



Knowledge of Health Impact of Climate Change and Practice of Preventive Measures among Students of a Nigerian Tertiary Institution

J. R. Nzeobi¹, H. N. Chineke², C. F. Ubajaka³ and P. O. U. Adogu^{3*}

¹Faculty of Medicine, CHS, Nnamdi Azikiwe University, Awka, Nigeria.

²Department of Family Medicine, Imo State University, Orlu, Nigeria.

³Department of Community Medicine, Nnamdi Azikiwe University, Awka, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Authors JRN and POUA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors HNC and CFU managed the analyses of the study and the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJEE/2020/v13i430193

Editor(s):

(1) Dr. Seema Akbar, University of Kashmir, India.

Reviewers:

(1) Collins Edet, University of Port Harcourt, Nigeria.

(2) R. D. Mavunda, University of Johannesburg, South Africa.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/64215>

Original Research Article

Received 15 October 2020
Accepted 21 December 2020
Published 29 December 2020

ABSTRACT

Background: Every century has its own public health challenge. Climate change is the present century's challenge. There are various health risks arising from climate change which without mitigation actions, will tend to worsen with each passing day.

Study Aim and Objective: To study the knowledge of health impact of climate change and practice of appropriate preventive measures among students of a Nigerian Tertiary Institution

Methodology: A descriptive cross-sectional survey was carried out using structured questionnaires. These questionnaires were shared randomly among students from five selected departments in the college of health science and data was analyzed using SPSS Version 20.0

Results: It was found that all the students were aware of climate change and 91.7% knew about the effect of climate change on health. Significantly 78.7% believed that climate change was from man-made causes but surprisingly only 34.3% were taking actions in mitigating the effect of climate change.

*Corresponding author: E-mail: po.adogu@unizik.edu.ng;

Conclusion: Despite the high knowledge about climate change, majority of actions taken by the students were just for convenience and to save money, not necessarily because they wanted to prevent the effects of climate change on health.

Recommendation: Government and Non-governmental organizations should form advocacy clubs for young students as a platform to sensitize them on climate change and its effects. There is need to introduce rewards and sponsorships for individuals who successfully learn about climate change and ways to mitigate its effect on health.

Keywords: Knowledge; health impact; climate change; preventive measures.

1. INTRODUCTION

Climate, usually defined as the "average weather," is more rigorously, defined in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years [1,2]. The classical period is 30 years, as defined by the World Meteorological Organization (WMO) [1]. These quantities are most often surface variables such as temperature, precipitation, and wind.¹Climate change is a global issue resulting from diverse anthropogenic activities [2]. Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity [3].

An extensive body of research continues to strengthen knowledge about the impact of climate change on physical health, including for example, a rise in vector-borne, water and food-borne diseases; an increase in acute and chronic respiratory conditions (including asthma and allergies); and, heat-related and extreme weather-related morbidity and mortality [4]. Indirect health implications that are increasingly recognized in global reports on climate change and health include illness related to food and water safety, [5] under-nutrition related to food insecurity, malignant melanoma from UV exposure, and chronic kidney disease from dehydration [4,6].

The human symptoms of climate change are unequivocal and potentially irreversible affecting the health of populations around the world today [4]. Climate change is no longer a looming threat but rather a destructive reality with dire predictions for the future. The World Health Organization (WHO) estimates an increase of 250,000 excess deaths per year between 2030 and 2050 due to the "well understood impacts of climate change". Impacts include man-made diseases heat-related morbidity and mortality, increases in vector-borne diseases (e.g. Dengue fever, malaria), increased respiratory illness, and

morbidity and mortality due to extreme weather events [4,6].

The risks and impacts of climate change, as well as the capacity to respond to it, vary considerably among countries. The baseline health status of a country, or a community, is the single largest determinant of the likely impact of climate change and the cost of adapting to it, according to the World Bank, 2010 [7]. Population growth is linked to climate change vulnerability as an increase of people in areas that are resource poor and affected by climate risks will magnify harmful impacts, including those related to health, [8] and this is exactly the case in Nigeria. Also changes in rainfall have altered distribution of some waterborne illnesses and disease vectors, and reduced food production for some vulnerable populations globally [8].

