



SOLID WASTE DISPOSAL AND SANITATION PRACTICES ACROSS DIFFERENT URBAN COMMUNITIES IN IMPHAL-EAST, MANIPUR: A COMMUNITY BASED CROSS-SECTIONAL STUDY

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Abstract

Background: Improper solid waste disposal and inadequate sanitation are major causes of infectious diseases and contributes to malnutrition, impaired cognitive function and impacts on well-being. The objective is to assess the knowledge and practices regarding solid waste disposal and sanitation and to find out the association with demographic variables. **Material & Methods:** A cross sectional study was conducted in urban communities of Imphal East among 412 households. Data was collected using a semi structured, pretested questionnaire and was analysed using descriptive and analytic statistics. **Results:** Almost two thirds (290,70%) had poor knowledge on solid waste disposal, more than half (244,59%) had poor practice. Majority had good knowledge (343,83%), but poor practice (323,78%) on sanitation. Respondents of higher educational status had significantly higher level of knowledge and practice on solid waste disposal and sanitation. ($p=0.001$). **Conclusion:** Most of the respondents had poor knowledge and practice on solid waste disposal but good knowledge and poor sanitation practice. It is recommended to have frequent, effective awareness campaigns regarding solid waste disposal and sanitation.

Keywords:- Solid Waste Disposal, Sanitation, Urban, Manipur.

INTRODUCTION

According to WHO, Solid waste refers to any type of garbage, trash, refuse or discarded material.^[1] Rapid increase in population and urbanization and the consequent increase in the volume of municipal solid waste, along with changing lifestyles and consumption patterns with 'use and throw' products have resulted in increase in the per capita generation of waste thereby making it difficult to manage with the existing infrastructure facilities.^[2,3,4] SDG

indicator 11.6 states, by 2030, to reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.^[5]

Sanitation refers to the provision of facilities and services for the safe management of human excreta from the toilet to containment and storage and treatment onsite or conveyance, treatment and eventual safe end use or disposal.^[6] Inadequate sanitation is a major

cause of infectious diseases and also contributes to stunting, impaired cognitive function and impacts on well-being through school attendance, anxiety and safety with lifelong consequences especially women and girls.^[7,8,9]

Government of India has been taking necessary measures in promoting total sanitation campaign under the recently launched Swachh Bharat Mission.^[10,11] According to NFHS-5 eighty-three percent of households have access to a toilet facility; a much higher accessibility in urban areas (96%) than in rural areas (76%).^[12] But still the condition can be very well depicted by above data, which denotes there is gap between knowledge, attitude and practice to adopt and utilize facilities to attain a target of 100% sanitation (open air defecation free India).^[13]

Studies show lack of knowledge on proper waste disposal and sanitation practices are harmful to health, environment. Therefore, the present study was undertaken to assess knowledge & practice regarding solid waste disposal methods and sanitation and to look for any association between knowledge and practices scores with some socio demographic variables of interest.

MATERIAL AND METHODS

A cross-sectional study was carried out during November and December 2022 across three urban communities in Imphal East District of Manipur namely Kongpal Mayai Leikai, Keikhu Muslim Khul and Keikhu Kabui Khul. Respondents aged 18 years and above and residing for at least one year in the area were included in the study. Those who refused to participate and who were not present at time of

study after consecutive 2 visits were excluded from the study.

Sample size and sampling method- Considering prevalence of sanitation practice 56% as per the study done by Paul S et al,^[10] allowable error (d) 5% and 95% confidence interval (CI) sample size came out to be 379. Taking a non-response rate of 10%, a minimum of 400 respondents were included in the study. Sampling was done according to population proportionate to size, in the proportion of 2:1:1 from Kongpal Mayai Leikai, Keikhu Muslim Khul, Keikhu Kabui Khul respectively. The first household from each community was selected using a random technique and the subsequent households were selective consecutively till the required sample size was met. Only one respondent was selected from each household for the study. If there were more than one eligible respondent in a household one was selected using lottery method.

