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Residents' Perception Of The Health Impacts Of Indiscriminate Solid Waste Disposal In Ifite Awka, Anambra State, Nigeria

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Abstract

Indiscriminate solid waste disposal has emerged as a critical environmental and public health issue in many urban areas worldwide. This work studied the residents' perception of the health impacts of indiscriminate solid waste disposal in Ifite Awka, Awka South LGA, Anambra State, Nigeria. A total of 398 respondents were randomly sampled using a simple random sampling. The result showed that 24.37% respondents strongly agreed on the lack of proper waste management infrastructure as affecting waste disposal methods, 23.90% strongly agreed that indiscriminate waste disposal helps to spread diseases. The Spearman's rank coefficient (Rs), which is 0.76, shows that there is a strong positive correlation between indiscriminate waste disposal and health impacts. The calculated value 4.35 is greater than the critical value 1.86 at a 0.05 significance level; the null hypothesis was rejected. It was recommended, among other things, for an increase in the enlightenment campaign through jingles in mass media on proper waste disposal methods.

Keywords: Solid Waste, Health impacts, waste management, residents, perception

1. Introduction

Indiscriminate solid waste disposal has emerged as a critical environmental and public health issue in many urban areas worldwide. In Ifite Awka, Awka South L.G.A., Nigeria, the rapid urbanization and increasing population density have exacerbated the challenges associated with waste management. Residents' perceptions of the health impacts arising from improper waste disposal are crucial for understanding the implications for public health and community well-being. According to ACCP (2023), UN-Habitat's global monitoring of SDG 11.6.1 found that in 2018, the world generated 2.4 billion tons of municipal solid waste, of which 1.08 billion tons (45%) were mismanaged. The situation is more serious in Africa, with an average collection rate of 52%, and more than 80% of municipal solid waste generated in Sub-Saharan Africa is mismanaged.

The common practice of dwellers in most of the major cities, according to Donuma, Ma, Bu, George, Gashau, and Suleiman (2024), is to indiscriminately dispose of plastic waste instead of properly discarding it into waste bins for eventual processing, recovery, and appropriate disposal through recycling centers, incinerators, or landfills. They are recklessly strewn or abandoned along major roads, open dumpsites, and water channels, which subsequently end up in water bodies (rivers, streams, oceans, etc.), causing clogging and pollution.

Studies have shown that poor waste management practices can lead to various health hazards, including respiratory diseases, vector-borne diseases, and gastrointestinal infections (Bernard Smith and Chukwuma. 2020; Njoku, Okonkwo, and Nwankwo., 2021). In Ifite Awka, where waste segregation and proper disposal facilities are often lacking, residents may be particularly vulnerable to these health risks. Understanding local perceptions can help identify communities' knowledge gaps, attitudes, and practices related to solid waste management (Ogunfowokan, Nwankwo, and Adediran, 2019). Over two billion metric tons of unsustainable, human-generated waste are thrown away globally every year, entering our environment and polluting every ecosystem around the world (earthday.org, 2024). According to Vinti et al. (2021), municipal solid waste can pose a threat to public health if it is not safely managed. Numerous issues linked with trash disposal without discrimination may lead to groundwater pollution, unpleasant smells, uncontrolled disposal, and public health threats.

This research aims to explore the residents' perceptions of the health impacts of indiscriminate solid waste disposal in Ifite Awka, highlighting the need for effective waste management strategies and public health interventions. By engaging with community members, this study will contribute to a deeper understanding of the social dynamics influencing waste management practices and their health outcomes.

2. Theoretical Framework

This study employed the Behavioral approach of human geography and the collective behavior theory (a sociological theory) to understand and uncover the attitudes and perceptions of the residents of Ifite Awka with respect to managing solid wastes. The behavioral approach addresses overt and covert behavior, thus exploring the attitudes of the people (Lutui, 2001). In collective behavior, a large group is said to convey a sense of transcending power, which serves to support, reinforce, inhibit, or suppress the individual participant in his activity. To mobilize for action, new devices such as incitement, agitation, gaining attention, the development of morals, the manipulation of discontent, the overcoming of apathy, and resistance. The fashioning of group images and the development of strategy gain precedence (Smelser, 1963). Collective behavior is therefore defined as mobilization on the basis of a belief that redefines social action. In order for behavior to become collective, some mode of communication of this belief and some mode of bringing people to action must be available. The belief may be communicated by gesture or sign, face to face, rumor, or one-way communication (Lutui, 2001). The collective behavioral theory is relevant to this study in that the behavior of individuals in managing wastes may be derived from, explained by, and understood from the perspective of the community (village, church, others). Insofar as individuals are members of these local communities, their behavior is influenced by the transcending power of the larger group (Lutui, 2001).