Climate change mitigation is a human intervention to reduce the sources or enhance the sinks of greenhouse gasses including but not limited to power plants, livestock/abattoirs, residential buildings, road transport, deforestation, commercial buildings, cement ceramics, landfill and other refuse dumpsites etc [9,10,11]. Human interventions also reduce the sources of other substances that may contribute directly or indirectly to limiting climate change including, for example, the reduction of particulate matter (PM) emissions that can directly alter the radiation balance (for example, black carbon) or measures that control emissions of carbon monoxide, nitrogen oxides (nox), [12] Volatile Organic Compounds (vocs) and other pollutants that can alter the concentration of troposphere ozone (O₃) which has an indirect effect on the climate [12]. Mitigation is relevant for the health sector, as reducing GHG emissions can be done in ways that promote and protect health [8].

Mitigation measures can also have positive health results. The WHO series, "Health in the Green Economy" has been reviewing evidence

about health benefits or “win outcomes from climate mitigation strategies in key economic sectors, including: housing, energy, transport, agriculture and health sector facilities, [13] when these are adequately advocated by students to the general public, it will go a long way in mitigating the effect of climate change.

Education and mass media campaigns should be strong enough to spark commitment and action among governments, international organizations, donors, civil society, business and communities, especially among the young people to anchor health at the heart of the climate change agenda [14]. They will also enhance creation of awareness and public understanding of the global and locally relevant health consequences of climate change [14].

The objectives of this study were to identify the knowledge of the effect of climate change on health among students of College of Health Science Nnamdi Azikiwe University Nnewi, Nigeria; to determine the perception of the students about the effect of climate change on health; and to explore the preventive practices adopted by students in reducing the effect of climate change on health.

2. METHODOLOGY

The study was carried out in college of health science Nnamdi Azikiwe University Nnewi campus, Nnewi in Nnewi North Local Government Area of Anambra State, South East Nigeria [15] Nnewi is an urban community and has tremendous influx of people from other towns because of the characteristic growth in business opportunities. It has an estimated land area of 2,789km² (1,076.9 square miles) in Anambra state and an estimated population of 391,227 according to 2006 Nigerian census. Nnewi Metropolitan Area and its satellite towns is home to nearly 2.5 million residents as of 2005. Dimensionally, Nnewi has an edge over all other units, being recognized by the 1953 census figures as the largest inland town of all others in the Eastern states of Nigeria [16].

Study population comprised of students in some selected departments in college of health science Nnamdi Azikiwe University, Nnewi Campus.

Study design was a descriptive cross-sectional survey to ascertain the knowledge of health impact of climate change and practice of preventive measures among the students.

Inclusion and exclusion criteria were male and female medical and health science students from second to sixth year of study, 2018/2019 session in the College of Health Science Nnamdi Azikiwe University, Nnewi campus and who were willing to participate in the study. Conversely, students who were diagnosed with a chronic illness or undergoing treatment for an illness were excluded.

2.1 Sample Size Determination

$N = Z^2PQ/D^2$ Where N = Minimum sample size, Z = Standard normal deviation at 95% confidence level which is 1.96, P = Prevalence = 0.071, [6] Q = 1 - P = 1-0.071 = 0.929, D = Level of precision required = 0.05

$N = (1.96)^2 \times 0.071 \times 0.929 / (0.05)^2 = 101$; The minimum sample size is 101

Total Sample Size = 111 to make up for attrition

2.2 Sampling Method

The stratified sampling method was used whereby the respondents were selected by class levels and gender so as to ensure a good representation. Among the three faculties in the college of health science; students from faculty of Medicine and some selected department from faculty of Health Science were chosen randomly to partake in this study.

