Original Research Article

Knowledge, Attitude and Practice of Water Handling and Sanitation in Urban Households of Chamarajanagar

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Abstract

Background: Water and sanitation form the core of sustainable development. The Sustainable Development Goal 6 seeks to ensure safe drinking water and sanitation for all. Water storage and handling methods along with point of use water treatment plays a crucial role in providing safe drinking water and thereby reducing the burden of water borne diseases. **Objectives:** To assess the knowledge, attitude and practice of water handling and sanitation. **Materials and methods:** A cross sectional study was conducted for 2 months (July-August 2021) in the urban field practice area including 500 households by simple random sampling using predesigned semi-structured questionnaire. Descriptive statistics using frequencies and percentages were done. Chi square test was applied and p value <0.05 was considered significant. **Results:** Most of the respondents (96%) opined that the water they used was safe and 85.2% knew that the quality of water affects health. Piped water supply was available in 78.2% houses. The commonest method of water treatment followed was boiling (264, 52.8%). Around 6.8% of households did not practice any method of water treatment. Majority had a sanitary latrine at home (88.6%). Community toilets were utilized by 2.2% of households and 9.2% practiced open air defaecation. Most of the household waste was collected by the corporation (90.6%) and 8.8% of the households were dumping the wastes. Higher level of education was significantly associated with increased knowledge and practice of water safety and sanitation. **Conclusion:** There is a need for educational intervention regarding water handling and treatment methods, promoting personal hygiene and sanitation.

Key words: water handling, household water treatment, drinking water, sanitation.

Introduction

Safe drinking water, sanitation and hygiene (WASH) are crucial to human health and wellbeing[1]. Safe water, sanitation and hygiene plays a key role in reducing the burden of Diarrhoeal diseases and Neglected Tropical Diseases (NTD) such as trachoma, soil transmitted helminths and schistosomiasis[2]. With the provision of safe drinking water and sanitation, the burden of diarrhoeal diseases due to inadequate WASH was reduced by half as a result of implementation of Millenium Development Goals (MDG) during the period 1990-2015[1].

Worldwide 8,29,000 deaths occur every year due to diarrhoea as a result of unsafe drinking water, sanitation and hand hygiene[1]. 1.7 billion cases of childhood diarrhoea occur every year. It is the second leading cause of death among under 5 age group, resulting in 5,25,000 deaths each year. Around 780 million people lacked access to improved drinking water and 2.5 billion lacked improved sanitation[3]. Improved sanitation also reduces the severity and impact of malnutrition, promotes dignity and safety of women[4].

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India achieved 93% coverage of access to improved water supply in rural areas by 2015. Due to the shift from MDG to Sustainable Development Goals, the new baseline estimates that less than 49% of rural population is using safely managed drinking water (improved water supply located on premises, available when needed and free of contamination)[5]. In 2015, India accounted for 90% of people in South Asia and half of the 1.2 billion in the world that defaecated in open. The rollout of the Swachh Bharat Abhiyan during 2015-19 provided 105 million household toilets and access to 525 million people[6]. As per National Family Health Survey 5 (2019-20) reports, Karnataka has 97.3% and 94.1% households in urban and rural areas respectively with an improved drinking water source. 84.4% and 68.5% of the households in urban and rural areas respectively had improved sanitation facilities[7].

Even though the ultimate goal is to provide access to improved water supply, we must strive to take measures to reduce water contamination during transport, storage and handling of water. Safe water storage with point of use water treatment system plays a significant role in reducing the extent of diarrhoeal disease in a community[8,9]. So, this study was conducted to assess the knowledge, attitude and practices regarding water handling and sanitation among urban households in Chamarajanagar District.

Materials and methods

This community based cross sectional study was conducted in the urban field practice area of Department of Community Medicine, Chamarajanagar Institute of Medical Sciences for two months from July- August 2021. Institutional Ethical Committee clearance was obtained before the start of the study. The Urban Health Centre has 6 subcentres and one subcentre was selected based on Simple Random sampling. There are 5 wards in this subcentre. 100 houses were selected from each ward by simple random sampling. Thus a total of 500 houses were included in the present study. Data was collected from one individual aged more than 18 years from each house. The study participants were informed about the purpose of the study and informed consent was obtained .Houses which were found locked after two consecutive visits or who did not consent to participate in the study were excluded from the present study.

