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Assessment of Environmental Knowledge, Attitude and Behavior Among Undergraduates in a Southern Nigerian University

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Abstract

With an obvious trend towards an increase in awareness of existing and emerging critical issues in the environment due to man's numerous activities which exposes the planet earth to threats of climatic changes and the respective consequences, this study aimed to determine how much young people know, their attitude and behavior towards environmental issues with a view to making recommendations to relevant policy makers. It was conducted among undergraduates in a southern Nigerian university using a cross-sectional approach. There was a near-uniform gender distribution of the respondents. Reasonable level of knowledge about the environmental was reported by a little over two-fifths (43.9%) of the respondents, with the electronic media being their major (77.1%) source of information. Most of the respondents were enthusiastic towards the environment; would care about deforestation of the rainforest; would do their best to protect their environment; would be willing to educate their friends and relations on the use of natural resources; and strongly agreed that environmental education should be incorporated into the secondary school curriculum. In conclusion, a moderate level of environmental knowledge and attitude has been demonstrated in this study which has shown a need for families to actively seek information on environmental sustainability, and for government to incorporate sustainable environmental education into the school curriculum.

Keywords

Environment, Undergraduates, Knowledge, Attitude, Behavior

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1. Introduction

Akwa Ibom is situated in the south-southern part of Nigeria, otherwise known as the Niger-Delta region. As at 2015, it had an estimated (projected from 2006 census) population of 5,272,029 [1], and an average density of more than 745 persons per square kilometer. Available resources of Akwa Ibom have been affected by the increasing population, as in other national and global settings, which also leads to environmental problems [2]. These problems arise from human activities of daily living such as fumes from vehicles, deforestation, waste disposal as well as exploration for petroleum [3, 4].

Globally, there is an obvious trend towards an increase in awareness of existing and emerging critical issues in the environment due to man's numerous activities which exposes the planet earth to threats of climatic changes with its related problems linked to food, energy, politics and ecology security, amongst others, with further constraints to sustainable development. The subject of climate change has been in the front burner for many years with the Intergovernmental Panel on Climate Change (IPCC) predicting over 90% of human induced climate change (IPCC, 2007) [5]. Climate change threatens human health, including mental health, and access to clean air, safe drinking water, nutritious food, and shelter [6]. The environment affects all living beings and it denotes a

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broad and comprehensive term referring to all that surrounds human: air, water, soil and light including the physical, chemical, biological, psychological and socio-cultural dimensions in which the individual lives [7, 8]. Environmental health, a dimension of the environment, is defined by the World Health Organization as "those aspects of the human health, including quality of life, that are determined by physical, biological, social and psycho-social factors in the environment" [9]. It is concerned with all aspects of the natural and built environment for the benefit of human health.

The natural environment enhances health, and advances in the field of environmental health have taught us much about human health hazards though air pollution, toxicity from elements, and global climate change which is likely to fuel the spread of infectious diseases, despite efforts by industry, especially newer companies with the capacity to design "greener" manufacturing practices, which has made some inroads into environmentally friendly production [10]. It is further suggested that since efforts have not been so successful in maintaining biodiversity research and policy, they must be directed toward understanding the interactions of human health and the natural environment, from the most personal level to the global scale [10].

Education about the environment is a life-long process and ought to be cautiously considered in order to create sustainable environments. The United Nations Conference on Environment and Development has advocated for the involvement of young persons in environment and development decision-making and in the implementation of programmes as a panacea for sustainability [11]. The higher education community has been noted to be a major actor in environmental education and sustainable development [12].