2.3 Data Collection

The data for this study was collected using self-administered questionnaire which was adopted from UK data base survey questionnaire and was adapted to suit the tropical conditions. It was divided into the following sections: Respondents' biodata, knowledge of, perception and practices of preventive measures against health impacts of climate change.

2.4 Data Analysis

This was done using Statistical Package for Social Sciences (SPSS) version 20 software package. The analyzed data included frequencies and percentages calculated and the results presented in tables.

3. RESULTS

Table 1 shows the socio-demographic characteristics of the respondents. Age ranges

from 16 to 30 years, with slightly more females (50.9%) than males (49.1%). Majority of the students were single (96.3%) and the largest proportion belonged to the department of Medicine. More than 70% of the subjects were from the southeastern part of Nigeria.

Table 2 shows that television, College and internet ranked high in the sources of information and knowledge about the subject matter. The table shows that students had good knowledge (91.7%) about effect of climate change.

The Table 3 shows that students are aware that climate change can cause the listed disease conditions. They also believed that these diseases were on the increase (about 61.1%) and must have affected themselves as well as their families and friends (77.8%). Significantly 78.7% believed that climate change was from man-made causes. Surprisingly students considered climate change effect as not being very important and so had less personal concern about its impact, but 89.8% believed that climate change was reversible. About 72.2% of students projected that health impacts from climate change would be on the increase if nothing was done to checkmate its progression.

Table 4 depicts the qualitative perceptions of students analyzed in percentages and tested to show statistically significant findings on beliefs about climate change and means of salvaging health.

About 61.1% strongly agreed that collective effort could reduce the effect of climate change, 50.9% agreed that climate change was inevitable and reduction in energy usage could ameliorate this effect. Those who believed that personal effort would help were far below average (34.3%) while 48.1% strongly agreed that government involvement would suffice in the control effort.

About 72.2% and 78.7% disagreed that climate change could not be salvaged and that humans were not responsible respectively. Only 2.8% strongly disagreed that industries were to blame for contributing to climate change and its effect on health while 48.1% agreed that climate change was a consequence of modern life with 49.1% agreeing on the need for radical changes.

Half of the participants strongly agreed that this effect would worsen without mitigation while about 65.7% strongly agreed that their contribution to this fight made no difference.

Table 1. Socio-demographic distribution of respondents

		Frequency	Percent
Age range	16-20 years	4	3.7
	21-25 years	82	75.9
	26-30 years	22	20.4
Gender	Male	53	49.1
	Female	55	50.9
Marital Status	Single	104	96.3
	Married	4	3.7
Department	Nursing Science	16	14.8
	Medicine	52	48.1
	Medical Laboratory Science	15	13.9
	Radiography	14	13
	Physiotherapy	11	10.2
State of Origin	Imo	17	15.7
	Anambra	58	53.7
	Enugu	13	12
	Cross River	1	0.9
	Ondo	1	0.9
	Abia	5	4.6
	Ebonyi	6	5.6
	Kogi	2	1.9
	Rivers	1	0.9
	Edo	2	1.9
	Delta	2	1.9

Table 2. Awareness and sources of knowledge on climate change and health impact

	Frequency	Percent
Awareness of climate change	108	100
Sources of knowledge		
Television	77	71.3
radio	48	44.4
Newspaper	40	37
Internet	68	63
Environmental groups	21	19.4
College/university	75	69.4
Government agencies	15	13.9
Family and friends	37	34.3
Awareness of impact of climate change on health	99	91.7
Sources of knowledge of impact of climate change on health		
Television	68	63
Radio	46	42.6
Newspaper	35	32.4
Internet	62	57.4
Environmental groups	19	17.6
College/university	57	52.8
Government agencies	11	10.2
Family and friends	31	28.7

Table 3. Awareness of health-related diseases of and perceptions about climate change