Finally, it is clear from the foregoing, that the topic of this research “Assessment of the Level of Perception of Ifite Awka Residents on Indiscriminate Solid Waste Disposal and its Health Implications” is built upon the theoretical framework of beliefs, feelings and behaviors towards the collection, removal, processing, and disposal of all solid waste materials considered waste, which can be determined by the use of questionnaires, which ask participants to express their attitude towards the particular object.

2.1 Study Area

Ifite Awka is a town located in Awka South Local Government Area of Anambra State, Nigeria. It is situated in the southeastern part of Nigeria, and it is bordered by other towns and communities in Awka South Local Government Area, such as Amawbia, Umuokpu, and Ezinato. Ifite Awka is occupied mostly by students of the Nnamdi Azikiwe University, and it's located at latitude $6^0.20^I$ N and longitude $7^0.04^I$ E in the Southeastern Region of Nigeria. Ifite Awka is about 600Km east of Lagos and the center of the densely populated Igbo heartland in south-eastern Nigeria. Ifite Awka is a predominantly residential area with few commercial and industrial activities. The town is characterized by low-lying hills and has a generally flat terrain. The land is generally fertile and suitable for agriculture. The town has basic amenities such as electricity, water supply, and telecommunications infrastructure. It is also well-connected by road to other towns and cities in Anambra State and the rest of Nigeria. Geologically, the area is part of the Benue Trough, which is a sedimentary basin that extends from the Gulf of Guinea in the south to Lake Chad in the north. The rocks in the Benue Trough are predominantly sedimentary, consisting of sandstones, shales, and siltstones. The sediments were deposited in a shallow marine environment during the early and mid-Cretaceous period, which was characterized by alternating cycles of marine transgression and regression. Awka is in the tropical rainforest zone of Nigeria and experiences two distinct seasons brought about by the two predominant winds that rule the area: the southwestern monsoon winds from the Atlantic Ocean and the northeastern dry winds from across the Sahara Desert. Seven months of heavy tropical rains, from April to October, are followed by five months of dryness from November to March. The harmattan, a particularly dry and dusty period, usually occurs during this period. The temperature in Awka is generally hot and humid in the range of 27–30 °C between June and December, but rises to 32–34 °C between January and April, with the last few months of the dry season marked by intense heat (Ezeigwe, 2015).

