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Knowledge, Perception and Solid Waste Management Practices among Residents of Oshodi-Isolo Local Government Area, Lagos State Nigeria

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Abstract

The rapid generation of waste through households, industrial and commercial activities are a common challenge of all globalization. This study therefore examined the knowledge, perception and solid waste management practices among the residents of Oshodi-Isolo Local Government area, Lagos State, Nigeria.

The study employed a descriptive cross-sectional design. A Multi-stage sampling technique was used to select 600 respondents for the study. A validated semi-structured interviewer administered questionnaire was used for data collection from the residents. Descriptive and inferential statistics were conducted to give statistical responses to the research questions and hypotheses using SPSS version 23.

The mean age of respondents 'was 38.28±12.48years. More than half (51%) of the respondents were male. The respondents' level of knowledge about solid waste management measured on 11point rating scale revealed that the respondents had a mean of 8.3±2.1. The respondents' perception measured on a 15-point rating scale showed a mean of 11.7404±2.56. The respondents' solid waste management practice measured on a 11-point rating scale revealed a mean score of 4.61±1.91. Less than half (35.2%) of the respondents practiced good solid waste management. A significant relationship between respondents' perception (r =0.16, p=0.00) and their solid waste disposal practice.

Although the residents had a high level of knowledge and positive attitude towards solid waste disposal, this does not translate to their practices as they had poor solid waste disposal practices. The study recommended that there should be education on laws regarding waste management and ensuring enforcement of the law by the government.

Keywords: *Knowledge, Perception, Solid Waste, Practices, Oshodi-Isolo.*

Introduction

Solid waste management is the persistent environmental challenge tackled by urban and rural areas of Nigeria. Nigeria, with population exceeding 170 million, is one of the largest producers of solid waste in Africa. A shared challenge of all globalizing cities is the rapid generation of waste through households, industrial and commercial activities. Solid waste generated in many cities in Nigeria is composed of organic materials, plastics/polythene, cans/metals, bottles/glasses, clothes/shoes, and ceramics [1].

Nigeria generates more than 32 million tons of solid waste annually, out of which only 20-30% is collected [2]. Thirteen thousand tonnes of waste were generated daily by 20million residents of Lagos in 2014 [3]. The current generation by extrapolation should be in excess of 20,000 tons per day [4].

In Nigeria, like in other developing regions, rapid population growth, as well as the expansion of service and manufacturing sectors, have led to an increase in the amount of solid waste produced, while its management has remained highly deficient [5]. First, poor areas experience limited or no waste collection. Second, refuse can be removed but improperly disposed of, typically in open dumpsites or landfills, which are often situated close to the city, particularly near informal settlements. The challenge of municipal waste generation and collection varies within the residential areas of urban areas [1,6].

Improper handling storage and disposal of wastes could lead to environmental pollution and epidemics, such as Escherichia coli, Staphylococcus aureus, and Salmonella Sp.,

discourage tourism and promote undesirable residential mobility[7,8]. Also, if these wastes are not disposed of properly, they create breeding places for insects such as flies, mosquitoes, etc.; they provide food and harborages for rats. These insects and rats are health risks in that they are potential disease transmitters. These insects and rats are health risks in that they are potential disease transmitters.

In developing economies, two major waste collection methods are practiced, namely collection from neighborhood deports and house-to-house collection. The first method of waste collection is a system by which common neighborhood dumpsites are established where each household is required to transport and deposit its refuse. From there, municipal vehicles load the refuse and evacuate them to final processing and disposal sites. In Lagos State, the neighborhood dumpsite method was the most popular until the beginning of the 21st century [9]. The second method of waste collection is characterized by the use of vehicles (pick lift, compactor), bicycles, and rickshaws to collect refuse from house to house at regular intervals to disposal sites. This is presently the order of the day in most Nigerian cities [9, 10, 11].

In Oshodi-Isolo Local Government area, it can be observed that too much garbage is lying uncollected in the streets, and other construction debris in a manner best described as "throw it where you like" that now resulted to piles of refuse dotting the entire metropolis causing inconvenience, environmental pollution, and posing a public health risk. Despite the efforts made by various levels of government to sanitize the environment, it is still filthy and harms the wellbeing of residents; most parts of the Oshodi-Isolo are hardly free of the waste menace since the private sector operators took over the refuse clearing. Besides the health problems, solid waste blocks the drainage system and causes severe flooding on the streets especially during the raining season.