		Frequency	Percent
Climate change related diseases	Malnutrition	81	75
	Diarrhea	60	55.6
	Vector disease	58	53.7
	Skin/mental/CPD	84	77.8
Health impact on family and friends	Yes	84	77.8
Awareness of increase in health impact over time	Yes	66	61.1
Causes of climate change	Man made	85	78.7
	Natural	62	57.4
	Divine	3	2.8
	Don't Know	4	3.7
Personal concern	Very important	53	49.1
	Quite important	34	31.5
	Not very important	21	19.4
Predicts that health impact will increase	Yes	78	72.2
	No	10	9.3
	Don't know	20	18.5
Belief about reversibility of climate change	Yes	78	72.2
	No	11	10.2

CPD = Cardiopulmonary disease

Alarmingly 73.1% strongly agreed that this topic was irrelevant and about 56.5% believed that nothing they did on daily basis would affect climate change and its impact. About 69.4% stated that they could not fight this alone while 51.9% strongly agreed that industries should contribute more. Finally, 70.3% strongly believed that it was of moral value to work towards mitigating climate change.

Table 5 shows actions taken by students in mitigating the effect of climate change and their reasons for doing so. Greater percentage did not practice a preventive measure in mitigating the effect of climate change on health. It was also noticed that their actions were not necessarily due to the concern about the effect of climate change but due to some reasons like convenience, saving money, personal health

concern, moral obligations etc. The table also shows deliberate actions of campaign groups in which students have participated to create awareness of climate change and its effect on human health and it shows that virtually all fall below average except proper waste disposal which is slightly above average (59.3%).

4. DISCUSSION

The increased rate of ill health from the effect of climate change brought about the concern to embark on this research, with the aim to assess the students' knowledge and perception about climate change and its effect on health. Actions taken by the students individually and collectively to reduce these effects on health were also determined.

From the results, the students were fully aware of climate change and 91.7% knew about the effect of such change on health. This is hardly surprising when one considers that the students' courses of study are health related. However, this finding is at variance with the outcome of another study carried out by Bruno DG et al on students in a Taiwan university that reveals a knowledge which was homogeneous by region but differed sharply by socioeconomic position [17]. In the CHS NAU students are of similar

sociodemographic status with similar level of literacy.

The source of knowledge about climate range from internet (63%), Colleges (69.4%), with other sources as environmental groups, government, family and friends. These are similar to that seen in the descriptive cross-sectional study done by Manisha C. et al on students in Pokhran valley India where almost all of the respondents had heard about climate change and the school/College (64%) was the most repeated source of information followed by radio, television and newspaper [18]. The study finding is also similar to that done in Ethiopia where 87.7% of the students were aware of health consequences of climate change, with electronic mass media as the major source of information [19]. These could be attributed the facts that the respondents are youths who are generally known to be new media savvy and conversant with modern technology.

About 78.7% students of CHS NAU had correct knowledge of cause of climate change attributing it to be man-made [6]. This is similar to a China study where 58% of respondents could correctly identify the causes of climate change [20]. However the China study involved medical, public health and nursing students in universities. Most respondents believed that climate change

Table 4. Analysis of qualitative responses on perceptions about climate change

	SD	D	ID	A	SA	X ²	p-value
Collective efforts	0.0	0.9	3.7	34.3	61.1	104.7	<0.01
Change is inevitable	0.0	13.9	10.2	50.9	25.0	43.9	<0.01
Reduce energy usage	4.6	7.4	22.2	50.9	14.8	74.7	<0.01
Personal effort	2.8	24.1	15.7	34.3	23.1	29.4	<0.01
Government efforts	2.8	1.9	3.7	43.5	48.1	120.8	<0.01
Climate cannot be salvaged	4.6	72.2	10.2	6.5	6.5	185.0	<0.01
Humans are not responsible	0.9	78.7	8.3	6.5	5.6	234.2	<0.01
Industries are to be blamed	2.8	18.5	20.4	38.9	19.4	35.4	<0.01
Need for radical changes	2.8		13.9	49.1	34.3	55.4	<0.01
Climate is consequence of modern life	2.8	11.1	14.8	48.1	23.1	65.1	<0.01
Worsens without mitigating actions	0.0	3.7	11.1	35.2	50.0	59.4	<0.01
I can't make a difference	0.0	2.8	8.3	23.1	65.7	105.2	<0.01
It is an Irrelevant topic	0.9	4.6	12.0	9.3	73.1	194.6	<0.01
I can't change it alone	0.9	4.6	11.1	13.9	69.4	170.7	<0.01
Daily activities donot contributeto change	0.9	3.7	15.7	23.1	56.5	107.4	<0.01
Industries should contribute more to reversing climate	1.9	3.7	4.6	38.0	51.9	117.1	<0.01
It's my moral duty	2.8	2.8	19.4	44.4	30.6	70.3	<0.01