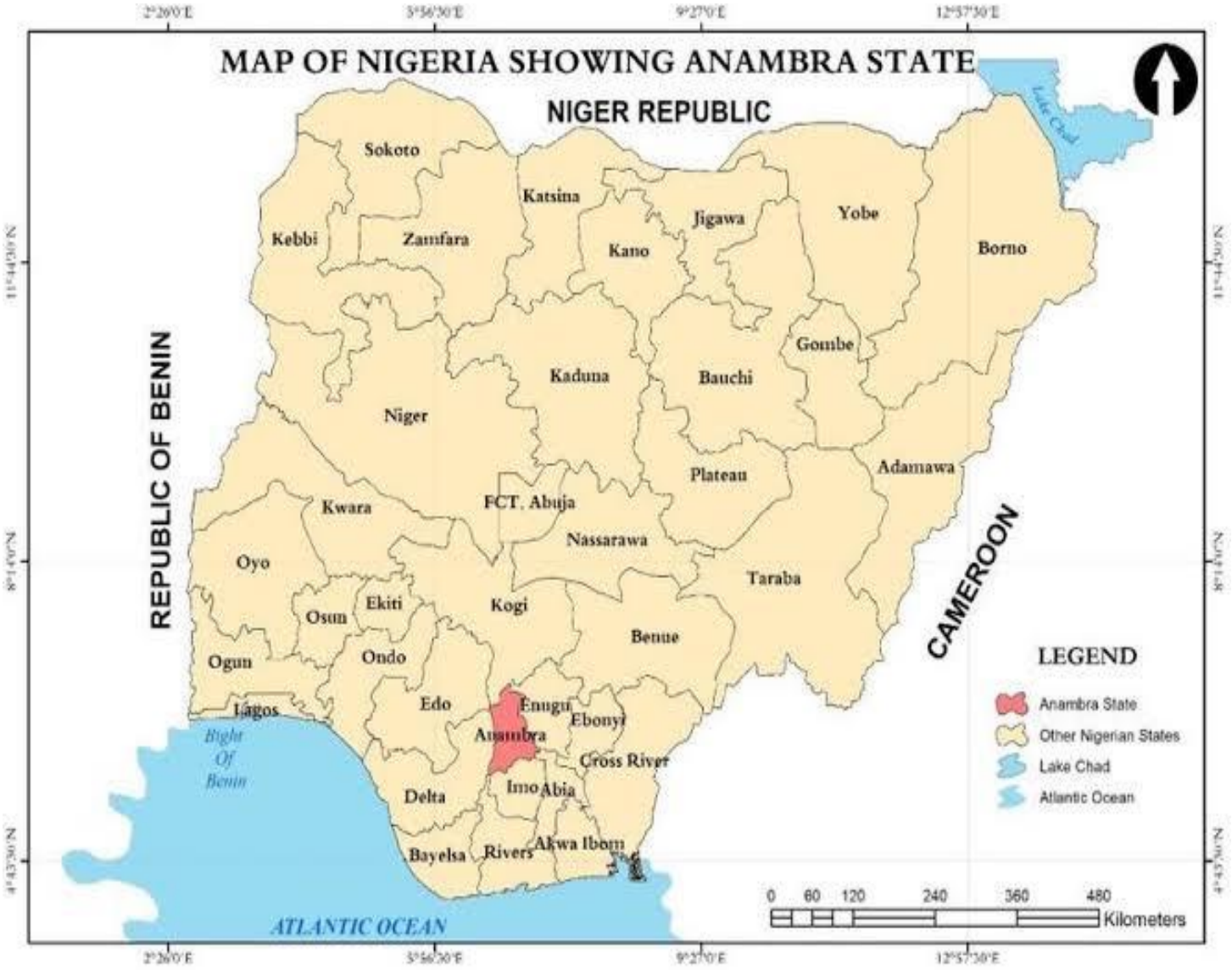


Figure 1. Map of Nigeria Showing Anambra State
Source: State Survey Department, Anambra State Ministry of Lands, Surveys and Town Planning.

