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Domestic solid waste disposal practice among the residents of a municipality area: A case study on Pabna municipality

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ABSTRACT

Background: All across the world, solid waste is a part of everyone's daily existence. Municipal solid waste refers to the majority of non-hazardous solid waste from a city, town, or village that requires frequent collection and transfer to a processing or disposal location. Solid waste management is critical in every community in Bangladesh because it prevents households from being exposed to the dangerous effects of solid waste. Rapid population growth exacerbates the problem of solid waste management. According to a survey, Bangladesh generates roughly 22.4 million tons of waste per year. When waste is not adequately collected and disposed of, the rate of waste generation is predicted to climb to 220 kg/cap/year in 2025, posing major environmental and health hazards. *Methods:* Direct interviews guided by questionnaires were utilized to gather data for this study, which assessed consumers' trash disposal practices and satisfaction with waste disposal facilities. Purposive sampling or judgmental sampling should be used in this research. Because the purpose of this study is to determine the users' waste disposal capabilities, the researcher should gather data from households that regularly dispose of waste. A total of 384 people was considered for sampling out of a total of 144440 people. Each factor's level of satisfaction was scored using a 5-point Likert scale, ranging from strongly agree to strongly disagree. The Pearson Correlation Matrix (PCM) was utilized to evaluate the association between waste disposal service parameters. *Result and Conclusion:* Increased domestic and household activities in urban areas are linked to the generation of large amounts of domestic waste, according to this study. Some of this garbage is clearly dumped on the streets, drains, pits, and adjacent vegetation. In their neighborhood, about 83.3 percent of respondents discovered inappropriate dumping sites. Almost 46.9% of those polled agreed that the neighborhood lacked an appropriate dustbin. Almost 63 percent of respondents said that the waste container is in the way of walking, implying that people discard their garbage on the streets. Solid waste management services were dissatisfied in 70.3 percent of the community's houses. The majority of respondents were dissatisfied with garbage collection patterns as well as the high cost of employing private collectors.

Keywords: Domestic Solid Waste, Disposal Practice, Municipality Area.

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1. INTRODUCTION

Solid waste is a part of everyone's daily lives all over the world. Most non-hazardous solid waste from a city, town, or village that requires frequent collection and transfer to a processing or disposal location is referred to as municipal solid waste (MSW) (Nyang'echi GN, 1992). It mostly consists of residential waste (domestic waste), with business wastes collected by a municipality within a specific area (Zia H. and Devadas V. 2008). The collection, transfer, treatment, recycling, resource recovery, and disposal of solid waste generated in metropolitan areas is referred to as municipal solid waste management (MSWM). MSWM is a primary duty of local governments and a complicated service that requires proper organizational, technical, and administrative competence as well as collaboration from a variety of corporate and public sector stakeholders (Owusu G et al., 2012). The quantity and type of municipal solid trash are thus determined by population density, source diversity, and the local population's income. The quantity and nature of (MSW), including non-biodegradable and hazardous wastes, is bound to increase as population, economic activity, and income rise (Ahmed SA and Ali SM, 2011). The growing amount and qualities of waste provide a management issue for local authorities, necessitating increased resources and technological competence. In developing countries where resources and capacity are constrained, the challenges thus become serious (Rhule RP, 2008). Municipal solid waste describes the stream of solid waste generated by household, communities, industries and different types of institutions. In more affluent cities, the management of municipal solid waste is high. In fact, countrywide average rates of waste generation in most industrialized countries lie between 0.8 and 1.4 kg per person per day, and they manage it efficiently (Palczynski RJ, 2002). Contrarily, in developing countries, the average generation rate is more likely to be in the range of 0.3 to 0.5 kg per person per day, but the way to handling and managing of solid waste has been low and still remains inadequate (Achankeng E, 2003).