Data was analyzed using SPSS Chi-square test of association. Data is significant at p<0.05
SD = strongly disagree, D = Disagree, ID = Indifferent, A = Agree, SA= Strongly agree

Table 5. Actions taken by respondents towards mitigating climate change and their reasons

		Frequency	Percent
I have taken actions towards changing the climate	No	71	65.7
	Yes	37	34.3
Walk or cycle to work		100	92.6
For these reasons	Convenience	41	38
	Save money	45	41.7
	Protect the environment	12	11.1
	Personal Health reasons	34	31.5
	Habit	20	18.5
	Moral obligation	4	3.7
Use public transport		96	88.9
For these reasons	Convenience	57	52.8
	Save money	33	30.6
	Protect the environment	4	3.7
	Personal Health reasons	9	8.3
	Moral obligation	4	3.7
	Habit	11	10.2
Buy energy efficient bulbs		104	96.3
For these reasons	Convenience	22	20.4
	Save money	50	46.3
	Protect the environment	36	33.3
	Personal Health reasons	32	29.6
	Habit	26	24.1
	Moral obligation	21	19.4
Recycle or reuse items		104	96.3
For these reasons	Convenience	40	37
	Save money	29	26.9
	Protect the environment	32	29.6
	Personal Health reasons	26	24.1
	Habit	10	9.3
	Moral obligation	4	3.7
Take part in environment issue campaigns		92	85.2
Such as	Planting of trees/flowers	46	42.6
	Discourage deforestation	38	35.2
	Proper waste disposal	64	59.3
	Discourage petrol burning	48	44.4
For these reasons	Convenience	11	10.2
	Save money	29	26.9
	Protect the environment	52	48.1
	Personal Health reasons	17	15.7
	Habit	16	14.8

was generally “bad” (83%) and bad for human health (88%), with only 39% recognizing malnutrition as a consequence of food deprivation resulting from climate change.[20] Here lies the difference with CHS NAU Nnewi students’ study where the knowledge level is high (about 75%) that malnutrition could result from climate change. The good knowledge of the link between climate change and malnutrition in the CHS NAU study could be attributed to the

relatively high prevalence of malnutrition in many parts of Nigeria. Compared to China, with better developed agricultural sector, malnutrition is not a disease of public health importance and may not attract the required attention in the country’s educational system.

The 77.8% mention among students of CHS NAU Nnewi, that cardiovascular and respiratory diseases are common sequelae of global

warming, is similar to the 83.8% awareness recorded in a cross sectional study in South India by Jetendra KS et al. [21] This is possibly due to the level of enlightenment and tutelage these CHS NAU college students are subjected to.

About 72.2% of students in CHS Nnewi predicted that health impact of climate change would increase with time. This is comparable to the result obtained in Saudi Arabia and Palestinian territory where more than two-thirds reported that each of the health-related impacts would increase within the next 20 years.[10]. However, this varies indirectly with that seen in Ethiopian study where many of the students had inadequate or no information of projected or actual impact of effect of climate change on health, [22] and in college of medicine Benin Nigeria where only 16.1% perceived that the global warming would affect the future generations [23].