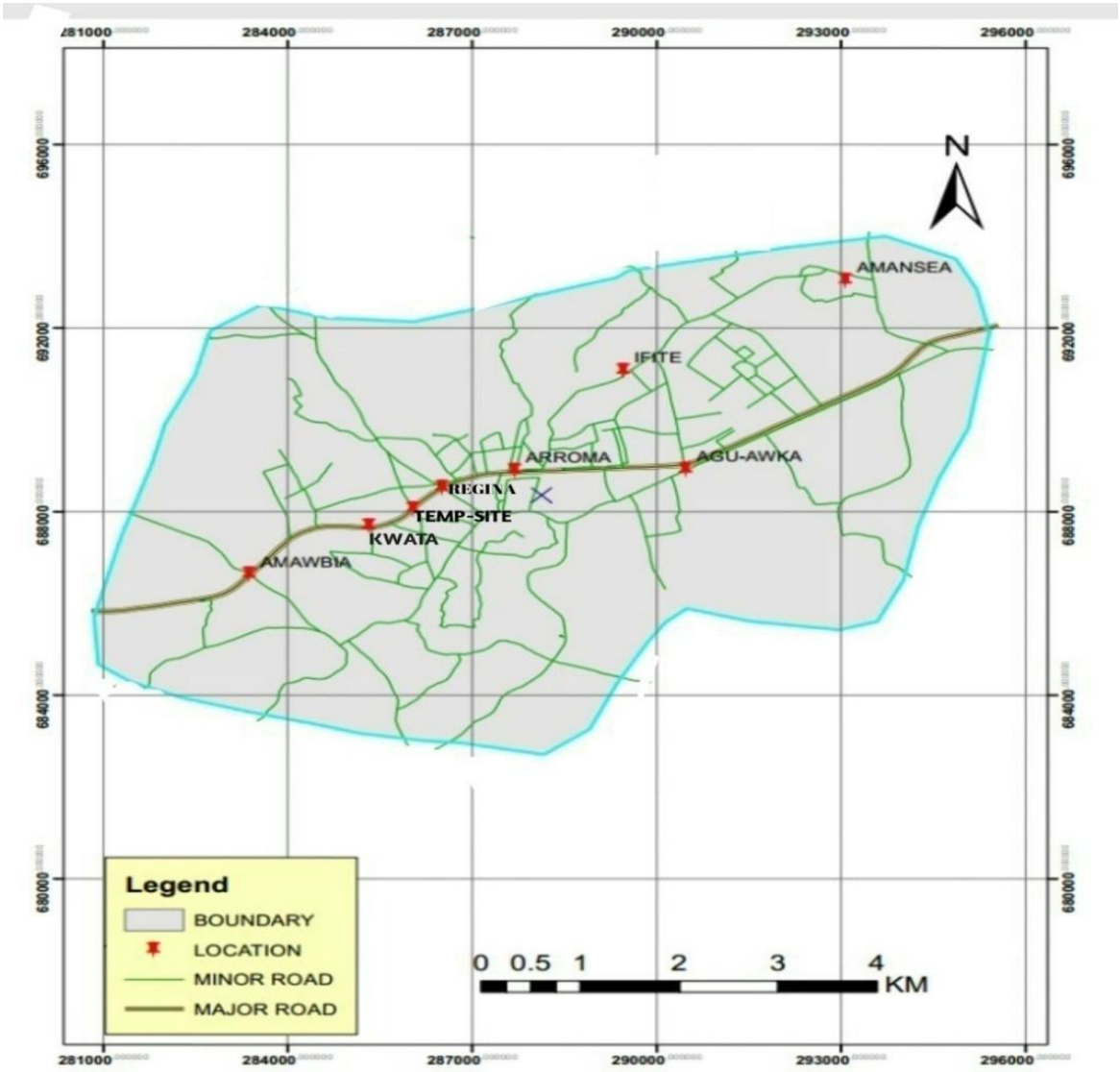


Figure 1.2 Map of Awka showing the location of Ifite Awka.
Source: State Survey Department, Anambra State Ministry of Lands, Surveys and Town Planning

2.2 Literature Review

Amusan, Amusan, Yusuf, Afolayan, and Akinbode (2023) observed that increasing population, urbanization, and scarce resources call for a study to evaluate the waste management challenges, practices, and habits for circular economy development and green growth in Nigeria. Consumption and development theories formed the theoretical framework of this study. Descriptive statistics and secondary sources of information were sourced through books, journal articles, and web pages of specific organizations. In addition, personal-expert knowledge of these fields and the study area was also used in the evaluation of waste management challenges, practices, and habits for circular economic development and green growth in the country. It was found that waste is often burned or disposed of in landfills, open dumps, and water bodies without prior treatment. Thus, waste management is a bottleneck in Nigeria because of the weak or lack of enforcement of environmental regulation policies and legislation. This may be connected with challenges like inadequate

environmental awareness, poor land use, recycling, producers' irresponsibility, corruption, inadequate funding, technology, and development.

