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Public Health Risks Associated With Solid Waste Disposal In Southern Taraba, Nigeria

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Abstract

This study investigates the consequences of solid waste disposal methods on the health of residents in the Southern Senatorial District of Taraba State, Nigeria. A cross-sectional survey design was employed. A total of 1,200 respondents were sampled using Taro Yamane's formula, and data were collected through questionnaires. Findings reveal that while respondents generally disagreed that improper solid waste disposal directly causes infectious diseases, they recognized significant environmental impacts, including land and water pollution, unpleasant odors, drainage blockages, and the potential for erosion and flooding. These issues highlight the risks posed by open dumpsites, which are often breeding grounds for disease vectors. Additionally, the study aligns with existing literature emphasizing the environmental and health hazards associated with inadequate waste management, particularly in low-income regions. Despite the perceived disconnect between solid waste disposal and specific diseases, the prevailing environmental contamination presents a tangible threat to public health, necessitating urgent action to improve waste management practices and raise community awareness. Ultimately, enhancing solid waste management systems is essential to safeguarding public health and promoting environmental sustainability in Southern Taraba.

Keywords: Sustainable living, Solid waste, Composting, Better health, Southern Taraba, Nigeria.

INTRODUCTION

The increase in human population, expansion of development, and changing consumption patterns have significantly raised waste generation, with improper disposal posing dire consequences for human health. [3] asserts that when waste is not collected, unsanitary conditions develop, leading to environmental and health risks. The prevalence of diseases such as malaria, cholera, and diarrheal infections in many Nigerian cities is largely attributed to these unsanitary conditions. [14] revealed that unsanitary disposal of solid

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waste promotes fecal-oral transmission of diseases through the contamination of hands, food, and water. He further noted that solid waste dumps serve as breeding grounds for mosquitoes, rats, and other vermin, contributing to the spread of diseases such as yellow fever, Lassa fever, and trachoma in Nigeria. [15] echoed these concerns, emphasizing that in Nigeria, refuse disposal and access to sanitary means of excreta disposal often remain low priorities, as evidenced by the litter that abounds in the environment.

There is considerable concern regarding the residues, including domestic waste, which may poison or damage the environment, adversely affecting species in the biosphere and destabilizing ecological balance. Modern Nigerian urban domestic waste is characterized by the presence of polythene materials, garbage, bottles, cans, paper, foil wrappings, and other household discards. The volume of these wastes is significantly increasing due to the constant consumer desire to discard old items in favor of new ones. [8] highlighted that improperly managed waste, particularly solid waste from households and communities, poses serious health hazards and facilitates the spread of infectious diseases. Unattended waste attracts flies, rats, and other creatures that transmit diseases. Typically, it is wet waste that decomposes and emits unpleasant odors. The ever-increasing consumption of resources leads to substantial amounts of solid waste from industrial and domestic activities, posing significant threats to human health [4],[5]. Consequences include health deterioration, accidents, flooding, and environmental pressures.

The consequences of indiscriminate solid waste disposal are numerous. In many developing countries, particularly Nigeria, solid waste disposal sites are often located on the outskirts of urban areas. These sites become sources of contamination for children due to the proliferation of flies, mosquitoes, and rodents that act as disease transmitters, adversely affecting human health. This situation can lead to a variety of diseases, including gastrointestinal, dermatological, respiratory, and genetic disorders [4],[12].

[13] revealed that many cities in developing countries face serious environmental degradation and health risks due to poorly developed municipal solid waste management systems. As a result, waste is often dumped in municipal disposal sites, and ineffective management transforms these dumps into sources of environmental and health hazards for nearby residents. This waste pollutes land, water, and air. Open dumpsites pose significant environmental challenges, particularly regarding air quality. The improper disposal of healthcare and medical waste mixed with domestic refuse heightens the risk of infections such as Hepatitis B and HIV [11]. Dumpsites emit noxious odors and smoke that can lead to illnesses among those living in close proximity (Marshal, 1995). According to [7], pollution is a major environmental consequence of dumpsites, with pollutants often entering the human body through contaminated crops, animals, food products, or water. Additionally, the unsightly and smelly conditions of dumpsites further contribute to public health concerns.

