



Attitudes and Practice of Solid Waste Disposal among Residents of Federal Capital Territory Municipal Council, Nigeria.

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Abstract

Background: Attitude is a major determinant of health behaviour. Proper management of solid waste at the household level can only be achieved by identifying the attitude of residents towards household solid waste management practices. Solid wastes (SW) are materials created from human activities that are no longer useful. They are disposable solid materials and might be hazardous to human well-being, e.g. plastics, wood, food, textiles, metals, glass, leather, sanitary waste, septic tank waste, etc.

Aim: This study assessed the attitude of Abuja residents towards solid waste management practices in the Federal Capital Territory (FCT) Municipal Council.

Method: A cross-sectional survey design was used for the study. The respondents for the study were adults from randomly selected households in the AMAC and Bwari suburbs of Abuja FCT. Data was collected from 197 respondents using a self-structured questionnaire ($\alpha=0.78$). Data was analysed using SPSS version 25.0.

Findings: The study showed that the residents of the FCT municipal agreed that organic and plastic materials are the most solid waste materials produced. There was a positive attitude towards waste collection through waste bins (mean value: 2.79, SD: 1.214) but a very poor attitude towards separation of solid wastes before final disposal (mean value: 1.45, SD: 0.939).

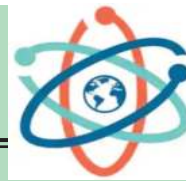


Conclusion: Despite having a favourable attitude towards collecting their solid wastes in waste baskets (bins) and plastic bags and temporary storage of their solid waste before disposal, 47.2% of FCT residents still dump refuse along the roadside and have a very poor attitude towards separating solid wastes before final disposal.

Keywords: *Solid waste, Management practices, FCT Municipal council, Solid Waste Management*

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Background

Waste is an unwanted and unusable material created during human exercises (The Federal Ministry of Environment, 2012). Waste is also described as any substance or material which is expected to be discarded as being broken, defiled or generally spoilt and, as such, lost its usability (Anifowose *et al.*, 2012). Solid wastes (SW) are annoying materials created from human exercises (Sharma *et al.*, 2014). They are disposable solid materials, which are not generally not required and might be hazardous to human well-being. Municipal Solid Wastes (MSW) comprise all kinds of rejected, trashable, and unusable materials such as plastics, wood, food, textiles, metals, glass, leather, sanitary, septic tank, and other wastes. According to the World Bank Group (2022), the world produces 2.01 billion tons of MSW yearly. Ezechiet *al.*(2017) grouped municipal solid waste in Nigeria according to their sources to include homegrown waste, market waste, business waste, and institutional waste.

In Nigeria, MSW is mainly made up of paper, plastic, metal, kitchen waste, and glass, among other things (Kadafaet *al.*, 2013). The treatment of MSW is a major problem worldwide, particularly among non-industrialized nations like Nigeria (Adekunle *et al.*, 2011; Zamorano *et al.*, 2009). The thickness of MSW in Nigeria, according to Ogwueleka(2009), ranges from 280 - 37 kg/m³, and its yearly age rate is 25 million tons with an everyday pace of 0.56 - 66 kg/limit/day. This has increased over the years, and Nigeria now creates over 32 million tons of solid waste yearly (Bakare, 2020).The management of municipal solid waste in many developed

countries has evolved into material flow management to include cautious treatment of natural substances to decrease green gas discharge, which inadvertently creates work, generates revenue generation, and protects the environment (Cheet *al.*, 2013; Odoemene & Ofodu, 2016). The management of Municipal solid waste is, for the most part, impacted by many factors like administrative capability, personnel education and pay level, waste collection or disposal fees, security and success, level of enforcement of waste disposal laws, industrialisation, human mentality or attitude, urbanisation, and neighbourhood climatic circumstances (Agwu, 2012).

Municipal Solid Waste Management (MSWM) is a universally difficult issue, particularly in developing nations (Adekunle *et al.*, 2011). Uncollected or improperly disposed wastes are a debacle for human well-being and the natural environment (Nabegu, 2017). Worldwide, there has been an expansion in municipal solid waste because of population increment and changes in the culture, mentality, and attitude of individuals toward waste disposal (Ali *et al.*, 2015).

