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Knowledge, attitudes and practice of solid waste disposal among residents of a selected community in Kano State, Nigeria

Abuhuraira Ado Musa^{1,2,3}, Yusuf Muhammad Abdullahi⁴, Maryam Dahiru Umar², Shehu Bello⁵, Faisal Muhammad^{6,7}*

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*Correspondence: Faisal Muhammad,

E-mail: fokkanya@yahoo.com

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ABSTRACT

Background: This study aimed to assess the level of knowledge, attitudes, and practice of solid waste disposal among residents of the Husuren-Kwari community in Kano, Nigeria.

Methods: A non-experimental descriptive survey research design was adopted and data were obtained from June to October 2019. A simple random sampling technique was used to select 45 households as the samples. The data was collected using a semi-structured questionnaire. The data obtained were analyzed using a statistical package for social sciences software.

Results: In this study, more than half (53.3%) of the respondents were \geq 36 years and 80.0% of them were males. About 42.2% of the respondents had a secondary level of education and 44.4% of the respondents were farmers. Close nine-tenths (88.9%) of the respondents agreed that proper waste disposal is any means that we can get rid of unwanted materials and 84.4% know the local method of disposing of waste. Only 24.4% of the respondents were aware of the modern methods of solid waste disposal. Little above half (51.1%) of the respondents were using the burning method to dispose of the waste, and close to half (46.7%) of the respondents were dumping the waste in front of the house.

Conclusions: The finding reported a poor level of knowledge, negative attitude, and poor level of practice regarding waste disposal among the people of this community. The government and non-governmental organizations should organize a massive campaign on the importance of proper waste disposal and to create awareness on proper waste disposal practices.

Keywords: Waste disposal, Community, Environmental Health, Kano

¹Department of Public Health, National Orthopedic Hospital Dala, Kano, Nigeria

²Department of Applied Health Sciences, School of Health Sciences (SHS), Saint Monica University, Cameroon

³Department of Medical Microbiology and Parasitology, Faculty of Clinical Sciences Bayero University Kano, Kano, Nigeria

⁴Department of Environmental Health, School of Health Sciences, Maryam Abacha American University of Niger, Maradi, Niger

⁵Department of Physical and Health Education, Faculty of Education, University of Maiduguri, Maiduguri, Nigeria

⁶Department of Public Health, Faculty of Allied Health Sciences, Daffodil International University, Dhaka Bangladesh

⁷Otu Institute of Research and Training (OIRT), London, United Kingdom

INTRODUCTION

In the present time, waste management has been a serious issue at the national, regional as well as international levels. The volume and types of solid and hazardous waste as a result of continuous economic growth and urbanization is experiencing a rapid increase all over the world.² It is estimated that in 2006 the total amount of refuse generated globally reached 2.02 billion tones, representing a (7.0%) annual increase since 2003.3 It's also estimated that between 2007 and 2011, global generation of municipal waste will rise by (37.3%) equivalent to roughly (8.0%) increase per year.³ According to the global waste management market report it is estimated that about 318 and 338 million tons of hazardous and others wastes were generated for 2000 and 2001 respectively.³ Most of the developing countries are facing new constraints and pressure about waste management. This is because the amount of waste produced by human activities keeps increasing across the globe, accompanied by problems of disposal.^{2,3}

Nigeria with a huge population and increasing industrialization, large quantities of industrial as well as municipal solid waste are generated and disposed of in the country. These waste materials end up in open dumps or buried at both approved and unapproved sites which result in the release of a cocktail of toxic chemicals into the aquifer and/or leached by storm runoff into surface water bodies used for domestic purposes. 1 A study estimated that an average Nigerian generates about 0.49 kg of solid waste in a day with households and commercial centers contributing almost 90.0% of the total urban waste burden.4 As in most developing countries; a greater percentage of solid waste is composed of organic matter, but recently there has been an increase in the number of plastic wastes generated in Nigeria. Many Nigerians had not been concerned with solid waste disposal; their concern had not gone beyond the physical removal of waste from streets.

