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Study on Knowledge, Attitude and Practice about Purification of Household Water among 210 Individuals of Urban Area of Patan District

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ABSTRACT

Introduction: Consumption of contaminated drinking water is a major source of water related illness. About 88% of diarrhoeal diseases are attributed to unsafe drinking water, poor hygiene and inadequate sanitation. Nowdays, simple, low-cost and acceptable household water treatment technology are available. In many communities, there is limited knowledge and poor practice for water treatment.

Methodology: A community based cross-sectional study was conducted among 210 community members living in Patan city. Head of the family (HOF) or any family member above 18 years was interviewed. Participant used at least one method of HWT was considered as good practices and given 1 scores, otherwise poor practices as 0 scores.

Result: Most prevalent method was filtration by cloth (60.0%) followed by boiling (11.4%), and chlorination (11.0%). The high awareness regarding filtration (92.9%) and, boiling (86.2%). Only 16.7% respondents had good knowledge on HWT methods. Educational status was observed as a significant predictor factor for knowledge and attitude towards HWT. One fourth participants (29.5%) did not use any method of water purification.

Conclusion: The attitude of respondents on HWT was positive but water purification practices were quite poor. There is wide gap between knowledge and practice of filtration and boiling methods.

Key Words: Knowledge, Attitude, Practice, Boiling, Filtration

INTRODUCTION

Water is the basic needs for survival, and potable water is essential for healthy life. Worldwide, more than 125 million people had limited access to safe drinking water[1]. Water sources, sanitation facilities and water purification affect on the health of household members, especially children[2]. Consumption of contaminated drinking water is a major source of water related illness[3].About 88% of diarrhoeal diseases are attributed to unsafe drinking water, poor hygiene and inadequate sanitation[4]. Despite diarrhoea is easy to prevent and treat, it causes approx 1.5 million deaths annually[5].

Household water treatment (HWT) is method for treating water at the household level or at the point of use in schools, health-care facilities and other community locations. It is also called domestic water purification or point of use water treatment[6].Even tapped water in urban areas is not always as a safe source of water due to improper treatments or microbial contamination during the distribution[7]. HWT interventions may protect public health where water is untreated, not treated properly or become contaminated during distribution or storage [8].Nowdays, simple, low-cost and acceptable household water treatment technology are available which can improve the microbial quality of stored water and reduce the risks of diarrheal disease[9, 10]. The method of household puri-

fication include filtration, boiling, ultraviolent radiation and chemical treatment to deactivate the pathogen (using chlorine, iodine compounds)[6]. In many communities, there is limited knowledge and poor practice for water treatment. Therefore, this study was conducted to assess the knowledge, attitude and practice (KAP) on alternative HWT technologies among an urban residents of Patan, Gujarat and also to correlate gap between KAP with socio demographic variable.

METHODOLOGY

A community based cross-sectional study was conducted among 210 community members living in urban residential areas of Patan city after getting permission from Institutional Ethics Committee. The study was carried out through home visit. Cluster sampling methods was used to select participants. According 2011 census, there is 133,737 populations and around 33000 house hold in Patan city. Therefore, class interval was 1100 for selection of 30 clusters. After identification of clusters, seven households were selected randomly from each cluster and head of the family (HOF)from each household was interviewed. If HOF was absent than family member above 18 years was interviewed. If any house was locked than next house was included in the study. Residents who denied consent and mentally unstable who could not understand the question were excluded.

The participants were informed of the objective of the study. A Self administered questionnaires were allotted to the participants. The questionnaire was prepared after reviewing literature of WHO and UNICEF Core questions on drinking water and sanitation for household surveys [11].There were two sections in structured questionnaire. Section A contained socio demographic information. Section B included questions regarding knowledge, attitude and practices about HWT. Translation of questionnaire from English to local language "Gujarati" by language experts. Gujarati version of questionnaire was given to 20 participants who knew both language (English and Gujarati) and after 2 week English version of questionnaire was given to same participants. Cronbach α and Pearson correlation coefficient was 0.97 and 0.95 respectively. Therefore, reliability and validity of Gujarati version of questionnaire was good.

