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Strategies of Proper Waste Management on the Health Status of Students in University of Calabar, Cross River State, Nigeria

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Abstract

This study investigated the strategies of proper waste management on the health status of students in, University of Calabar, Cross River State, Nigeria. To achieve the purpose of the study, two null hypotheses were formulated to guide the study. The sample size of study was three hundred (300) students. The instruments used for data collection was a modified four-point scale questionnaire. Simple random sampling technique was used to select the sample for the study. All the variables were subjected to test at .05 level of significance with 289 degree of freedom, using the Pearson Product Moment Correlation Coefficient Analysis. The results showed that burning and burying of waste have significant relationship with the health status of students, University of Calabar, Cross River State. It was recommended among others that state government should mobilize enough trucks/waste dispose heavy duty vehicles to always remove waste from dump sites.

Introduction

Man's ultimate desire in life is to live as long as possible; provided the environments we live in support our survival as well as other living creatures. Globally, efforts are made to make people aware about the need to protect the environment. Research has however revealed that one of the main causes of environmental degradation is improper disposal of solid waste generation and its management (Licy, Raghavan, Saritha, Anies & Josphina, 2018).

Today's world is quickly becoming more concerned with the effects of human activity on the environment and how those effects affect human health. Globally, the most important goals include avoiding human exposure to hazardous chemicals, lowering the impact of natural catastrophes on human health, safeguarding water and air quality, and decreasing the rate of climate change caused by humans. An increasing number of people are also worried that not enough is being done to stop climate change. A citizenry capable of thoughtfully engaging with environmental health issues is imperative in these conditions, and this can only be achieved through taking the right steps and strategies in the disposal of waste and management (Kujuo, Ojong, Effiom & Dan, 2021).

Waste management as viewed by Enete (2015) is the process of collecting, transporting, processing or disposing, managing and monitoring waste materials including all items that are no longer in use or have already been discarded like old paints containers, metal scrap, papers from offices, bottles and nylon, etc. Poor waste management has been a major problem to human health and existence affecting individuals in the environment.

Adogu, Uwakwe, Egenti, Okwuoha and Nkwocha (2015) reported that proper waste disposal management is essential to sustain healthy living conditions in any environment. Hence, "a clean environment influences good health and further affects the productivity of man". The volume of wastes generated does not actually constitute the problem but the ability or inability of government, individual and waste disposal firm to keep up with the task of managing waste and the environment, using approved methods such as open dumping to ocean/sea, sanitary land filling, composting, incineration, encapsulation, underground disposal and a more systematic method of waste management that includes recycling, reuse, recovery, segregation and reduction. Adeyemo and Gboyesola (2018) stated that, the attitude of people towards waste management can be affected by their level of knowledge and awareness of waste management.

Statement of hypotheses

1. There is no significant relationship between burning of waste and the health status of student in University of Calabar, Cross River State.
2. There is no significant relationship between burying of waste and the health status of student in University of Calabar, Cross River State.

Literature review

The relationship between humans and their surroundings is said to be reciprocal since man greatly modifies his surroundings to meet his needs and preferences, but the environment also has a significant impact on him. In addition to providing benefits to humanity, human activity on the environment has led to a number of environmental issues, including waste management, pollution, and other issues. In these situations, health education is crucial in order to address the man-made environmental problems particularly as it concerns proper waste disposal and management (Kujuo, Ojong, Effiom & Dan, 2020).

Burning of waste and the health status of students

Burning of refuse/waste is a process in which unwanted products, bye products and materials are incinerated, typically at low temperatures and in an uncontrolled matter (Akinpelu, 2017). Generally, waste generation is a worldwide issue that is not likely to go away, but presently, the production rates have increased in recent years and are projected to increase significantly in the coming years to 2.2 billion tons per year in 2030 and beyond (Kaza, Yao, Bhada-Tata & Van-Woerden, 2018).

Henry (2019) estimated that about 620 million tons of waste per year are burned openly most of which occurs in dumpsites that have been filled far beyond their maximum capacity. Peterson (2015) opined that there is an estimated 41% of global waste burning, in developing low income countries; that figure according to him is relatively higher. He added that, creating a well-executed waste collection programme, or disposal mechanism is difficult in less economically developed countries noting that the practice is popular because it is a fast, effective and inexpensive way to reduce waste.

Asari (2017) submitted that burning of waste releases a variety of toxic pollutants into the air and can exacerbate soil pollution, water pollution and food contamination among others. The scholar further stated that there are different types of waste burning ranging from residential open burning to deliberate open burning in landfills and incineration, which all possess an effect on the health status of an individual as well as the environment. Akinpelu (2017) added that burning of waste material such as garbage, plastic and painted or treated wood is harmful to the environment, because these materials release toxic chemicals that pollute our air. Polluted air can be inhaled by human and animals and deposited in the soil and surface water and on plants.