Given the severe health risks and environmental degradation associated with solid waste mismanagement, studying the consequences of solid waste in Southern Taraba is vital. Understanding these consequences can help identify effective waste management strategies tailored to the region's unique challenges, ultimately improving public health outcomes and fostering sustainable development.

METHODOLOGICAL APPROACH

This study utilized a cross-sectional survey design, selected for its effectiveness in gathering pertinent data within a constrained timeframe from a representative sample. The cross-sectional nature of this methodology allowed for the collection of a snapshot of information at a specific point in time, facilitating the examination of relationships between variables related to solid waste disposal practices and public health in the Southern Senatorial District of Taraba State, Nigeria. Additionally, this design enhances the generalizability of the findings to the broader population, thereby improving the external validity of the research.

To establish the sample size, Taro Yamane's formula was employed, resulting in a target of 1,200 participants drawn from a total study population of 1,068,367. This formula is well-regarded for producing a statistically valid sample size that accurately reflects the population. Following the distribution of questionnaires, a total of 1,090 responses were collected, achieving an impressive response rate of 91.0%. This high level of engagement underscores the community's interest in the research topic, thereby strengthening the dataset's robustness. The comprehensive nature of this dataset was deemed sufficient for thorough analysis, providing a solid foundation for drawing meaningful conclusions and making informed recommendations regarding solid waste disposal practices and public health in the region.

In summary, the methodological rigor employed in this study not only enhances the reliability of the findings but also positions the research as a significant contribution to the ongoing dialogue surrounding waste management and public health in Southern Taraba.

DATA PRESENTATION ANALYSIS

Consequences of solid waste disposal methods on the health status of the people of Southern Taraba, Nigeria

Data showed that respondents rated environmental dirtiness as the resultant effect of solid waste disposal systems in the study area, a majority of the respondents maintained that the blockages of drainages/gutters in the study area were caused by the inappropriate methods of solid waste disposal in the area, some of the respondents stated that the uncontrolled disposal of solid waste causes erosion and flood, a majority of the respondents also rated that the inappropriate methods of solid waste disposal in the study area were responsible for the poor health of the people. The findings were reported in the Table below

Table 4.1. Respondents Ratings of the Consequences of solid waste disposal methods on the health status of the people of Southern Senatorial District of Taraba State

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Mean	STDV
1. Southern Taraba residents suffer from different infectious	-	-	-	425	665	3.83	1.464

diseases (such as typhoid fever, diarrheal, malaria, HIV, Hepatitis, cholera, etc.) as a result of solid waste disposal							
2. Land and water pollution are commonly caused by solid waste disposal in my area	460	3	26	394	207	3.11	1.674
3. Solid waste disposal especially improper disposal causes unpleasant odour in my area	462	328	-	190	110	3.77	1.407
4. Environmental dirtiness in my area is determined by solid waste disposal	849	166	-	73	2	4.64	.809
5. The blockages of the drainages/gutters in our locality is as a result of the methods of solid waste disposal in the area	718	294	-	31	47	4.47	.969
6. Uncontrolled disposal of solid waste has the tendency of resulting to erosion and flood	706	295	-	33	56	4.43	1.022
7. Solid waste disposal is responsible for the poor health of the residents in Sothern Taraba State	529	407	35	101	18	4.22	.995

Source: Field Survey, 2024

Data on Table 4.1 showed that most of the statements had mean score that were above 3.50 which indicated an average ratings of the statements. The standard deviation values ranged from 0.809 to 1.674, indicating the proximity of these values to the mean. This implies that the position of the respondents is almost the same.