Each correct response was scored as 1 and incorrect response was scored as 0.Poor knowledge was defined as a score of < 50%, average knowledge was considered when score between 50-69% whereas a score > 70% was considered as good knowledge. The attitude toward HWT was measured based on a Likert scale 1–5 scoring system (from strongly disagree to strongly agree for positive attitude and from strongly agree to strongly disagree for negative attitude). Likert score above 3 for any question was considered as correct response and given score 1 and incorrect response was scored as 0.Score 50% and above were considered as a positive attitude and <50% as a negative attitude [12,13]. Participant used at least one method of HWT was considered as good practices and given 1 scores, otherwise poor practices as 0 scores.

Statistical analysis:

The data was entered in "Microsoft Excel" and analyzed using the Epi info 7. Qualitative variables were described in percentages. Association between qualitative variables was done by chi-square test. A p values less than 0.05 was considered significant was considered significant.

RESULT

A total of 210 households were visited for the study. All the respondents willingly participated in the study. Total 113 (53.8%) respondents were in 25-34 age group and most of them were married (180, 85.7%) and housewives (156, 74.6%). About 86 (41.0 %) were illiterate and 173 (82.4%) were Hindu.

Table 1: Socio demographic characteristics of participants

Characteristics	Frequency (%)
Age	
18-24	36 (17.1)
25-34	113 (53.8)
35-44	44 (21)
>45	17 (8.1)
Religion	
Hindu	173 (82.4)
Muslim	37 (17.6)
Education	
Illiterate	86 (41)
Primary	31 (14.8)
Secondary	34 (16.2)
Higher secondary	40 (19)
Graduate	15 (7.1)
Higher graduate	4 (1.9)
Marital status	
Married	180 (85.7)
Unmarried	7 (3.3)
Divorced	4 (1.9)
Widow	19 (9)
Occupation	
House wife	156 (74.3)
Bussiness	16 (7.6)
Labour	15 (7.1)
Job	13 (6.2)
Unemployed	10 (4.8)
Family size	
<5	128 (61)
>5	82 (39)

More than five family members were observed in 82 (39.0%) household. (Table 1)

Knowledge regarding HWT methods of participants (Table 2): Most common source of water was municipality water (84, 40.0%) followed by bore well water (63, 3.00%) and public tap (63, 3.00%). Most common listed HWT method by participants was filtration with cloth (195, 92.9%) followed by boiling (181, 86.2%), reverse osmosis (140, 66.7%). Total 74 respondents (35.2%) believed that clear water from the source is safe to drink and ccould not cause any disease. Diarrhoea (128, 610%) was most commonly disease cited by participants as water borne disease followed by cholera (117, 55.7%). Dysentery was rarely known (23, 11.0%) by participants. One fourth of respondents (54, 25.7%) had correct knowledge about how much time after chlorination water should be used for drinking purpose. Around 60% respondents had complain of about change of taste of water after purification. Most of respondents received knowledge regarding HWT by family members (193, 91.9%) followed by doctor (23, 11.0%) and health workers (21, 10.0%). Nearly one third of respondents (64, 30.5%) had poor knowledge and only 35 respondents (16.7%) had good knowledge regarding HWT.

There was no significant difference among respondents according to age and occupation. (Table 3). However, married (18.3%) and literate (22.6%) respondents had better knowledge as compared to unmarried (6.7%) and illiterate (8.1%) respondents respectively ($p < 0.05$ in both groups). (Table 3)

Attitude towards HWT methods among participants (Table 4): Most of the respondents (184, 87.6%) showed positive attitude for doing purification of water while only 26 (12.4%) were believed it was worthless.

