ORIGINAL RESEARCH PAPER

Community Medicine

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING HOUSEHOLD SOLID WASTE DISPOSAL AMONG RESIDENTS OF AN URBAN AREA IN CHENNAI.

KEY WORDS: Knowledge, Attitude, Practice, Solid waste, Disposal

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ABSTRACT

Every year tonnes of solid waste is generated from households and disposed of by various means. Improper waste management can directly or indirectly have an effect on air, water and soil pollution which in turn may affect the natural ecosystem and environment. Education and proper waste management practices can help to reduce the pollution from improper waste disposal thereby protecting the environment and preventing diseases. Hence the study has been conducted to assess the Knowledge, Attitude and Practices regarding disposal of household solid waste among residents of an urban area in Chennai. The study has conducted among individuals above 18 years of age who were residing in the urban area of Tiruvanmiyur, Chennai. Systematic random sampling method was used and interview was conducted using a semi-structured questionnaire which was validated and translated to the local language. 89.2% residents knew the difference between biodegradable and non-biodegradable waste. 39.8% residents agreed that there is room for improvement in the way solid waste is disposed at their household. Proper household solid waste segregation is practiced by 43% residents. 86% residents dispose their household wastes every day. Even though there is good knowledge about different type of waste and importance of waste segregation. It is only being practiced by less than half of the residents. Further education and implementation by the public health department can help to improve solid waste disposal practices and reduce environmental pollution.

INTRODUCTION

Solid waste refers to any type of garbage, trash, refuse or discarded material. (1)

Household solid waste consists of everyday items such as food scraps, plant waste, newspapers, bottles, furniture, clothing, paint, appliances, batteries, etc. (5)

Household solid waste can be categorized into three separate streams namely biodegradable, non-biodegradable and domestic hazardous waste. These different type of waste need to be segregated and stored in separate suitable bins. The segregated waste is then handed over to authorized waste collectors as per the directions of the local authorities from time to time. (2)

India generates around 150,000 metric tons of waste per day out of which 75% of waste is processed. The government of India launched the Swacch Bharath Mission on October 2, 2014 with the target to process all Municipal Solid Waste generated in the country. (3)

In Tamilnadu there are 15 corporations, 121 municipalities and 528 town panchayats. The total solid waste generation is 13422 tonnes per day. Out of which 12,844 tonnes per day is being collected, 9,430 tonnes per day is being treated and 2,301 tonnes per day of municipal solid waste is disposed into landfills and dumpsites situated in the state. (4)

Although collection, transportation and segregation is being done by the local bodies, the process of proper waste segregation and management must begin right from the level of waste generators. (5,6).

Improper disposal can lead to adverse health outcomes, for example through water, soil and air contamination. Hazardous waste or unsafe waste treatment such as open burning can directly harm waste workers or other people involved. (7,8) Vulnerable groups such as children are at increased risk of adverse health outcomes. Poor waste collection leads to environmental and marine pollution and can block water drains. This can result in flooding and standing water in waste items favors cholera and vector-borne diseases such as malaria and dengue. (9,10)

Education and proper waste management practices can help to reduce the pollution from improper waste disposal.

In view of the above issues, this study has been undertaken to find out the depth of Knowledge, their Attitude and common Practices of solid waste management among the residents of an Urban area of Chennai

MATERIALS AND METHODS

The study is a cross-sectional study of descriptive nature and was conducted over a period of 3 months (March to May) in 2023.

The study was conducted among the patients attending the out-patient department at Urban Health Training Centre of Sri Ramachandra Medical College & Research Institute, Tiruvanmiyur, Chennai. Only the individuals above 18 years of age who were residing in and around area of Tiruvanmiyur were included in the study.

The study was conducted using a semi-structured questionnaire which has been validated and also translated to local language 'Tamil'. The questionnaire consists of 4 parts. The first part contained relevant information on demographic data of the participant such as Name, age, sex, education level, occupation, marital status and type of household. The subsequent 3 parts contained questions for the assessment of the knowledge, attitude and practice respectively regarding the disposal of household solid waste.

Health education about proper methods of household solid waste disposal was also given to the participants at the end of the interview through pamphlets in both English and Tamil language.

The analysis of the study after data collection was done using 'Statistical Software for Social Science (SPSS) version 16. This study has been approved by Institutional ethics committee of Sri Ramachandra University.

Sample Size

Based on the Review of Literature published from an indexed journal – BMC Public Health titled "Household solid waste management practices and perceptions among residents in the East Coast of Malaysia" which showed that practice of

waste segregation was followed by 50.3% residents; sample size was calculated to be 96. Participants were selected using systematic random sampling.

RESULTS

Background distribution of study participants

The mean age of participants was 50 years. 52.7 % of the study participants were females and 47.3% were males. Among the study participants, 80.7% were educated out of which 65.6% received upto school education and 15.1% received graduate level education.83.9% of study participants are residents of Tiruvanmiyur area of Chennai while the others are from nearby areas of Adyar, Guindy and Neelankarai.21.5% of participants are belonging to category of skilled workers performing occupations such as engineer, IT employee & 47.3% participants belong to category of unskilled workers performing occupations such as security worker, coolie or house maid.91.4% of study participants are married, 5.4% are single and 3.2% are widowed.86% of study participants is found to be residing in individual houses while 14% are residing in apartment buildings.