Study tool and technique- After obtaining informed consent, the participants were interviewed by using a pre-tested, semi-structured questionnaire consisting of four sections: Section (i) consisted of sociodemographic profile, Section (ii) consisted of questions on knowledge and practices on solid waste disposal methods, Section (iii) consisted questions on knowledge and sanitation practices and Section (iv) was based on observation of the solid waste disposal methods and sanitation practices. Pretesting of questionnaire was done among residents of nearby urban community, Kongpal Makha Leikai. Necessary modifications were made before finalising the questionnaire.

Operational definition-

- In our study, knowledge refers to an individual's understanding of solid waste disposal and sanitation methods. Out of a total score of 06 knowledge related questions on solid waste disposal, a score of <04 was considered as having Poor knowledge and a score of 04 and above was considered as having Good knowledge. The total score for knowledge on sanitation ranges from 0-10 wherein those scoring < 6 was considered as having Poor knowledge on sanitation and a score of 6 and above was considered as having Good knowledge on sanitation.
- Practice refers to an individual's practices of solid waste disposal and sanitation measures. For solid waste disposal, Poor practice refers to a score of 0-3 and Good practice as a score of 4 and above. For sanitation, Poor practice refers to a score of 0-3 and a score of 4-6 is considered as Good practice.

Data analysis:

Collected data was entered in MS Excel and analysed using SPSS version 20. Demographic characteristics of the participants were reported using descriptive statistics. Significance of association was analysed using Chi-square test. P-value of less than 0.05 was taken as statistically significant.

Ethical consideration:

Approval was obtained from Institutional Ethics Committee vide protocol No. 385/79/2022. Verbal informed consent was obtained from the participants. Strict confidentiality was maintained for all the collected data.

RESULTS

Total number of respondents was four hundred and twelve (412) and they were mostly females (296,72%). Demographic characteristics of the respondents show majority belonged to older age group (≥ 40 years - 242,58.7%), mostly Hindus (168,48%) and of Meitei community (213,52%). There was an equal number of respondents from both nuclear and joint family. Educational status of the participants show that majority studied up to class 10th (155,38%). Almost half the respondents were unemployed (190,46%).

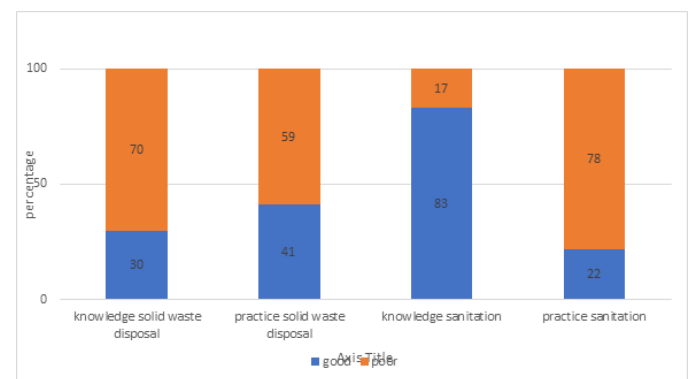


Figure 1: Bar graph showing the distribution of respondents according to their knowledge, practice on sanitation and solid waste disposal (N=412)

Regarding solid waste disposal, one third (122, 30%) of respondents had good knowledge however more than half of them (244, 59%) had poor practice on solid waste disposal. Regarding sanitation, majority of them (343, 83%) had good knowledge However, majority (323, 78%) had poor sanitation practices.

As for association of demographic variables with knowledge on solid waste disposal and sanitation, we found that respondents who

were Males, Christians, belonging to Tribal community, with higher educational status and of private occupation was found to have significantly better knowledge on solid waste disposal. ($p = 0.01$). [Table 1] and younger age group respondents ($p=0.005$) with higher education status ($p=0.001$) had significantly better knowledge on sanitation. [Table 2]

However, Hindus ($p=0.001$), Meitei ($p=0.001$), and higher educational status respondents ($p=0.005$) had significantly better practice on solid waste disposal [Table 3] and when it came to sanitation practices, respondents with higher educational status ($p=0.001$) had better practice

and was found to be statistically significant. [Table 4].

