



# Households' Waste Disposal Practices and Its Impact on Health

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

Waste management has been a worldwide concern today. India being the most populous country the rate of waste generation is also increasing rapidly. The problem of waste management has become a serious issue due to improper disposal of waste. The present study was conducted to examine the existing disposal practices of household waste. An Exploratory research design was used to conduct the present study with 60 respondents. Information on various types of waste, frequency of waste disposal and methods of waste disposal were obtained through the structured interview schedule. It was observed that majority of the respondents complain about the ill effects of improper disposal of solid waste. More than 80 per cent have collectively said that it causes

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infectious diseases, unpleasant odour and unclean surroundings. Through the study, it was observed that respondents are disposing the household waste by just throwing away outside the house. Burning of waste is also the most common practice followed by the respondents to clean their surroundings. Findings revealed that even though respondents have knowledge on waste management but their practice towards disposal of dry waste is poor. Age and family size were negatively correlated with waste disposal practices while education has a significant positive correlation with waste disposal practices.

*Keywords: Solid waste; waste disposal; environment; human health; Knowledge.*

## 1. INTRODUCTION

Globally, municipal solid waste (MSW) generation is increasing rapidly and its management is becoming more challenging, particularly in developing nations. The difficulty to effectively and properly manage the unprecedented increase of solid waste is due to the rapid growth of cities and population, and change in living standard and consumption patterns. The following are the main objectives of the study along with general profile of the respondents.

1. To assess the knowledge of the respondents regarding waste management.
2. To understand the waste disposal practices followed by the respondents
3. To analyse the correlation between age, family size, education and knowledge of the respondents with the existing waste disposal practices.

Agarwal [1] stated that an improper municipal solid waste disposal can lead to unhygienic circumstances, which can deteriorate the environment. Rodents and insects can spread diseases. The handling of solid waste poses a number of technical issues. They can also cause lots of new economic, administrative, and social issues that need to be addressed Elbeshbishy and Okoye, [2].

Ibrahim and Atanga [3] through their study explained that waste disposal is an important management activity that requires proper planning. The study found that all the generated solid waste of Wadajir district was disposed together, with no habit of segregating organic and inorganic waste at the household level. Zakianis and Djaja [4] explained that large amounts of organic materials are transported from rural regions to feed the urban population, with no mechanism for the leftovers to return to

the source to build the soil, causing difficulties for human health and the environment.

According to Shahzadi [5], wastes like daily waste, junk, and human excreta must be disposed of at their source. Boehlke [6] also stated that, waste is produced in different ways. Its content and volume are strongly influenced by consumer behavior, industrial and economic frameworks in force. Generally, Generation of waste is directly proportionate to population.

Chen et al. [7] & Shafy [8] found that solid waste disposal is a serious issue in many developing countries, both in urban and rural areas. Several canals and drainages are widely used as open sites to deposit various types of domestic waste and inorganic waste. Irregular garbage collection systems, convenient landfills, open canals, and drainage clogs are the root cause of this severity. These wastes are mainly plastic and paper with few more toxic elements. However, the decomposition of these toxic materials creates environmental hazards, adding considerable amounts of BOD (Biological Oxygen Demand) to the local eco-system.

Geetha and Rajalakshmi [9] stated that Inappropriate disposal of solid waste endangers human health and environment. Insects like flies and mosquitoes breed in these wastes, which also provide food and shelter for rats. These insects and rats are potentially disease-carriers [10].

According to Mahdi et al. [11] study, rapid growth in population, urbanization, and changing lifestyles patterns increased municipal solid waste. Their research found that waste segregation at the source of generation might enhance recycling by 33.5 percent. Poor collection rates, open dumping, and inappropriate recycling methods are the major environmental issues with Municipal Solid Waste Management.

Brasch [12] found that the most serious environmental problems is the disposal of municipal solid waste (MSW). In most cases, waste management falls under the jurisdiction of the local government. Population must be served by an effective and efficient system. Despite this, they are frequently confronted with a wide range of issues that go much beyond the local authority's capacity to manage MSW [13]. As a result, lack of financial resources, lack of organization, and complexity are to be blamed.

