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Factors Affecting Waste Management in Ibadan North West Local Government

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Annotation: Introduction

Solid Waste Management (SWM) is a critical issue affecting public health and environmental sustainability, exacerbated by rapid urbanization and increasing waste generation. Historically, solid waste management has evolved from ancient practices to contemporary systems grappling with modern challenges. The rise in urban populations has intensified the strain on municipal waste systems, especially in developing countries like Nigeria.

Keywords: Solid Waste Management, Public Health, Ibadan North West, Urbanization, Infrastructure, Community Participation.

In Ibadan North West Local Government Area (LGA), waste management practices face significant obstacles including inadequate infrastructure and economic constraints, impacting both the environment and public health.

Objective

This study aims to analyze the factors affecting waste management in Ibadan North West LGA, assess their impact on public health, and provide recommendations for improving solid waste management practices. The research seeks to understand the current waste management practices, identify key challenges, and propose strategies to enhance waste management in this region.

Method of Analysis

A descriptive cross-sectional study was conducted using a self-designed questionnaire to gather data on waste disposal practices within Ibadan North West LGA. A multi-stage sampling technique was employed to select participants. The collected data was coded, entered, and analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics, including tables and frequencies, were used alongside inferential statistics, with Chi-square tests employed to explore the relationship between variables.

Results

The study population had a mean age of 27 years, with 56.5% female and 43.5% male respondents. Educational attainment varied: 57.6% had secondary education, 20.6% had no formal education, 9.4% had basic education, and 12.5% had tertiary education. The majority (81.8%) lived in households of 4-6 members. Occupations included 47.1% traders, 27.9% civil servants, and 25.0% self-employed individuals. Respondents largely believed that improper waste management increases disease risk (87.0%), contaminates water sources (91.4%), causes air pollution (87.2%), and fosters pests (85.2%). Awareness of educational programs related to waste management was high (97.4%), with 75.8% seeking information daily. Food waste was the most common type generated (67.9%), and 71.6% reported daily waste generation. Most households (52.1%) used closed containers for waste storage, with challenges including high disposal costs (40.4%), lack of disposal sites (16.4%), and collection delays (26.0%). The majority (71.1%) had a dumping site nearby, with 67.7% located within 10-50 meters. Management methods included burying (69.3%), burning (20.6%), and unattended sites (10.2%). Barriers to effective waste management included inadequate infrastructure (87.8%), insufficient policies (74.7%), lack of community awareness (85.7%), and socioeconomic factors (84.9%).

Conclusion

The study highlights significant issues in waste management practices in Ibadan North West LGA, including high disposal costs, inadequate infrastructure, and delays in collection. Despite high levels of public awareness, challenges persist, necessitating targeted interventions. Recommendations include investing in waste management infrastructure, strengthening policy enforcement, enhancing public awareness campaigns, and addressing socioeconomic factors. Community engagement and participation are crucial for successful waste management initiatives, aiming to improve environmental and public health outcomes.

Background

The progress of human civilization has been intricately tied to the effective handling of solid waste, given its significant impact on both public health and the environment. Solid Waste Management (SWM) systems can be traced back to ancient times, with one of the earliest instances occurring in the 4th century A.D. among the Ancient Greeks. Confronted with challenges such as a burgeoning population, limited space, and sanitation issues, the Greeks implemented basic waste management

practices involving the collection and transportation of trash to designated pits outside their cities.

In contemporary times, SWM has been recognized as one of the biggest challenges facing municipal authorities worldwide, driven by population growth, urbanization, and poverty (Hoornweg & Bhada-Tata, 2012; Tacoli, 2018; United Nations, 2013; UNDP, 2012). Since 2007, more than half of the world's population has been living in urban centers, with this figure expected to exceed 70% by 2050 (United Nations, 2018). This demographic shift poses immense challenges for urban waste management systems, which must adapt to the increased generation of solid waste. The World Bank classifies countries by income, with more economically developed countries (MEDCs) having advanced waste management systems compared to less economically developed countries (LEDCs), which face higher birth rates, infant mortality rates, death rates, and lower life expectancies and literacy rates (Revision World, 2017; Sullivan & Sheffrin, 2022).