In contrast to study which was carried out in College of medicine Benin Nigeria which showed that 52% felt they were already taking actions to conserve energy, [24] as against CHS NAU students that falls below average (34.3%). In contradistinction to the Indian study where majority of the students (57.5%) were willing to walk or cycle instead of driving [21] and the Benin Nigerian study which recorded only 34(9%) who would rather use public transport than buy a car in order to conserve energy, [22] 88.9% CHS NAU students apparently showed poor (3.7%) interest in the reversibility of climate change by that practice citing convenience as the main reason for their action. Much as these practices in Indian and Benin studies also reduce the effect of climate change on health, the reason for their action could be due to poor financial status of students not necessarily deliberate action on their part to minimize the effect of climate.

It was shown that slightly above average 61.1% strongly agreed on collective efforts can reduce the effect of climate change, about an average (50.9%) agreed that climate change was inevitable and reduction in energy usage can salvage these effects. Percentage of those who believe that personal effort would help were far below average (34.3%) while slightly below average (48.1%) strongly agreed that government efforts would just suffice. About 72.2% and 78.7% disagreed that climate change could not be salvaged and humans are not responsible respectively. About 2.8% strongly

disagreed that industries were to be blame for contributing to climate change and its effect on health while about 48.1% agreed that climate change was consequence of modern life with 49.1% agreeing on the need for radical changes. Half of the participants strongly agreed that these effects would worsen if not mitigated. About 65.7% strongly agreed that their contributions to this fight made no difference. Alarmingly 73.1% strongly agreed that this topic was irrelevant while 56.5% believed that their daily activities have no bearing on climate change and its effect. It was also observed that 69.4% stated that they could not fight this alone and about half of the participants 51.9% strongly believing that industries should contribute more. These negative attitudes exhibited by students could possibly be as a result of their erroneous belief that they were not affected directly by any of the dangers of climate change, or perhaps they are ignorant of the indirect effect of climate change on health. This could only explain the reason why they were not individually convinced about deleterious effects of climate change on health, hence rather than take action to mitigate such effects, they were still waiting for the government and other stakeholders to set the ball rolling.

A study by Yazdanparast et al [24] in Iran showed that 88.8% and 71.2% respectively believed that "if the greenhouse effect gets bigger the earth will get hotter" and "incidence of more skin cancers as a consequence of global warming" thus 68.4% believed that "not using cars so much is a cure for global warming. These are much better performances compared to the 11.1% and 31.5% on environment and health concerns respectively recorded in our current study among students of CHS NAU. Again the few positive actions taken against climate change by students may actually be due to their poor financial status, not necessarily due to their concern about effect of climate change on health.

A fairly large proportion 42.6% of CHS NAU engaged in planting of trees/flowers to combat climate change. This is much higher than the 12% recorded in the Iranian study [24]. About 35.2% of students were discouraging people from burning of bushes and excessive burning of petrol fuel (44.4%) but percentage of students who practiced proper waste disposal was 59.3%. This is encouraging, and their reason could possibly be due to their concern for environmental sanitation and particularly proper collection and disposal of all types of wastes [12,25].

5. CONCLUSION

This study reveals that there is a good knowledge of effect of climate change on health among students of CHS NAU and it shows that they are also knowledgeable that human activities on earth bring about this change which result in adverse health effects. Many could rightly point out that climate change results to ill health such as diarrhea diseases, respiratory, cardiopulmonary, skin cancers, psychiatric, and diseases arising from malnutrition etc. They were also aware that the prevalence of these diseases would continue to be on the increase if mitigating actions were not taken to prevent climate change. Surprisingly little effort are made by the student to stop this change. Those who carried out practices towards mitigating this climate change were doing so for convenience and to save money and not necessarily because they wanted to prevent these effects of climate change on health. Many perceived that this topic was irrelevant to them saying that the government and industries were to blame for climate change. More than 50% of the students were not willing to take actions to checkmate climate change despite their detailed knowledge on its health impact.

