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Perceived Influence of Environmental Pollution on the Health of the People in Ilorin Metropolis

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Abstract

Toxic chemicals and substances escape to the environment through a number of natural and anthropogenic activities and may cause adverse effects on human health and the environment. The study examined the perceived

influence of environmental pollution on the health of the people of Ilorin metropolis. Specifically, the study sought to find out whether people in Ilorin Metropolis perceive air pollution to influence cardiovascular, lung and skin diseases. A descriptive research design of survey type was employed for the study. A sample of 400 heads of households was selected across household in the three Local Government Areas that made up Ilorin Metropolis using multistage sampling technique. A researcher developed questionnaire tagged "QPIEPOH" which was validated by three Jurors and tested for reliability using test re-test method was used for the study. A result of 0.76r clearly indicated the instrument was reliable. Chi-square was used to analyze the data for the study at 0.05 alpha level of significance. The findings revealed that the people in Ilorin metropolis perceived exposure to environmental pollution as influencing normal functioning of the heart, [calculated $\div^2$ value (355.5) > table value (16.9)]; lungs [calculated $\div^2$ value (301.5) > table value (16.9)]; and skin [calculated $\div^2$ value (355.5) > table value (16.9)]. It was concluded that people in Ilorin Metropolis have significantly perceived environmental pollution as a major cause of heart attacks, unexplained cough, tuberculosis and skin infections. It was recommended that the people in Ilorin Metropolis should protect themselves from harmful effects of pollution.

Keywords: Health, Pollution, heart diseases, environment, skin diseases

Introduction

Environmental pollution is one of the biggest menaces to the human race today. Pollution is the addition of any substance or form of energy (heat, sound and radioactivity) to the environment at a rate faster than what the environment can accommodate by dispersion, breakdown, recycling or storage in some harmless form (Jerry, 2011). The first Healthy People report in 1979 stated that "there is virtually no major chronic disease to which environmental factors do not contribute, either directly or indirectly" (Dixon, Hendrickson, Ercolano, Quackenbush & Dixon, 2009).

Environmental health is defined as the "freedom from illness or injury related to exposure to toxic agents and other environmental conditions that are potentially detrimental to human health".

According to the World Health Organization (WHO), (2006) worldwide, one quarter of all deaths can be attributed to environmental conditions and are responsible for one third of all child deaths. In the U.S. about 13per cent of total deaths can be attributed to the environment, specifically cardiovascular disease, neuropsychiatric disorders, cancers, asthma, and musculoskeletal diseases. In Nigeria, an estimated 7 million people were killed by diseases related to indoor and outdoor air pollution alone in 2012 according to the WHO, (2012). Data for Nigeria included in the newly released Little Green Data Book 2015 indicates that 94 per cent of the population is exposed to air pollution levels (measured in PM2.5) that exceed WHO guidelines and air pollution damage costs about 1 percentage post of Gross National Income.

A study conducted by Nursan, Müge, Cemile, Pinar and Sevin, (2014) on Parent's knowledge and perceptions of the health effects of environmental hazards revealed that **a**mong the participants, 357 (98.6%) knew that smoking was a health risk, but exposure to radoM gas was not that prevalent (n=194; 53.6%). The most intimidating risk was claimed as unsafe water (n=311; 85.9%), while noise exposure was the least source of worry among the environmental risks (n=134; 37.0%). This shows that people may be aware of hazards of environmental pollution but may not know the intensity of the health effects.

Air pollution is a significant risk factor for a number of health conditions including respiratory infections, heart disease, stroke and lung cancer (WHO, 2011). The health effects of air pollution may include difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac health problems. These inhaled substances have strong pulmonary and systemic inflammatory potential and can cause irritation and allergy in the lungs and air passage of individuals who are exposed to them for a long time. However, the type of disease developed may depend on the size of the particles or what is inhaled and where it ends up in the airway or lungs. In some cases, larger particles tend to

end up trapped in the nose or larger airways (Ekpenyong, Ettebong, Akpan, Samson & Daniel, 2012)

Orish (2014) asserted that although cholesterol levels are lower in African population when compared with their American counterparts, but exposure to lead through air pollution alters the metabolism of cholesterol and thus increases the risk of cardiovascular diseases and atherosclerosis in lead-exposed subjects. The cardiovascular effects of lead have been associated with increased blood pressure (BP) and hypertension. Studies in general populations have identified a positive association of lead exposure with coronary artery disease and stroke mortality, and peripheral arterial disease.

Godson, Oyewale and Gregory (2015) opined that there is increasing evidence linking indoor air pollution to increased risk of respiratory Infections, exacerbations of inflammatory lung conditions, development of chronic obstructive lung disease, cardiac events, stroke, eye disease, tuberculosis, cancer and hospital admissions especially in women and children who are the most exposed. Hence, a study on how people perceive the health effects of environmental pollution is very essential as it will contribute to peoples' knowledge on this important global problem.