Table 2: Knowledge of the participants regarding HWT

Correct knowledge regarding	Frequency(%)
Source of house hold water	
Municipality	84 (40)
Borewell	63 (30)
Public tap	63 (30)
Types of HWT methods	
Filtration with cloth	195 (92.9)
Boiling	181 (86.2)
Reverse osmosis	140 (66.7)
Chlorination	117 (55.7)
Sedimentation	33 (15.7)
Diseases caused by contaminated water	
Diarrhea	128 (61)
Cholera	117 (55.7)
Roundworm	92 (43.8)
Typhoid	31 (14.8)
Dysentry	23 (11)
Not caused any disease	74 (35.2)
Time requires to boil water?	105 (50)
Time require after chlorination to drink water	54 (25.7)
Believe that clear water is safe to drink	74 (35.2)
Complain of changing the taste of water after purification	126 (60)
Importance of covered drinking water	210 (100)
Usage of ladle to draw water	129 (61.4)
Source of knowledge of water purification	
Family member	193 (91.9)
Doctor	23 (11)
Health worker	21 (10)
Media	11 (5.2)
Friend	7 (3.3)
School education	11 (5.2)
Level Knowledge on HWT methods	
Good	35 (16.7)
Average	111 (52.9)
Poor	64 (30.5)

Table 3: Comparison of knowledge among participants according to sociodemographic variable*

Characteristics	Good (n=35) (%)	Average (n=111) (%)	Poor (n=64) (%)	Total (n=210) (%)	X^2 value	P value
Age						
18-24	8 (22.2)	17 (47.2)	11 (30.6)	36 (100.0)	3.71	0.71
25-34	21 (18.6)	60 (53.1)	32 (28.3)	113 (100.0)		
35-44	4 (9.1)	24 (54.5)	16 (36.4)	44 (100.0)		
>45	2 (11.8)	10 (58.8)	5 (29.4)	17 (100.0)		
Marital status						
Married	33 (18.3)	98 (54.4)	49 (27.2)	180 (100.0)	7.07	0.02
Unmarried	2 (6.7)	13 (43.3)	15 (50.0)	30 (100.0)		
Education						
Illiterate	7 (8.1)	52 (60.5)	27 (31.4)	86 (100.0)	7.98	0.01
Literate	28 (22.6)	59 (47.6)	37 (29.8)	124 (100.0)		
Occupation						
House wife	25 (16.0)	84 (53.8)	47 (30.1)	156 (100.0)	10.4	0.23
Bussiness	6 (37.5)	5 (31.3)	5 (31.3)	16 (100.0)		
Labour	1 (6.7)	10 (66.7)	4 (26.7)	15 (100.0)		
Job	3 (23.1)	5 (38.5)	5 (38.5)	13 (100.0)		
Unemployed	0 (0.0)	7 (70.0)	3 (30.0)	10 (100.0)		

*A score > 70% was considered as good knowledge, between 50-69% as average knowledge and < 50% as poor knowledge.

Table 4: Comparison of attitude among participants according to sociodemographic variable.

Characteristics	Positive (n=184) (%)	Negative (n=26) (%)	Total (n=210) (%)	X^2 value	p value
Age					
18-24	32 (88.9)	4 (11.1)	36 (100.0)	1.89	0.59
25-34	96 (85.0)	17 (15.0)	113 (100.0)		
35-44	40 (90.9)	4 (9.1)	44 (100.0)		
>45	16 (94.1)	1(5.9)	17 (100.0)		
Marital status					
Married	158 (87.8)	22 (12.2)	180 (100.0)	0.02	0.86
Unmarried	26 (86.7)	4 (13.3)	30 (100.0)		
Education					
Illiterate	68 (79.1)	18(20.9)	86 (100.0)	9.81	0.01
Literate	116 (93.5)	8 (6.95	124 (100.0)		
Occupation					
House wife	138 (88.5)	18 (11.5)	156 (100.0)	4.65	0.32
Bussiness	14 (87.5)	2 (12.5)	16 (100.0)		
Labour	14 (93.3)	1 (5.7)	15 (100.0)		
Job	9 (69.2)	4 (30.8)	13 (100.0)		
Unemployed	9 (90.0)	1 (10.0)	10 (100.0)		