Commonly practiced waste disposal methods in Nigeria, according to Omole, Isiorho, and Ndambuki (2016), such as burning, open-air burning, and open dumping, were found to be ineffective and detrimental to public health and the environment. It was also shown that waste management cannot be successfully operated as a social service. Rather, the generator of waste must be held responsible. Problems confronting efficient waste management in Nigeria include the proliferation of unplanned settlements, traffic congestion, insecurity, and ignorance. Fadhullah, Imran., Ismail, Jaafar, and Abdullah (2022) worked on Household solid waste management practices and perceptions among residents in the East Coast of Malaysia. A stratified random sampling technique using a cross-sectional survey questionnaire was used to collect data. A total of 338 households were interviewed in the survey, and data were analyzed using SPSS. Results of the study revealed that 74.3 % of households disposed of food debris as waste, and 18.3% disposed of plastic materials as waste. The study also showed that 50.3% of the households segregate their waste, while 49.7% did not. About 95.9% of the respondents were aware that improper waste management leads to disease, such as diarrhea and malaria. There was an association between locality, age, and house type with waste segregation practices among respondents (Chi-square test, $p<0.05$). Associations were also found between locality and the perception of improper waste management, which led to disease (Chi-square test, $p<0.05$). Principal Component Analysis showed that 17.94% of the variance has a high positive loading (positive relationship) with age, marital status, and type of house. The study highlights the importance of designing waste separation programs that suit the needs of the targeted population as a boost towards sustainable solid waste management practices.

Addo, Dun-Dery, Afoakwa, Elizabeth, Ellen, and Rebecca (2017) in their work on Correlates of domestic waste management and related health outcomes in Sunyani, Ghana: a protocol towards enhancing policy observed that though more than half of the respondents (53.6%) had a positive attitude towards waste management, only 29.1% practiced waste management. The study reveals that there is no proper management of domestic waste except in a few households that segregate waste. The study identified several elements as determinants of waste management practice. Female respondents were less likely to practice waste management (AOR 0.45; 95% Cl 0.29, 0.79), and household size also determined respondents' practice (AOR 0.26; Cl 0.09, 0.77). Practice of recycling (AOR 0.03; Cl 0.02, 0.08), distance to dumpsite (AOR 0.45; Cl 0.20, 0.99), were all significant predictors of waste management practice. Cholera, which is a hygiene-related disease, was three times more likely to determine households' waste management practice (AOR 3.22; Cl 1.33, 7.84). Considering the low waste management practice among households, there is a need for improved policy and enhanced education on proper waste management practices among households.

3. Methodology

The survey design was used in this study. A well-structured questionnaire was administered to respondents, and the responses were used to elicit relevant information from the respondents on the purpose of the study. The distribution of the questionnaire was carried out within a week. Taro

Yamane's formula was used to determine a sample of 398 respondents who were randomly selected from the residents of Ifite Awka, and a questionnaire was administered to them. The collected data were analyzed using Spearman's rank correlation.

4. Result Presentation and Discussion

Table 1: Level of Education of the Respondents

Education level	**Frequency**	**Percent**
O'Level	50	12.56
Undergraduate	154	38.69
Graduate	77	19.35
Vocational Education	45	11.30
Others	20	5.02
None	52	12.55
Total	**398**	**100**

Source: Researcher's fieldwork,2023

Table 1 shows that respondents with O'Level education qualifications are 50 which is 12.56%, Undergraduate are 38.69% of the respondents, Graduates are 19.35% of respondents, those with Vocational education are 11.30% respondents. Others are 5.02% and respondents who don't have any educational qualifications are 12.55%