In Ghana, a research done at Kodiabe focused on the way refuse materials were dumped, which included direct observations at disposal sites from five divisions (Peter SA, 2002). Another study conducted in Nigeria found that people's attitudes and perceptions of sanitation concerns contribute to the waste management problem (Peter SA, 2002). Similarly, city dwellers in Khulna, Bangladesh, think that because they pay taxes, it is the municipal authority's sole responsibility to provide them with a nuisance-free habitable city (Rhule RP, 2008; Islam SM D et al., 2016). Local governments are often in charge of collecting and disposing of garbage created within their jurisdiction, as well as operating and maintaining their equipment. Local governments, on the other hand, frequently lack the authority and resources necessary to deliver a satisfying and financially viable service. An equitable allocation of responsibility, authority, and revenue between the national government and the local governments is required for effective and efficient solid waste management (Mensah A and Larbi E, 2005; Amin N et al., 2005).

Problem Statement

In the most developing country like Bangladesh a solid waste management system compromises four functional elements: waste generation, Onsite handing or storage, collection and disposal (Mensah A and Larbi E, 2005). Finally, properly collection, storage and disposal ensure the maximum success of the management systems. Solid waste for disposal can go directly to open dumps or sanitary landfill and indirectly composting. Many municipalities of Bangladesh are known as solid waste management systems. Some municipalities are not properly managing the solid waste which hampers our healthy life and environment. Different types of pollution can be occurred if municipalities properly collection and disposal of wastes (Haque A et al., 1997). But some municipality also can solve this problem in planned way.

Solid waste management is extremely important in every community in Bangladesh because it will prevent household from experiencing the hazardous outcomes of solid waste material (Alam O and Qiao X, 2020). Rapid population increases harmful situation of solid waste management. A study found that current waste generation in Bangladesh is around 22.4 million tons per year [10]. The rate of waste generation is expected to increase to 220 kg/cap/year in 2025 when waste is not properly collected, it will be illegally disposed of this will pose serious environmental and health problems (Mensah A and Larbi E, 2005; Haque A et al., 1997).

In the Pabna municipality, total waste generation 0.257kg per person in a day. In the city 27,478 tons waste is generated in the year 2016. The total of wastes generated most 75% of the waste comes from households, 0.75% from commercial areas and 1.2% street sweeping, 14% from industrial waste and the remaining from hotels, hospitals etc. (Alam O and Qiao X 2020; Peter SA, 2002). This study aims at understand of current municipal solid waste disposal practices and problems with particular emphasis to the perception of citizen regarding solid waste disposal practices and services.

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Research Design

Study Area

The administrative capital of Bangladesh's Pabna district is Pabna municipality. It is a municipality in Bangladesh that is classified as 'A'. The city is situated on the Isamati River's banks. It covers a total area of 27.20 km2. Pabna municipality has a population of 144,442, according to the most recent national census numbers, with an annual urban population growth rate of 3.5 percent. The municipality had 42,848 households and 213 kilometers of road in 2020, with 162 kilometers of bituminous road. The residential and commercial sector dominates the municipality of Pabna's southern part, while industrial districts are mostly situated on the outskirts. (Fahim AU et al., 2022)