During observation, two thirds of the respondents (66%), had different waste bins for kitchen waste and general wastes. Most of the households (96%) had self-owned latrine out of which majority was sanitary (96%). On inspection of the physical quality of drinking water majority of the households (98.8 %) had clean water and only minor proportions (0.5%) and (0.7%) of them had suspended particulate matter and was turbid. Upon asking whether they carried an alcohol-based sanitizer while going out, less than one third replied “always” and more than half (58%) replied “sometimes”.

Table 1: Association between sociodemographic variables with knowledge on solid waste disposal methods(N=412).

Variable	Knowledge		p-value
	Good n (%)	Bad n (%)	
Age group			
<40 years	55(32.4)	128(75.3)	0.307
≥40 years	67(27.7)	175(72.3)	
Gender			
Male	53(46.1)	62(53.9)	0.001
Female	69(23.2)	228(76.8)	
Religion			
Christianity	17(44.7)	21(55.3)	0.001
Hinduism	65(38.7)	103(61.3)	
Islam	15(13.5)	96(86.5)	
Others (TRC, Sanamahi)	25(26)	71(74)	
Community			
Meitei	73(34.3)	140(65.7)	0.001
Meitei Pangal	17(14.8)	98(85.2)	
Tribal	32(38)	52(61.9)	
Education level			
Illiterate	11(16.4)	56(83.6)	0.001
Upto class X	35(22.6)	120(77.4)	
Class X to Class XII	27(35.5)	49(64.5)	
Graduate and above	49(43)	65(57)	



Occupation			
Government	24(53.3)	21(46.7)	0.001
Private	10(55.6)	8(44.4)	
Self-employed	39(24.5)	120 (75.5)	
Unemployed	49(25.8)	141 (74.2)	

Table 2: Association between sociodemographic variables and practice on solid waste disposal methods(N=412)

Variable	Practice		p-value
	Good n (%)	Bad n (%)	
Age group			
<40 years	66 (38.8)	104 (61.2)	0.199
≥40 years	102 (42.1)	140 (57.9)	
Gender			
Male	51 (44.3)	64 (55.7)	0.359
Female	117 (39.4)	180 (60.6)	
Religion			
Christianity	3 (7.9)	35 (92.1)	0.001
Hinduism	86 (51.2)	81 (48.8)	
Islam	47 (42.3)	64 (57.7)	
Others(TRC, Sanamahi)	32 (33.3)	64 (66.7)	
Community			
Meitei	110 (51.6)	103 (48.4)	0.001
Meitei Pangal	49 (42.6)	66 (57.4)	
Tribal	9 (10.7)	75 (89.3)	
Education level			
Illiterate	20 (29.9)	47(70.1)	0.005
Upto class X	53 (34.2)	102 (65.8)	
Class X to Class XII	37 (48.7)	39 (51.3)	
Graduate and above	58 (50.9)	56 (49.1)	
Occupation			
Government	22 (48.9)	23(51.1)	0.065
Private	12 (66.7)	6 (33.3)	
Self-employed	59 (37.1)	100 (62.9)	
Unemployed	75 (39.5)	115 (60.5)	

Table 3: Association between sociodemographic variables and knowledge on sanitation (N=412)

Variable	Knowledge		p-value
	Good n (%)	Bad n (%)	
Age group			
<40 years	152 (89.4)	18 (10.6)	0.005