Participation in solid waste management depended on the level of knowledge on solid waste management [12.13]. The population's perception and willingness to participate in the best waste management practices will affect solid waste disposal practices [14]. Residents with positive environmental perception tend to perform responsible solid waste management which entails the waste collection and proper disposal [15]. This study therefore examined the knowledge, perception and solid waste management practices among the residents of Oshodi-Isolo Local Government area, Lagos State, Nigeria.

Material and Methods

The study adopted a descriptive cross-sectional design. The study population included permanent residents of the Oshodi-Isolo Local Government Area.

Oshodi- Isolo is a Local Government area within Lagos state. It was formed by the second republic Governor of Lagos State, Alhaji Lateef Kayode Jakande. The LGA is part of the Ikeja Division of Lagos State, Nigeria. At the 2006 census, it had a population of 1,134,548 (Male-514,857, Female- 619,691, Source: Lagos state ministry of Science and Technology) and an area of 41.98 square kilometers (Source: Surveyor-General Office, Secretariat, Ikeja, Lagos State). The Historical development of Oshodi-Isolo Local Government Area dates back to the creation of the defunct Oshodi-Isolo Local Government on Tuesday, 28th October 2003. The history dates back to the early part of the 15th century when the Awori's of the present Lagos State was said to have migrated from Ile-Ife led by Akinbaye. Isolo Local Government is located in the Lagos- West Senatorial District of Lagos State. It shares boundaries with Amuwo, Ejigbo, and Ikeja Local Government Areas. It is bounded in the west by Amuwo Local Government via Ago-Palace way Okota. In the North, by Ejigbo Local Government Oke-Afa, Ejigbo, and in the North- East (NE) by Ikeja Local Government. The total population of Isolo Local Government Area is 62,509 consisting of 37,250 females and 25,259 males.

Six hundred respondents were selected through multi-stage sample technique. The instrument for data collection was a semi-structured questionnaire that was interviewer-administered and developed by the researcher.

Measure

Participants' knowledge about solid waste disposal was on a dichotomous scale with one correct response measured on a11-points rating scale. Knowledge scores were categorized by the 50th percentile. Those who scored between 0-5.5

were regarded as having a poor level of knowledge, those with 5.6 -11 were regarded as having a good level of knowledge. Perception of solid waste management was measured on a 15-point rating scale using a 4-point Likert response scale which consists of five items ranging from SA- Strongly Agree to SD- Strongly Disagree. The best option was assigned 3, while the wrong response was assigned zero. Perception scores were classified by 50th percentile into two those who scored between 0-7.5 were regarded as having unfavorable perception, those with 6.0-10.9 were regarded as having moderate perception, and those with 7.6-15 were regarded as favorable perception in line with the biomedical view.

Self-reported waste disposal practice constituted the dependent variable and was operationalized in section D of the questionnaire that asked questions about waste disposal practices measured on an 11-points response scale. It comprises Yes/ No questions. One (1) was assigned to the correct answer while zero (0) was assigned to the wrong answer. Waste disposal practice scores were classified based on the 25th percentile into three. Those who scored between 0-5.5 had poor waste disposal practices; those with 5.6 to 11 had good waste disposal practices.

Validity and Reliability

The instrument was pre-tested (pilot testing) with the respondents from Ikorodu Local Government Area. The main purpose of pre-testing the research instrument was to identify any weaknesses and improve them. The pre-test was likely to indicate the time required to complete the tool. These respondents were re-tested a second time two weeks later and their consistency between the two sets of the score was computed using Cronbach's alpha coefficient which yielded an alpha of 0.78. Therefore, the instruments were found reliable since the alpha value obtained was to >0.7.

Results

Socio-demographic Characteristics of Respondents'

The respondent's ages ranged from 18 to 77 years with a mean age of 38.28±12.48years. The ages of the majority of the respondents (31.2%) fell within the 28 to 37 years age range. More than half 306(51.0%) of the respondents were male. Less than half 261(43.5%) of the respondents were heads of their households. Forty-eight percent of the houses had 1-4 occupants. For the educational attainment of the respondents' less than half 246(41.0%) had secondary education and thirty-nine percent were self-employed. Less than half 246(41.0%) of the respondents earn between 18000-50000 naira with almost half 289(48.2%) living in self-contained flats (See table 1).