Because of poor monitoring and lack of knowledge, household solid waste gets combined with biological and hazardous wastes. The private sector can provide waste treatment and disposal facilities on its own land or on municipal land if local bodies lack adequate lands or if local bodies find it difficult to manage the same departmentally. Local bodies can pay tipping fees for the treatment and disposal of their garbage by private entrepreneurs in such situations. Apart from the efforts put up by private and public sectors, even households have to be responsible in disposing the waste at individual level in a befitting manner. Hence to understand the role of households in disposing waste, the present study has been taken up.

## 2. MATERIALS AND METHODS

The present study was conducted to examine the existing waste disposal practices followed by the households. An exploratory research design was used to conduct the present study. A total of 60

respondents were selected from urban area by using random sampling method for the study. Information on general profile of the respondents, knowledge on household solid waste management and existing waste disposal practices being followed for the past one year were obtained from the structured interview schedule and were analyzed using standard statistical tools.

## 3. RESULTS AND DISCUSSION

Towns and cities around the world face a major problem when it comes to disposal of household waste. Disposal of waste from all three types of sources i.e, municipal waste, commercial and industrial waste, building and demolition waste generates lot of challenges. Waste from the kitchen contributes a large percentage of municipal waste. Human well-being and happiness are positively impacted by a healthy environment. Households must be educated and aware of their waste disposal options. For the sake of a healthy environment, effective waste disposal is essential.

The primary causes of improper waste disposal are due to lack of knowledge and an irregular and unplanned pattern of waste disposal. For the present study, demographic profile of the respondents, knowledge of the household solid waste management and existing waste management practices were analysed. The present study was derived by analyzing descriptive statistics presented below.

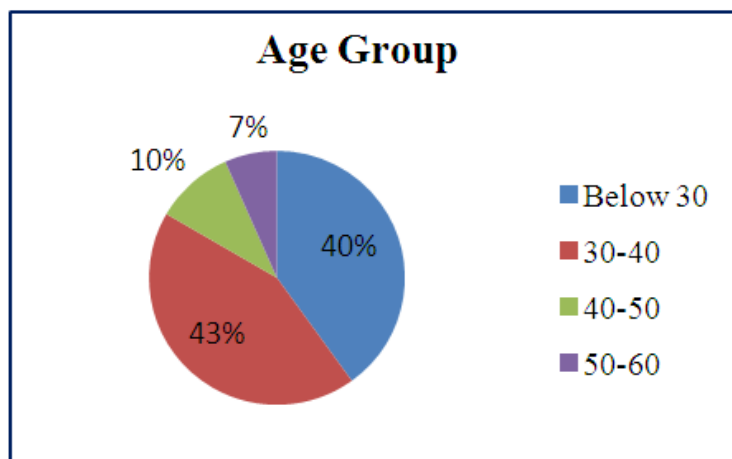
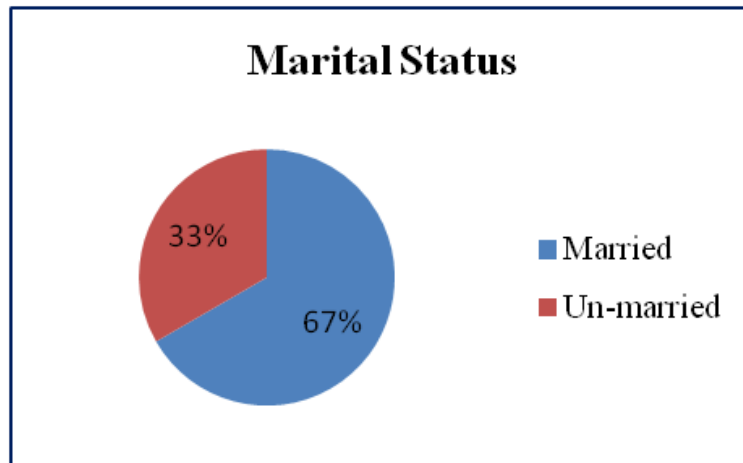
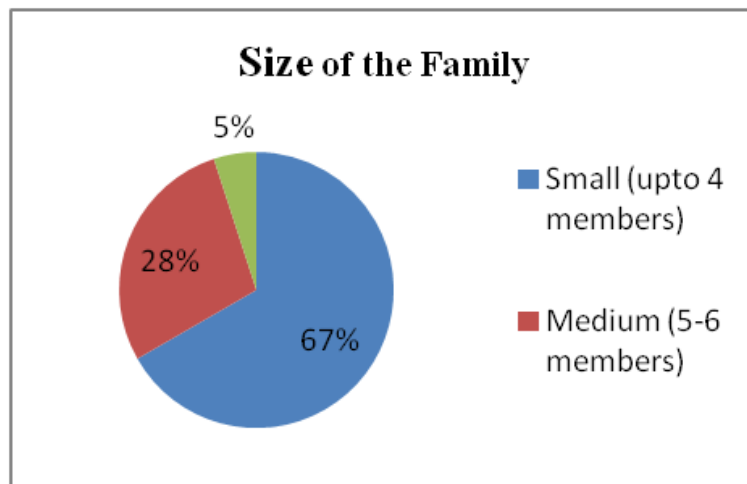