Knowledge

89.2% study participants knew the difference between biodegradable and non-biodegradable waste. Only 16.1 % study participants knew about hazardous waste and its disposal.26.9 % study participants did not have any knowledge about the diseases caused by improper solid waste disposal.32.3 % study participants did not have any knowledge about pollution caused by improper solid waste disposal.58.1 % study participants felt that laziness among the general public was the cause of improper solid waste disposal whereas only 29% study participants felt that it was because of lack of awareness.97.8% study participants were aware of the fact the Tamilnadu government mandates waste segregation at households. Only 52.7% study participants were aware that littering warrants a fine of Rs.500.

Attitude

89.2 % study participants felt that the current method of waste disposal at their households was satisfactory.39.8 % study participants felt that there was room for improvement in their current practices of solid waste disposal.49.5% study participants felt that their locality is clean. 72% study participants felt there is room for improvement.78.5% study participants felt that imposing fines would improve waste disposal practices among the general public.

Practice

43% study participants practiced waste segregation at their households. The common solid wastes that were generated in the participants households were found to mainly consist of vegetable waste, food waste and plastics.57% study participants were using a closed type of dustbin for waste collection.71% study participants disposed their wastes by municipal collection. 26.9% practiced composting and 3.2% were dumping their waste.86% study participants disposed their household solid waste on a daily basis.38.7% study participants practiced reusing of waste45.2% study participants admitted to littering on roads.18.3% study participants admitted to littering in water bodies.

Table 1; Shows knowledge of solid waste disposal as an independent factor using logistic regression model

Knowledge on Waste disposal	Likelihood of Reduced Model	Chi-Square	df	Sig.
Do you know the difference between BD(Bio degradable) and NBD(non-bio degradable) waste	149.588	29.545	37	.803
Knowledge about Disposed waste in ditches water body	120.043a	.000	0	.554
	155.239	35.196	37	

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model.
The reduced model is formed by Omitting an effect from the final model.
The null hypothesis is that all parameters of that effect are 0.This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.The above Table 1; Shows the likelihood ratio has no significance in difference between the disposal of bio medical and non-bio medical waste and proper disposal of waste in water bodies.

Table 2: Shows inter description of various factorial variable using Wald test

Description of variable of Waste disposal	B	Std error	Wald	df	sig	Exp(B)	95% CI
Knowl-edge	10.744	214.754	0.003	1	.960	1.65	`.99-1.99
Atti-tude	-1.804	828.695	0.00	1	.998	1.992E	
Prac-tice	29.942	.000		1			

The description of the above table using wald test showed no difference of observation in knowledge attitude and practice and 95%CI showed an protective factors for the variables. Fig:1&.2 shows linear distribution of study participants on various factors, in this graph we can clearly see there is an upward and down ward linear trend of distribution of the study participation.

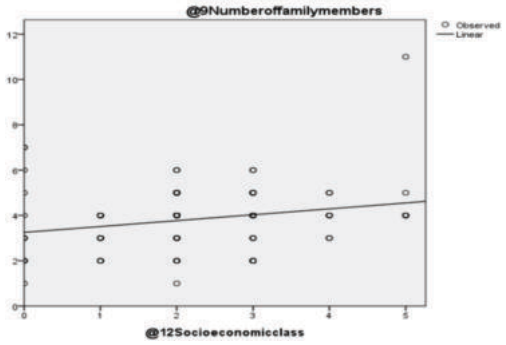

Fig: 1 Linear distribution of family members and socio economic status

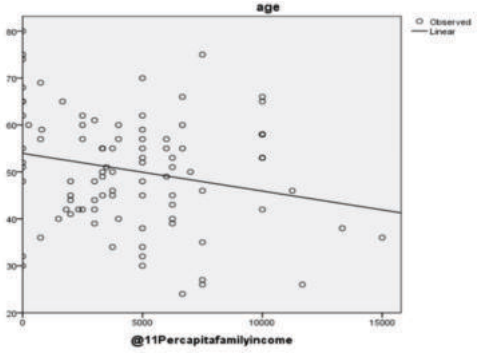

Fig 2: Linear distribution of age and per capita income

DISCUSSION:

This study results reveal that many residents in urban area do not have complete knowledge to constitute the natural environment for disposal of waste in a proper manner. This

means there is an urgent need for more protection to public environmental education in the nearby health centres and schools of the required population. Many of the residents complained that the dump sites were insufficient and was rarely cleared by the required sanitary workers, a situation which has prompted them to resort to the dumping of wastes from fig 1 and 2. These serves as breeding site for disease vectors as have been identified by the people. Casual workers should be employed to collect household garbage from house to house. The households will have to pay a small token for such services. This survey has revealed that many respondents are willing to pay for such services. Due to the unhygienic living conditions, education of the children living in the affected areas is also hampered. Although many respondents have toilet facilities in their homes they have identified sewage as an environmental issue. Many of the respondents believed that there was need for more frequent removal of garbage by the sanitary workers and that recycling laws and programs should be put in place by the Local Government.

SUMMARY AND CONCLUSION:

The urban residents are generally concerned about the environment but are not doing enough to reduce, recycle and reuse the household garbage they generate and there is significant lack in their knowledge attitude and required practice for disposal of waste. It is clear from their responses that they are ready to help fix the garbage problem if given the appropriate support from the local government as have been identified in this study. The natural environment requires protection in order to remain healthy for all of their urban inhabitants. To protect and bring about a healthy and sustainable environment requires the collective efforts of the urban people.

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