In most countries, SWM operations are typically a local responsibility, with nearly 70 percent of countries establishing institutions responsible for policy development and regulatory oversight in the waste sector. About two-thirds of countries have created targeted legislation and regulations for solid waste management, although enforcement varies drastically. Direct central government involvement in waste service provision, other than regulatory oversight or fiscal transfers, is uncommon. About 70 percent of waste services are overseen directly by local public entities, and at least half of services, from primary waste collection through treatment and disposal, are operated by public entities. Approximately one-third of these services involve public-private partnerships, which can be successful under certain conditions with appropriate incentive structures and enforcement mechanisms.

Financing solid waste management systems is a significant challenge, especially for ongoing operational costs, which often exceed initial capital investments. High-income countries spend over $100 per tonne on integrated waste management, including collection, transport, treatment, and disposal. Lower-income countries spend about $35 per tonne but face greater difficulties in recovering costs. Waste management is labor-intensive, and transportation costs alone range from $20–$50 per tonne. Cost recovery for waste services differs drastically across income levels, with user fees averaging $35 per year in low-income countries and $170 per year in high-income countries. Full or nearly full cost recovery is largely limited to high-income countries. User fee models may be fixed or variable based on the type of user being billed. Typically, local governments cover about 50 percent of investment costs for waste systems, with the remainder coming mainly from national government subsidies and the private sector (Baabereyir, 2019).

Effective SWM is crucial for sustainable development, particularly in developing countries where rapid urban development poses critical environmental challenges. Solid waste arising from human domestic, social, and industrial activities is increasing in quantity and variety due to growing populations, rising standards of living, and technological advancements (Jumanne, 2010). In Nigeria, solid waste management is a major responsibility of state and local governments. The Federal Government has instituted the National Integrated Municipal Solid Waste Management Intervention Programme in several cities, including Lagos, which has implemented a municipal solid waste management policy encompassing private sector participation in waste collection and transfer to designated landfill sites (Momoh & Oladebeye, 2010).

Despite these efforts, Nigerian cities, including Ibadan North West Local Government Area, face serious environmental challenges due to poor solid-waste management. Rapid urbanization, economic constraints, inadequate infrastructure, low public awareness, and governance shortcomings contribute to a poor solid-waste management system, resulting in serious environmental crises. In cities undergoing rapid urbanization, the problems and issues of solid-waste management are of immediate importance (Momoh & Oladebeye, 2010). Nigerian cities and towns are currently facing serious environmental challenges due to poor solid-waste management. Solid waste is generated at a rate beyond the capacity of authorities to handle, leading to an unsustainable urban environment. This has resulted in a poor solid-waste management system that portends

serious environmental crises in most Nigerian towns and cities (Abel & Afolabi, 2007).

The improper handling of waste can lead to public health problems such as cholera, diarrhea, and typhoid, as well as environmental pollution affecting groundwater and marine ecosystems. The perception of garbage as a threat to human and environmental health emerged with the rapid growth of urban populations. As cities expanded to accommodate the increasing populace, living conditions deteriorated for the densely packed communities. The plagues that swept through Europe from the 14th to the 16th centuries were often exacerbated by vermin thriving in the unhygienic urban environments of that era. It was during this period that early waste-management techniques were devised to counteract the spread of diseases.