Table 1. Socio-Demographic Characteristics of Respondents'

Socio-demographic variables	N=600	Percent (%)
Age (in years) x̄ (SD) 38.28±12.48years		
18-27	118	19.7
28-37	187	31.2
38-47	163	27.1
48-57	87	14.5
58-67	33	5.5
68-77	12	2.0
Gender		
Male	306	51.0
Female	294	49.0
Respondent Head of household		
Yes	261	43.5
No	339	56.5
Number of people in the household		
1-4	291	48.5

5-9	272	45.3
10-14	21	3.5
15-19	16	2.7
Educational Attainment		
No formal education	26	4.4
Primary	68	11.3
Secondary	246	41.0
Diploma/B.Sc	210	35.0
Master/PhD	50	8.3
Occupation		
Unemployed	74	12.3
Self-employed	236	39.3
Civil servant	204	34.1
Private employed	86	14.3
Monthly income		
< 18,000	60	10.0
18000-50000	246	41.0
50,000-100000	203	33.8
100000-250000	91	15.2
Type of house		
Flat	289	48.2
Bungalow/Duplex	95	15.8
Studio/one room apartment	112	18.7
One storey/two storey	54	9.0
Multi-purpose apartment	50	8.3
Number of rooms in the household		
1-2	159	26.5
3-4	262	43.7
5-6	93	15.5
7& above	86	14.3

Respondents' Knowledge about Solid Waste Management

Respondents' level of knowledge about solid waste was assessed with the aid of an 11-point knowledge scale. Respondents' mean knowledge score was 8.3±2.1. Only 64(10.7%) of the respondents had poor knowledge of solid waste management while eighty-nine percent had good knowledge of solid waste management. Overall, one can infer that majority of the respondents had a high level of knowledge on solid waste management (See table 2).

Respondents' Perception of Solid Waste Management

The respondents' perception measured on a 15-point rating scale showed a mean of 11.7404±2.56. Overall, Majority 565(94.2%) of the respondents had a favorable perception of solid waste management while Only 35(5.8%) of the respondents had an unfavorable perception of solid waste management. One can infer that most of the respondents had the favorable perception in line with the biomedical view (See table 2).

Respondents' Solid Waste Disposal Practice

The respondents' solid waste disposal practice measured on an 11-point rating scale revealed a mean score of 4.61±1.91. More 389(64.8%) of the respondents had poor solid waste disposal practice (See table 2).

Table 2. Category/Level Respondents' Level of Knowledge and Perception on Solid Waste Management

Level of Knowledge	**N=600**	**Percent (%)**	**Mean (S.E)**	**SD**
Poor	64	10.7		
Good	536	89.3	8.39(0.08)	2.07
Perception				
Unfavorable perception	35	5.8	40.69(0.23)	5.69
Favorable perception	565	94.2		
Solid Waste Practice				
Poor	389	64.8	4.61(0.08)	1.91
Good	211	35.2		

Association between Respondents' Socio-demographic Characteristics and Solid waste Disposal Practices

The type of houses the respondents' lived (X^2= 35.80, p=0.000); the number of people in the household (X^2=18.81*;* p=0.001); respondents' educational level (X^2=24;06; p=0.000), and respondents' age (X^2=22.38, p=0.000), were significant to their solid waste practices. However, the respondent's sex (X^2=0.36; p=0.39); occupation (X^2=7.9*;* p=0.05), and income (X^2=4.47; p=0.22) had no significant relationship with their solid waste disposal practices (See table 3).

