

Original Research Article

Assessment of Household Waste Disposal Methods and their Environmental Health Risks Among Residents in Ogbia Town, Bayelsa State, Nigeria

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Abstract: Background: Improper household waste disposal remains a major environmental and public health challenge in semi-urban communities in Nigeria. This study assessed household waste disposal methods and their environmental health risks in Ogbia Town, Bayelsa State. Methods: A descriptive cross-sectional design was used. A sample of 379 household heads (>18 years) was selected using simple random sampling. Data were collected with a validated structured questionnaire (4 sections) and analyzed using SPSS version 26.0 with descriptive statistics (frequencies, percentages). Results: Majority had heard of proper waste management 301(79.4%), mainly through media 187(49.3%), and 298(78.6%) believed improper disposal affects health. Despite high awareness, unsafe practices predominated: open dumping 142(37.5%) and open burning 88(23.2%), while only 28(7.4%) used waste management agencies. Most 218(57.5%) reported no authorized collection service. Environmental problems observed included flies/rodents 298(78.6%), bad odour 281(74.1%), flooding from blocked drainage 214(56.5%), and water pollution 178(47.0%). 263(69.4%) reported household illnesses linked to waste, notably malaria 198(52.2%), diarrhoea 143(37.7%), typhoid 112(29.6%), and respiratory problems 74(19.5%). 302(79.7%) agreed current practices pose health risks, and 287(75.7%) were willing to adopt improved methods. Conclusion: High knowledge coexists with poor practice due to infrastructural deficits. There is an urgent need for improved collection services, enforcement, and health education.

Keywords: Household Waste, Waste Disposal, Environmental Health Risks.

Introduction

Household solid waste generation is inevitable in daily human activities, especially in developing communities experiencing population growth (Tchobanoglous et al., 2014). In Ogbia Town, waste includes food remains, plastics, polythene, paper, metals, and bottles. Storage, collection and disposal methods determine environmental quality and public health.

Ogbia Town faces challenges of rapid population increase, limited collection services, inadequate disposal facilities, and low awareness, worsened by poor road access and irregular evacuation (Ogbonna et al., 2007). Common methods include open dumping, disposal into bushes/waterways, roadside dumping, and open burning.

Improper disposal blocks drainage, causing flooding, contaminates surface and groundwater, and open burning causes air pollution (UNEP, 2015). It creates breeding sites for mosquitoes, flies, and rodents, transmitting malaria, cholera, typhoid, and dysentery (WHO, 2018). Despite evident risks, limited empirical data exist for Ogbia Town, hindering intervention design. This study, therefore, assessed disposal methods, knowledge, and associated environmental health risks.

Objectives

1. To identify the main household waste disposal methods used.
2. To determine residents' knowledge of household waste management.
3. To assess environmental health risks associated with disposal methods.

Literature Review and Theoretical Framework

Conceptually, household waste comprises organic, inorganic and hazardous fractions (Tadesse & Endris, 2020). Disposal includes formal (municipal collection) and informal (open dumping, burning) methods (Hoornweg & Bhada-Tata, 2012). Knowledge strongly correlates with practice (Abdullah et al., 2018) but is mediated by attitudes, norms, and infrastructure (Ajzen, 1991).

This study was anchored on the Health Belief Model (Rosenstock, 1974), Theory of Planned Behavior (Ajzen, 1991), and Environmental Awareness Theory (Kollmuss & Agyeman, 2002), which explain how perceived susceptibility, social norms, and awareness shape disposal behaviour.

Empirical studies show open dumping and burning dominate in developing countries due to poor infrastructure (Guerrero et al., 2013; Nabegu, 2010), while education improves knowledge (Abdullah et al., 2018; Afon, 2012) but does not guarantee proper practice without services.

Methodology

Study design: A descriptive cross-sectional study was adopted for the study. The study was carried out in Ogbia Town, headquarters of Ogbia LGA, Bayelsa State, Niger Delta, Nigeria. Semi-urban, tropical climate, residents engaged in farming, fishing, trading, and civil service.

The population included all households in Ogbia Town, adult household heads (>18 years).