Addressing these challenges requires comprehensive analysis and strategic, sustainable solutions. Public awareness and community participation are crucial for effective waste management, which can also provide employment opportunities and contribute to poverty alleviation. The need to manage increasing waste in an environmentally effective, technologically feasible, economically affordable, and socially acceptable manner is a problem faced by all nations today. Waste management is not glamorous; yet without it, every city would cease to exist (Zurbrugg, 2022). Consequently, the degree of success with which developed and developing countries, including Nigeria, are coping with the problem is very different. While the developed world has sought effective solutions through greater efforts to move up what is called the “solid waste hierarchy,” developing countries are often overwhelmed with the waste problem or can barely grapple with the elementary stages of it. The solid waste hierarchy is an internationally accepted and recommended ranked priority of waste handling using the following ascending order of preference: open burning, dump landfill, incinerate, recycle, reuse, and prevent (Kreith, 2023). The first two methods (open burning and dump) are least preferred and actually not recommended, even though they are highly used by many developing countries. In most developing countries, typically one to two-thirds of the solid waste generated is not collected (Zerbock, 2019). As a result, uncollected waste is dumped indiscriminately in the streets and in drains, contributing to flooding, breeding of insect and rodent vectors, and the spread of diseases.

The inadequate state of solid waste management in developing countries' urban areas is swiftly transforming into a social and environmental concern. Consequently, there has been an ongoing push for recycling-oriented practices to ensure sustainable growth by reducing the depletion of natural resources and mitigating environmental impacts, both technologically and socially. The composition of various wastes has evolved over time and location, with industrial development and innovation directly influencing the types of waste materials generated. Certain components of waste possess economic value and can be recycled when properly recovered (Awunyo et al., 2013).

Waste encompasses all items that individuals no longer find useful, and they either plan to dispose of or have already discarded. Numerous items fall under the category of waste, including household refuse, sewage sludge, by-products from manufacturing processes, packaging materials, abandoned vehicles, outdated televisions, garden waste, and used paint containers (European Environment Agency, 2013). Consequently, the various activities we engage in on a daily basis contribute to a diverse range of waste arising from different sources. The municipal waste problem is frequently discussed and has become a main issue in urban management. In fact, the issue of waste management is becoming more complex and challenging in the future due to the tremendous growth in urban population and their consumption patterns. It is argued that the greater the economic prosperity and the higher the percentage of urbanization, the greater the amount of solid waste produced, making waste management more complex (Hassan, 2000).

Moreover, Solid Waste Management is a crucial public service issue affecting both the environment and public health. That means it is not only limited to the collection of waste and its disposal, but it also requires clear strategies for collection, transportation, sorting, and recycling of waste. Solid waste management is highly affected by the culture of the people and their level of awareness. Municipal waste is generated by households, commercial activities, and other sources whose

activities are similar to those of households and commercial enterprises. Municipal waste is made up of residual waste, bulky waste, secondary materials from separate collection like paper and glass, household hazardous waste, and yard waste. However, the rapid increase in the urban population and the expansion of cities in developing countries have made the management of municipal waste more complex and challenging, especially in the context of inadequate infrastructure and financial constraints.

Given the severity of the situation, this research aims to understand the factors affecting waste management in Ibadan North West Local Government Area and its impact on public health, contributing to the methodology and practice of SWM in developing countries. The situation in Africa, particularly in the capital cities, is severe. The public sector in many countries is unable to deliver services effectively, regulation of the private sector is limited, and illegal dumping of domestic and industrial waste is common. Solid waste management is given a very low priority in these countries. As a result, very limited funds are provided to the solid waste management sector by the governments, and the levels of services required for the protection of public health and the environment are not attained. The problem is acute at the local government level, where the local taxation system is inadequately developed, and the financial basis for public services, including solid waste management, is weak. The service provided in a majority of developing country cities and towns can, at best, be described as unreliable, irregular, and inefficient. In Nairobi, the capital city of Kenya with about 4 million people, only about 25 percent of the estimated 1,500 tons of solid waste generated daily gets collected (UN-HABITAT, 2010). Yet, until the mid-1970s, the Nairobi City Council (NCC) singly collected over 90 percent of the waste.