Statement of the problem

It is a well known fact that air pollution in Nigeria does not discriminate among social classes. Researches revealed that 18 million residents in Nigeria inhale daily a deadly mix of Particulate Matter (PM), asbestos, Sulfur Dioxide (SO2), Nitrogen Oxide (NO), Carbon Monoxide (CO) and partially unburnt hydrocarbons. These substances contribute to the death of seven million people, one in eight of total global deaths as a result of air pollution exposure, according to new estimates by WHO, (2012). This finding more than doubles previous estimates and confirms that air pollution is now the world's largest single environmental health risk and reducing air pollution could save millions of lives (Chinedum, Tunde & Chukwuma, 2015).

Chinedum, Tunde & Chukwuma, (2015) further said that the new data reveal a stronger link between both indoor and outdoor air pollution

exposure and cardiovascular diseases, such as strokes and ischemic heart disease, as well as between air pollution and cancer. This is in addition to air pollution's role in the development of respiratory diseases, including acute respiratory infections and chronic obstructive pulmonary diseases.

The researchers gathered that there have been increase in hospitalization and due to cardiovascular and lungs infections in Kwara State. Could these have been caused by exposure to environmental pollution? If it is, how do the people in Ilorin Metropolis perceive the effects of environmental pollution on their own health? It is in this light that the researchers deemed it fit to carry out this research on the "Perceived influence of air pollution on health of the people of Ilorin metropolis" in order to enlighten them on the possible hazards air pollution can cause to them.

Research Hypotheses

The following research hypotheses were raised:

1. Air pollutants will not significantly influence cardiovascular diseases as perceived by the people of Ilorin metropolis.
2. Air pollutants will not significantly influence the functioning of the lungs as perceived by the people of Ilorin metropolis.
3. Air pollutants will not significantly influence skin diseases as perceived by the people of Ilorin metropolis.

Methodology

The study is a descriptive research of the survey type. The choice of this design was based on the fact that it allows for direct observation in the collection of data. The population of this study includes all adults residing in Ilorin metropolis. Ilorin Metropolis is made up of three Local Government Areas namely: Ilorin East, Ilorin West and Ilorin south. According to the National Population Census of the year 2006, there are 207,462 thousand people living in Ilorin East Local Government Area, 209,251 thousand people living in Ilorin South Local Government Area and 365,221 thousand people living in Ilorin West Local Government Area making a sum total of 781,934 thousand people living in Ilorin metropolis.

According to the Research Advisor (2006), for a population of 10,000 and above, a sample of 380 is sufficient enough to represent the entire population at a level of confidence of 95% and a margin error of 5%. Therefore, a value of 392.2 was derived which made the researchers to round it up to a sample of 400 respondents used for the study. A Multi-stage sampling procedure was used to select respondents for this study. A stratified random sampling was used to divide the three Local Government Areas in Ilorin metropolis into wards. Cluster sampling was also used to select four wards from each of the Local Government Areas. A simple random sampling was used to select sampling of two streets each from the wards. A systematic sampling was used to select every 5th household, while a purposive sampling technique was used to select heads of household across the selected streets. The research instrument used for this study was a researchers' structured questionnaire tagged "Questionnaire on Perceived Influence of Environmental Pollution on Health" (QPIEPOH). The research instrument was validated by five experts in the Department of Health Promotion and Environmental Health Education, Faculty of Education, University of Ilorin. A test-retest method of reliability was used to ascertain the reliability of the instrument. Twenty copies of the instrument was administered on twenty respondents in Kiama Local Government Area of Kwara State, at two weeks interval. The results were correlated using Pearson Product Moment Correlation, the result yielded .76r which was considered high enough to show that the instrument is reliable.

The data was collected by the researchers with the help of four trained research assistants. Data collected were analyzed using simple percentages for demographic data while Chi-square was used to test the hypotheses for the study.

Results

Test of Hypotheses

Ho1: Air pollutants will not significantly influence cardiovascular diseases as perceived by the people of Ilorin metropolis

Table 1: Chi square analysis investigating the influence of air pollution on the incidence of cardiovascular diseases

S/N	Items	SA	A	D	SD	Calculated chi square	Df	Critical value	Decision
1	Polluted air consists of a large mass of tiny particles	234	118	19	29				
2	When we breathe in polluted air, the particles in the air are carried through various parts of the body.	185	166	29	20				
3	The particles embedded in the polluted air we breathe lodge in various compartments of the heart.	164	169	51	16	355.5	9	16.9	Rejected
4.	Polluted air disrupts the normal functioning of the heart and leads to different heart diseases.	181	159	37	23				

A critical analysis of the table above revealed that the calculated chi square value of 355.5 at a degree of freedom of 9 is greater than the critical value of 16.9 at 0.05 alpha level of significance. Therefore the null hypothesis that says that air pollutants will not significantly influence cardiovascular diseases as perceived by the people of Ilorin metropolis was rejected.