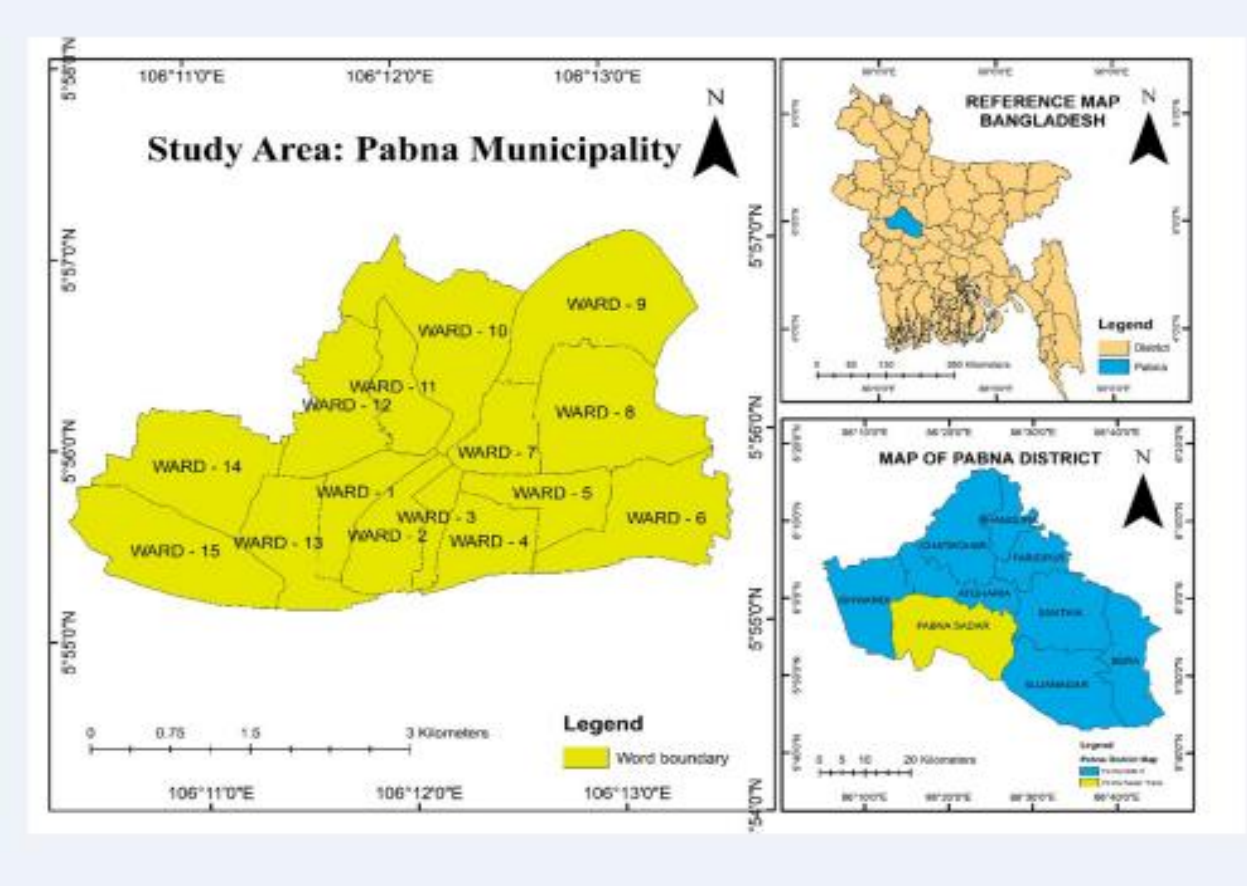

Figure 1 Study Area (Pabna Paurashava)

2. METHODS

Personal interviews guided by questionnaires were utilized to gather data for this study, which assessed consumers' trash disposal practices and satisfaction with waste disposal facilities. Purposive sampling or judgemental sampling should be used in this research. Because the purpose of this study is to determine the users' waste disposal capabilities, the researcher should gather data from households that regularly dispose of waste. For the study to be conducted, the users need be familiar with garbage disposal practices. In this case, the survey respondents should be picked based on the researcher's own judgment or aim. The surveyors collected data from January 1, 2022, to February 28, 2022, using purposive sampling methods and a one-week interval. This study used individual households as survey locations. A total of 384 respondents were examined for sampling size selection out of 144440 populations (5 percent precision level and 95 percent confidence level). The questionnaire for the study was created after much research and brainstorming. There were two sections to the questionnaire. The first portion collects non-parametric socioeconomic data (age, gender, education, and occupation) as well as garbage disposal practices (dustbin, disposal sites, disposal management, transportation of waste etc.). The second portion collects parametric data on the level of satisfaction with the user's perspective of garbage disposal. Each factor's level of satisfaction was scored using a 5-point Likert scale, ranging from strongly agree to strongly disagree. The descriptive statistics along with chi-square were used to learn about the respondents of socio-economic characteristics and waste disposal practice. For assessing the satisfaction among waste disposal services, several statistical procedures were

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available. To investigate the relationship between factors of waste disposal services, Pearson Correlation Matrix (PCM) was used. PCM is effective tools to determine the correlation between factors.