≥40 years	191 (78.9)	51 (21.1)	
Gender			
Male	100 (87)	15 (13)	0.531
Female	251 (84.5)	46 (15.5)	
Religion			
Christianity	32 (84.2)	6 (15.8)	0.281
Hinduism	148 (88.6)	20 (11.4)	
Islam	91 (82)	20 (18)	
Others(TRC, Sanamahi)	80 (54.4)	67(45.6)	
Community			
Meitei	189 (88.7)	24 (11.3)	0.096
Meitei Pangal	95 (82.6)	20 (17.4)	
Tribal	67 (79.8)	17 (20.2)	
Education level			
Illiterate	47 (70.1)	20 (29.9)	0.001
Upto class X	131 (84.5)	24 (15.5)	
Class X to Class XII	68 (89.5)	8 (10.5)	
Graduate and above	105 (92.1)	9 (7.9)	
Occupation			
Government	40 (88.9)	5 (11.1)	0.792
Private	16 (66.7)	8 (33.3)	
Self-employed	136 (85.5)	23 (14.5)	
Unemployed	159 (83.7)	31 (16.3)	

Table 4: Association between sociodemographic variables and sanitation practices (N=412)

Variable	Practice		p-value
	Good n (%)	Bad n (%)	
Age group			
<40 years	42 (24.7)	128 (75.3)	0.199
≥40 years	47 (19.4)	195 (80.6)	
Gender			
Male	30 (26.1)	85 (73.9)	0.169
Female	59 (19.9)	238 (80.1)	
Religion			
Christianity	8 (21.1)	30 (78.9)	0.140
Hinduism	47(28)	121 (72)	
Islam	20 (18)	91 (82)	
Others(TRC, Sanamahi)	14 (14.6)	82(85.4)	
Community			
Meitei	50 (23.5)	163 (76.5)	0.623
Meitei Pangal	22 (19.1)	93 (80.9)	

Tribal	17 (20.2)	67 (79.8)	
Education level			
Illiterate	8 (11.9)	59 (88.1)	0.001
Upto class X	24 (15.5)	131 (84.5)	
Class X to Class XII	21 (27.6)	55 (72.4)	
Graduate and above	36 (31.6)	78 (68.4)	
Occupation			
Government	15 (33.3)	30 (66.7)	0.037
Private	7 (38.9)	11 (61.1)	
Self-employed	28 (17.6)	131 (82.4)	
Unemployed	39 (20.5)	151 (79.5)	

DISCUSSION

The current study was conducted to assess the knowledge and practice regarding waste disposal methods and sanitation in urban areas in Manipur. A total of 412 participants were included in the study. Informants were mostly females (72%) and almost half of respondents belonged to Meitei community (52%) and from Kongpal Mayai Leikai (51.9%).

In our study, majority had poor knowledge (70%) and poor practice (59%) on solid waste disposal. It is contrary to the study conducted by Eshwari K et al,^[14] in which more than half (60.3%) had satisfactory knowledge and average practices (72.8%) towards solid waste management. Because in that study majority of the participants having a better education and holding a skilled and professional jobs were the independent predictors of knowledge, so because of the better knowledge in that study they were having good practices.

Regarding sanitation, majority (83%) had good knowledge. Despite the knowledge, majority (78%) had poor sanitation practices. It is similar to Kuberan A et al study,^[15] where majority of the participants (70%) had good knowledge on

water treatment, and almost half (45%) didn't follow any methods of water treatment.

During observation we found majority of the participants had sanitary latrine (96%) and only 4% were having insanitary type. It is similar to Paul S et al study,^[10] where 100% of them had sanitary latrine. It is contrary to cross-sectional study done by Mittal A et al,^[2] where it was found that on an average, there is 1 toilet among 13 people in surveyed areas. Un-availability of toilet was 70% among study population; 40% of them stated financial reasons for absence of toilets.

We were able to cover three different communities in the stipulated time. Health talk regarding solid waste disposal and sanitation practices & government schemes for sanitation and services available for solid waste disposal in their local area were taught at the end of every data collection making them more aware.

As the study was conducted in only one district of Manipur, therefore it cannot truly reflect the scenario of the urban communities of the whole state. Regarding the preventive practices of the households included in our study, some of them were self-reported.



CONCLUSIONS

With the launch of initiatives such as Total Sanitation Campaign and Swachh Bharat Mission by the Government of India in order to bring about an improvement in the general quality of life, it is seen that citizens also have an important role to play.

In our study overall knowledge and practices on solid waste disposal and sanitation was unsatisfactory.

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