Inappropriate waste handling practices and inadequate provision of solid waste management facilities in cities of developing countries results in indiscriminate disposal and unsanitary environments that pose a threat to the health of urban residents. Improper handlings, storage, and disposal of wastes are the major causes of environmental pollution, which provide a breeding ground for pathogenic organisms and encourages the spread of infectious diseases (such as cholera) in addition an association was found between waste burning and the incidence of respiratory health symptoms among adult and children.6 Household solid waste is one of the most difficult types of waste to managed owing to its diverse range of composite materials.7 This issue of improper handling, storage, and disposal of wastes is as well seen in many communities in Kano State (including Husuren-Kwari-our area of study). This consequently arouses the researcher's interest to carry out a study that will explore as well as assesses the level of knowledge, attitude, and practices of waste disposal among the households of Husuren-Kwari community of Kabo LGA, in Kano State with a view of identifying areas of deficiency and recommending appropriate interventions.

METHODS

Research design and setting

A non-experimental descriptive survey research design was used in assessing the knowledge, attitude, and practice of solid waste disposal among residents of a selected community in Kano, Nigeria from June to October 2019. This study was conducted in the Husuren-Kwari community of Kabo local government area (LGA) of Kano State, Nigeria. Husuren-Kwari community was chosen because of the increasing amount of waste generated in this area; this community is situated in Kabo LGA of Kano state. It is about three and a half km away from the southern part of the local government headquarters.

Target population, sample and sampling technique

The target population of this study was the entire population of the Husuren Kwari community of Kabo LGA in Kano State. The total population of the community was 2,337 people occupying 450 households (NPC, 2006). The sample for this study was (10%) of the 450 households of this community which is 45 households. A cluster random sampling technique was used in selecting the 45 households; The Garo-ward was clustered into six (6) settlements, out of which three (3) settlements were selected at random using a balloting system. Fifteen (15) households were further selected from each settlement using balloting simple random sampling making a total of (45) households.

Method and instrument for data collection

The instrument that was used in collecting data for this study was a self-developed structured questionnaire; which was formulated based on our research questions. The questionnaire contains sections A and B with a total number of 13 questionnaire items. Section-A consist of socio-demographic data and Section-B consist of questions items (based on KAP). A letter was collected by the researcher from the school and presented to the village head of the Husuren-Kwari community before the data collection. Data were collected by face-to-face interview technique using a self-developed structured questionnaire.

Validity and reliability of the instrument

The questionnaire and the checklist as the instruments were constructed and submitted to three experts for validation; a lecturer from School of Hygiene Kano, a lecturer from school of nursing Kano, and a staff of Aminu Kano teaching hospital (AKTH), Kano. The

reliability of the instrument (i.e. questionnaire) was ascertained through the test and retest method. This was done by administering the instrument on a sample and after some time had elapsed; the same instrument was used for the second time on the same sample. The two results were corrected and the co-efficient of variability was obtained.

Method of data analysis

After the collection of data, all interviewed questionnaires were checked for completeness, correctness, and internal consistency to exclude missing or inconsistent data and those were discarded. Corrected data was entered into statistical package for social sciences (SPSS) statistical software version 20 for the analysis. A formal consent of all the forty-five (45) households was obtained before the data collection; more-over all their norms and values were duly respected. All data generated from this research study was kept with absolute confidentiality and it's only be used for academic purposes.

RESULTS

Socio-demographic characteristics of the respondents

More than half (53.3%) of the respondents were 36 years and above, followed by 22.2% who were between 31-35 years, 17.8% were between 26-30 years and 6.7% were 25 years and below (Table 1).

Table 1: Socio-demographic characteristics of the respondents (n=45).

Socio-demographic	Frequency	Percentage
Age (years)		
≤25	3	6.67
26-30	8	17.8
31-35	10	22.2
≥36	24	53.3
Sex		
Male	36	80.0
Female	9	20.0
Educational level		
No formal education	10	22.2
Primary	11	24.4
Secondary	19	42.2
Tertiary	5	11.1
Occupation		
Civil servants	7	15.6
Business holders	17	37.8
Farmers	20	44.4
Others	1	2.2

Four-fifths (80.0%) of the respondents were male and the rest of them were female (20.0%). About 42.2% of the respondents had a secondary level of education, 24.4% had a primary level of education, 22.2% had no formal education and 11.1% had a tertiary level of education. According to occupation, about 44.4% of the respondents

were farmers, 37.8% were business holders, 15.6% were civil servants, and the rest (2.2%) engaged in other activities.