3. RESULTS AND DISCUSSION

In considering the study aim (i.e., waste disposal practice), a self-developed question was applied to find out the services and facilities related to waste disposal management in the paurashava of Bangladesh. Besides, the questionnaire included basic socio-demographics (age, gender, occupation, education, family member), waste disposal practice (dustbin, disposal sites, disposal management, transportation of waste etc.). Table – 1 summarizes the different characteristics of the participants.

To understand respondents' basic features, the Chi-square Test and factor distribution are used. With the analyzed variables at a significant level of p 0.05 and a 95 percent confidence interval, the Chi-square ($\chi 2$) Test was used. The Chi-square test reveals the relationship between the factors' variables. The association between the variables of the factors is significant when the p value is less than 0.05. Table 1 displays the chi-square value distribution of the factors.

Table 1 Descriptive Statistics of Solid Waste Disposal services

Variables	Frequency	Percentage	$\chi 2$ value	Df	p value
Gender (F1)					
Male	283	73.7	83.260	1	.000
Female	101	26.3			
Age (F2)					
11-20	4	1	664.516	4	.000
21-30	42	10.9			
31-40	276	71.9			
41-50	13	3.4			
Above 51	49	12.8			
Marital Status (F3)					
Married	367	95.6	319.010	1	.000
Unmarried	17	4.4			
Education (F4)					
SSC	4	1	705.271	4	.000
HSC	56	14.6			
Graduate	14	3.6			
Post Graduate	282	73.4			
Under SSC	28	7.3			
Monthly Income(F5)					
0-10,000	18	4.7	364.021	3	.000
10,001-20,000	15	3.9			
20,001-30,000	106	27.6			
30,001 Above	245	63.8			
Residential Unit (F6)					
Detached House	25	6.5	769.938	3	.000
Semi Detached	4	1			
Flats	331	86.2			
Compound House	24	6.3			
Family Member (F7)					
1	6	1.6	251.313	5	.000
2	107	27.9			
3	65	16.9			
4	150	39.1			
5	49	12.8			

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Variables	Frequency	Percentage	χ2 value	Df	p value
10	7	1.8			
Separation of Waste (F8)					
Yes	113	29.4	65.010	1	.000
No	271	70.6			
Disposal Site (F9)					
Appropriate	64	16.7	170.667	1	.000
Inappropriate	320	83.3			
Transportation of Waste (F10)					
Servants	103	26.8	328.438	3	.000
Family Members	237	61.7			
Housemaid	40	10.4			
Paid Collectors	4	1			
Cost (F11)					
0-50	42	10.9	177.250	4	.000
51-100	118	30.7			
101-150	4	1			
151-200	150	39.1			
Above 201	70	18.2			
Types of Collection (F12)					
Curb Collection	113	29.4	130.609	2	.000
Communal Collection	226	58.9			
Others	45	11.7			
No Appropriate Dustbin in the area (F13)					
Strongly Disagree	83	21.6	126.208	3	.000
Disagree	00	0			
Moderate	121	31.5			
Agree	15	3.9			
Strongly Agree	165	43			
Dustbin is not easily accessible (F14)					
Strongly Disagree	181	47.1	235.089	4	.000
Disagree	40	10.4			
Moderate	56	14.6			
Agree	100	26			
Strongly Agree	07	1.8			
Dustbin is in the way of walking (F15)					
Strongly Disagree	00	00	75.688	3	.000
Disagree	139	36.2			
Moderate	138	35.9			
Agree	58	15.1			
Strongly Agree	49	12.8			
Offensive odour from scattered Solid Waste (F16)					
Strongly Disagree	00	00	92.563	3	.000
Disagree	40	10.4			
Moderate	115	29.9			
Agree	66	17.2			
Strongly Agree	163	42.4			
Waste is not properly removed from the area (F17)					