Though Nigeria is a signatory to several legal and regulatory frameworks of the environment such as: The Vienna Convention (1994); The Bonn Convention (1979); Convention on Biological Diversity (19920; Basel Convention on the Control of Trans-boundary movement of Hazardous Waste and their Disposal (1987); World Heritage Convention (1978); United Nations Framework Convention on Climatic Change (1992); International Union for the Conservation of Nature and Natural Resources (IUCN Guideline 1996); Convention on the Conservation of Migratory Species of World Animals (1979) and World Convention on International Trade in Endangered species of Fauna and Flora (1973); not much is known about the environmental knowledge, attitudes and practice among undergraduates in Akwa Ibom, southern Nigeria. There is as yet, little understanding of the extent to which the main actors that are responsible for the acquisition and development of environmental perspectives are fostering a sense of environmental responsibility and a greater commitment towards sustainable development. Hence, this study aimed to determine how much young people know, their attitude and behavior towards environmental issues with a view to making recommendations to relevant policy makers.

2. Methodology

2.1. Study Design

This was a cross-sectional study conducted in 2018 to assess knowledge, attitude and behavior in a tertiary institution.

2.2. Study Area

The study was conducted in Akwa Ibom State of Nigeria.

2.3. Study Population/Study Subjects

Undergraduate students of the Akwa Ibom State University, Obio Akpa campus were the subjects.

2.4. Sampling Technique

Sampling was by a stratified random technique across the various faculties of the University.

2.5. Selection Criteria

Students that were currently enrolled in the institution were considered for the study.

2.6. Sample Size

A total of 180 students were sampled but 23 offered a no- or incomplete response, hence only a sample of 157 was considered. The sample size of 185 was determined appropriate to yield significant results with a 95% confidence level and a 7% margin of error.

2.7. Data Collection

A structured questionnaire was administered to the students. It was stratified into the following sections: demographic, knowledge on environment, and attitude towards environmental issues.

2.8. Data Analysis

Descriptive analysis was carried out with respect to frequencies and proportions. Other analyses conducted were correlation, multiple regression and comparing means using the F-test.

2.9. Ethical Considerations

Protocol for this study was approved by the Akwa Ibom State Ministry of Health, and oral informed consent was obtained from willing participants.

3. Results

Table 1. Demographics information of the Respondent.

Variable	Frequency	Percentage (%)
Age		
17-20 years	27	17.2
24-25years	96	61.1
26-30years	32	20.4
31-40years	1	0.6
Over 40years	1	0.6
Gender		
Male	79	50.3
Female	78	49.7
State of Origin		
Akwa Ibom	134	85.4
Abia	7	4.5
Rivers	16	10.2
Environment respondents spent their childhood		
Rural	40	25.5
Sub Urban	37	23.6
Small town	14	8.9
Small city	13	8.3
Large city	50	31.8
Others	3	1.9
Year of study		
Year 1	30	19.1
Year 2	40	25.5
Year 3	19	12.1
Year 4	68	43.3
Pre-degree	0	0.0
Faculty		
Agriculture	31	19.7
Business	27	17.2
Liberal Art and sciences	22	14.0
Others	77	49.0
How long you have lived in Akwa Ibom		
Less than 5 years	33	21.0
About 5-10 years	16	10.2
About 11-20years	21	13.4
About 21-30 years	25	15.9
All my life	62	39.5
Activities experience during childhood		
Planting a tree	74	47.1
Gardening	81	51.6
Fishing	53	33.8
Hunting	18	11.5
Campy	26	16.6
Reading a nature-related book	91	58.0
Having a wild place or visiting one	29	18.5
Just being outdoors	56	35.7
Canoeing	14	8.9
Bird-watching	60	38.2
Visiting Zoos	19	12.1
Watching “Animal planet”	71	45.2
Others	28	17.8

The demographics of the respondents are presented in Table 1. Result indicates that 17.2% of the respondents were between 17-20 years, 61.1% were between 21-25 years, while 0.6% were between 31-40 years and over 40 years, respectively. Result also reveals that majority of the respondents were male (50.3%), of Akwa Ibom state origin (85.4%) and reside in big cities (31.8%). Majority of the respondents were in their fourth year (43.3%), and majority of respondents had spent all their lives in Akwa Ibom (39.5%). It can also be deduced from table 1 that a few of the respondents had experienced having a wild place experience or visited one (18.5%) or had ever visited a zoo (12.1%).