6. RECOMMENDATIONS

1. There is need to revisit the curriculum in education system starting from primary to tertiary institutions and introduce scheme that deals on climate change and its effect on health. This will enable collective participation of students to fight against climate change.
2. Government should set up Agencies to educate the people adequately on safe practices in protecting the climate, putting certain rules and regulations that will protect the environment, intervention to those who are victims of ill health from climate change, provision of housing, food, clean water and adequate care to those in internally displaced camp due to effect from climate change in caring for their whole health.
3. Non-government organizations should form advocacy clubs involving young students where they will be sensitized on climate and its effects and need to sponsor and reward these individuals to learn ways of combating climate change and its effects on health.

7. LIMITATIONS OF STUDY

This included unwillingness of some students to partake in the study. Even some eligible students were absent from school. To overcome the above stated challenges, data was obtained from willing students who were present and under very strict ethical considerations.

CONSENT AND ETHICAL APPROVAL

The entire study with special focus on the objectives, and technique involved were clearly explained to every respondent and an informed consent was obtained. The respondents were assured of the confidentiality and anonymity of their responses which enabled them to provide sincere answers. They were also assured that the information given would be used strictly for academic and research purposes.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. World Meteorological Organization; 2019. Available:http://www.wmo.int/pages/prog/wcp/ccl/faq/faq_doc_en.html [Last Date Accessed 10/08/2019]
2. Agbo EP, Ettah EB, Eno EE. The impacts of meteorological parameters on the seasonal, monthly and annual variation of radio refractivity. *Indian J Phys*; 2020. Available:<https://doi.org/10.1007/s12648-020-01711-9>
3. Available:<https://en.m.wikipedia.org/wiki/Health> [Last Date Accessed 10/08/2019]
4. Blashki G, Wiseman J, Burke S, Reifels L. Climate change and mental f/health: risks, impacts and priority actions. *International Journal of Mental Health Systems*; 2018. [Last Date Accessed 10/08/2019]
5. Chineke HN, Emerecole CO, Adogu PU. The socio-economic status of households, sources of water supply and associated water related diseases of communities in Njaba Local Government area of Imo State. *The Nigerian Journal of General Practice*. 2014;12(2):31-36
6. Adogu POU, Ubajaka CF, Emelumadu OF, Alutu COC. Epidemiologic transition of diseases and health-related events in developing countries: A review. *American*