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Variables	Frequency	Percentage	χ2 value	Df	p value
Strongly Disagree	83	21.6			
Disagree	15	3.9			
Moderate	72	18.8	161.885	4	.001
Agree	49	12.8			
Strongly Agree	165	43			
Waste is disposed in drain (F18)					
Strongly Disagree	09	2.3			
Disagree	89	23.2			
Moderate	121	31.5	135.458	3	.000
Agree	165	43			
Strongly Agree	00	00			
Waste is scattered outside the bin (F19)					
Strongly Disagree	74	19.3			
Disagree	09	2.3			
Moderate	72	18.8	355.089	4	.000
Agree	15	3.9			
Strongly Agree	214	55.7			
Waste is disposed on the road (F20)					
Strongly Disagree	09	2.3			
Disagree	138	35.9			
Moderate	123	32	211.729	4	.000
Agree	07	1.8			
Strongly Agree	107	27.9			
Presence of flies, mosquitoes due to indiscriminate disposal of waste (F21)					
Strongly Disagree	00	00			
Disagree	83	21.6			
Moderate	72	18.8	255.646	3	.000
Agree	222	57.8			
Strongly Agree	07	1.8			
No proper disposal practice and management(F22)					
Strongly Disagree	83	21.6			
Disagree	31	8.1			
Moderate	105	27.3	36.208	3	.000
Agree	165	43			
Strongly Agree	00	00			

The table showed that about 73.7% of the responders are male and 26.3% are female (Chi-square value is 83.260 and p value is .000). The prominent age group of the responders is 31-40 years which covers 71.9%& and above 51 years covers 12.8% of the group (Chi-square value is 664.516 and p value is .000). The table also indicates that 95.6% respondents are married and 4.4% respondents are unmarried and its Chi-square value is 319.010 and p value is .000. The level of education of the respondents is Under SSC (7.3%), SSC(1%), HSC(14.6%), Graduate (3.6%), post-Graduate (73.4%) and the Chi-square value of this variable is 705.271 and p value is .000. The stated data also showed that maximum people highly educated in Pabna municipality area which is very significant in the context of a 'A' category municipality. In line with higher education level about 63.8% of the respondent's income is above 30001 BDT. The next lower income group (20001-30000) covers 27.6% of the group (Chi-square value is 364.021 and p value is .000). The table also shows 86.2% residential units are flats and 6.5% residential are detached house (Chi-square value is 769.938 and p value is .000) and most of the family consists of four members (39.1%), two members (27.9%) and three members (16.9%) and the Chi-square value of this variable is 251.313 and p value is .000. About 70.6% domestic waste produced in the municipality are not separated and 29.4% of waste is separated (Chi-square value is 650.010 and p value is 0.000). About 83.3% domestic wastes are