Table 2. Knowledge of Environmental Issues of the respondents.

	Frequency	Percentage (%)
Knowledge of environment issues		
A lot	45	28.7
A reasonable amount	69	43.9
A little	35	22.3
Almost nothing	8	5.1
Nothing	0	0.0
Don’t know	0	0.0
Primary sources of information		
Tv	121	77.1
Ratio	89	56.7
Internet	111	70.7
Magazine	37	23.6
Newspaper	41	26.1
Classes/courses	83	52.9
Books	71	45.2
Library	34	21.7
Friend/relatives	86	54.8
Others	14	8.9
Knowledge of source of pollution that affect rivers and oceans		
Waste disposal from the cities	50	31.8
Trash washed into water from polluted shorelines	12	7.6
Waste disposal from factories and industries	20	12.7
Oil spill from pipelines	67	42.7
Don’t know	8	5.1
Knowledge of source of pollution that affect air quality		
Emission from factories	54	34.4
Emission form vehicles	57	36.3
Gas flaring	27	17.2
Emission from Nuclear plants	7	4.5
Don’t know	12	7.6
Knowledge of world population		
30 billion	6	3.8
7 billion	46	29.3
10 billion	11	7.0
25 billion	42	26.8
Don’t know	52	33.1
Knowledge of global climate change		
Ozone layer depletion	84	53.5
Fossil fuel consumption	9	5.7
Carbon dioxide (CO_2) emission	33	21.0
All of the above	8	5.1
Don’t know	23	14.6
Knowledge of non-renewable resource		
White –nosed monkey	48	30.6
Fresh water	42	26.8
Oil	31	9.6
Trees	15	19.7
	21	13.4
Knowledge of major source of energy worldwide		
Fossil fuels	25	15.9
Wind power	14	8.9
Hydro power	65	41.4
Nuclear power	33	21.0
Don’t know	20	12.7

	Frequency	Percentage (%)
Knowledge of major source of energy in Nigeria		
Fossil	51	32.5
Wind power	13	8.3
Hydro power	56	35.7
Nuclear	17	10.8
Don't know	20	12.7
Knowledge of what constitute erosion.		
Glacier	6	3.8
Wind	5	3.2
water	96	61.1
People's activities on land	26	16.6
All of the above	24	15.3
Source of oil pollution in the ocean		
Leakage from ships	15	9.6
Leakage from crude oil in barrels	18	11.5
Oil spill	115	73.2
Oil from factories	9	5.7

Table 2 presents level of environmental knowledge possessed by the respondents, result shows that the respondents possessed a reasonable amount of knowledge about environmental issues (43.9%), with the television being their major source of information (77.1%). Result also reveals that most of the respondents recognized oil spill from pipelines (42.7%) as the most important source of pollution that affect rivers and oceans in Nigeria, and emission from vehicles (36.3%) as the most important source of air pollution. Most (33.1%) of the respondents indicated no knowledge of the population of the earth, followed by (29%) who stated it was 7 billion; 53.5% stated that Ozone layer depletion causes global warming with majority also identifying the white-nosed monkey (30.6%) as a non-renewable resource. The majority of respondents also recognized hydro power and fossil fuel as the major sources of energy that people use both in the world and Nigeria, 41.4% and 35.7%, respectively. With regards to the cause of erosion, majority of the respondent said it was caused by water (61.1%); whereas oil spill (73.2%) was identified to be the major source of oil pollution in the ocean shores.

Table 3. Attitude towards environmental issues.