In Nigeria, Solid Waste Management (SWM) is under the domain of the Ministry of Environment at the Federal and State levels and the Environmental Health Department at the Local Government level. Abuja, the capital of Nigeria, is encountering a dramatic expansion in municipal solid waste (MSW) generation because of its fast-growing population and the attitude of the populace. Wastes that are not properly disposed of constitute preventable dangers to both human health and the environment, and the attitude of the inhabitants



of a city is responsible for how waste is sorted and unloaded (Arimieari et al., 2014). Despite being the Federal Capital Territory, Abuja is littered with sites of indiscriminate refuse dumps along roadsides, empty lands, streets, and waterways. Therefore, it is pertinent to evaluate the attitude of the households in the FCT Municipal Council towards household solid waste management.

Research Questions

1. What are the attitudes of Abuja residents towards household solid waste disposal in FCT municipal Councils?
2. What are the attitudes of Abuja residents towards the various methods of collecting household solid waste in FCT Municipal Councils?

Method

The descriptive cross-sectional survey design was used for the study. The descriptive cross-sectional survey design was used for the study. The Federal Capital Territory, commonly known as FCT, is a federal territory in central Nigeria. The respondents for the study were heads of randomly selected households in the AMAC and Bwari suburbs of FCT Abuja. AMAC and Bwari Area Councils have a population of 778,567 (Federal Republic of Nigeria Official Gazette, 2007). Considering that the 2006 Nigerian population census made an annual population growth projection of 2.39% for Nigeria, the AMAC and Bwari Area Council's population would be 1,076,291 in 2023 (United Nations, 2024).

A self-structured questionnaire was used to assess the attitude of households toward solid

waste management practices. This questionnaire was developed in line with the study objective and was based on the reviewed literature. The instrument was divided into two (2) parts. While part 1 contains the respondents' socio-demographic information, part 2 contains items that assess households' attitudes towards the practice of solid waste management. The instrument's reliability was established using Cronbach's alpha coefficient, which yielded a score of 0.78 after the instrument was pre-tested at Gwarimpa district, another suburb of Abuja, in a test-retest approach. Three experts in waste management reviewed the content accuracy and ascertained the instrument's validity.

On ethical considerations, a letter of introduction was obtained from the Department of Public Health, National Open University FCT Abuja. This letter was used to seek permission from the council areas of the municipalities and the heads of the communities where data was collected. Consent was sought from the respondents after the aim of the study was thoroughly explained to them, and their participation was informed and willful. Data was collected with questionnaires administered to heads of randomly selected households within the study area from April to June, 2023. The collected data were analysed using IBM® SPSS Statistics version 25. Descriptive statistics was used to present the research questions, while inferential statistics was used to test the hypothesis at $p < 0.05$ significance level.



Results

Table 1: Socio-demographic Characteristics of Respondents

Variables	Categories	Frequency	Percentage (%)
Gender	Male	80	40.6
	Female	117	59.4
Age	18-20yrs	12	6.1
	21-30yrs	50	25.4
	31-40yrs	69	35
	41-50yrs	47	23.9
	51 & above	19	9.6
Marital status	Single	78	39.6
	Married	110	55.8
	Divorced	3	1.5
	Widowed	6	3
Houshold size	1-3	35	17.8
	4-6	105	53.3
	7-10	51	25.9
	11 & above	6	3
Educational status	Primary	3	1.5
	Secondary	97	49.2
	Tertiary	97	49.2
Employment status	Government Worker	38	19.3
	Non-Government	32	16.2
	Selfemployed	110	55.8
	Unemployed	17	8.6

Table 1 indicated that most respondents were females (117, 59.4%), as against males (80, 40.6%). The ages of most of the respondents were 31- 40 years old (35%), followed by 21 - 30 years (25.4%), 41-50 years (23.9%), 51 and above (9.6%) and 10-20 years (6.1%) respectively. More than half of the respondents were married (55.8%), followed by single (39.6%), widowed (3%) and divorced (1.5%). More than half of the respondents (53.3%) had a family size of 4-6 persons in their household, followed by 7-10 (25.9%), 1-3 (17.8%), and 11 & above (3%). Considering educational levels, 49.2% of respondents indicated that they had achieved secondary school education; 49.2% also indicated that they had tertiary education, whereas 1.5% said they had primary education. On employment status, the majority of respondents were self-employed (55.8%), followed by government employees

(19.3%); non-government employees made up 16.2% of the respondents, while 8.6% were unemployed.

