RELATIONSHIP BETWEEN ENVIRONMENTAL POLLUTION AND RESPIRATORY DISEASES IN AWKA SOUTH, ANAMBRA STATE NIGERIA

Arinze Chinelo Rita¹ and Aroh Jennifer Chinwendu²

ABSTRACT

This study investigates the relationship between environmental pollution and respiratory diseases in Awka South Local Government Area (LGA) of Anambra State, Nigeria. Three research questions guided the study. The study employed correlational survey research design. The population consists of residents of Awka South LGA Anambra. Random sampling techniques was used to obtain 100 respondents from the population that formed the study. The instrument for data collection was 20 items questionnaire which was validated by three experts in the faculty of Education, Nnamdi Azikiwe University, Awka. Statistics mean was used to analyze the collected data. The findings of the study indicate that waste burning is a common practice that contribute significantly to pollution, noise pollution from vehicles is one of major issue in their community, improper waste disposal contributes to environmental pollution. The study further indicate that poor air quality contributed to the respiratory problems they had experienced, and also, that there is a strong correlation between waste burning and the occurrence of respiratory diseases.

Key Words: Relationship, Environmental Pollution & Respiratory Diseases

Introduction

More than 12 million people around the world die every year because they live or work in unhealthy environments. Environmental pollution, including air, water, and soil contamination, poses significant threats to human health (Smith *et al.*, 2020). Respiratory diseases such as asthma, chronic bronchitis, and lung cancer have been increasingly linked to pollutants like particulate matter (PM2.5), nitrogen dioxide (NO2), and sulfur dioxide (SO2) (Tan, Jiayi,Yang and Jiang, 2023). The burden of respiratory diseases is compounded by factors such as poverty, inadequate sanitation, and limited access to health care (Fullerton, 2016) Environmental pollution is a pervasive issue affecting both developed and developing nations. It encompasses the contamination of air, water, and soil by harmful substances, leading to adverse effects on human health and the environment. Air pollution, in particular, has garnered significant attention due to its direct impact on respiratory health. Common air pollutants include particulate matter

(PM2.5 and PM10), nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic compounds (VOCs). These pollutants originate from various sources, such as industrial activities, vehicular emissions, agricultural practices, and residential fuel burning (Smith *et al.*, 2013).

Ighnibia, Wordu, and Saue (2017), opined that Respiratory diseases encompass a range of conditions that affect the lungs and other parts of the respiratory system. These include chronic obstructive pulmonary disease (COPD), asthma, bronchitis, emphysema, and lung cancer. The prevalence of these diseases has been rising globally, correlating with increased levels of air pollution. For instance, fine particulate matter (PM2.5) can penetrate deep into the lungs, causing inflammation and exacerbating conditions like asthma and bronchitis (Isabela, 2024) Awka South Local Government Area (LGA) is a rapidly developing region in Anambra State, Nigeria. The area has experienced significant urbanization and industrialization in recent years, leading to increased pollution levels. This development, while contributing to economic growth, has also resulted in heightened environmental challenges. The major sources of pollution in Awka South LGA include industrial emissions, vehicular exhaust, waste burning, and construction activities. These pollutants have the potential to degrade air quality and pose health risks to the local population (Nwankwo and Eze 2019).

The relationship between environmental pollution and respiratory diseases is a critical area of public health research. Numerous studies have demonstrated that exposure to pollutants is linked to adverse respiratory outcomes. For example, research conducted in various parts of the world has shown that areas with high levels of air pollution report higher incidences of respiratory diseases among their populations (Abumero,. Ebeniro and Ogbodo 2021) Understanding this relationship in the context of Awka South LGA is essential for developing

https://journals.unizik.edu.ng/ujhpe

effective health interventions and pollution control strategies. Given the growing concerns about the health impacts of environmental pollution, this study aims to investigate the specific relationship between pollution levels and respiratory diseases in Awka South LGA. By identifying the sources and types of pollutants, and analyzing their correlation with respiratory health outcomes, the study seeks to provide evidence-based recommendations for mitigating the adverse health effects of pollution in the region. This expanded background provides a more detailed context for the study, including the sources of pollution, the types of respiratory diseases, and the specific situation in Awka South LGA.