Attitude towards environmental issues	SD	D	SOD	DHO	SOA	A	SA	Total
All life on earth has the right to exist for no required reasons, regardless of their value to humans.	20 (12.7)	31 (19.7)	19 (12.1)	22 (14.0)	6 (3.8)	39 (24.8)	20 (12.7)	157
I am willing to protect endangered animals on my land only if the federal government provides me with some financial incentives.	10 (6.4)	26 (16.6)	0 (0.0)	21 (13.4)	20 (12.7)	25 (15.9)	32 (20.4)	157
Environmental activists over-exaggerate in justifying their causes and actions.	4 (2.5)	29 (18.5)	22 (14.0)	28 (17.8)	48 (30.6)	45 (28.7)	4 (2.5)	157
We all should care about deforestation of the rainforest.	9 (5.7)	25 (15.9)	6 (3.8)	7 (4.5)	14 (8.9)	56 (35.7)	40 (25.5)	157
I'll do my best to protect our environment as long as I don't have to change my lifestyle.	11 (7.0)	16 (10.2)	21 (13.4)	12 (7.6)	13 (8.3)	58 (36.9)	26 (16.6)	157
I would be willing to educate my friends and relations on promoting the sustainable use of our Natural Resources.	3 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	58 (36.9)	56 (35.7)	157
Environmental education should be part of every secondary school's curriculum.	3 (1.9)	0 (0.0)	13 (8.3)	0 (0.0)	13 (8.3)	72 (45.9)	77 (49.0)	157
I have decided to read books/publications on the environment henceforth.	6 (3.8)	10 (6.4)	2 (1.3)	16 (10.2)	22 (14.0)	64 (40.8)	46 (29.3)	157
We should not worry about the future of our environment because, even though we won't be here to see it, advancing technology will take care of our potential environmental problems.	66 (42.0)	31 (19.7)	12 (9.6)	7 (4.5)	24 (15.3)	55 (35.5)	1 (0.6)	157
How other people use their private land is of no concern to me.	33 (21.0)	45 (28.7)	13 (8.3)	21 (13.4)	12 (7.6)	16 (10.2)	7 (4.5)	157

SD- strongly disagree, D- disagree, SOD- somewhat disagree, DHO- Don't have an option, SOA- somewhat agree, A- agree and SA- strongly agree.

Table 3 presents the attitude towards environmental issues among the respondents. Result reveals that the most of the respondents agree that they would be willing to protect endangered animals on their land only if the Federal Government provided them with financial incentives (20.4%); that environmental activists over-exaggerate in justifying their causes and actions (30.6%); that we should care about deforestation of the rainforest (35.7%); and that they would do their best to protect their environment (36.9%). The result also shows that most of the respondents agree that they are willing to educate their friends and relations on the use of natural resources (36.9%); have decided to read books/publications on the environment (40.8%); while 42.0% strongly disagree that they are not to worry about the future of the environment. Most of the respondents disagree that 'how other people use their private land' is of no concern to them (28.7%) and majority strongly agree that environmental education should be incorporated into the secondary school curriculum (49.0%).

Table 4. Correlation matrix between demographics of the respondents, knowledge of the environment and attitude towards the environment.

	1	2	3	4	5	6	7	8	9	10
1. Age	1									
2. Gender	-0.340** (0.000)	1								
3. State of origin	-0.260** (0.001)	-0.094 (0.240)	1							
4. Environment	0.066 (0.410)	-0.195* (0.015)	0.469** (0.000)	1						
5. Level of study	0.311 (0.000)	-0.162 (0.043)	-0.112 (0.163)	0.193* (0.015)	1					
6. Faculty	-0.040 (0.621)	0.004 (0.965)	0.210** (0.008)	-0.167* (0.037)	-0.77* (0.027)	1				
7. Department	-0.164 (0.041)	-0.109 (0.176)	0.092 (0.252)	0.091 (0.257)	0.063 (0.437)	-0.329** (0.000)	1			
8. Duration of residence	0.130 (0.105)	0.183 (0.022)	-0.513 (0.000)	-0.556 (0.000)	0.145 (0.071)	0.020 (0.803)	0.026 (0.747)	1		
9. KOE	0.224** (0.005)	0.488** (0.000)	-0.242** (0.002)	-0.073 (0.366)	0.252* (0.001)	-0.085 (0.289)	0.105 (0.194)	0.167* (0.037)	1	
10. ATE	-0.037 (0.650)	-0.153 (0.055)	-0.176* (0.027)	0.048 (0.547)	0.073 (0.361)	-0.010 (0.901)	-0.063 (0.432)	0.181* (0.023)	0.309** (0.000)	1