Wiedinmyer (2015) viewed that, Methane gas (CH_4) is also a product of excessive burning of waste. This gas health impacts are significant. The gas just like CO_2 impacts on those who inhale it. Short-term effect of methane gas exposure causes nausea, vomiting, headache and coordination loss at high concentrations can cause respiratory arrest that could results in coma or even death. In addition, methane gas is highly flammable and can be explosive at between concentrations 5% and 15% High methane levels can also cause serious injury due to explosion.

According to Asukpani (2015), Carbon monoxide (CO) is a greenhouse gas which result from waste burning and can be very harmful to health when inhaled. The most significant health impact of CO exposure is known as Carbon monoxide poisoning; and the complication of this is that it builds up in the bloodstream. Minor effects of CO poisoning include headache, exhaustion, dizziness, nausea, shortness of breath and more, while severe effect includes loss of coordination (ataxia), vertigo, chest pain and seizure, loss of consciousness, neurological difficulties, mood swings and death.

Pascal (2018) opined that there is a large number of noxious emissions and product from open burning of waste. The exact emission from a waste fire ranges/varies depending on the burning conditions (temperature) environment, location and the composition of waste being burnt. One

of the results of burning waste is the emission of greenhouse gases. These gases are pollutants, primarily associated with climate changes. These gaseous constituents in the atmosphere, both natural anthropogenic, absorb high amount of radiation. In turn, the greenhouse gases molecules radiate the energy back into the atmosphere, leading to the greenhouse effect and global warming.

Burying of waste and the health status of students

Burying of waste is one of the strategies/methods used to reduce and manage waste in our environment; this involves emptying the waste in the ground and covered with soil. In most cases, liquid waste or sewage are buried in the soil and is seen as the cheapest method of waste management especially in rural areas (Williams, 2014).

According to Abuo (2019), burying of waste has resulted to the contamination of many farm lands and has led to the bad yield of farm produce, which when consumed may have a great influence on the health status of people. He furthered that, improper waste management/burying of waste has led to the pollution of the environment with offensive smell and harmful toxins in the soil affects water ways and the quality of water consumed by man, leading to cases such as vomiting, dysentery, stooling, skin irritation and stomach ache. Bolatito (2015) asserted that the disposal of untreated health care wastes in landfills (hole dug of burying waste's) can lead to the contamination of drinking, surface and ground waters from those landfills not properly constructed, which in all, affect the health of man who are the primary user (consumers) of water supply.

According to Kelvin (2015), one of the widely known and publicized landfill sites is that of love canal in New York State. Large quantities of toxic materials, were deposited in the 1930's and 1940's, followed by the building of houses and a school on and around the landfill in the 1950's. By the mid 1970's, chemicals leaking from the site were detected in local streams, sewers, soil and indoor air of houses. This site and the subsequent studies of health of the population in the vicinity revealed that the inhabitants of this areas faced one health complication or the other.

Trills (2018), opined that in Lipari, due to Landfill in New Jersey, there was an increase in the proportion of low birth weight of babies found living within the environment. She opined that between 1971 – 1975, studies had it that there was a period of heavy pollution of streams and a nearby lake from the site thus trends in low birth weight and neonatal deaths were found to correspond closely with time among people living around Landfill sites. The author further explained that there were researched cases of cancer particularly (oesophageal, stomach, colon and rectal cancer were common health problems) faced by people living around site were wastes are buried.

In relation to this, Victoria (2016), also stated that some health problems associated with burying of waste as investigated include respiratory symptoms, irritation of the skin, nose and eyes, gastro-intestinal problems, fatigue, headaches, psychological problems and allergies. She

concluded that burying waste can be cheap yet so harmful to people as its implications on their health are enormous.

Methodology

Design

The survey design was considered for this study. Survey design is a form of enquiry which deals with the present and is oriented towards the determination of status of a given phenomenon.

Population

The population of this study include all students in the University of Calabar, Calabar.

Sample

A sample of three hundred (300) students was randomly selected from five Faculties, University of Calabar, comprising both males and females using simple random sampling technique.

Instrumentation

The instrument used for the data collection was a questionnaire titled "Waste Management Strategies and Effects Questionnaire (WMSEQ)". The questionnaire was divided into two sections. Section A was designed to collect the respondent's personal data such as sex, most preferable waste management practice, etc. Section "B" contains items with four questions on each variable used in collecting opinions of the respondents from the variable investigated during the study. The instrument adopted a four (4) point modified likert questionnaire with the options of strongly agree (SA), Agree (A), Disagree (D) and strongly Disagree (SD).

Results and discussion

Ho:1

There is no significant relationship between burning of waste and the health status of students of University of Calabar, Cross River State. The independent variable is burning of waste while the dependent variable is health status of students. The result obtained from the analysis is presented in table 1.

Table 1

Results of Pearson products moment correlation analysis on the relationship of burning of waste on the health status of students of University of Calabar (N = 300).