Respondent's knowledge towards waste disposal

About 88.9% of the respondents agreed that proper waste disposal is any means which we can get rid of unwanted materials and 84.4% knows the local method of disposing of waste; however most of them (39.5%) mentioned the composting method, 31.6% mentioned burning method, 18.4% dumping in rivers and the rest (10.5%) mentioned other methods (Table 2).

Table 2: Respondent's knowledge towards waste disposal (n=45).

Item	Frequency	Percentage			
Proper waste disposal is any means which we can					
get rid of unwanted materials					
True	40	88.9			
False	5	11.1			
Knows the local method of disposing waste					
Yes	38	84.4			
No	7	15.6			
If yes which of the local method? (n=38)					
Burning	12	31.6			
Composting	15	39.5			
Dumping in rivers	7	18.4			
Others	4	10.5			
Aware of the modern me	ethods of solid	waste			
disposal					
Yes	11	24.4			
No	34	75.6			
If yes, which of the methods? (n=11)					
Sanitary land fill	6	54.6			
Incineration	2	18.2			
Recycling	1	9.1			
Others	2	18.2			

In this study, only 24.4% of the respondents were aware of the modern methods of solid waste disposal and among them, 54.6% knows about the sanitary landfill, 18.2% incineration, 9.1% recycling, and 18.2% mentioned other modern methods.

Respondent's attitude towards waste disposal

More than half (53.4%) of the respondents disagreed (37.8% disagreed; 15.6% strongly agreed) that the modern and local methods of waste disposal are the same and about 73.3% agreed that the local method of waste disposal is more preferable than modern method (Table 3). Close to eight-tenths (77.8%) of the respondents agreed that the preference of the local method is because it is cheaper and simpler and 75.5% have also agreed that the local method is rejected because it increases disease spread, blocks drainages, and causes a nuisance to the community.

Table 3: Respondent's attitude towards waste disposal (n=45).

Attitude	Strongly Agree N (%)	Agree N (%)	Disagree N (%)	Strongly Disagree N (%)
The modern and local methods of waste disposal are the same	8 (17.8)	13 (28.9)	17 (37.8)	7 (15.6)
Local method of waste disposal is more preferable than modern method	19 (42.2)	14 (31.1)	7 (15.6)	5 (11.1)
The preference of the local method is because it is cheaper and simpler	21 (46.7)	14 (31.1)	3 (6.7)	7 (15.6)
Local method is rejected because it increase disease spread, blocks drainages and causes nuisance to the community	20 (44.4)	14 (31.1)	8 (17.8)	3 (6.7)

Respondent's practice towards waste disposal

Little above half (51.1%) of the respondents were using the burning method to dispose of the waste, 35.6% were using composting method, 8.9% dumping in the river and 4.4% were using other methods (Table 4).

Table 4: Respondent's practice towards waste disposal (n=45).

Items	Frequency	Percentage		
Method employed in disposing waste				
Composting	16	35.6		
Burning	23	51.1		
Dumping in river	4	8.9		
Others	2	4.4		
The site of waste dumping	ng			
Inside the house	14	31.1		
In front of the house	21	46.7		
Inside the drainage	3	6.7		
At the backyard	7	15.6		
The distance between the dumping site to the well				
(meters)				
7	7	15.6		
6	19	37.8		
4	17	42.2		
≤3	2	4.4		
The distance between dumping site to the kitchen				
(meters)				
3	10	22.2		
2	24	53.3		
1	8	17.8		
<1	3	6.7		
Accessibility of waste to children				
Not accessible at all	4	8.9		
Accessible sometimes	26	57.8		
Always accessible	15	33.3		