Table 2: Types of Household Solid Waste Generated

Type of waste generated in the Municipality	SD N (%)	D N (%)	A N (%)	SA N (%)	M	Std
Organic waste (food & garden waste)	0(0)	0(0)	9(4.6)	188(95.4)	3.95	0.209
Plastic waste	19(9.6)	38(19.3)	63(32)	77(39.1)	3.01	0.987
Paper waste	48(24.4)	42(21.3)	81(41.1)	26(13.2)	2.43	1.001
Textile (cloth) waste	115(58.4)	33(16.8)	17(8.6)	32(16.2)	1.83	1.139
Glass waste	158(80.2)	15(7.6)	21(10.7)	3(1.5)	1.34	0.728
Metal waste	169(85.8)	8(4.1)	11(5.6)	9(4.6)	1.29	0.771
Electronic waste (Ewaste)	176(89.3)	3(1.52)	11(5.6)	7(3.6)	1.23	0.712
Other waste	151(76.6)	45(22.8)	1(0.5)	0(0)	1.24	0.439

Note: 1-Strongly disagree, 2-Agree, 3-Disagree, 4- Strongly disagree

The result in Table 2 shows the distribution of the respondents by the type of solid waste generated. From the table, it was observed that the highest numbers for each waste category are as follows: 188 (95.4%) of the respondents strongly agreed on generating organic waste, 77 (39.1%) strongly agreed on generating plastic waste, 81 (41.1%) agreed on generating paper waste, 115 (58.4%) strongly disagreed on generating textile waste, 158 (80.2%) strongly disagreed on generating glass waste, 169 (85.8%) strongly disagreed on generating metal waste, 176 (89.3%) strongly disagreed on generating electronic waste. Finally, 151(76.6%) strongly disagreed on generating other waste. The four (4) point scale is considered an interval scale, and the mean is very significant. The range 1.00 to 1.75 means strongly disagree, 1.85 – 2.50 means disagree, 2.60 – 3.25 means agree, and 3.35 – 4.00 means strongly agree, respectively. From the resulting means, it was strongly agreed that the



respondents generated organic waste (3.95). The respondents agreed that plastic (3.01) and paper (2.43) waste was generated. However, they disagreed that paper waste (1.83) was generated in their households. Furthermore, they strongly disagreed that glass waste (1.34), metal waste (1.39), and other waste (1.24) were generated in the households. From the means in Table 2, the order of solid waste generation ranking from the most to least includes: organic waste (3.95), plastic (3.01), paper (2.43), textile (1.83), glass (1.34), metal (1.29), other waste (1.24), and e-waste (1.23), respectively.

Table 3: Methods of Collecting Household Solid Waste

Methods of Collecting Household Solid Waste	SD N (%)	D N (%)	A N (%)	SA N (%)	M	Std
Use of waste basket (bin)	47 (23.9)	29 (14.7)	40 (20.3)	81 (41.1)	2.79	1.214
Use of plastic bag	28 (14.2)	7 (3.6)	105 (53.3)	57 (28.9)	2.97	0.947
Use of tin/can	140 (71.1)	15 (7.6)	30 (15.2)	12 (6.1)	1.56	0.96
Use of old bucket	164 (83.2)	2 (1.02)	16 (8.1)	15 (7.6)	1.4	0.929
Use of carton	171 (86.8)	4 (2.03)	22 (11.2)	0 (0)	1.24	0.64
Use of sack	134 (68)	2 (1.02)	42 (21.3)	19 (9.6)	1.73	1.1
Use of other methods (drums, floor hiping etc)	187 (94)	8 (4.06)	2 (1)	0 (0)	1.06	0.279

Note: 1-Strongly disagree, 2-Agree, 3-Disagree, 4- Strongly disagree

Table 3 shows the distributions of respondents by their agreement on the methods used for collecting refuse. The highest numbers were as follows: 81 (41%) strongly agreed on the use of waste bins, 105 (53.3%) agreed on the use of plastic bags, 140 (71.1%) strongly disagreed on the use of tin or cans while 164 (83.2%) strongly disagreed on the use of; old bucket, 171 (86.8%) strongly disagreed on the use of carton, 134 (68%) strongly disagreed on the use of sack and 187 (94%) strongly disagreed on the use of any other methods such as drums, floor hiping, etc. The means for

respondents who agreed on the use of plastics is 2.99, while that of waste baskets or bins is 2.79. The mean for sacks is 1.73, while those of tins/cans, old buckets, cartons, and other mediums are 1.56, 1.4, and 1.24, respectively. In descending order of the means, the ranking of the preferred method of collecting household refuse among the respondents is as follows: plastic bags, waste bins, sacks, tins or cans, old buckets, cartons, and other mediums.