KOE-knowledge of the environment, ATE- attitude to the environment, *correlation is significant at 0.05 ($p<0.05$), **significant at 1% ($p<0.05$)

Table 4 shows the relationship between demographic variables, knowledge of environment and their attitude towards the environment. The correlation result shows that state of origin of the students ($r = -0.176\%$, $p=0.027$, $p<0.05$) had a negative relationship with their attitude towards the environment while duration of residence ($r=0.181$, $p=0.023$, $p<0.05$) and knowledge of environment ($r=0.309$, $p=0.00$) were established to have significant positive relationship with attitude towards the environment. Other variables show insignificant results ($p>0.05$).

Table 5. Correlation between the different knowledge dimensions and attitude to environment.

	1	2	3	4	5	6	7	8	9	10	11
EK 1	1										
1. EK5	-0.103 (0.198)	1									
2. EK6	0.204* (0.011)	-0.167* (0.036)	1								
3. EK7	0.251 (0.002)**	-0.322 (0.000)**	0.039 (0.628)	1							
4. EK8	-0.004 (0.961)	-0.195* (0.015)	-0.016 (0.840)	0.042 (0.604)	1						
5. EK9	-0.178* (0.026)	0.020 (0.801)	0.480** (0.000)	-0.123 (0.124)	-0154 (0.055)	1					
6. EK10	-0.240** (0.002)	-0.070 (0.383))	-0.048 (0.550)	0.179* (0.025)	-0.101 (0.209	0.013 (0.867)	1				
7. EK11	0.006 (0.937)	-0103 (0.198)	0.047 (0.561)	0.181* (0.023)	-0.161 (0.044)	0.101 (0.210)	0.590** (0.000)	1			
8. EK12	-0.433** (0.000)	-0.080 (0.322)	-0.243** (0.00)	0.193* (0.015)	-0.098 (0.220)	-0.051 (0.523)	0.396** (0.000)	0.159* (0.047)	1		
9. EK13	-0.299 (0.000)	-0.094 (0.244)	0.273** (0.001)	0.010 (0.904)	0.009 (0.909)	-0.005 (0.951)	-0.248 (0.002)	-0257** (0.001)	0.017 (0.834)	1	
10. ATE	0.251** (0.002)	0.127 (0.113)	0.011 (0.894)	0.054 (0.499)	-0.033 (0.678)	-0.185* (0.020)	0.257** (0.001)	0.029 (0.717)	0.229** (0.004)	0.238** (0.03)	1

*Significant at 5%, **significant at 1% ($p<0.05$)

Table 5 shows the relationship between each of the construct of knowledge of the environment and attitude towards the environment. The correlation coefficient reveal EK1 ($r=0.251$; $p=0.002$, $p<0.05$), EK9 ($r=0.257$, $p=0.001$, $p<0.05$), EK 12 ($r=0.229$, $p=0.004$, $p<0.05$) and EK12 ($r=0.238$, $p=0.03$, $p<0.05$) have significant positive relationship with attitude towards environment while knowledge EK9 ($r =-0.185$, $p=0.020$, $p<0.05$) has significant negative relationship with attitude towards the environment. EK3 was found to be mostly associated with their attitude towards the environment.

Table 6. Multiple regression showing the influence of demographic variable and knowledge of the environment on attitude towards.

