what pollution is. It also shows that that the participants are aware of the effects of pollution, their types and the risk factors. In this study, about 26% of the respondents are not aware of the term smog, this is in contrast with number of respondents (3%) in a study by Wang et. al., (2016), this disparity may be due to the geographical location. The study of Wang et al., (2016), was in a smog polluted city in China; Zibo city, a place that is known to be more affected by poor visibility due to smog and awareness of smog are from news, weather forecast and online query.

Twenty-five (6.0%) and 15(3.6%) of the respondents strongly disagreed and disagree respectively to the fact that septic tanks should not be sited close to wells and other water sources while 370(90.2%) generally agreed that septic tanks should not be sited near water source, while 400(91.2%) agreed that blocking water drainage cannot cause water pollution. This agrees with findings of Adeyemi et. al., (2019) that consumption of fecal polluted water from well located near septic tank resulted in multidrug resistant *E. Coli* infections. This could increase the cost of treatment, because more expensive and scarce antibiotics will be needed for the treatment of the resistant strains. Wang et.al., (2016) found that most of their respondents agreed that man's activities were the main causes of heavy smog in Zibo city of China.

Recommendations

1. People should be encouraged to promote environmental conservation through promoting afforestation and reduction of toxic emissions into the atmosphere

2. Policies and laws should be strengthened in order to ensure companies that violate the environmental conservation laws are penalised

3. There should be progressive health education and sensitization regarding pollution and their health impacts, especially regarding e waste and radiation pollution.

4. This study should be used as a basis for policy making regarding environmental protection

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