Sample size: the sample was determined by Cochran's formula: $n = \frac{Z^2 P(1-P)}{d^2}$, using $Z=1.96$, $P=0.56$ (David et al., 2020), $d=0.05$, giving $n=379$.

Sampling Technique: A simple random sampling was used to select households; household heads were administered the questionnaire.

Instrument for data collection: A structured questionnaire in four sections was used with sections A, B, C and D. A-Socio-demographic data, B-methods of waste disposal, C-Knowledge of waste disposal, D-Health risks associated with waste disposal.

The instrument was validated by a research committee of the Environmental Health Science Department, Bayelsa State College of Health Technology, Otuogidi.

The reliability of the instrument was confirmed via a test-retest pilot (10% outside the study area).

Data analysis: the data collected were analyzed with the use of SPSS 26.0, and descriptive statistics were presented as frequencies and percentages.

Results

All the 379 administered questionnaires were returned (100% response).

Socio-demographic: the socio-demographic data were ;Male 198(52.2%), female 181(47.8%). Age 31-45 years 143(37.7%) highest. Married 221(58.3%). Secondary education 158(41.7%), tertiary 129(34.0%). Traders 98(25.9%), civil servants 87(23.0%).

Knowledge of waste: 301(79.4%) of the respondents had heard of proper waste management. Through the following ways, the mass media 187(49.3%), in school

102(26.9%), through health workers enlightenment campaigns 98(25.9%). Respondents also recognized various waste disposal practices as follows: proper storage 218(57.5%), segregation 192(50.7%), recycling 175(46.2%), composting 121(31.9%). 298(78.6%) believed improper disposal affects health.

Disposal methods: the various waste disposal methods were indicated by the respondents in the study area ; Mixed waste (food, plastic, paper, metal/glass) 238(62.8%). The main methods are, open dumping 142(37.5%), burning 88(23.2%), public bins 58(15.3%), burying 34(9.0%), river/stream 29(7.7%), agency collection 28(7.4%). The disposal frequency is daily 168(44.3%). 218(57.5%) reported no authorized collection service.

Associated environmental health risks: The observed problems are : flies/rodents 298(78.6%), bad odour 281(74.1%), flooding 214(56.5%), water pollution 178(47.0%). 263(69.4%) also reported waste-related illness in household: malaria 198(52.2%), diarrhoea 143(37.7%), typhoid 112(29.6%), skin infections 89(23.5%), respiratory problems 74(19.5%). 302(79.7%) agreed that current practices pose risks. 287(75.7%) and are willing to adopt improved methods of disposal

Discussion

High awareness (79.4%) aligns with Adogu et al. (2015) in Owerri and Adekola et al. (2021) in Benin City, suggesting awareness campaigns have an impact. However, persistence of open dumping/burning despite knowledge mirrors Jatau (2013) in Jos, confirming that knowledge alone is insufficient without infrastructure.

Predominance of open dumping (37.5%) and burning (23.2%) agrees with Nwoke and Nwabueze (2015) and Ayoola and Olaniyi (2014), and Kaza et al. (2018) in developing countries. Low agency collection (7.4%) supports Ezeah and Roberts (2014) that service availability determines practice.

Health risks observed corroborate Ferronato and Torretta (2019), Ogwueleka (2009), and Akinbile and Yusoff (2011) linking poor disposal to vector proliferation, drainage blockage, water contamination, and respiratory illness.

Conclusion

Improper waste disposal remains a significant challenge in Ogbia Town. Open dumping and burning dominate due to inadequate infrastructure and irregular collection,

leading to pollution, flooding, vector breeding, and a high burden of communicable diseases. Interrelated factors include weak services, poverty, low awareness of specific practices like composting, and poor enforcement.

Recommendation

1. The Bayelsa State Government should provide bins, trucks, and designated dumpsites and ensure regular collection.
2. Intensify health education via media and health workers on segregation, recycling, and composting.
3. Strengthen enforcement of sanitation laws against illegal dumping and open burning.
4. Promote community participation through leaders and youth groups.
5. Construct proper drainage and establish a sanitary landfill for Ogbia Town.
6. Deploy more environmental health officers for monitoring.
7. Further research on attitudes and socio-economic determinants across Bayelsa State.

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