inappropriately disposed on site, on the other hand 16.7% waste appropriately disposed on site and its Chi-square value is 170.667 and p value is 0.000 The research found that there is lack of waste transport system and most of the wastes are transported by family members (61.7%) and servants (26.8%) and the Chi-square value is 328.438 and p value is 0.000.Cost associated with waste disposal is mainly 151-200 taka (39.1%) and 51-100 taka (30.7%) and their Chi-square and p value is 177.250 and 0.000. Most of the waste are communally collected (58.9%) and (29.4%) of waste are Curb Collection (Chi-square value is 130.609 and p value is 0.000). The table also showed that about 43% of the responders claimed lack of appropriate dustbin in the area and moderately claimed 31.5% and their Chi-square, p value is 126.208 and 0.000.Though 47.1% respondents claimed dustbins are easily accessible and 26% of respondents claimed dustbin is not easily accessible (Chi-square and p value are 235.089 and 0.000).36.2% responders commented that dustbins are not in the way of walking and moderately claimed 35.9% dustbin is in the way of walking. This may be a major cause of inappropriate disposal of domestic waste (Chi-square value is 75.688 and p value is .000). About 42.4 % people strongly agreed that these scattered solid wastes are responsible for offensive odor and 29.9% of people moderately said that statement and their Chi-square and p value is 92.563 and 0.000. Moreover 43% people also claimed this domestic waste are not properly removed from the municipality area and 21.6% of people strongly disagree about that statement (Chi-square value is 161.885 and p value is 0.000). To make the thing even worse practice of waste disposing into drain is also practiced in this municipality, 43% of the responders agreed and moderate majority is 31.5% (Chi-square value is 769.938 and p value is .000). About 55.7% people strongly agreed that waste is scattered outside of the bin and 19.3% of people strongly disagree and their Chi-square value is 355.089 and p value is 0.000. Almost27.9% people claimed that waste is also dumped on the road in this municipality and 35.9% of people disagree with this statement (Chi-square and p value is 211.729 and 0.000. Around 57.8% responders agreed that this indiscriminate disposal of waste is responsible for flies and mosquitos and 21.6% is disagree, Chi-square value is 255.646 and p value is 0.000. About 43% responders agreed and 27.3% moderately said that (Chi-square and p value is 36.208 and 0.000) there is no proper disposal practice and waste management in the Pabna municipality.

Table 2 Pearson correlation matrix of Solid Waste Disposal services

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F 10	F 11	F 12	F13	F 14	F 15	F 16	F 17	F 18	F 19	F 20	F 21	F 22
F1	1																					
F2	-.145**	1																				
F3	-.129*	-.150**	1																			
F4	.281**	.085	.028	1																		
F5	.060**	-.223**	-.188**	.042	1																	
F6	.206**	-.468**	.184**	.013	-.145**	1																
F7	-.554**	.057	.248**	-.016	-.320**	.003	1															
F8	-.380**	.049	.139**	-.234**	-.365**	-.098	.204**	1														
F9	-.669**	.010	.096	-.169**	-.230**	-.073	.382**	.693**	1													

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	F22	F 21	F 20	F 19	F 18	F 17	F 16	F 15	F 14	F 13	F 12	F 11	F 10
F 10	.052**	-.077	.049	-.132**	-.145**	-.031	.001	.709**	.399**	1			
F 11	.425**	.274**	.205**	.421**	-.232**	.084	.048	.341**	.360**	-.195**	1		
F 12	-.279**	.164**	.411**	-.158**	.296**	.002	.032	.408**	.597**	.244**	.012	1	
F 13	-.714**	-.214**	.213**	-.354**	-.158**	.018	.503**	.666**	.711**	.267**	-.649	.179**	1
F 14	-.385**	.047	.064	-.389**	-.077	-.118*	.472**	.064	.374**	.120*	-.185**	.411**	.190**
F 15	-.436**	-.374**	.078	-.267**	.034	.209**	.968**	.164**	.462**	.241**	-.338**	.196**	.430**
F 16	-.737**	.155**	.219**	-.015	-.037	.186**	.483	.078	.444**	.341**	-.384**	.025	.673**
F 17	-.721**	-.213**	.203**	-.337**	-.136**	.022	.543**	.498**	.714**	.141**	-.560**	.185**	.943**
F 18	-.651**	-.209**	.214**	-.353**	-.204**	.003	.468**	.601**	.675**	.167**	-.502**	.179**	.926**
F 19	-.770**	-.218**	.171**	-.286**	.043	.041	.561**	.379**	.735**	.068	-.606**	.202**	.907**
F 20	-.455**	-.131*	.245**	-.008	-.141**	.008	.292**	.646**	.469**	.287**	-.326**	.005	.781**
F 21	-.775**	-.254**	.259**	-.233**	-.076	.081	.616**	.408**	.743**	.049	-.568**	.256**	.905**
F22	-.822	-.068	.199**	-.345**	-.156**	-.072	.578**	.579**	.733**	.136**	-.595**	.214**	.972**