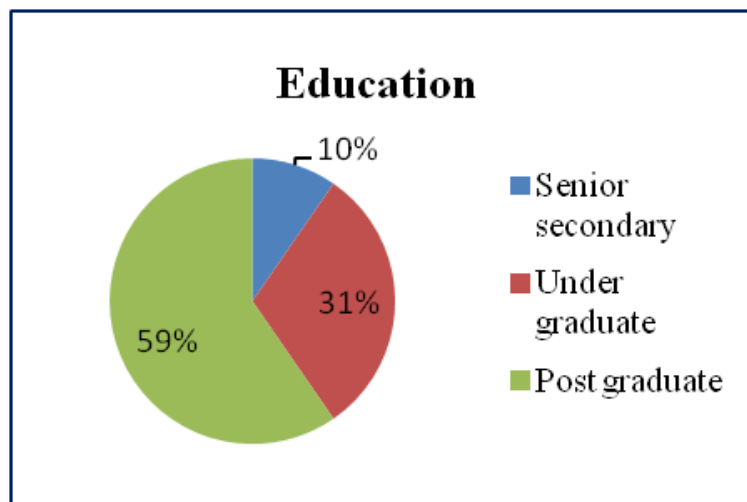
Fig. 1. Age Group



**Fig. 2. Marital status**



**Fig. 3. Size of the family**



**Fig. 4. Education**

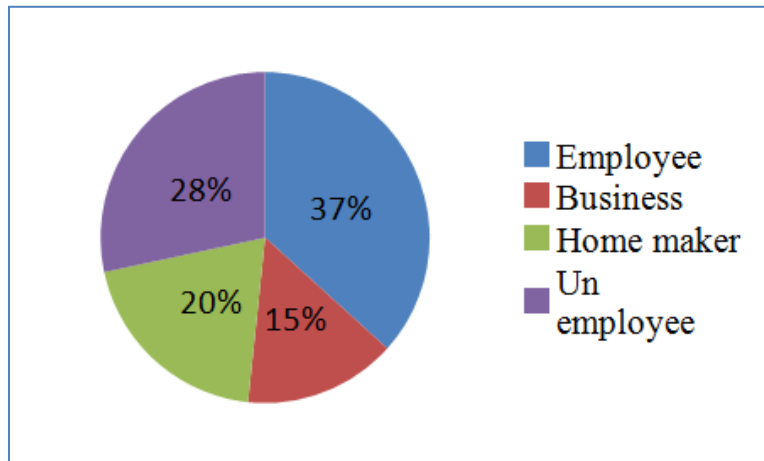


Fig. 5. Occupation

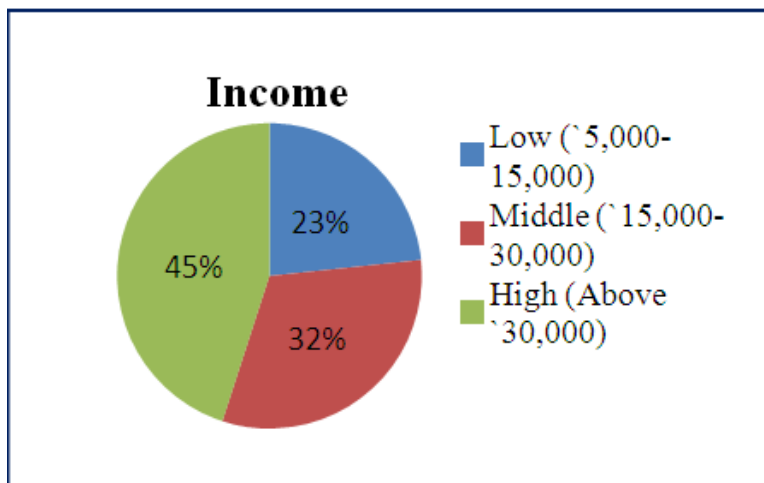


Fig. 6. Income

**Age Group:** As indicated in the Fig.1, Majority of the respondents belonged to 30-40yrs age group (43%) followed by below 30 yrs age group (40%). Rest of the respondents belonged to 40-50yrs age group and 50-60yrs age group respectively. People may have different waste- generating behaviour according to age (Velton, 2016).