Variable	β	SE	t-calc.	p-value	$R^2_{adj.}$	F-value	p-value
Age	-0.196	1.009	-2.29	0.024*			
Gender	-0.112	1.548	1.14	0.255	0.156	4.182	<0.0001
State	-0.077	1.371	-0.72	0.470			
Environment	0.304	0.490	2.95	0.004**			
Level of study	-0.049	0.558	-0.59	0.559			
Faculty	-0.036	0.334	-0.40	0.687			
Department	-0.151	0.210	-1.82	0.071			
Duration of state in the study area	0.310	0.518	3.00	0.003**			
Knowledge of environment	0.286	0.470	3.16	0.002**			

β= standardized beta coefficient, *significant at 5% (p<0.05), **significant at 1%(p<0.01).

Table 7. Comparing mean scores on knowledge and attitude towards environment in relation to the demographic variables of the respondents.

Demographic variables	n	Knowledge of the environment			Attitude to environment		
		Mean	F-calc./t-cal	p-value	Mean ±SD	F-calc.	p-value
Age (years)							
17-20	27	3.07±1.27			47.37±6.81		
21-25	96	4.71±1.59			52.19±6.90		
26-30	32	4.63±NA	7.84	<0.0001**	47.97±10.61	3.83	0.005**
31-40	1	3.00±NA			53.00±NA		
Over 40yrs	1	3.00±NA			37.00±NA		
Sex							
Male	79	5.13±1.46^b	6.97	<0.0001**	51.63.±7.75^a	1.93	0.055
Female	78	3.64±1.19^a			49.17±8.24^a		
State of origin							
Akwa Ibom	134	4.51±1.47^b			50.96±7.90^a		
Abia	7	5.06±0.00^b	6.96	0.0001**	49.00±7.93^a	2.47	0.088
Rivers	16	3.13±1.75^a			46.38±8.82^a		
Type of environment							
Rural	40	4.70±1.09^a			48.85±6.18^a		
Sub urban	37	4.24±1.21^a			51.32±5.90^a		
Small town	14	4.43±1.45^a	1.32	0.260	49.29±8.50^a	2.25	0.053
Small city	13	4.31±1.65^a			56.69±2.29^a		
Large city	50	4.16±1.96^a			49.56±10.80^a		
Other	3	6.00±0.00^a			52.00±0.00^a		
Level of study							
Year 1	30	4.33±0.92^b			50.10±3.92^b		
Year 2	40	4.00±1.01^b	22.93	<0.0001**	51.93±5.81^b	17.74	<0.0001**
Year 3	19	2.53±1.50^b			39.68±3.09^a		
Year 4	68	5.16±1.47^c			52.65±9.14^a		
Faculty							
Agriculture	31	5.29±1.74^c			54.10±9.28^b		
Business Administration	27	3.81±1.59^b	17.98	<0.0001**	45.81±6.49^a	6.48	<0.0001**
Liberal Art and Sciences	22	2.82±1.30^b			48.18±8.11^a		
Other	77	4.68±1.00^c			51.17±7.21^b		
Duration in Akwa Ibom							
Less than 5 years	33	3.58±1.77^a			47.61±7.43^a		
About 5-10 years	16	4.63±0.50^b			51.19±12.67^b		
11-20 years	21	5.00±1.45^b	3.77	0.006**	47.24±5.13^a	3.88	0.005**
21-30 years	25	4.68±2.19^b			54.56±7.43^b		
All my life	62	4.44±1.07^b			51.10±7.23^b		

NA- not applicable, similar superscript letters means no significant difference (p>0.05) while different superscript letters means significantly different (p<0.05).

Table 6 presents the result of the regression showing factors that have significant influence on attitude towards the environment. The adjusted R^2 of 0.156 (15.6%) indicates that 15.6% of the variation in attitude towards environment was accounted for by the nine supplementary variables. The F-(calculated) of 4.182 and p-value of 0.0001 was obtained (p<0.001) which implies that these independent variables accounted for significant variation in attitude towards the environment. This also shows that the model is adequate. Result also shows that out of the nine-predictor variables, age (β= -0.196, p=0.004, p<0.05), duration of residence in Akwa Ibom State (β = 0.310, p=0.003, p<0.05) and knowledge of environment have significant influence on respondents' attitude towards the environment. Age was found to have significant negative influence on their attitude whereas the nature of the environment had significant positive influence on their attitude towards the environment. Result also reveals that of all the factors considered, duration followed by their

knowledge of the environment were the major factors that significantly influenced attitude to environment.