Materials and Methods

Study Area

The study focuses on Ibadan North West Local Government Area (LGA), which emerged as a distinct LGA from the former Ibadan Municipal Government. This LGA encompasses both meticulously planned regions such as Onireke, Jericho, Idi-Ishin, and Eleyele, as well as unplanned areas including Inlalende, Oni-Yanri, Olosa-Oko, Ayeye, Agbaje, and Abebe. The administrative center of the Local Government is situated in Dugbe, a prominent Central Business District within Ibadan. This diversity in the landscape of Ibadan North West presents an opportunity to examine solid waste disposal practices across both planned and unplanned areas within the LGA.

Study Design

This is a descriptive cross-sectional study which will employ a self-designed questionnaire to gather pertinent data on solid waste disposal practices within Ibadan North West Local Government Area.

Study Population and Sample Size

The study population included all adult females and males aged 18 years and above living in the study area. To account for possible attrition and non-response, the sample size was increased by 10%, resulting in an actual sample size of 352 participants. The sample size for this study was determined using Cochran's formula

Sampling Techniques and Procedure

A multi-stage sampling technique was adopted for the selection of study participants. Initially, five out of the ten wards in Ibadan North West Local Government Area were selected using a simple random technique (balloting). The names of all the council wards in the Local Government were written on separate pieces of paper, folded, and placed in a basket. After thorough mixing and shuffling, five pieces were picked without replacement, representing the five wards for the study.

In each selected ward, the total number of houses was obtained from the Primary Health Care Department, utilizing the house numbering used for immunization purposes. A conservative recruitment sampling approach was then applied, starting from the village square and the chief's house, to select the required number of houses and households from each ward.

Within each selected household, an adult female or male was chosen as the respondent. In households with multiple adult females and males, a simple random technique (balloting) was employed. "Yes" and "No" were written on pieces of paper, folded, and placed in a basket. The adult females and males were asked to pick from the basket, and the individual who picked "Yes" was selected for the interview.

Data Collection

Data were collected from respondents at the household level using a semi-structured questionnaire. The questionnaire consisted of Section A, which gathered socio-demographic data, and Section B, which included questions on the types of waste generated, methods of waste collection and disposal, and self-reported health problems associated with solid waste disposal. To ensure the appropriateness of the questions, the questionnaire was pre-tested among 10% of the sample population in Ibadan North Local Government Area, which had similar characteristics to the study area.

Three research assistants with tertiary education were recruited and trained for one week by the research coordinator to assist in data collection. The questionnaires were administered to each respondent after obtaining their verbal consent, with the researcher providing proper explanations when needed. Participants were eligible for the study if they were male or female and 18 years or older, residing in Ibadan North Local Government Area. Those not living in this area, despite meeting the age criteria, were excluded from the study.

Methods of Data Analysis

The data collected was coded, entered, cleaned, and analyzed using the Statistical Package for Social Sciences (SPSS) software version 20. Descriptive analysis was conducted, and the data was presented in tables and frequencies. Inferential statistics were used. The association between independent and dependent variables was tested using the Chi-square test.

Ethical consideration

A letter of introduction was obtained from the Department of Public Health, Lead city University, Ibadan, Oyo State, to facilitate the acquisition of ethical clearance from the Lead City University Research Ethics Committee and gain access to the community. Verbal consent was sought from the community heads in Ibadan North Local Government Area, where the research was conducted. Informed verbal consent was also obtained from the study participants. Participants were informed that participation in the study was voluntary and assured of the anonymity of their identity before the survey commenced. They were also informed that they could withdraw from the study at any point without facing consequences.