Close to half (46.7%) of the respondents were dumping the waste in front of the house, 31.1% were dumping the waste inside the house, 15.6% at the backyard, and 6.7%

inside the drainage. Little above two-fifths (42.2%) of the respondents mentioned that the distance between their dumping site to the well was about 4 meters, 37.8% 6 meters, 15.6% stated it was about 7 meters and 4.4% mentioned it was 3 or below meters. According to the distance between the dumping site to their kitchen, 53.3% mentioned that it was about 2 meters, 22.2% 3 meters, 17.8% 1 meter and the rest (6.7%) mentioned less than 1 meter. About 57.8% mentioned that the waste was accessible sometimes to the children, 33.3% mentioned it was always accessible and the remaining (8.9%) not accessible at all.

Table 5: Level of knowledge, attitude and practice towards waste disposal (n=45).

Level	Frequency	Percentage
Knowledge		
Good	10	22.2
Poor	35	77.8
Attitude		
Positive	22	48.9
Negative	23	51.1
Practice		
Good	14	31.1
Poor	31	68.9

Level of knowledge, attitude and practice (KAP) towards waste disposal

About 77.8% of the respondents had a poor level of knowledge regarding waste disposal and a little above half (51.1%) had a negative attitude towards waste disposal (Table 5). Close to seven-tenths (68.9%) had a poor level of practice regarding waste disposal; however, the remaining (31.1%) had a good level of practice about waste disposal.

DISCUSSION

Current study aimed to assess the level of knowledge, attitudes, and practice of solid waste disposal among residents of the Husuren-Kwari community in the Kabo local government area of Kano State, Nigeria. In this

study, about 77.8% of the respondents had a poor level of knowledge regarding waste disposal and more than half had a negative attitude towards waste disposal. Close to seven-tenths of the respondents were found to have a poor level of practice regarding waste disposal. This is consistent with the findings of a similar study conducted which reported that indiscriminate waste disposal is caused by a carefree attitude, as well as the lack of environmental awareness.8 Another study also reveals the gap in the knowledge of the environmental impact of products and services among the people of the communities.9 In this study little above half of the respondents were using the burning method to dispose of the waste, 35.6% were using composting method, 8.9% dumping in the river and 4.4% were using other methods. A study conducted in Portugal on solid waste management found (21.0%) were disposed of in landfills, (68.0%) were burnt at the plant waste to energy, (8.0%) were treated in the waste recovery plant, and (3.0%) served on sorting. 10 From the findings we found that close to half of the respondents were dumping the waste in front of the house, 31.1% were dumping the waste inside the house, 15.6% at the backyard, and 6.7% inside the drainage. A study reveals that some of the waste is dumped on the streets, gutters, holes, and in nearby bushes; this has the potential of serving as breeding grounds for rodents and insects that could increase the risk of the spread of parasitic and zoonotic diseases.11 furthermore, the food debris disposed of indiscriminately could give rise to choked drains and blocked waterways, which can cause flooding during the wet season.12

Based on the distance between dumping sites to the kitchen, about half mentioned that it was about 2 meters. This is inappropriate practice; the dumping site should be far away from the kitchen because poorly managed waste serves as a breeding ground for disease vectors. The indiscriminate open dumping of wastes poses significant threats to public health and the environment if they are not stored, collected, and disposed of properly.¹³

CONCLUSION

The finding of this study was able to explore that most of the people in this community had a poor level of knowledge, negative attitude, and poor level of practice regarding waste disposal. It was suggested that both the government and non-governmental organizations should organize a massive campaign on the importance of proper waste disposal and to create awareness on proper waste disposal practices.

Recommendations

The government should organize a proper awareness campaign for the community on the importance of proper waste disposal. The government should provide personnel that will health educate the community on the negative effects of improper waste disposal. The government

should enact a law on waste disposal and provide law enforcement agencies on waste management to implement punishment on defaulters. The government should provide adequate skilled personnel and adequate materials for disposal, collection, transporting, and management of waste. The community themselves should organize sanitation to provide people involvement and assign a penalty to any defaulter.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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