A predesigned pretested semistructured questionnaire was used to assess the knowledge, attitude and practices of water handling and sanitation. Data was obtained regarding socio-demographic profile, water facilities and existing problems, water handling practices, treatment methods and sanitation facilities. Socio economic status was estimated using the BG Prasad's Socio economic classification, modified for August 2020[10].

Data was entered in Microsoft Excel software and analyzed using SPSS IBM Statistics 22 version. Descriptive statistics using frequencies and percentages was done. Chisquare test was applied and p value <0.05 was considered significant.

Results

Among the respondents, 45.2% were in the age group of 35-50 years. Most of them were Hindus (453, 90.6%), belonged to nuclear families (361, 72.2%). About 25.2% were illiterate and 23.2% were graduates. 38.8% were unemployed and 21.8% unskilled workers. Most of the families belonged to class III (35.8%) and class II (27.6%) socio economic status [Table 1].

Table 1: Sociodemographic profile of the study participants

Sociodemographic profile		Frequency (N=500)	Percentage
Age	< 35 years	151	30.2
	35-50 years	226	45.2
	50- 65 years	123	24.6
Religion	Hindu	453	90.6
	Muslim	47	9.4
Education	Illiterate	126	25.2
	Primary school	37	7.4
	Middle school	48	9.6
	High school	85	17
	PUC	88	17.6
	Graduate	116	23.2
Occupation	Professional	24	4.8
	Semiprofessional	39	7.8
	Skilled worker	47	9.4
	Semiskilled worker	87	17.4
	Unskilled worker	109	21.8
	Unemployed	194	38.8
Total number of family members	< 5	271	54.2
	5-10	224	44.8
	>10	5	1
Type of family	Nuclear	361	72.2
	Joint	93	18.6
	3 generation	31	6.2
Socioeconomic status(Modified BG Prasad classification)	I	46	9.2
	II	138	27.6
	III	179	35.8
	IV	69	13.8
	V	68	13.6

Table 2 depicts the knowledge related to water safety and sanitation.

Table 2: Knowledge related to water safety and sanitation

Variables		Frequency (N=500)	Percentage
Is the water used safe?	Yes	480	96
	No	20	4
Does quality of water affect health?	Yes	426	85.2
	No	74	14.8
Reason for hand washing	Prevents infection	220	44
	Hygiene	266	53.2
	Everyone does it	10	2
	Appears good	4	0.8
Awareness about diseases spread by open air defaecation	Aware	444	88.8
	Unaware	56	11.2
Mode of spread of diarrhoeal disease*	Flies	320	64
	Contaminated food/ water	383	76.6
	Unclean hands	264	52.8
	Don't know	33	6.6

Importance of waste disposal	Aware	412	82.4
	unaware	88	17.6
Reason for waste disposal	Fear of disease	204	40.8
	Bad odour	152	30.4
	To maintain cleanliness	144	28.8

* multiple responses

Most of the respondents (96%) opined that the water they used was safe and 85.2% knew that the quality of water affects health. Hand washing practice was followed to maintain hygiene (53.2%) and to prevent infection (44%). Most of the respondents (88.8%) were aware about disease spread by open air defaecation. Contaminated food/ water, flies and unclean hands were thought to be the major mode of spread of disease. About 82.4% knew the importance of disposal of waste and fear of disease (40.8%) was the commonest reason to dispose the waste. Higher education level was significantly associated (p< 0.001) with increased knowledge of water safety and sanitation [Table 6].

Table 6: Association of sociodemographic variables and knowledge of water safety and sanitation