Environmental pollution, particularly air pollution, poses a significant threat to public health globally, with pronounced effects in developing regions. Awka South Local Government Area (LGA) in Anambra State, Nigeria, has experienced rapid urbanization and industrialization, leading to increased levels of pollution. This rise in pollution has been paralleled by a growing incidence of respiratory diseases among the local population. Despite the evident increase in both pollution levels and respiratory health issues, there is a lack of comprehensive research investigating the direct relationship between these two variables in Awka South LGA. Understanding this relationship is crucial for formulating effective public health policies and interventions aimed at mitigating pollution and improving health outcome

Research Questions

- 1. What is the major environmental pollutants in Awka South LGA, Anambra state?
- 2. What is the prevalence level of respiratory diseases in Awka South?

3. What is the correlation between the levels of environmental pollutants and the incidence of respiratory diseases in Awka South LGA?

Methodology

The correlational research design was used for the study as it would enable the researcher to determine the relationship between environmental pollution and Respiratory disease in Awka South LGA in Anambra State. The population of this study comprises of 270,300-person, 149,993 Female and 120,307 Males. The data was gotten from National Population Census (2006-2022). A sample size of 100 was selected using the simple random sampling techniques. The L.G.A was divided into three clusters based on the nine towns in the area. Using the simple random Sampling techniques, two cluster was selected from the three clusters. The villages in the selected cluster was numbered and four villages was selected equally using simple random techniques. The household in the selected villages was numbered. A total of 100 household was selected for the study, from each household, one respondent was selected. Thus, 100 respondents was gotten. The instrument for data collection was structured questionnaire designed by the researcher. The questionnaire was titled "Relationship between environmental pollution and Respiratory disease in Awka South L.G.A. Anambra State". The questionnaire consisted of twenty (20) questions. The instrument was structured with four-point Likert scale of Strongly Agree (SA)- 4 points, Agree (A)- 3 points, Disagree(D)- 2 points, Strongly Disagree (SD)- 1 point was used to weigh each of the options answered. For the reliability of the Instrument, the test-retest reliability method was used on three towns in Awka North L.G.A. The instrument was administered to ascertain its reliability before it was administered to the actual respondents in Awka South L.G.A. Cronbach Alpha Method was used to determine the internal consistency of the Instrument and the values 0.77,0.88, and 0.78 was obtained respectively. The instrument was administered objectively to the stipulated respondents by the researcher and two (2) research

assistants selected and briefed by the researcher to participate in carrying out this exercise. Data

Collected was analyzed using descriptive statistics particularly the means score.

Result

Cluster One: What is the major environmental Pollutant in Awka South LGA, Anambra state?

S/N	Major Environmental Pollutants	Ν	SA	Α	D	SD	MEAN	REMARK
1	Industrial activities are one of the sources of pollution in Awka South	100	30	40	20	10	2.90	Agree
2	Waste burning is a common practice that contribute significantly to pollution	100	75	20	5	-	3.70	Agree
3	Noise pollution from vehicles and industries are not a major issue in my community	100	35	40	15	10	3.00	Agree
4	Improper waste disposal contributes to environmental pollution	100	30	70	-	-	3.60	Agree
5	Water bodies in Awka South LGA are often polluted by improper waste disposal.	100	75	25	-	-	3.75	Agree
6	Air pollution is the most significant environmental issue in Awka South LGA.	100	35	40	15	10	3.00	Agree
7	Vehicular emissions contribute greatly to air pollution in my area.	100	60	30	10		3.50	Agree
	TOTAL MEAN						2.96	Agree

Data in Table 1 reveals that the respondents agree that industrial activities are one of the sources of pollution in Awka South, waste burning is a common practice that contribute significantly to pollution, noise pollution from vehicles and industries are not a major issue in my community, Improper waste disposal contributes to environmental pollution, water bodies in Awka South LGA are often polluted by improper waste disposal, air pollution is the most significant environmental issue in Awka South LGA, and vehicle emissions contribute greatly to air pollution in my area.