Table 1; Socio demographic characteristics of the respondents

Variable	Frequency	Percentage
Age range(years)		
Less than 20	56	14.6
20-29	208	54.2
30-39	50	13.0
40-49	70	18.2
Mean±Standard Deviation	**27±5.7**	
Sex of respondent		
Female	217	56.5
Male	167	43.5
Level of education		
No formal education	79	20.6
Basic	36	9.4
Secondary	221	57.6

Tertiary	48	12.5
Household size		
1-3	48	12.5
4-6	314	81.8
More than 6	22	5.7
Occupation		
Trader	181	47.1
Civil servant	107	27.9
Self employed	96	25.0
Marital status		
Single	138	35.9
Married	200	52.1
Divorced	16	4.7
Widowed	30	7.8
Religion		
Christainity	168	43.8
Islam	200	52.1
Traditional	16	4.7
Residential area		
Dugbe	192	50.0
Ayeye	149	38.8
Onireke	43	11.2
How long have you lived in this area		
1-3years	293	76.3
More than 4years	91	23.7

The socio-demographic characteristics of the respondents reveal a diverse population in terms of age, sex, education, and other factors. The age distribution shows that the majority of respondents (54.2%) were between 20 and 29 years old, with fewer individuals in the younger (less than 20 years: 14.6%) and older age ranges (30-39 years: 13.0%; 40-49 years: 18.2%). The mean age of the respondents was 27 years, with a standard deviation of 5.7 years, indicating a relatively young population. A higher proportion of respondents were female (56.5%) compared to male (43.5%). In terms of education, the majority had attained secondary education (57.6%), while a smaller percentage had no formal education (20.6%) or had only basic education (9.4%). Tertiary education was held by 12.5% of the respondents.

Household size varied, with most respondents living in households of 4-6 members (81.8%), while a minority lived in households of 1-3 members (12.5%) or more than 6 members (5.7%). The occupational distribution shows that a significant proportion of respondents were traders (47.1%), followed by civil servants (27.9%) and those self-employed (25.0%).

Marital status data indicate that a majority of respondents were married (52.1%), followed by single individuals (35.9%). Divorced and widowed respondents constituted smaller proportions (4.7% and 7.8%, respectively). Religious affiliation was predominantly Islamic (52.1%), with Christianity followed by 43.8% of the respondents and traditional religion practiced by 4.7%. Respondents were most commonly from Dugbe (50.0%), followed by Ayeye (38.8%) and Onireke (11.2%). Finally, the majority of respondents had lived in the area for 1-3 years (76.3%), with fewer residing there for more than 4 years (23.7%).

Table 2: Waste generation and waste management practices

Variables	Frequency	Percentage
What are the types of solid waste generated by your household?		
Food waste	261	67.9
Paper and plastic	83	21.6
Textiles	30	7.8
Glass and others	10	2.6
How often does your household generate these wastes?		
Daily	275	71.6
Weekly	53	13.8
Occasionally	56	14.6
Where do you keep the generated waste before disposal?		
In a closed container	200	52.1
In an open container	87	22.7
In a polythene bag or sac	97	25.3
How do you dispose your solid waste		
Collection by company	319	83.1
Carrying to the dumpsite	55	14.3
By burning	10	2.6
How many dumping sites are there in your community		
1	273	71.1
2	91	26.7
3	20	5.2
How close are you to the nearest dumping site(meters)		
Between 10-50	260	67.7
Between 51-100	74	19.3
Above 100	50	13.0
How are the community's dumping sites managed?		
Burying	266	69.3
Burning/Incineration	79	20.6
Unattended to	39	10.2
How often are the community waste containers managed?		
Everyday	265	69.0
Every three days	45	11.7
Every five days	74	19.3

Table 2 provides an overview of waste generation and management practices within the community. Food waste was identified as the most common type of solid waste generated by households, with 67.9% of respondents indicating its prevalence, followed by paper and plastic at 21.6%, textiles at 7.8%, and glass and other materials at 2.6%. Most households reported generating waste daily (71.6%), while 13.8% did so weekly and 14.6% occasionally. Waste is primarily stored in closed containers (52.1%), with a smaller proportion using open containers (22.7%) or polythene bags/sacs (25.3%). The predominant method of disposal is through collection by a waste management company (83.1%), whereas 14.3% of respondents carry their waste to dumpsites and only 2.6% dispose of it by burning. Regarding the availability of dumping sites in the community, 71.1% reported having one site, 26.7% reported two sites, and 5.2% reported three sites. The majority of respondents live within 10-50 meters of the nearest dumping site (67.7%), while 19.3% are between 51-100 meters away, and 13.0% are more than 100 meters from the site. Waste management at community dumping sites is mainly done by burying (69.3%), with burning or incineration

accounting for 20.6%, and 10.2% of sites being left unattended. Community waste containers are managed daily by 69.0% of respondents, every three days by 11.7%, and every five days by 19.3%