Table 4: Methods of Disposing Household Solid Waste

Methods of disposing of household solid waste	SD N (%)	D N (%)	A N (%)	SA N (%)	M	Std
Separation	157 (79.7)	6 (3)	20 (10.2)	14 (7.1)	1.45	0.939
Storing it in a temporary storage medium	15 (7.6)	3 (1.5)	62 (31.5)	117 (59.4)	3.43	0.858
Burning	131 (66.5)	14 (7.1)	51 (25.9)	1 (0.5)	1.6	0.89
Burying/composting	178 (90.4)	8 (4.1)	11 (5.6)	0 (0)	1.15	0.492
Reusing/refurbishing	161 (81.7)	1 (0.5)	29 (14.7)	6 (3)	1.39	0.848
Reduction	156 (79.2)	11 (5.6)	27 (13.7)	3 (1.5)	1.38	0.777
Recycling	181 (91.9)	0 (0)	12 (6.1)	4 (2)	1.18	0.628
Municipal waste collector(AEPB)	127 (64.50)	20 (10.2)	15 (7.60)	35 (17.8)	1.79	1.18
Approved Private waste collectors	120 (60.9)	42 (21.3)	25 (12.7)	10 (5.1)	1.62	0.893
Scavengers (bola)	138 (70.1)	10 (5.1)	17 (8.6)	32 (16.2)	1.71	1.166
Pour into drainage water	158 (80.2)	11 (5.6)	19 (9.6)	9 (4.6)	1.39	0.841
Dump along the roadside/open spaces	73 (37.1)	4 (2)	27 (13.7)	93 (47.2)	2.71	1.379
Communal bins/dumpster	105 (53.3)	31 (15.7)	42 (21.3)	19 (9.6)	1.87	1.059
Burying it in my backyard	176 (89.3)	6 (3)	14 (7.1)	1 (0.5)	1.19	0.572
burning	147 (74.6)	4 (2)	43 (21.8)	3 (1.5)	1.5	0.884

Note: 1-Strongly disagree, 2-Agree, 3-Disagree, 4- Strongly disagree

Table 4 shows the result of the respondent's level of agreement on various handling strategies for household solid wastes. The result showed that the highest numbers were as follows: 157 (79.7%) of the respondents strongly disagreed on separating or sorting their solid waste generated, 117 (59.4) strongly agreed on storing their solid waste in a temporary collection medium, 131 (66.8%) strongly disagreed on burning their waste, 178 (90.4%) strongly disagree on burying their solid waste at in their backyard, 161 (81.7) strongly disagreed on reusing or refurbishing their solid waste, 156 (79.2%) strongly disagreed on reducing their solid waste and 181 (91.9%)



strongly disagreed on recycling their solid waste. The resulting means revealed that in handling their household solid wastes, most of the respondents strongly agreed to storing their solid waste in temporary storage mediums before their disposal (3.43), whereas some of the respondents strongly disagreed on reusing (1.39), reducing (1.38), recycling (1.15), and burying or composting (1.15) their household solid wastes respectively.

Also, according to Table 4, the respondents strongly disagreed as follows: 127 (64.5%) disposing disposal through the municipal solid waste collectors, known as Abuja Environmental Protection Board (AEPB), 120 (60.9%) using the approved private waste collection services, 138 (70.1%) use of scavengers (bola), 158 (80.2%) dumping their solid waste in water bodies or drainage and 93 (47.2%) by the roadside or open spaces. The respondents strongly disagreed as follows regarding the disposal of solid waste: 105 (53.3%) strongly disagreed with disposing of their solid waste in public or communal bins or dumpsters, 176 (89.3%) strongly disagreed with disposing of their solid waste by burying and finally 147 (74.6%) respondents strongly disagreed on burning their waste as means of disposing their solid waste. The mean of the result shows that the respondents agreed on disposing of their solid waste along the roadsides or open spaces (2.71), while some of the respondents disagreed on using public or communal bins (1.87) and municipal solid waste collectors (AEPB) (1.79). In the same light, some of the respondents strongly disagreed on disposing their household solid waste using scavengers (1.71) or through approved private solid waste collectors (1.71), as well as through burning (1.62), dumping in water bodies or drainage disposal (1.39) and

burying (1.19) their solid waste.