S/N	Prevalence of Respiratory Diseases	Ν	SA	A	D	SD	MEAN	REMARK
8	Respiratory disease such as cough is common among the residents of Awka South	100	70	20	10	-	3.60	Agree
9	I have experienced respiratory issues such as coughing or wheezing frequently in the last year	100	30	45	20	5	3.00	Agree
10	Children and elderly in my household often experience respiratory problem	100	30	50	10	10	3.20	Agree
11	Poor air quality contributed to the respiratory problems around my area	100	55	34	5	6	3.38	Agree
12	Respiratory diseases have not increased in my community over the past few years.	100	30	45	10	15	2.95	Agree
13	People in my community suffer from asthma or air- related respiratory conditions.	100	35	40	15	10	3.00	Agree
	TOTAL MEAN					3.18		Agree

Cluster Two: What is the prevalence of respiratory diseases in Awka South LGA?

Data in Table 2 reveals that the respondents agree that respiratory disease such as cough is common among the residents of Awka South, they have experienced respiratory issues such as coughing or wheezing frequently in the last year, poor air quality contributed to the respiratory problems they had experienced, respiratory diseases have not increased in my community over the past few years, people in their community suffer from asthma or air related respiratory conditions, and that children and elderly in their household often experience respiratory problem

Cluster Three: What is the correlation between the level of environmental Pollutants and the incidence of respiratory diseases in Awka South LGA Anambra State.?

S/N	Correlation between	Ν	SA	Α	D	SD	MEAN	REMARK
	Environmental Pollutants and							
	Respiratory Diseases							
14	Living near industrial areas can negatively impact the respiratory health of residents	100	70	20	5	5	3.55	Agree
15	There is a strong correlation between waste burning and the occurrence of respiratory diseases	100	50	30	10	10	3.20	Agree
16	When air quality worsens, I noticed an increased in respiratory issues among my family members	100	30	45	20	5	3.00	Agree
17	During period of heavy pollution, the number of respiratory diseases cases increases in my community	100	50	20	20	10	3.10	Agree
18	Reducing pollution levels would significantly lower the incidence of respiratory diseases.	100	66	34	-	-	3.66	Agree
19	Higher pollution levels are directly linked to an increase in respiratory problems.	100	30	50	10	10	2.90	Agree
20	Poor environmental conditions can lead to an increase in the prevalence of respiratory diseases	100	50	20	10	20	3.00	Agree
	TOTAL MEAN				3.20			Agree

Data in Table 3 reveals that the respondents agree that there is a strong correlation between waste burning and the occurrence of respiratory diseases, when air quality worsens, they noticed an increased in respiratory issues among their family members, during period of heavy pollution, the number of respiratory diseases cases increases in my community, reducing pollution levels would significantly lower the incidence of respiratory diseases, higher pollution levels are directly linked to an increase in respiratory problems in my community, living near industrial areas can negatively impact the respiratory health of residents, and poor

https://journals.unizik.edu.ng/ujhpe

environmental conditions can lead to an increase in the prevalence of respiratory diseases in Awka South LGA.

Discussion of Findings.

The major environmental pollutants in Awka South LGA

The findings of the study reveal that in Awka South, Industrial activities are one of the sources of pollution. Waste burning is a common practice that contribute significantly to pollution, noise pollution from vehicles is one of major issue in their community, improper waste disposal contributes to environmental pollution, water bodies in Awka South LGA are often polluted by improper waste disposal, air pollution is the most significant environmental issue in Awka South LGA, and vehicle emissions contribute greatly to air pollution in my area.

The prevalence level of respiratory diseases in Awka South

The findings of the study reveal that respiratory disease such as cough is common among the residents of Awka South, they have experienced respiratory issues such as coughing or wheezing frequently in the last year, poor air quality contributed to the respiratory problems they had experienced, respiratory diseases have not increased in my community over the past few years, people in their community suffer from asthma or air related respiratory conditions, and that children and elderly in their household often experience respiratory problem.