Table 5: Practice of the participants regarding HWT methods and water handling

Practice regarding HWT methods	Frequency (%)
Method of purification you use (n=210)	
Filteration by cloth	126 (60)
Boiling	25 (11.9)
Chlorination	23 (11)
Reverse osmosis	11 (5.2)
Not using any method	62 (29.5)
Frequency of doing water purification (n=148)*	
Daily	75 (50.7)
Twice weekly	64 (43.2)
Weekly	3 (2)
Twice monthly	1 (0.7)
Monthly	5 (3.4)
Who does your house water purification (n=148)	
Housewife	119 (80.4)
Other female family member	10 (6.8)
Other male family member	4 (2.7)
Outsource mineral water	15 (10.1)
Practice regarding water handling (n=210)	
Covered drinking water	207 (98.5)
Usage of ladle to draw water	66 (31.4)
Storedrain water	0 (0)

*(excluded 62 respondents who are not using any HWT method,)

Table 5 displayed that significant difference was not observed in attitude of respondents according to age, marital status and occupation. However, positive attitude was more seen in literate (93.5%) as compared to illiterate (79.1%) respondents respectively ($p < 0.05$ in both groups).

Practices of HWT methods and handling of water (Table 6): The prominent method of water purification practice was filtration by cloth (126, 60.0%) followed by, boiling (25, 11.4%) and chlorination (23, 11.0%). Total 62 respondents (29.5%) were not using any HWT method and considered it as inappropriate practice. These respondents had poor knowledge and negative attitude towards HWT. Purification of water was done daily by nearly half of respondents (75, 50.7%). In most of the house hold it was done by housewife (119, 80.4%). Almost all the respondents (98.5%) had good storage practice by covering the store water. However, only 64 (31.4%) used ladle for taking water from the storage source. No one had facility for storing the rain water.

DISCUSSION

In the present study, most prevalent method was filtration by cloth (60.0%) followed by, boiling (11.4%), and chlorination (11.0%). Study from urban area of Lucknow reported that boiling (26.2%) was the most prevalent method followed by filtering (26.9%) [7].

High awareness regarding filtration (92.9%), boiling (86.2%) and reverse osmosis (66.7%) was not matched with their routine practice of water purification as very few respondents used filtration (60.0%), boiling (11.9%), and reverse osmosis (5.2%). They stated that boiling was time-consuming method and reverse osmosis was costly method. Although chlorination is low cost and most effective method, knowledge and practice of chlorination was observed very low among participants (55.7%, 11.0% respectively).

In this study, only 16.7% respondents had good knowledge on HWT methods which is lower than study conducted in rural Haryana (33.5%)[14], and Madhya Pradesh (20%)[15]. The knowledge of filtration (92.9%), boiling (86.2%), chlorination (55.7%) was higher than the study conducted in rural Haryana (boiling-64.3%)[14], and study of Northwest Ethiopia[16] (filtration-27.1%, chlorination -12.9%).

The knowledge regarding "unsafe water can cause any diarrheal disease" was observed relatively

high in our study (64.8%) as compared to study of Bharti mehta et al [14] (33.5%) and Bhattacharya et al[15](20.0%).In the present study, there was also wide gap between knowledge (61.4%) and practice (31.4%) for using ladle to draw water. It increases the risk of microbial contamination. This is in consonance with various studies such as study conducted by Bharti Mehta et al [14] (30.5%) and Bhattacharya et al [15] (38.0%). In the present study, educational status was observed as a predictor factor for knowledge and attitude towards HWT.

In the present study, 62 (29.5%) respondents did not use any method of water purification. These respondents had also poor knowledge and negative attitude towards HWT which indicated that inappropriate practice may be the result of negative attitude and poor knowledge of the negative health impact of poor water quality. However, NFHS-4reported that approximately half of urban population (47.1%) did not use any method of water purification [17]. In the present study, inappropriate practice was observed even though positive attitude among respondents. A contradictory finding was reported by Kioko from western Kenya revealed that the residents of urban households had significant knowledge on water safety, but their practice of safe handling and was very poor[18].

CONCLUSION

The attitude of respondents on HWT was positive but their practice of water purification was quite poor. There is wide gap between knowledge and practice of filtration, boiling, and reverse osmosis. Statistically significant predictor factors for knowledge and attitude towards HWT was educational status. Well designed health awareness programs should be effectively implemented with active participation of health workers.

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