	F 9	F 8	F 7	F 6	F 5	F 4	F 3	F 2	F 1
F 9	.289**	.479**	.747**	.958**	.921**	.939**	.732**	.928**	
F 8	.433**	.686**	.798**	.913**	.817**	.977**	.570**	1	
F 7	-.390**	.027	.563**	.739**	.820**	.589**	1		
F 6	.396**	.718**	.797**	.949**	.841**	1			
F 5	.139**	.489**	.654**	.946**	1				
F 4	.266**	.631**	.741**	1					
F 3	.098	.579**	1						
F 2	.646**	1							
F 1	1								

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

In this study, the Pearson correlation matrix (PCM) is applied to described the relationship of solid waste disposal services (Table-2). There are strong significant correlation among sixty six pairs of variables. F8 and F9 have a strong positive correlation of 0.693, which illustrates the relationship of separation of waste and disposal site. F8 and F10 have a strong positive correlation of 0.709, which (separation of waste and transportation of waste). F9 and F12 have a strong positive correlation of 0.597. This finding indicated that (disposal site & types of collection). F7 and F13 have a strong correlation of 0.503, which the relationship of family member & no appropriate dustbin in the area. F8 and F13 have a strong correlation of 0.666, while F9 and F13 have a positive correlation of 0.711. This finding indicated that (separation of waste &no appropriate dustbin) and (disposal site & no appropriate dustbin) are related. There also F7 and F15 have a strong positive correlation of 0.968 and this illustrates the relation between Family member and Dustbin is in the way of walking. F14 and F15 also have strong positive correlation of 0.646, which (Dustbin is not easily accessible and Dustbin is in the way of walking), while F1 and F16 have a positive correlation of 0.737. This finding indicated that Gender & Offensive odour from scattered Solid Waste. F13 and F16 have a strong positive correlation of 0.673, while F15 and F16 have a positive correlation of 0.579. This finding indicated that (No Appropriate Dustbin in the area & Offensive odour

from scattered Solid Waste) and (Dustbin is in the way of walking & Offensive odour from scattered Solid Waste). F7 and F17 have also strong positive correlation of 0.543 which illustrates the relationship of Family Member and Waste is not properly removed from the area. A strong significant correlation is found among the statement F9 and F17 of 0.714, indicates Disposal Site and Waste is not properly removed from the area. Besides, between the statement F13 and F17, significant strong correlation is also found, that is 0.943, which illustrate the relationship of No Appropriate Dustbin in the area and Waste is not properly removed from the area. Again, significant positive correlation is found within the statement F15 and F17 and F16 and F17, their positive value is 0.631 & 0.741 and they illustrates the relationship of Dustbin is in the way of walking, Offensive odour from scattered Solid Waste and Waste is not properly removed from the area. F8 and F18 have a strong positive correlation of 0.601, which (Separation of Waste and Waste is disposed in drain). F13 & F18 have a strong positive correlation of 0.926. This finding indicated that (No Appropriate Dustbin in the area and Waste is disposed in drain). F16 and F18 have a positive correlation of 0.654 which the relationship of Offensive odour from scattered Solid Waste and Waste is disposed in drain. F17 & F18 have a strong positive correlation of 0.946, which illustrates the relationship of Waste is not properly removed from the area and Waste is disposed in drain. F7 and F19 have a positive correlation of 0.561, this finding indicated that Family Member and Waste is scattered outside the bin. F9 and F19 have also a positive correlation of 0.735, which relates Disposal Site and Waste is scattered outside the bin. F13 and F19 have a strong positive correlation of 0.907, while F15 and F19 have a positive correlation of 0.718. This finding showed that (No Appropriate Dustbin in the area & Waste is scattered outside the bin) and (Dustbin is in the way of walking & Waste is scattered outside the bin). F17 and F19 have a strong correlation of 0.949, this illustrates the (Waste is not properly removed from the area and Waste is scattered outside the bin). A strong significant correlation is found among the statement F17 & F21 of 0.913, indicates Waste is not properly removed from the area and indiscriminate disposal of waste. F17 and F22 have a strong positive correlation of 0.958, while F18 and F22 have a positive correlation of 0.921. This finding indicated that (Waste is not properly removed from the area and management system) and (Waste is disposed in drain and management system). There also strong significant correlation is found among the statement F19 and F22 of 0.939 indicates waste scattered outside the bin and management system. Besides, between the statement F21 and F22, significant strong correlation is also found, that is 0.928, which illustrate the relationship of indiscriminate disposal of waste and management system.