Table 3: Public Awareness and Perceptions of Waste Management Practices in Ibadan North West Local Government Area"

Variable	Frequency	Percentage
Are you aware of any educational programs or initiatives related to waste management in Ibadan North West Local Government Area?		
Yes	374	97.4
No	8	2.1
I don't know	2	0.5
How often do you seek proper information about proper waste disposal practices?		
Daily	291	75.8
Weekly	61	15.9
Monthly	27	7.0
Rarely	5	1.3
How would you rank environmental sanitation in your community in relation to others in the city?		
One of the cleanest neighborhoods	200	52.1
Averagely clean	167	43.5
Dirty	17	4.4
To what extent do you agree that rapid urbanization has affected solid waste management?		
Strongly agree	266	69.3
Indifferent	10	2.6
Disagree	108	28.1
Do you think there is need for more public awareness campaigns regarding the impact of improper waste management?		
Strongly Agree	230	59.9
Agree	121	31.5
Disagree	30	7.8
Strongly Disagree	3	0.8

The data presented in Table 2 provides a comprehensive overview of public awareness and perceptions regarding waste management practices in Ibadan North West Local Government Area. The overwhelming majority of respondents, 374 (97.4%), were aware of educational programs or initiatives related to waste management in their area. Only 8 respondents (2.1%) were not aware of such programs, and 2 respondents (0.5%) did not know whether they existed. This high level of awareness suggests that waste management education is effectively reaching most of the community. Regarding how often respondents seek information about proper waste disposal practices, 291 individuals (75.8%) reported doing so daily. A smaller proportion, 61 respondents (15.9%), sought information weekly, 27 respondents (7.0%) did so monthly, and 5 respondents (1.3%) sought information rarely. This indicates a strong and regular engagement with waste disposal information among the majority of respondents. When asked to assess the cleanliness of their community compared to others in the city, 200 respondents (52.1%) rated their neighborhood as one of the cleanest. In comparison, 167 respondents (43.5%) considered it averagely clean, and 17 respondents (4.4%) deemed it dirty. This suggests that a majority of the residents view their community's sanitation positively relative to other areas. A significant 266 respondents (69.3%) strongly agreed that rapid urbanization has negatively impacted solid waste management in their

area. In contrast, 108 respondents (28.1%) disagreed with this statement, and only 10 respondents (2.6%) were indifferent. This indicates a prevalent concern about the effects of urban growth on waste management practices. As regards the need for more public awareness campaigns about the impact of improper waste management, 230 respondents (59.9%) strongly agreed that additional campaigns were necessary, while 121 respondents (31.5%) agreed. Conversely, 30 respondents (7.8%) disagreed, and 3 respondents (0.8%) strongly disagreed. This reflects a strong consensus on the need for increased public education to address waste management challenges effectively.

Table 4: Effect of improper waste management practices on the community

Variable	Frequency	Percentage
Have you personally experienced any negative consequences of ineffective waste management in your neighborhood? (e.g., pollution, health issues)?		
Yes	301	78.4
No	83	21.6
How?, If yes		
Increased risk of diseases		
Yes	334	87.0
no	45	11.7
I don't know	5	1.3
Contamination of water sources		
Yes	341	91.4
No	30	7.8
I don't know	10	2.6
Air pollution		
Yes	335	87.2
No	49	12.8
I don't know	0	0.0
Proliferation of pests(rats,mosquitoes etc)		
Yes	327	85.2
No	47	12.2
I don't know	10	2.6