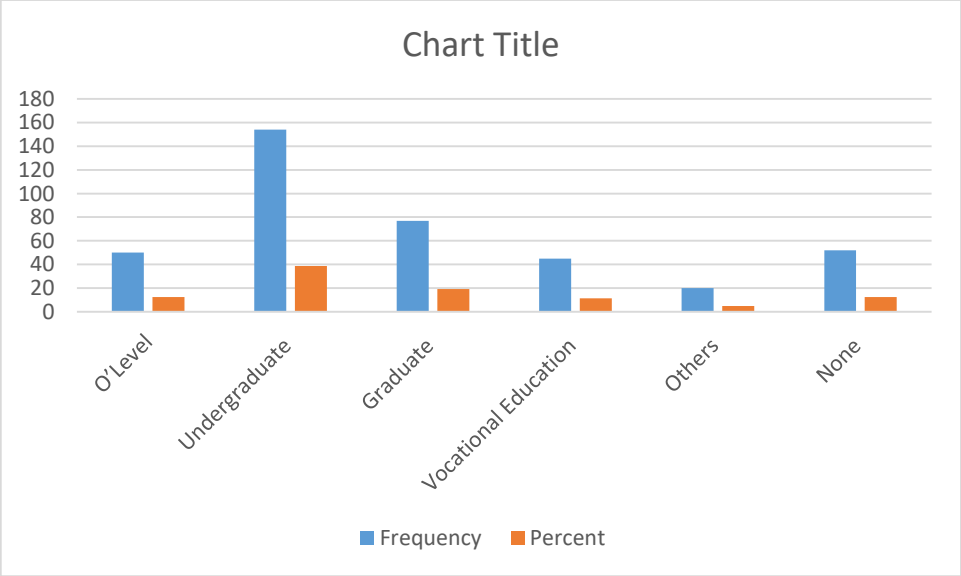


Figure 3 Bar Chart showing distribution of respondents' educational qualifications

Table 2: Occupation of Respondents

Student	201	50.50
Civil Servants	49	12.31
Business Owner	128	32.16
Others	20	5.02
Total	**398**	100

Source: Researcher's fieldwork,2023

The Findings of this table show that 50.50% respondents who participated in the study are Students, 12.31% are Civil servants, 32.16% are Business Owners while 5.02% are Others.

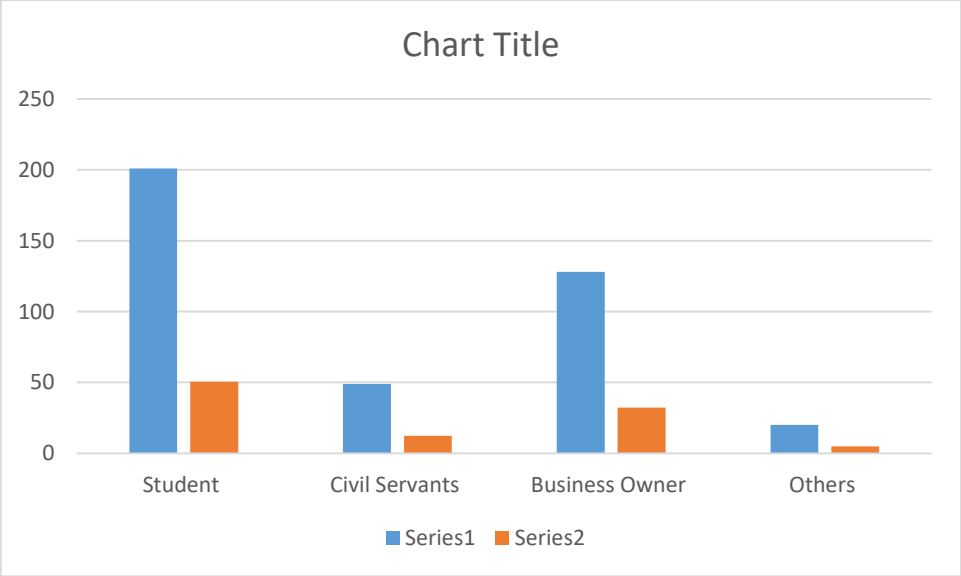


Figure 4. Bar Chart showing the frequency and percentage distribution of respondents' occupations

Table 3: Response to the Existing Situation of Waste Disposal in Ifite Awka

	SA	**A**	**NS**	**D**	**SD**	**Total Frequency**	**Total Percentage**
1. Lack of proper waste management infrastructure	97 (24.37)	84 (21.10)	82 (20.60)	72 (18.10)	63 (15.83)	398	100

2. Open dumping of waste	100 (25.13)	90 (20.10)	90 (22.61)	68 (17.09)	50 (12.56)	398	100
3. Poor waste separation	100 (25.13)	80 (20.10)	108 (27.14)	70 (17.59)	40 (10.05)	398	100
4. Inadequate public awareness	120 (30.15)	70 (17.60)	78 (19.58)	70 (17.59)	60 (15.08)	398	100