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	Cal-r
Burning of waste	4668	15563		
			86859	.43[x]
Health status	4192	15302		

Significant at .05 level, df =298, Critical r = 197

The result from table 1 shows that the calculated r -value of .43 is greater than that of the critical value of 197 at .05 level of significance with 298 degree of freedom. With the result, the null hypothesis was rejected while the alternate hypotheses were accepted. Hence, there is a significant relationship between burning of waste and the health status of students University of Calabar, Cross River State.

Ho:2

There is no significant relationship between burying of waste and the health status of students in University of Calabar, Cross River State. The independent variable is burying of waste while the dependent variable is health status of students the summary of the results obtained from the analysis as presented in table 2.

Table 2

Result of Pearson Product Moment Correlation Analysis on the relationship between burying of waste and the health status of students in University of Calabar. (N=300)

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	Cal-r
Burying of waste	4824	17326		
			91898	.56[x]
Health status	4192	18624		

Significant at .05 level, df =298, Critical r = 197

The result from table 2 reveals that the calculated r -value of .56 is greater than the critical r -value of .197 at .05 level of significance and 298 degree of freedom. With the result, the null hypothesis was rejected while the alternate hypothesis was accepted. It therefore means that, there is a significant relationship between burying of waste on the health status of students in University of Calabar, Cross River State.

Discussion of findings

The first hypothesis states that there is no significant relationship between burning of waste and the health status of students in University of Calabar, Cross River State. This null

hypothesis was rejected because the calculated r-value was found to be greater than the critical r -value. The implication of this result is that there is a significant relationship between burning of waste on the health status of students in University of Calabar, Cross River State.

The finding of the study is in line with the views of Peterson (2015) who opined that there is an estimated 41% of global waste burning in developing low income countries; that figure according to him is relatively higher. He further stated that creating a well-executed waste collection programme, or disposal mechanism is difficult in less economically developed countries noting that the practice is popular, because it is a first, effective and inexpensive way to reduce waste.

Also, in support of this is the finding of Asari (2017), he submitted that burning of waste releases a variety of toxic pollutants into the air and can exacerbate oil pollution, water pollution and food contamination among others. Asukpani (2015), also supported the view by stating that Carbon monoxide (CO) is a greenhouse gas which results from waste burning and can be very harmful to health when inhaled. The most significant health impact of CO exposure is known as Carbon Monoxide poisoning; and the complication of this is that it builds up in the bloodstream. Minor effects of CO poisoning include headache, exhaustion, dizziness, nausea, shortness of breath and moves; while severe effect includes loss of coordination, ataxia, vertigo, chest pain, seizure, loss of consciousness, neurological difficulties, mood swings and death.

The second hypothesis states that there is no significant relationship between burying of waste and the health status of students in faculty of education, University of Calabar, Cross River State, Nigeria. However, this null hypothesis was rejected because the calculated r -value was discovered to be greater than the critical r -value. This implies that there is a significant relationship between burying of waste on the health status of students University of Calabar, Cross River State.

The findings of these hypothesis is in agreement with the views of Abuo (2019) who opined that burying of waste has resulted to the contamination of many farm land and has led to the bad yield of farm produce which when consumed may have a great influence on the health status of people. Also in support, this hypothesis is the assertions of Kelvin (2015), who stated that one of the widely known and publicized land fill sits is that of love canal in New York State. He noted that Large quantities of toxic materials, were deposited in the 1930's and 1940's followed by the building of houses and a school on and around the land fill in the 1950's. By the mid 1970's, chemicals leaking from the site were detected in local streams, sewers, soil and indoor air of houses. This site and the subsequent studies of health of the population in the vicinity revealed that the inhabitants of these areas were faced with one health complication or the other.

Balatito (2015), asserted that the disposal of untreated health care wastes in landfills (hole dug of burying wastes) can lead to the contamination of drinking water, surface and ground waters from those landfills not properly constructed, which in all, affect the health of man who are the primary users (consumers) of water supply. The researcher in tandem with Abuo (2019) viewed

that improper waste management/burying of waste has led to the pollution of the environment with offensive smell and harmful toxins in the soil, affects water ways and the quality of water consumed by humans, thereby leading to cases such as vomiting, dysentery, stooling, skin irritation and stomach aches.

Conclusion

The essence of this study was to investigate strategies of proper waste management on the health status of students. Thus, the findings obtained from analysis of data and testing of hypotheses in the study revealed that there was a significant influence of burning and burying of waste on the health status of students.

Recommendations

Based on the findings obtained from analysis of data and testing of hypotheses in the study, it was recommended that:

1. That the university management should mobilize enough trucks/waste disposal heavy vehicles to always remove waste from dump sites.
2. The masses should be sensitized to dispose off their waste at dump site not at drainages.
3. Seminars and workshops on proper waste management strategies should be organized to educate the university community on proper waste management disposal methods.

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