DISCUSSION OF FINDINGS

Findings on the consequences solid waste disposal methods on the health status of the people of Southern Senatorial District of Taraba State, showed that respondents disagreed with the statement that Southern Taraba residents suffer from different infectious diseases (such as typhoid fever, diarrheal, malaria, HIV, Hepatitis, cholera, etc.) as a result of solid waste disposal. Also, a majority of the respondents were of the view that land and water pollution are commonly caused by solid waste disposal in their area, most of the respondents were of view that solid waste disposal especially improper disposal causes unpleasant odour in their area; environmental dirtiness in their area is determined by solid waste disposal, blockages of the drainages/gutters in their locality is as a result of the methods of solid waste disposal in the area;

uncontrolled disposal of solid waste has the tendency of resulting to erosion and flood which to a large extent can lead to poor health of the residents in Sothern Taraba State.

In many parts of the world where solid waste disposal is done indiscriminately, the health of the people in such places is at risk. The findings here are in line with [1] who noted that solid waste is recognized to have environmental and health hazards to the people, solid waste is rarely sorted making recycling difficult but also more hazardous to handle from the point it is generated to final disposal. Furthermore, in general, less than half of all solid waste in low income countries is collected implying that a large fraction of solid waste is disposed of in unsafe ways posing health risks to the general public. Open dumpsites are a common disposal method and this poses serious environmental contamination risks and also act as sources of diseases vectors and pathogenic agents.

Due to poor handling and maintenance, even disposal methods that are deemed safe in other setting can be hazardous in poor countries. Poorly maintained and run incinerators pose a health risk not only to the operators but also to those living in the neighborhood due to incomplete combustion and subsequent release of dioxins. [2], 74(55) Page 8 of 11 revealed the adverse health effects and mortality attributable to solid waste. The framework clarifies many of the linkages, but definitely not exhaustive due to lack of knowledge of causal linkages while in other cases where the linkages are known, the burden of the impact is not clear to many including policy makers. However, in spite of these challenges, existing evidence on the need to appreciate the health risks associated with various types of solid waste is strong and can be a good basis for drawing more attention on improving solid waste management. There is compelling evidence to show that solid waste, especially medical waste and other biodegradable waste are potential sources of pathogenic organisms such as viruses, bacteria and fungi and as such need to be strictly managed. This has been demonstrated among handlers of medical waste, pickers of solid waste and those living in the neighborhood of dumping sites.

In addition to the poor solid waste collection and disposal practices, mitigation against known risks are also limited. Handlers of medical waste can benefit from consistent use of personal protective equipment, and vaccination against certain infection such hepatitis B virus. These can be ensured through legislation enforcement, health education to all those involved in the solid waste management chain, and provision of vaccinations to those at risk and provision of treatment to those already affected.

CONCLUSION AND RECOMMENDATIONS

The findings of this study highlight the significant consequences of solid waste disposal methods on the health status of residents in the Southern Senatorial District of Taraba State. While respondents generally disagreed that infectious diseases were directly attributable to solid waste disposal, there was widespread acknowledgment of the adverse environmental impacts resulting from improper disposal practices. The prevalent concerns regarding land and water pollution, unpleasant odors, drainage blockages, and the potential for erosion and flooding underscore the urgent need for improved waste management strategies. Moreover, the study aligns with existing literature that identifies solid waste as a source of environmental and health hazards, particularly in low-income countries where inadequate waste collection and unsafe disposal methods are common.

To address these pressing issues, it is imperative to implement a comprehensive waste management framework that focuses on both the health and environmental aspects of solid waste disposal. A major recommendation is to enhance community education and awareness programs about the importance of proper waste disposal practices and their implications for public health. Such programs should aim to:

1. Educate residents on the health risks associated with improper solid waste disposal and the benefits of responsible waste management.

2. Implement waste segregation initiatives to facilitate recycling and minimize the hazards associated with mixed waste, especially medical and biodegradable materials.

3. Provide training and resources for waste handlers and community members to ensure safe practices, including the use of personal protective equipment and vaccination against infectious diseases like hepatitis B.

4. Establish robust waste collection systems to reduce the prevalence of open dumpsites, improve overall cleanliness, and mitigate environmental contamination.

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