Socio demographic variable		Knowledge of water safety and sanitation			Chi square test	P value
		Does quality of water affect health?				
Socioeconomic status		**Yes**	**No**	**Total**	11.15	0.025*
	Class I	36(8.5)	10(13.5)	46(9.2)	Df = 4	
	Class II	112(26.3)	26(35.1)	138(27.6)		
	Class III	157(36.9)	22(29.7)	179(35.8)		
	Class IV	56(13.1)	13(17.6)	69(13.8)		
	Class V	65(15.3)	3(4.1)	68(13.6)		
	Total	426(100)	74(100)	500(100)		
Education	Illiterate	101(23.7)	25(33.8)	126(23.4)	556.62	<0.001*
	Primary school	25(5.9)	12(16.2)	37(6.9)	Df = 5	
	Middle school	41(9.6)	7(9.5)	48(8.9)		
	High school	75(17.6)	10(13.5)	85(15.8)		
	PUC	79(18.5)	9(12.2)	88(16.3)		
	Graduate	105(24.6)	11(14.9)	116(21.5)		
	Total	426(100)	74(100)	500(100)		
Socioeconomic status		**Awareness of disease spread by open air defaecation**			7.02	0.135
		Aware	**Unaware**	**Total**	Df = 4	
	Class I	43(9.7)	3(5.4)	46(9.2)		
	Class II	127(28.6)	11(19.6)	138(27.6)		
	Class III	153(34.5)	26(46.4)	179(35.8)		
	Class IV	58(13.1)	11(19.6)	69(13.8)		
	Class V	63(14.2)	5(8.9)	68(13.6)		
	Total	444(100)	56(100)	500(100)		
Education	Illiterate	100(22.5)	26(46.4)	126(23.4)	558.22	<0.001*
	Primary school	32(7.2)	5(8.9)	37(6.9)	Df = 5	
	Middle school	42(9.5)	6(10.7)	48(8.9)		
	High school	80(18)	5(8.9)	85(15.8)		
	PUC	82(18.5)	6(10.7)	88(16.3)		
	Graduate	108(24.3)	8(14.3)	116(21.5)		
	Total	444(100)	56(100)	500(100)		

*p<0.05 significant

Majority of the houses had piped water supply (391, 78.2%) and the water source was within 100metres distance (92.2%). Water was stored in drums and steel containers. Most of them kept the water containers covered (98.4%). More than half of the households dipped a glass into the water container (278, 55.6%). The water containers were cleaned once in 2-3 days (253, 50.6%).Boiling was the commonest method of water treatment followed (264, 52.8%). Around 6.8% of households did not practice any of the methods of water treatment [Table 3].

Table 3: Drinking water source and handling practices

Variables		Frequency(N=500)	Percentage
Source of water	Public standpipe	94	18.8
	Handpump	8	1.6
	Well	7	1.4
	Piped water supply	391	78.2
Distance of water source from household	<100m	461	92.2
	100-500m	33	6.6
	>500m	6	1.2
Water storage container	Bucket	29	5.8
	Drum	113	22.6
	Steel container	110	22
	More than one type	248	49.6
Container covered	Yes	492	98.4
	No	8	1.6
Access to drinking water	Dip a glass	278	55.6
	Use a ladle	48	9.6
	Use of tap	174	34.8

Cleaning of water container	Daily	209	41.8
	Once in 2-3 days	253	50.6
	Weekly	33	6.6
	Monthly	5	1
Water treatment method	Boiling	264	52.8
	Ceramic filter	43	8.6
	Membrane filter	144	28.8
	Cloth	8	1.6
	Settling	6	1.2
	Chlorine tablet	1	0.2
	None	34	6.8

Water supply was irregular in 129(25.8%) houses and 1.6% felt that the water was unclean. 4.4% did not treat water because they felt it was clean and 1.8% did not know how to treat drinking water [Table 4].

Table 4: Challenges faced in water handling

Variables		Frequency(N=500)	Percentage
Problems faced in water supply	None	360	72
	Irregular	129	25.8
	Too far	3	0.6
	Unclean	8	1.6
Number of times there is water scarcity in a month	No scarcity	406	81.2
	<3 times	60	12
	>3 times	34	6.8
Average time period of water shortage	Not applicable	406	81.2
	1-2 days	57	11.4
	>2 days	37	7.4
Reason for not treating water	Do not know how to do it	9	1.8
	Expensive	3	0.6
	Water is clean/safe	22	4.4
	Not applicable	466	93.2

Individuals belonging to higher socioeconomic status and with better education levels practiced household level of water filtration [Table 7].