Source: Researcher's fieldwork, 2023

From the responses shown in Table 3, it shows that 24.37% of respondents strongly agreed on the lack of proper waste management infrastructure, 21.10% respondents agreed, 20.60% were not sure, 18.10% disagreed, and 15.83% strongly disagreed. On the issue of open dumping, option 25.13% strongly agreed that people engage in open dumping, 20.10% agreed, 22.61% were not sure, while 17.09 and 12.56% disagreed and strongly disagreed respectively. On option of poor waste separation, 25.13% strongly agreed, 20.10% agreed,27.14% were not sure of the situation,17.59% disagreed, and 10.05% strongly disagreed with the existing situation. In the option of inadequate public awareness, 30.15% strongly agreed, 17.60% agreed, 19.58% were not sure,17.59% disagreed, while 15.08% strongly disagreed with this situation.

Table 4: Response to Influences of Environmentally Significant Behavior

	SA	**A**	**NS**	**D**	**SD**	**Total Frequency**	**Total Percentage**
Attitude	95 (23.90)	110 (27.64)	40 (10.05)	81 (20.34)	72 (18.09)	398	100
Social norms	100 (25.13)	80 (20.10)	70 (17.59)	80 (20.10)	68 (17.09)	398	100
Habits	130 (32.66)	84 (21.11)	57 (14.32)	67 (16.83)	60 (15.08)	398	100
Personal belief and values	126 (31.70)	88 (22.11)	68 (16.09)	66 (16.58)	50 (12.70)	398	100

Source: Researcher's fieldwork, 2023

From Table 4, the responses on attitudes affecting waste disposal methods were that 23.90% strongly agreed, 27.64% agreed,10.05% were not sure, 20.34% disagreed, and 18.09% strongly disagreed. For the response to the option of social norms influencing community members' behavior,

25.13% strongly agreed, 20.10% agreed, 17.59 % were not sure, 20.10% disagreed, and 17.09% strongly disagreed on the option. For the option of habits influencing waste disposal, 32.66% strongly agreed, 21.11% agreed, 14.32% were not sure, 16.83% disagreed, and 15.08% strongly disagreed. While responses to the option of personal beliefs and values are 31.70% strongly agree, 22.11% agreed, 16.09% were not sure, 16.58% disagreed, and 12.70% strongly disagree with this option as an environmentally significant behavior that influences community members.

Table 5: Response to the Health Effects of Indiscriminate Disposal of Waste

	SA	A	NS	D	SD	Total Frequency	Total Percentage
Spread of disease	100 (25.13)	148 (37.19)	50 (12.56)	70 (17.59)	30 (7.53)	398	100
Air pollution	128 (32.16)	90 (22.61)	60 (15.08)	70 (17.59)	50 (12.56)	398	100
Water pollution	110 (27.64)	80 (20.10)	68 (17.09)	80 (20.10)	60 (15.08)	398	100
Vector attraction	100 (25.13)	118 (29.65)	50 (12.56)	70 (17.59)	60 (15.08)	398	100

Source: Researcher's fieldwork,2023

Table 5 shows that 25.13% strongly agreed, 37.19% agreed, 12.56% are not sure, 17.59% disagreed, and 7.53% strongly disagreed that indiscriminate waste disposal spreads diseases. On the responses of waste pollution causing air pollution, 32.16% strongly agreed, 22.61% agreed, 15.08% not sure, 17.59% disagreed, 12.56% strongly disagreed. On indiscriminate waste disposal causing water pollution, 27.64% strongly agreed, 20.10% agreed, 17.09% were not sure, 20.10% disagreed, 15.08% strongly disagreed. On the issue of vector attraction option, 25.13% strongly agreed, 29.65% agreed, 12.56% were not sure, 17.59% disagreed, and 15.08% strongly disagreed on views associated with the health effects of indiscriminate disposal of solid waste

4.1 Test for Hypothesis.

The researcher tested the one hypothesis postulated for this study. The hypothesis tested was:

Ho: There is no significant relationship between indiscriminate waste disposal and its health implications.