**Marital status:** Majority of the respondents was married (67%) and one-third of them were unmarried.

**Size of the Family:** Fig. 3 indicates that majority (67%) of the respondents belonged to small family (up to 4 members) followed by 28 per cent of the respondents belonged to medium size (5-6 members) and rest of the respondents belonged to large family (7& above members).

**Education:** Majority of the respondents studied up to post graduation (59 %), followed by under graduation (31%) and very few of the respondents studied up to senior secondary (10%).

**Occupation:** From Fig. 5, it can be understood that 37 per cent of the respondents were employees, followed by 28 per cent unemployed, 20 per cent respondents' homemakers and 15 per cent had business as their occupation.

**Income:** As indicated in the Fig. 6, a little less than majority of the respondents belonged to high income group (45%), followed by Middle income group (32 %) and low income group (23.00%).

**Table 1. Knowledge on households' waste management (n=60)**

S. No	Statements	*Frequency (F)	Percentage (%)
	Kitchen waste, vegetable waste, garden waste, cropwaste, and cattle dung belongs to wet waste	54	90.00
	Plastic waste , glass, metal, rubber, polythene belongs to dry waste	45	75.00
	Wet and dry waste should be segregated	51	85.00
	Kitchen waste is used to prepare compost	50	84.00
	Plastic, glass, newspaper, magazines, polythene etc can be recycled	47	78.00
	Reusing help in reducing the waste generation	46	77.00
	Burning of plastic, polythene, rubber, thermocol etc are hazardous to health and environment	49	82.00
	Drainage system blockage happens due to improper disposal of waste	45	75.00
	Insects, mosquitoes, flies and rodents breeding increase due to waste disposal	50	83.00
	Dumping will affect the health and environment	44	73.00

*\*Total exceeds cent per cent due to multiple responses*

**Table 2. Existing waste disposal practices of the households (n=60)**

S. No	Statements	*Frequency (F)	Percentage (%)
	Dustbin at the home	54	90.00
	Throw house waste in dustbin	45	75.00
	Throw dry waste in street/open area/pond etc	51	85.00
	Have access to throw the waste in municipality garbagebins	50	83.00
	Facing any problem in disposing the waste	51	85.00
	Separate bins for wet and dry waste	50	83.00
	Burn the household waste (general waste, polythene etc) to avoid storage	48	80.00
	Prepare the compost from the kitchen waste and use as a manure	50	83.00
	Recycle every recyclable product to increase its life span	45	75.00
	Practice 3R's reduce/reuse/recycle strategy to manage the household waste	43	72.00

*\*Total exceeds cent per cent due to multiple response.*

From Table 1, it is observed that majority of the respondents have knowledge on wet waste (90%) and dry waste (75%) categories. Eighty five per cent of the respondents were aware about the segregation of waste and eighty four per cent about compost preparation with waste.

Majority of the respondents have knowledge on recycling and reducing the household waste. More than half of the respondents were aware about the burning of household waste as hazardous to health and environment (82%). Most of the respondents have knowledge on

drainage system blockage happens due to improper disposal of waste (75%), which leads to breeding of insects, mosquitoes and flies (83%). While three-fourth of the respondents were aware about the dumping of waste will affect the health and environment.

Table 2 presented the information on existing waste management practices followed by the households. Majority of the respondents (90%) had dustbin at their home. Because dustbin is compulsory for storing the waste, either government distributed bin, own bins, old buckets, etc were used as bins. More than half of the respondents were only throwing only wet waste in dustbin (75%) but dry waste is either thrown in street/open area/pond etc (85%).