Result in Table 7 reveals significant differences in knowledge of the environment in relation to age ($F=7.84$, $P< 0.05$), gender (F-calc. = 6. 97, $p<0.05$), level of study (F-calc. = 22.93, $p<0.05$), Faculty (F-calc. =17.98, $p<0.05$) and duration of the respondents' stay in Akwa Ibom (F-calc. =3.77, $P<0.05$). The level of knowledge was significantly higher among males, those in year 4, and students in the Faculty of Agriculture. Those that had lived in Akwa Ibom for 11-20 years also show higher level of knowledge than those that had lived in Akwa Ibom for less than 5 years, about 5-10 years, 21-30 years and all their life. Attitude towards the environment was significantly different based on age (F-calc.= 3.83, $p<0.05$,), level of study (F-calc.=17.74, $p<0.05$), faculty (F-calc.= 6.48, $p<0.05$) and duration the respondents had lived in Akwa Ibom (F-calc.=6.48, $p<0.05$). Students in year 4, in Faculty of Agriculture and that had lived for 21-30 years in Akwa Ibom State reported better attitude towards the environment.

4. Discussion

In this study the knowledge, attitude and behavior on environmental issues among undergraduates was determined. Majority of the respondents were in their fourth year and had spent all their lives in Akwa Ibom, the study location. There was a gender balance among the respondents with the sexes distributed as follows: males (50.3%) and females (49.7%). While a third of the respondents reported having grown up in big cities, an experience of having lived around a wild place or ever visited were reported in a little under a fifth of the respondents (18.5%). This is contrary to a Nigerian study which showed that majority (73.8%) of the undergraduate students had had a first-hand 'wild-environment' experience [13]. This can be explained by the absence of botanical gardens or wildlife parks in this part of the country.

Reasonable level of knowledge about the environmental was reported by a little over two-fifths (43.9%) The electronic media was the major (77.1%) source of information of the respondents. This is in tandem with a Turkish study where 73.73% of the respondents stated that print and electronic media were their major influencers on environmental issues [14]. However, in another Turkish study, only 43.4% of the respondents cited the media as their source of environmental information [15]. These respondents from the cited studies were all in higher institutions of study but showed varying sources of information regarding environmental issues but have demonstrated the place of electronic media in environmental education. The most important source of pollution was posited to be oil spill for both rivers and oceans in Nigeria (42.7%), and the ocean alone (73.2%) as evinced by some studies demonstrating oil spill incidents in Nigeria's coastal zone [16, 17]. Oil spills are majorly due to corroded pipelines, faulty valves and by criminal saboteurs. On the other hand, the most important source of air pollution in Nigeria was posited to be emission from vehicles by 36.3% of the respondents; factories by 34.4%; and gas flaring by 17.2%. This is in consonance with other studies on air pollution [18, 19]. These arise as a result of weak regulatory systems on emission control.

Less than one third of the respondents correctly stated the correct figure for the earth's population as 7 billion. Again, less than a third correctly identified the white-nosed monkey as a non-renewable resource. However, over half of the respondents correctly stated that Ozone layer depletion causes global warming. with majority also identifying. About two-fifths of the respondents recognized hydro power and fossil fuel as the major sources of energy that people use both in the world and Nigeria; and three-fifths correctly mentioned the cause of erosion. There is a demonstration of an incomprehensive acquisition of environmental knowledge by the respondents, hence the need for a formal and structured learning system as it relates to the environment. This has been posited by some studies which describe environmental knowledge as a product obtained from information and interaction process involving concept, method, facts, principle, social norm, law norm, religious norm, value system and human's attitude, and natural phenomenon about environment covering the unity of space with living and non-living creatures and the conditions in it [20, 21].