Level of significance is 0.05

Critical value: Degree of freedom (n-2)

Df = 10-2= 8

At a 0.05 level of significance and 8 degrees of freedom, the critical value of t is 1.86

Test statistics: $rs = 1 - \frac{6\sum d^2}{n\,(n^2-1)}$ - - - Eqn. 1

Where, rs = spearman rank correlation coefficient n = number of row d^2 = (rank (x) – rank (y))^2

Test for significance - - - - - - Eqn.2

df = n-2, the critical value is obtained using the Student t-test distribution table

Where n = sample size, r = coefficient of correlation

Table 6 Spearman's ranking hypothesis

X	Y	Rx	Ry	D(x-y)	d2
100	110	3	2	1	1.00
148	80	1	4.5	-3.5	12.25
50	68	8.5	7	1.5	2.25
70	80	5.5	4.5	1	1.00
30	60	10	8	2	4.00
128	100	2	3	-1	1.00
90	118	4	1	3	9.00
60	50	7	10	-3	9.00
70	70	5.5	6	-0.5	0.25

50	60	8.5	8	0.5	0.25
	10				40

Source: Researcher's fieldwork,2023

From Table 6, the Spearman's rank coefficient (Rs), which is 0.76, shows that there is a strong positive correlation between X and Y. The degree of freedom, which is 8, is used to get the critical value 1.86. The calculated value is 4.35

Since the calculated value 4.35 is greater than the critical value 1.86 at a 0.05 significance level, the null hypothesis is rejected, and the alternative hypothesis is accepted. Therefore**, there is a significant relationship between indiscriminate waste disposal and its health implications.**

After assessing the level of perception of Ifite Awka residents on indiscriminate solid waste disposal and its health implications, it can be concluded that there is a lack of awareness and knowledge on the issue. Many of the residents do not see solid waste disposal as a serious problem and are not aware of the health implications associated with it.

The assessment revealed that there is a need for increased awareness and education on the proper methods of solid waste disposal and its potential health hazards. This can be achieved through public awareness campaigns and educational programs aimed at educating the public on the importance of proper waste management practices. Additionally, there is a need for improved waste management infrastructure, including the provision of waste bins and regular waste collection services, to encourage residents to dispose of their waste properly.

Health hazards associated with indiscriminate waste disposal are real and pose serious public health threats ranging from the transmission of endemic zoonosis to the emergence and re-emergence of health issues, arising either from direct or indirect effects of poor waste management. Most of the developing countries, like Nigeria, are unable to provide proper facilities for the collection and disposal of communal solid waste to the whole population. In Ifite Awka, Anambra state, there's a poor level of perception of residents on proper waste disposal methods, which also impacts the environment and human health greatly. Open dumps are responsible for the blockage of drains, breeding of flies, and spread of epidemic diseases.

Remote areas of Ifite Awka are mostly ignored, and the collection efficiency is very low. This allows for an increase in the level of indiscriminate waste disposal, and it also hinges on their level of perception. Hospitals and other hazardous waste materials are being treated as ordinary waste. Considering the overall negative impacts associated with indiscriminate waste disposal, these practices must be strongly discouraged.

5. Conclusion and recommendation

In conclusion, addressing the issue of indiscriminate solid waste disposal and its health implications requires a multifaceted approach that involves public education, improved waste management infrastructure, and community participation. This work examined the people's

perception of the health impacts of waste disposal. The result of the analysis shows that even though people have the idea that indiscriminate waste disposal can cause health issues, they still indulge in it. By working together, a healthier and more sustainable environment can be created for us and future generations.

The study recommends the following:

i. Public enlightenment and awareness programs should be carried out frequently by the Government through various media to sensitize the people on the health implications and environmental dangers of improper dumping of solid waste. Increase the enlightenment campaign through jingles in mass media.
ii. These health hazards associated with the indiscriminate disposal of waste can be reduced to minimal levels through enactment and re-enforcement of policies and legislation, improvement of funding, monitoring and supervision, recycling waste, and development of landfills, among others.
iii. It is pertinent that all human settlements, regardless of their sizes and locations, develop landfills for proper waste management, which will preserve the environment and promote the well-being of the Nigerian public.
iv. Promoting the production of goods that minimize waste generation after use
v. Emphasizing participation in the monthly environmental sanitation program.

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