Most of the respondents have access to throw the waste in municipality garbage bins (83%). Even though respondents have separate bins for wet and dry waste (83%), they were facing problem in disposing the waste as they found segregation of waste as a difficult task. Hence, 80 per cent of the respondents were burning the dry waste to avoid storage at home due to the irregular collection of waste by municipality workers. However, 83 per cent of the respondents were preparing the compost from wet waste and use as manure.

It was also observed that respondents were recycling every recyclable product to increase its life span (75%). In order to make recycling a success, factors like political, economic, social conditions and most importantly the attitudes of people play a significant role in practicing the strategy. More than half of the respondents were

practicing 3R's reduce/reuse/recycle strategy to manage the household waste (72%).

Table 3 shows the significant relationship between knowledge on households' solid waste management and existing waste disposal practices. The results revealed that there is a significant relationship between knowledge on household's solid waste management and existing waste disposal practices with r value of .918, p-value =.001. This indicates that knowledge had influenced the respondents' waste disposal practices. In other words, as knowledge increases, waste disposal practices followed by households would also be better. Gusti [14] also stated that the respondents' level of knowledge was related to the practices. One possible explanation could be that respondents with good knowledge could understand the impact of improper waste management practices on potential health and environment.

It was evident from Table 4 that, there was a negative and significant relationship between age of the respondents and waste disposal practices, which indicates that if there is an increase in age there is a decrease in waste disposal practices like throwing or dumping the waste in dust bin which might be due to the decrease in mobility, aged people were unable to get up and dispose the waste in dust bin kept at designated place. Talalaj and Walery [15] found that people aged between 14 to 64 years age group generate maximum waste at household level. Kayode and Omole [16] discovered that the age of the households was weakly and negatively correlated with solid waste practices in the Ibadan metropolitan area of Nigeria.

**Table 3. Correlation analysis between knowledge on households' solid waste management and existing waste disposal practices**

S. No	Waste disposal practices	Practice (r value)
1.	Knowledge	.918**

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

**Table 4. Correlation analysis between age, family size and education on households' solid waste management and existing waste disposal practices**

S. No	Dependent Variables	Independent Variables		
		Age	Family size	Education
1	Dispose waste in dustbin	-303*	-149 <sup>NS</sup>	285*
2	Accessibility in throwing waste	-313*	-090 <sup>NS</sup>	336**
3	Waste disposal problems	-049 <sup>NS</sup>	-286*	-153 <sup>NS</sup>
4	Kitchen waste Composting	-219 <sup>NS</sup>	-006 <sup>NS</sup>	276*

The results also indicated that, with the increase in family size, there is a decrease in waste disposal practices, which states that difficulty in managing the house waste as the number of members' disposal practices differ and also due to more generation of waste. Noufal et al. [17] stated that more members of a family generate more waste, some researchers highlighted the phenomenon of "group living" and "common consumption" of the family as the household runs as a unit and most products are shared and sometimes waste generated.

The results also indicated that, with the increase in education level there is an increase in waste disposal practices, which describes that respondents with better education might have knowledge about the effects of improper waste disposal practices on environment and health. They might be aware of composting with kitchen waste and how it can help in managing the waste. Further analysis revealed that as education increased, disposal of waste in dust bins, accessibility in throwing waste and kitchen waste composting was increased. Babei et al. (2015) found that with the increase in the residents' level of education, it was discovered that their general knowledge of waste management practises increased, thereby increasing their environmental responsibility.

#### 4. CONCLUSION

Household solid waste is a major concern in every developing nation. After thorough analysis of the findings, it can be concluded that the respondents have knowledge on waste segregation. Majority of them were preparing composting from wet waste, following 3R practices and aware about the ill effects of dumping waste on human health and environment which may transmit many diseases. Thus people with higher education, younger age, and small family size had better waste disposal practices.

However, a large number of respondents were burning dry waste due to irregular waste collection by municipality. This calls for an immediate action to raise awareness about the consequences of burning on human health and environment; and also policy makers to take proper actions in making the municipality work effectively.

#### 5. RECOMMENDATIONS

There is a need to promote community awareness and change the attitude of people towards handling dry waste, as this is fundamental step towards developing proper and sustainable waste management systems in and around the surroundings.

Attitude towards handling the waste, environmental concern, lack of motivation and individual responsibility, burning and dumping the waste are serious issues which need to be considered while making the policies and regulations regarding handling the household waste.

#### CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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