- Journal of Medicine and Medical Sciences. 2015; 5(4):150-157
DOI:http://dx.doi.org/10.5923/j.ajmms.20150504.02
7. World Bank, World Development Report: Development and Climate Change. Washington; 2010.
Available:https://www.who.int/globalchange/summary/en/index12.html
[Last Date Accessed 10/08/2019]
 8. IPCC, Fifth Assessment Report (AR5). Cambridge; 2014. Slide adapted from SEARO/WPRO Training (draft, 2015)
Available:http://who.int/globalchange/mediacentre/events/climate-health-conference/en
[Last Date Accessed 10/08/2019]
 9. Obidiegwu CS, Chineke HN, Ubajaka CN, Adogu PO. Public Health Challenges in Somachi Main Abattoir Owerri, Nigeria: A Review and Field Activity Report EJMED, European Journal of Medical and Health Sciences. 2019;1(2).
DOI:http://dx.doi.org/10.24018/ejmed.2019.1.2.34
 10. Agriculture and Greenhouse Gas Emissions Agriculture and Greenhouse Gas Emissions.
Available:https://www.fb.org/market-intel/agriculture-and-greenhouse-gas-emissions
 11. Mengpin GE, Johannes Friedrich. 4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors. World Resources Institute; 2020.
Available:https://www.wri.org/blog/2020/02/greenhouse-gas-emissions-by-country-sector
 12. Adogu et al Adogu POU, Uwakwe KA, Egenti NB, Okwuoha AP, Nkwocha IB. Assessment of Waste Management Practices among Residents of Owerri Municipal Imo State Nigeria. Journal of Environmental Protection 2015;6(5):10. Article ID:56212.
DOI: 10.4236/jep.2015.65043
 13. Health in the Green Economy: 2019.
Available:www.who.int/hia/green_economy/en
[Last Date Accessed 10/08/2019]
 14. Horton and Mcmichael. Major adaptive strategies to lessen health risks associated with climate change. Bayero Journal of Pure and Applied Sciences. 2008;2(1):168-172 Received: February, 2009 Accepted: May, 2009.
[Last Date Accessed 10/08/2019]
 15. Local Government Areas in Anambra State; 2007.
Available:https://en.m.wikipedia.org/wiki/[Last Date Accessed 10/08/2019]
 16. Nnewi; 2016.
Available:https://en.m.wikipedia.org/wiki/Nnewi
[Last Date Accessed 10/08/2019]
 17. Di Giusto B, Lavelle JP, Yu T-Y. Towards an East Asian model of climate change awareness: Towards an East Asian model of climate change awareness: A questionnaire study among university students in Taiwan; 2018. Pub Med DOI:10.1371/journal.pone.0206298
Available:https://www.ncbi.nlm.nih.gov/pmc/article/pmc6201920
[Last Date Accessed 10/08/2019]
 18. Manisha Chalise, Gokul Pathak, Shraddha Parajuli, Ankush Mala Chalise, Pratap Thakur, Hoshiar Singh Chauhan. Knowledge on climate change and its impact in human health among health sciences students of Pokhara Valley, Nepal. International Journal of Health Science and Research (www.ijhsr.org). 2016;6;(1):362.
[Last Date Accessed 10/08/2019]
 19. Andualem S Nigatu, Email author, Benedict O Asamoah and Helmut Kloos Knowledge and perceptions about the health impact of climate change among health sciences students in Ethiopia: a cross-sectional study. BMC Public Health. 2014;14:587.
Available:https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-14-587
[Last Date Accessed 10/08/2019]
 20. Lianping Yang, Wenmin Liao, Chaojie Liu and Cunrui Huang. Associations between Knowledge of the Causes and Perceived Impacts of Climate Change: across-Sectional Survey of Medical, Public Health and Nursing Students in Universities in China International Journal of Environmental Research and Public Health. 2018;15(12):2650. Published: 26 November 2018.
[Last Date Accessed 10/08/2019]
 21. Jitendra Kumar Sah, Asha Anil Bellad. Awareness and knowledge about global warming among the school students of south India. 234 • US National Library of Medicine enlisted journal • ISSN 0974-1143 Al Ameen J Med Sci 2015;8(3):230.
[GOOGLE SCHOLAR]
[Last Date Accessed 10/08/2019]

22. Aklilu Dalelo. Climate change literacy among postgraduate students of Addis Ababa university, Ethiopia Addis Ababa University, Ethiopia Southern African Journal of Environmental Education. 2011;28. [AJOL].
[Last Date Accessed 10/08/2019]
23. Isah YC, Idolor EE, Ofili AN, Isah EC. Awareness and perception of global warming among undergraduate medical students in a Nigerian University. Journal of Community Medicine and Primary Health Care. 2011;23(1-2). [AJOL].
[Last Date Accessed 10/08/2019]
24. Yazdanparast T1, Salehpour S, Masjedi MR, Seyedmehdi SM, Boyes E, Stanisstreet M, Attarchi M. Global warming: knowledge and views of Iranian students. Acta Medica iranica. 2013;51(3):178-184. PMID 23605603 [Indexed for MEDLINE]
[Last Date Accessed 10/08/2019]
25. Prosper OU. Adogu, Chika F. Ubajaka, Joachim E. Nebuwa. Knowledge and practice of medical waste management among health workers in a Nigerian General Hospital. Asian Journal of Science and Technology. 2014;5(12):833-838.

© 2020 Nzeobi et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/64215>