Ho2: Air pollutants will not significantly influence the functioning of the lungs as perceived by the people of Ilorin metropolis.

Table 2: Chi square analysis of the influence of Air pollution on the incidence of respiratory diseases

S/N	Items	SA	A	D	SD	Calculated chi square	Df	Critical value	Decision
1	Most of the particles embed in the air we breathe cling to the respiratory tract and causes inflammation.	170	147	67	16				
2	Pollution is the cause of different respiratory diseases e.g asthma.	192	142	47	19	301.3	9	16.9	Rejected
3	Pollution affects respiratory diseases among young people.	161	174	42	23				
4.	Smoke from vehicles' incomplete combustion, burning of refuse and factories are dangerous to the respiratory system.	192	137	40	31				

Table 3: Chi square analysis of the influence of air pollution on the incidence of skin diseases

S/N	Items	SA	A	D	SD	Calculated chi square	Df	Critical value	Decision
1	The skin which serves as a protection to vital organs in the body can be irritated by pollution.	183	144	53	25				
2	The skin is capable of absorbing substances or particles from the air into our bloodstream.	138	184	53	25				
3	Prolong exposure to air pollutants can lead to some skin diseases such as rashes, and skin dryness.	157	153	61	29	303.1	9	16.9	Rejected
4.	Air pollutants can erode the ozone layer allowing ultraviolent radiation from the sun to come in contact with the upper layer of the skin causing skin cell damage.	155	141	61	43				

A critical analysis of the table above revealed that the calculated chi square value of 355.5 at a degree of freedom of 9 is greater than the critical value of 16.9. Therefore the null hypothesis that says Air pollutants will not significantly influence skin diseases as perceived by the people of Ilorin metropolis was rejected.

Discussion of Findings

H_o1 stated that Air pollutants will not significantly influence cardiovascular diseases as perceived by the people of Ilorin metropolis was rejected because the calculated chi square value of 355.5 is greater than the critical value of 16.9. It means that the people in Ilorin metropolis have a negative perception of air pollutants in relation to cardiovascular diseases. This finding is line with World Health Organization (2014) who stated that air pollution is a significant risk factor for a number of health conditions including respiratory tract infections, heart disease, Stroke and lung cancer. It is also in line with Chinedum, Tunde & Chukwuma, (2015) who said that the new data reveal a stronger link between both indoor

and outdoor air pollution exposure and cardiovascular diseases, such as strokes and ischemic heart disease, as well as between air pollution and cancer.

H_o2 which stated that Air pollutants will not significantly influence the functioning of the lungs as perceived by the people of Ilorin metropolis was rejected because the calculated chi square value of 301.3 is greater than the critical value of 16.9 with a degree of freedom of 9 at .05 alpha level of significance. This implies that the highly polluted air we breathe in which is possibly carrying toxic materials or dangerous chemicals makes the lungs more vulnerable to infections. This is in line with Ekpenyong, Ettebong, Akpan, Samson & Daniel, (2012) who asserted that inhaled substances have strong pulmonary and systemic inflammatory potential and can cause irritation and allergy in the lungs and air passage of individuals who are exposed to them for a long time. However, the type of disease developed may depend on the size of the particles or what is inhaled and where it ends up in the airway or lungs. In some cases, larger particles tend to end up trapped in the nose or larger airways.

H_o3 which stated that Air pollutants will not significantly influence skin diseases as perceived by the people of Ilorin metropolis was rejected because the calculated chi square value of 303.1 is greater than the critical value of 16.9 with a degree of freedom of 9 at .05 alpha level of significance. This implies that exposure to air pollution can make individuals suffer from different types of skin infections. This is in line with WHO (2014) who stated that short-term exposure of humans to high levels of dioxins may result in skin lesions, such as chloracne and patchy darkening of the skin, and altered liver function. Long-term exposure is linked to impairment of the immune system, the developing nervous system, the endocrine system and reproductive functions.

Based on the findings of this study the following conclusions were made:

1. There is significant influence of air pollution on the incidence of cardiovascular diseases as perceived by the people of Ilorin metropolis.
2. There is significant influence of air pollution on the incidence of respiratory diseases as perceived by the people of Ilorin metropolis.

3. There is significant influence of Air pollution on the incidence of skin diseases as perceived by the people of Ilorin metropolis.

Recommendations

Based on the findings of this study, the researcher made the following recommendations

1. All vehicles plying the road should be properly checked and serviced before they are used on our roads to prevent the emission of smoke which can affect our health.
2. Government and NGOs should endeavor to educate the public through various media on the dangers of environmental pollution and encourage them to be cautious of the actions that can lead to pollution and also put in place proper waste disposal systems.
3. People in Ilorin Metropolis should endeavor to protect themselves from the dangerous effects of air pollution that have become part and parcel of their everyday lives.

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