Table 4 examines the perceived impact of improper waste management practices on the community, focusing on personal experiences and specific consequences. A significant portion of respondents, 301 individuals (78.4%), reported having personally experienced negative consequences due to ineffective waste management in their neighborhood. This highlights a widespread recognition of issues related to waste management in the community. Among those who experienced negative effects, the majority identified increased risk of diseases as a major consequence, with 334 respondents (87.0%) acknowledging this issue. Only 45 respondents (11.7%) did not perceive a connection, and 5 respondents (1.3%) were uncertain about the impact. Contamination of water sources was another prominent concern, with 341 respondents (91.4%) indicating that improper waste management had led to this problem in their area. A smaller group of 30 respondents (7.8%) did not see contamination as an issue, while 10 respondents (2.6%) were unsure. Air pollution was reported as a significant issue by 335 respondents (87.2%), demonstrating a clear association between waste management practices and air quality concerns. Only 49 respondents (12.8%) did not perceive air pollution as a problem, and there were no respondents who were uncertain about this issue. The proliferation of pests, such as rats and mosquitoes, was also commonly reported, with 327 respondents (85.2%) experiencing this problem due to poor waste management. A smaller number, 47 respondents (12.2%), did not observe this issue, and 10 respondents (2.6%) were unsure about the presence of pests. Overall, these responses reflect a strong consensus among residents regarding the negative effects of improper waste management, highlighting significant public health

and environmental concerns within the community.

Table 5: Main Barriers and Challenges faced in waste disposal and waste management

Variable	Frequency	Percentage
What major challenge does your household face in disposing of waste		
High cost of disposal	155	40.4
Lack of disposal sites	63	16.4
Unavailability of household collection bins	66	17.2
Delays in collection	100	26.0
Do you believe that improving waste management practices can lead to a cleaner and healthier environment in your local area?		
Yes	383	99.7
No	1	0.3
What are the main barriers to effective waste management in Ibadan North West Local Government area?	**Yes**	**No**
Lack of infrastructure(waste disposal facilities	337(87.8)	47(12.2)
Inadequate government policies and enforcement	287(74.7)	97(25.3)
Lack of community awareness and participation	329(85.7)	55(14.3)
Socioeconomic factors	326(84.9)	58(15.1)

Table 5 explores the main barriers and challenges encountered in waste disposal and management, as well as the perceived effectiveness of improving waste management practices in the Ibadan North West Local Government Area. The most common challenge faced by households in waste disposal is the high cost associated with disposal, reported by 155 respondents, which constitutes 40.4% of the sample. This financial burden appears to be a significant obstacle for many households. Following this, 66 respondents (17.2%) identified the unavailability of household collection bins as a barrier, while 63 respondents (16.4%) cited a lack of disposal sites. Additionally, delays in waste collection were noted as a challenge by 100 respondents (26.0%). Regarding the belief in the potential benefits of improving waste management practices, there is overwhelming consensus among respondents. A remarkable 383 individuals (99.7%) believe that enhancing waste management can contribute to a cleaner and healthier environment in their local area, underscoring strong support for better waste management initiatives. When examining the main barriers to effective waste management in Ibadan North West Local Government Area, several key issues emerge. A significant majority, 337 respondents (87.8%), cited a lack of infrastructure, specifically waste disposal facilities, as a major barrier. Additionally, inadequate government policies and enforcement were identified by 287 respondents (74.7%) as a critical issue. Lack of community awareness and participation was another prominent barrier, noted by 329 respondents (85.7%). Socioeconomic factors also posed challenges, with 326 respondents (84.9%) recognizing them as a barrier to effective waste management.