Table 7: Association of socio demographic variables and practice of water filtration

Socio demographic variable		Practicing water filtration			Chi square test	P value
Socio econo-mic status		**Yes**	**No**	**Total**	8.974	0.06
	Class I	45(9.66)	1(2.94)	46(9.2)	Df = 4	
	Class II	134(28.76)	4(11.77)	138(27.6)		
	Class III	165(35.4)	14(41.18)	179(35.8)		
	Class IV	61(13.09)	8(23.52)	69(13.8)		
	Class V	61(13.09)	7(20.59)	68(13.6)		
	Total	466(100)	34(100)	500(100)		
Education	Illiterate	113(24.25)	13(38.23)	126(25.2)	14.187	0.014*
	Primary school	35(7.50)	2(5.89)	37(7.4)	Df = 5	
	Middle school	40(8.58)	8(23.52)	48(9.6)		
	High school	81(17.38)	4(11.77)	85(17)		
	PUC	85(18.35)	3(8.82)	88(17.6)		
	Graduate	112(24.03)	4(11.77)	116(23.2)		
	Total	466(100)	34(100)	500(100)		

*p<0.05 significant

Most of the respondents used soap for handwashing (389, 77.8%). Majority of them had a sanitary latrine at home (88.6%). Community toilets were utilized by 2.2% of households and 9.2% practiced open air defaecation. The distance from house to place of defecation was more than 500 metres for 3.8% of the households. Most of the household waste was collected by the corporation (90.6%) and 8.8% of the households were dumping the wastes nearby. Most of the houses did not segregate the wastes (287, 57.4%) [Table5].

Table 5: Sanitation facilities and existing practices

Variables		Frequency(N=500)	Percentage
Hand washing practices*	Before cooking	381	76.2
	Before meals	465	93
	Before feeding child	226	45.2
	After defecation	415	83
Hand washing is done with	Only water	111	22.2
	Water and soap	389	77.8
Place of defaecation	Sanitary latrine at home	443	88.6
	Community toilet	11	2.2
	Open air defaecation	46	9.2
Distance from home to place of defaecation	Within premises	452	90.4
	100-500m	29	5.8

	>500m	19	3.8
Method of disposal of household waste	Collection by corporation	453	90.6
	Dumping	44	8.8
	Burying	1	0.2
	Composting	2	0.4
Segregation of waste	Done	213	42.6
	Not done	287	57.4

*multiple responses

Discussion

Household water treatment and safe storage (HWTS) is an important intervention at the household level to improve the quality of drinking water and thereby reduce the burden of diarrhoeal diseases. The present study was conducted in urban setting of one of the backward districts in the state to assess the knowledge, attitude and practices of water handling and sanitation. Most of the respondents opined that the water they used was safe and knew that the quality of water affects health. With regard to hand washing practices, respondents knew that it prevents infection (44%) and maintains hygiene (53.2%). Whereas in a study done by Kuberan A et al 82% participants knew that it prevents infection and 76% opined that hygiene can be maintaine[11].d Majority were aware of disease spread due to open air defaecation(88.8%). This was in contrast to a study done in rural TamilNadu where only 12.8% had awareness and nearly 33.1% practiced open air defaecation[12].

Most of the houses had piped water supply (78.2%) compared to 20% in rural Tamilnadu and 32% in Burla[12,13]. Study done in Guntur found that 76% houses had piped water supply[14]. Study done by Oinam J et al in urban area of Manipur found that main source of drinking water was tanker (68%)[15]. Water containers were cleaned daily (41.8%) which was less compared to rural Chennai (70%) and Guntur (61%).[11,14] In the present study, half of the households boiled water (52.8%) and 6.8% did not follow any water treatment method. Whereas in rural TamilNadu and Burla, 45% and 53.2% respectively did not treat drinking water[12,13]. Piped water supply, better water handling practices, water treatment at household level helps prevent contamination of drinking water and transmission of water borne diseases.

In the present study, 88.6% households had sanitary latrine, 2.2% used community toilets and 9.2% practiced open air defaecation. Whereas only 75% had sanitary latrines, 7% used community toilets and 17% practiced open air defaecation in rural TamilNadu[12]. In Guntur, 87% households used sanitary latrines and 13% practiced open air defecation[14]. In Amritsar, most of the houses had sanitary latrines (98.2%) and 1.8% practiced open air defecation[16]. Study done in Manipur found that there was 100% utilization of sanitary latrines[15]. Household waste was collected by corporation (90.6%) and 8.8% of households were dumping the waste. Similar findings were noted in Guntur[14]. Whereas in Amritsar and Manipur more than half the households (56.9% and 55.3% respectively) were dumping the wastes[16,15]. Utilization of sanitary latrines, proper waste disposal can significantly reduce the burden of diarrhoeal disease in the community.

Conclusion

Safe water storage and water treatment methods at the household level are crucial in improving the quality of drinking water. Health education regarding water handling and sanitation can significantly reduce the burden of water borne diseases.

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