The correlation between the levels of environmental pollutants and the incidence of respiratory diseases in Awka South LGA.

The findings of the study reveal that there is a strong correlation between waste burning and the occurrence of respiratory diseases, when air quality worsens, they noticed an increased in respiratory issues among their family members, during period of heavy pollution, the number of respiratory diseases cases increases in their community, reducing pollution levels would

significantly lower the incidence of respiratory diseases, higher pollution levels are directly linked to an increase in respiratory problems in my community, living near industrial areas can negatively impact the respiratory health of residents, and poor environmental conditions can lead to an increase in the prevalence of respiratory diseases in Awka South LGA.

Conclusion

Based on the findings of the study, it was concluded that waste burning, improper waste disposal, noise from vehicles, and, vehicle emissions are the major environmental pollutant in Awka South LGA, Anambra state. The prevalence of respiratory diseases in Awka South is average and there is a strong correlation between waste burning and the occurrence of respiratory diseases.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Enhanced Air Quality Monitoring: Implement air quality monitoring systems in key areas of Awka South to continuously measure pollutants such as particulate matter (PM2.5, PM10), nitrogen oxides (NOx), sulfur dioxide (SO2), and carbon monoxide (CO). This will help track pollution sources and levels, providing real-time data.

2. Reduce Emissions from Transportation: Develop public transport infrastructure to reduce the reliance on private vehicles. Initiatives such as the introduction of buses and encouraging walking or cycling can reduce vehicle emissions, a major contributor to air pollution. Also Implementing and enforcing stricter emission standards for vehicles, especially in urban areas like Awka South, to reduce harmful pollutants from exhaust fumes.

3. Public Health Interventions: Implement periodic respiratory health screenings, especially for vulnerable groups such as children, the elderly, and those with pre-existing conditions, to

detect early signs of respiratory diseases. Also raise awareness about the link between environmental pollution and respiratory diseases. Educating the public on preventive measures (e.g., wearing masks during high-pollution days, avoiding outdoor activities when air quality is poor) can help reduce exposure.

References

- Abbaspour M, Karimi E., Nassiri P., Monazzam M. R, Taghavi L. (2020), Hierarchal Assessment of Noise Pollution in urban Areas - A case study. *Transportation Research, Part D 34*, 95-103. DOI:10.1016/j.trd.2014.10.002
- Abumere O. E, Ebeniro J. O., Ogbodo S. N.(2021), Investigation of Environmental Noise within Port Harcourt City Metropolis. *Nigerian Journal of Physics*, *11*(*3*), *129-132*.
- Avwiri G. O. Enyinna F. I., Agbalagba E. O.(2007), Environmental Noise Assessment of Kolo Creek Gas Turbine, Bayelsa State. Journal of Environmental *Research and Policies 2(1)*, 61-64.
- Fullerton, D. G., Semple, S., Kalambo, & Gordon, S. B.(2016). Biomass fuel use and indoor air pollution in homes in Malawi. Journal of Occupational environmental medicine, 73(2), 113-120
- Ighnibia, V. Wordu, C.C.R. Saue, B. P. (2017). Environmental Safety and Health Education (ESHE) in Nigeria tertiary instution. Nigeria journal of Health Education (njhe) Vol 22(2), 227-247.
- Isabela, S. (2024). Examining the relationship between air quality and respiratory health in urban environments in Brazil. America Journal of physical sciences 2(2): 1-12.
- Monika W and Aleksandra kita (2024) the impact of air pollution on the number of diagnosed respiratory and cardiovascular diseases. Journal of Ecological Engineering. 25(2): 167-175.
- Nwankwo, A., & Eze, C. (2019). "Pollution in Awka South: Sources and impacts." *Nigerian Journal of Environmental Studies*, 14(2), 123-137.
- Smith, J., et al. (2020). "Urban air quality and its health impacts." Environmental Science Journal, 35(4), 567-580.
- Tan N, Jaiyi C, Yang J, and Jiangbo W (2023). Impact of air pollution on respiratory diseases in typical industrial city in the North China Plain. Sustainability (2023) 15(14), 11198.