F1 and F17 have a strong negative connection of -0.721, while F1 and F19 have a negative correlation of -0.770. This statement showed that (Gender and Waste is not properly removed from the area) and (Gender and management system). F11 and F19 have also strong negative correlation of -0.606, which (cost and waste scattered outside the bin), while F11 and F22 have negative correlation of -0.595, which illustrate (cost and management system). F4 and F13 have a strong negative correlation of -0.354, which described the relationship between education and dustbin shortage. F4 and F14 have a strong negative correlation of -0.389, while F4 and F19 have a negative correlation of -0.286. This research found that (education and accessibility of dustbin) and (education and waste throw outside the bin) are inversely related.

4. DISCUSSION

This study indicates that increased domestic and household activities in urban areas are linked to the generation of large amounts of domestic waste. Some of this waste is also evidently dumped on the streets, drains, pits, and surrounding flora. Almost 83.3% respondents found inappropriate disposal sites in their residential area. This could act as a breeding site for rodents and insects, thus increasing the risk of parasitic and zoonotic disease transmission. Furthermore, haphazardly disposed of food particles could block drains and impede rivers, perhaps resulting in flooding during the rainy season. Almost 46.9% respondents are agreed that there is no appropriate dustbin in the area. At final disposal locations, garbage is scattered outside the bin. Almost 63% respondents told that the waste bin is located in the way of walking which means that people thrown out their wastes in the roads. Unfortunately, indiscriminate open dumping of wastes poses serious health and environmental risks if they are not properly kept, collected, and disposed by municipal authority.

Only 113 (29.4 percent) of the 364 homes segregated their waste when storing it, while the rest 271 (70.6 percent) did not separate their solid waste at all, which is typical of most Bangladeshi cities. This condition fosters the reproduction of disease vectors such as mosquitoes and cockroaches, as well as the proliferation of rodents such as rats and mice, both of which pose health risks. Almost 80% respondents claimed that there are presences of flies, mosquitoes due to indiscriminate disposal of waste. Moreover, 60% respondents told that waste is not properly removed from the area and 51.7% told that waste is disposed in drain.

The private sector provides waste collection throughout the city, as well as the usage of communal bins provided by private companies. The private sector's services, on the other hand, were said to be inadequate. Overall, 70.3 percent of homes in the community were dissatisfied with solid waste management services. The majority of respondents expressed dissatisfaction with

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rubbish collection patterns and the high expense of hiring private collectors. Most respondents stated they would be happier if more waste collection transports were given and solid waste was collected on a regular basis for disposal sites, and some said they would be ready to pay more if the fees were raised for better services.

5. CONCLUSION

The majority of solid waste generated at home was food debris and plastics, which were mostly stored in uncovered containers and disposed of without separation, according to the survey. Despite the fact that waste was properly disposed of at designated locations, some people of the community dumped waste in gutters, open fields, streets, and bushes. Despite the prevalence of indiscriminate dumping, the community showed interest in waste management by using containers and collecting trash on a regular basis at dump sites. The communities valued improved waste management methods and were willing to pay for them. Some of the waste management difficulties that communities face can be alleviated with a little initiative, cooperation, and awareness to improve people's waste management practices and perceptions.

Ethical approval

Not applicable.

Informed consent: Not applicable.

Conflicts of interests: The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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