Discussion

The majority of the adults in a household who responded to the questionnaire were females (117, 59.4%). This is because women are more likely to be housewives and more likely to be at home during the distribution of the questionnaire, and some households may be led by unmarried or widowed women. The modal age range of the respondents was between 31 and 40 years old (35%). This is expected because that is the peak age for family life. All the respondents had at least primary education. This confirms the urban nature of the study area, as more educated people usually live in urban areas where they can find employment in varied forms, as seen in Table 1, compared to rural agrarian communities.

Attitude towards the types of household solid wastes

From Table 2, it was observed that 188 (95.4%) of the respondents strongly agreed on organic waste generation, and 77 (39.1%) agreed on generating plastic waste. This is expected because most household wastes are generated from the kitchen and are mostly organic wastes from vegetables, fruits, food, etc. This type of waste can easily be used as manure for farming. Plastic waste is common in urban areas and constitutes major health and environmental problems. They are non-biodegradable and need to be properly disposed of since they can remain for years without decomposing (World Bank Group, 2022). Unlike other major Nigerian cities, Abuja, the capital of Nigeria, with low industrial density compared to major cities like Lagos, Port Harcourt, Kaduna and Kano. As a city with little or no industrial clusters, it is expected that most waste generated would be from the kitchen



and mostly organic waste from vegetables, fruits, food, etc.

Attitude Towards different methods of Collecting Household Solid Waste in FCT Abuja

The result, as shown in Table 3, showed that household solid wastes generated were collected using waste baskets (bins), plastic bags, tin or cans, old buckets, cartons, sacks, and other containers. About half of the respondents (41.1%) strongly agreed to using waste bins, followed by plastic bags (28.9%), sacks (9.6%), old buckets (7.6%), and tin or cans (6.1%). The finding that up to 53.3% strongly agreed while 28.8% agreed to the use of plastic bags was a good development because packaging household solid wastes in plastic keeps away flies between the period of collection and disposal of refuse (Oladejo et al., 2013). Some states in Nigeria have been producing customised plastic bags for household refuse collection. In Abuja FCT, the AEPB also promotes the use of customised plastic bags. These findings are closely related to studies conducted by Oladejo et al. (2013), where more (61.8%) of the respondents reported that they had waste receptacles or bins in their homes, and Magaji & Adenyuma (2020) where 43% of them used plastics bins, while 25% used nylon in storing their waste, respectively.

Attitude Towards Methods of Household Solid Waste Disposal Methods in the FCT Abuja

From Table 4 above, more than 59.4% of the respondents strongly agreed to storing their waste temporarily before disposal. This was followed by Separation (7.1%), reusing (3%), recycling (2%), reduction (1.5%), burning

(0.5%), and burying, respectively. The finding that only 7.1% of households separate their solid waste shows a very low level of understanding of the proper method of handling solid waste. Separation makes waste easy to dispose of and recycle. This finding aligns with the findings of Eshete et al. (2023) that households lack experience in sorting solid waste before disposal. Table 4 also showed that 47.2% of the respondents strongly agreed on disposing of their solid waste in open spaces or along the roadsides. This is a very bad attitude towards refuse disposal. Other bad attitudes affirmed by respondents include the use of Scavengers (bola) and the dumping of wastes in drainage channels or water bodies. Scavengers pose a security risk to the community (Emelumadu et al., 2016), and dumping solid refuse into drainage can lead to flooding. These findings did not align with a study by Vinti et al. (2021), where the majority of households (66.6%) favoured the disposal of solid wastes in refuse dumps.

Conclusion

Most of the household solid waste produced by the FCT Municipal Council is made up of organic and plastic materials. FCT Municipal Council residents have favourable attitude towards collecting their solid wastes in waste baskets (bins) and plastic bags before disposal. Despite having a favourable attitude towards temporary storage of solid waste before disposal, 47.2% of FCT residents still engage in dumping refuse along the roadside, and they have a very poor attitude towards separating solid wastes before final disposal.



Recommendations

There is need to intensify public education on household waste disposal practices in the FCT Municipal Council to promote a positive attitude towards proper methods of collecting separating, and disposing of solid waste. FCT Municipal Council, through the AEPB, should avail customized plastic bags at affordable costs to promote continued use of this good method that has already been favoured by the FCT Abuja households for collecting and storing solid wastes. Further studies should be conducted on the knowledge and practice of solid waste disposal among households in the FCT Municipal Council.

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