Table 3. Relationship between Respondents' Socio-demographic Characteristics and Solid waste Disposal Practices

Variables	**Solid Waste Disposal Practices**		**X^2**	***p*-value**
	Poor	**Good**		
Age (in years)			22.38	0.000
18-27	75	43		
28-37	132	55		
38-47	111	52		
48-57	38	49		
58-67	25	8		
68-77	8	4		
Gender			0.85	0.36
Male	193	113		
Female	196	98		
Number of people in the household			18.82	0.001
1-4	213	78		
5-9	155	117		
10-14	12	9		
15-19	9	7		
Educational Attainment			24.06	0.000
No formal education	21	6		
Primary	56	12		
Secondary	167	79		
Diploma/B.Sc	121	89		
Master/PhD	24	26		
Occupation			7.90	0.05
Unemployed	45	29		
Self-employed	169	67		
Civil servant	124	80		
Private employed	51	35		

Monthly income			4.47	0.22
< 18,000	40	20		
18000-50000	170	76		
50,000-100000	126	77		
100000-250000	53	38		
Type of house			35.80	0.000
Flat	173	116		
Bungalow/Duplex	49	46		
Studio/one room apartment	98	14		
One storey/two storey	36	18		
Multi-purpose apartment	33	17		

Hypothesis: There is no significant relationship between knowledge, perception and waste disposal practices of residents in Oshodi-Isolo Local Government Area. The correlation showed a significant relationship between respondents' perception (r =0.16, *p*=0.00) and their solid waste disposal practice. However, the respondent's knowledge of solid waste (r =0.05, *p*=0.21) has no relationship with their solid waste disposal of practice (See table 4).

Table 4. Relationship between Knowledge, Perception and Solid Waste Disposal Practice

	Solid waste Disposal Practices	
	R	**p-value**
Knowledge	0.05	0.210
Perception	0.16	0.000

Discussion

The finding revealed a significant relationship between the respondent's age and solid waste disposal; this is supported by Agwu in Port-Harcourt. However, the finding is at variance with the findings of Chanda who reported that age does not have significant influence on waste disposal [16,17] The study also revealed that no significant relationship between sex and solid waste management. This finding corroborates the findings of Chanda in Botswana [17].

More of the respondents have formal education with 41% having at least secondary level education. This trend particularly appears to be reflected in the level of knowledge and attitude of the respondent's solid waste management. There was a significant relationship between the respondent's level of education and solid waste management. This finding is similar to the findings of Pussadee et al where they reported that education has a positive and significant relationship with solid waste management [18]. However, Mamdy, reported that education does not have a significant relationship with solid waste management [13].

The household sizes averagely range between 1and 4 persons. The number of people in a household had a significant relationship with respondents' solid wastes disposal practices; this is similar to the findings of Osbjer et al, that household practice of waste management is associated with a higher number of people in the households [19]. This may be because of an increase in population increase in waste generation. There were no relationships between the level of income, occupation, and solid waste disposal practice. This is consistent with the findings of Pussadee et al [18]. However, this is not in line with the findings of Medina that higher-income earners disposed of waste in an appropriate site than a lower-income earner [20]. This observation is contrary to finding carried out in Kenya where income significantly influenced the method of waste disposal among households [21]. Socio-demographic variables do not seem to have any significant relationship with solid waste disposal practices. Although the type of houses respondents lives in had a relationship with their solid waste disposal practice. This may be because of their socio-economic status.

Most of the respondents' in this study had a high level of knowledge of solid waste

management; this is in line with the findings of Mamdy in Guinea and Adeyemo *et al*, in Ogbomoso and where they reported that the respondents were knowledgeable in solid waste disposal management [13, 22] The majority of the respondents had a positive attitude towards solid waste disposal practices as most of the respondents agreed that proper waste disposal can better their health and believed that the practices of waste management are their responsibility and they are committed to minimizing waste. Also, the majority of respondents reported that waste management promotes good health and a healthy environment. The study revealed that the respondents had a favorable perception of solid waste management as many perceived that indiscriminate waste disposal could cause flooding and also contaminate the environment. This is findings are at variance to the study conducted in Sokoto where it was reported that the respondents had a fair perception of waste management [23].

Conclusion

The majority of the residents had a high level of knowledge of solid waste management and also knowledgeable about various methods of waste disposal. However, there was evidence to the contrary considering the observation that some still buried and burned their waste, and these wastes are not separated before disposal. These are inappropriate as they pollute and constitute aesthetic blithe in the environment. The residents had a favorable perception of solid waste management. Although the residents had a high level of knowledge and favorable perception towards solid waste disposal, this does not translate to their practices as they had poor solid waste disposal practices. The residents should provide household environmental sanitation facilities while the government and Community-Based Organizations (CBOs) should provide community environmental sanitation facilities and services.

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