Discussion

The respondents in the study had a mean age of 27 years with a standard deviation of 5.7, contrasting with a study in Ethiopia where the average age was 41-60 years (Silamlak et al., 2021). Gender distribution showed a slight majority of females at 56.5%, compared to 43.5% males. Educational attainment varied, with 57.6% having secondary education, 20.6% with no formal education, and smaller percentages with basic (9.4%) or tertiary education (12.5%). Most respondents (81.8%) lived in households of 4-6 members, while 12.5% were from smaller households (1-3 members) and 5.7% from larger ones. Occupationally, 47.1% were traders, 27.9% civil servants, and 25.0% self-employed. Marital status was predominantly married (52.1%), with 35.9% single, 4.7% divorced, and 7.8% widowed. Religiously, 52.1% were Muslim, 43.8% Christian, and 4.7% adhered to

traditional beliefs. Dugbe was the most common residence (50.0%), followed by Ayeye (38.8%) and Onireke (11.2%). A majority (76.3%) had lived in their area for 1-3 years.

Respondents overwhelmingly believed that improper waste management increases disease risk (87.0%), contaminates water sources (91.4%), causes air pollution (87.2%), and fosters pests (85.2%). These findings align with previous studies highlighting environmental and health risks associated with poor waste management (Al-Delaimy et al., 2014; Adelowo et al., 2012; Nduka et al., 2008). Awareness of educational programs related to waste management was high (97.4%), with 75.8% seeking information daily. The strong belief in the need for more public awareness campaigns (91.4%) echoes Taneja's (2006) observation of inadequate awareness as a barrier to effective waste management. Food waste was the most common type generated (67.9%), consistent with Butu et al. (2020), who also found high food waste generation. Daily waste generation was reported by 71.6%, aligning with Gidde et al. (2008) who noted a daily generation of 0.5 kg per person. Most households (52.1%) stored waste in closed containers, while 22.7% used open containers and 25.3% used polythene bags, differing from Butu et al. (2020) and IDP Hantam Municipality (2020/2021) findings.

Challenges included high disposal costs (40.4%), lack of disposal sites (16.4%), unavailability of collection bins (17.2%), and collection delays (26.0%). Most respondents (71.1%) had one dumping site nearby, with 67.7% reporting it within 10-50 meters. The management of dumping sites was mostly by burying (69.3%), with some reported burning (20.6%) and unattended sites (10.2%). These issues align with findings from Shibamoto et al. (2007) on health risks from poorly managed incinerators. A significant majority (78.4%) experienced negative consequences from ineffective waste management, corroborating the hazards associated with incomplete waste combustion (Shibamoto et al., 2007). The frequency of waste container management varied, with 69.0% reporting daily management, while 28.1% disagreed that rapid urbanization significantly impacts waste management, suggesting a consensus on urbanization's impact. Barriers included lack of infrastructure (87.8%), inadequate policies (74.7%), lack of community awareness (85.7%), and socioeconomic factors (84.9%). These findings highlight the complexity of barriers to effective waste management, supported by Butu et al. (2020), who identified insufficient funds, attitudes, and political influence as major barriers.

Conclusion and Recommendation

The study presents a comprehensive analysis of waste management practices and their impact on public health in the Ibadan North West Local Government Area. The respondent demographics revealed a diverse distribution across age brackets, with trading being the predominant occupation. Most respondents were aware of the adverse effects of improper waste management, including health risks and environmental contamination. Despite this awareness, significant challenges such as high disposal costs, inadequate infrastructure, and delays in waste collection were identified.

To address these issues, it is crucial to invest in waste disposal facilities and infrastructure to enhance waste collection and disposal processes, tackling the identified barrier of insufficient infrastructure. Strengthening government policies and enforcement is essential to regulate waste disposal practices and promote environmental sustainability, thereby addressing the challenges related to inadequate policies. Public awareness campaigns should be launched to educate residents on the importance of proper waste management and to encourage active participation in waste reduction and recycling initiatives. Additionally, addressing socioeconomic factors that contribute to ineffective waste management through economic empowerment programs and alternative livelihoods can help reduce dependency on informal waste disposal practices. Lastly, fostering community participation is vital; residents should be actively involved in waste management initiatives through community engagement programs, volunteer opportunities, and incentive schemes that promote a sense of ownership and responsibility in waste management efforts.

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