As against a study across four countries among a much younger age group where respondents would willingly protect the environment [22, 23], the respondents in this study: were enthusiastic towards the environment and would be willing to protect endangered animals on their land only if the Federal Government provided them with financial incentives (20.4%); would care about deforestation of the rainforest (35.7%); would do their best to protect their environment (36.9%); would be willing to educate their friends and relations on the use of natural resources (36.9%); strongly agree that environmental education should be incorporated into the secondary school curriculum (49%); disagree that 'how other people use their private land' is of no concern to them (28.7%); strongly disagree that they are not to worry about the future of the environment (42%); have decided to read books/publications on the environment (40.8%); and that environmental activists over-exaggerate in justifying their causes and actions (30.6%. Whilst most of these respondents demonstrate a positive attitude towards the environment, they also demonstrate a deep sense of hunger for formal environmental education, as in a Turkish study

where respondents with positive attitude towards the environment believed that environmental education is necessary and environmental related courses should be obligatory in curricula [12]. A study has also demonstrated that informal methods of education also abound as demonstrated by a study which posits that environmental education can also be executed in non-formal ways, for example by raising public awareness through campaign and published materials by non-governmental organizations (NGOs) [24].

It has been demonstrated that the respondents' attitude towards the environment was significantly but weakly positively correlated with their duration of residence ($r=0.181$, $p=0.023$, $p<0.05$) and knowledge of environment ($r=0.309$, $p=0.00$). The latter is similar to what was obtained in another study in Malaysia, $r=.217$, $n = 854$, $p = <.001$ [25]. This is a demonstration of a weak linkage between knowledge claim and actual practice, hence a need for re-enforcement of environmental education through innovative mechanisms since good level of knowledge among students may not necessarily lead them to engage in the right environmental practice. This weak linkage was further demonstrated by constructs of environmental knowledge and attitudes among the respondents, perhaps the knowledge claim was merely superficial. This calls for family training on environmental sustainability as a foundation for environmental knowledge. There is probably a sort of complexity in understanding the relationship between students' knowledge, attitude and practice towards the environment [26].

Nine predictor variables accounted for significant variation in attitude towards the environment, with a demonstration of the model being adequate. Outstandingly, age, duration of residence in Akwa Ibom State and knowledge of environment had a significant influence on respondents' attitude towards the environment. This is consistent with another study which demonstrated a negative correlation for age and attitude towards the environment [27]. The study further demonstrated that most consistent findings are that environmental supporters tend to be younger and better educated. This shows a good prospect for under-graduate students to lead the change towards environmental sustainability. In an American study, no significant differences were found between environmental health attitudes of males and females [28], however, this was not determined in this study.

In this study, the level of environmental knowledge was significantly higher among males than females, contrary to several studies reported by a survey, where females were more knowledgeable than males [29]. Senior level students and those that had resided in the study area for longer periods showed a higher level of knowledge than others. Obviously, this is a demonstration of the "acclimatization" factor.

A limitation of this study is that these responses were self-reports and no additional information was used to verify the accuracy of these responses especially the attitudinal responses. Future qualitative studies could address this shortfall. There is an environmental health knowledge gap and an environmental health attitude disparity that needs to be addressed through curriculum adjustments so the knowledge gained can be translated into positive environmental health behaviors now and in the future.

5. Conclusion

A moderate level of environmental knowledge and attitude has been demonstrated by this study, however, there is a need for family units to actively seek information on environmental sustainability, and for Nigerian government to incorporate sustainable environmental development component into the country's education system and institutions of higher learning since undergraduates ought to play proactive roles in championing sustainability.

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Competing Interests

The authors declare that they have no competing interests.

Data Availability

The data used to support the findings of this study is available on request to the corresponding author.

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