KNOWLEDGE ATTITUDE AND PRACTICES REGARDING WATER HANDLING AND WATER QUALITY ASSESSMENT IN A RURAL BLOCK OF HARYANA

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ABSTRACT

Lack of safe water creates an enormous burden in the form of diarrheal and other waterborne disease. Water safety in a community depends on a range of factors, from the quality of source water to storage and handling in the domestic setting. The purpose of the present study is to assess knowledge, attitude and practices regarding water handling as possible determinants of diseases in the rural population of Haryana, India. The present cross-sectional study was conducted in Community Health Centre (CHC) Chiri area of block Lakhanmajra, rural field practice area attached with the Department of Community Medicine, Pt. B.D.Sharma. PGIMS, Rohtak, Haryana during period of Nov.2012-Jan.2013. Multistage random sampling was used. A pre-tested semi-structured, schedule was used as a tool for the study. Orthotolidine test was carried out for qualitative assessment of drinking water at the household level. In majority of households (62.5%) well water was being used for drinking & cooking purposes while piped water was being used mainly for washing clothes and bathing in two third of households. Around two third of informants did know about importance of ladle to draw water while ladle was actually being used in less than one third of households only. We found that two third of informants did not associate knowledge unsafe water with diarrhea. The common reason cited for cause of diarrhoea, were 'heat', spicy food, excessive sweets, ingesting mud or mosquitoes. Orthotolidine test negative in 100% of households. In conclusion, water handling practices and quality assessment in most of the households were not satisfactory in the present study. As most of the people in study area were unaware of the close linkage between unsafe drinking water and diarrhea, thus showing an urgent need of health education in this area.

Key Words: Knowledge, Practice, Water handling, Orthotolidine test, Rural Community, India

INTRODUCTION

The World Health Organization (WHO) defines safe drinking water as, "water that does not represent any significant risk to health over a lifetime of consumption, including different sensitivities that may occur between life stages (World Health Organization, 2008). However for billions of people across the globe, access to safe drinking water is limited. Lack of safe water creates an enormous burden in the form of waterborne illnesses such as diarrheal disease, cholera, typhoid etc. Diarrhea and water-borne diseases are leading causes of mortality and morbidity in developing countries (WHO/ UNICEF, 2000). Approximately 88% of diarrhoeal diseases are attributed to unsafe water supply, inadequate sanitation and hygiene (WHO, 2004). The proportion of population in rural areas with access to safe drinking water has a direct impact on the health of the masses. Water sources and sanitation facilities have an important influence on the health of household members, especially children. The drinking water target under Millennium development goals (MDGs), which calls for halving the proportion of the population without sustainable access to safe drinking water between 1990 and 2015, was met in 2010 but over 780 million people are still without access to improved sources of drinking water (WHO/UNICEF, 2010).

A 2012 WHO/UNICEF Joint Commission Report states that 89% of population in India now has access to improved water sources, an increase from 72% in 1990 (WHO/UNICEF, 2012).

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However, the same report notes that simply having improved water sources does not necessarily mean that the water is safe to drink. Moreover because of improper behaviour regarding maintenance and utilization of resources, the consequent loss in terms of economy and productivity is great and is difficult to access. It has been observed that in developing countries like India, social institutions, cultures and beliefs of the people had bearing upon everyday water consumption pattern of the people (Swarnakar and Sharma, 2003). In order to understand the socio-cultural factors impacting on water safety of rural community the present study was conducted to assess knowledge attitude and practices regarding water handling and quality assessment at community level in rural Haryana (India).

MATERIALS AND METHODS

The present cross-sectional study was conducted in Community Health Centre (CHC) Chiri area of block Lakhanmajra, rural field practice area attached with the Department of Community Medicine, Pt. B.D.Sharma. PGIMS, Rohtak, Haryana during period of Nov.2012-Jan.2013. This area has a population of 106,935. It includes 24 villages and is served by one Community Health Centre (Chiri), three Primary Health Centers (PHC) (Chiri, Samargopalpur, Lakhanmajra) and 20 sub-centres. These centers are used for the purpose of teaching, training and research activities. Multistage random sampling was used including all the 3 PHCs of the block. From each PHC, 2 sub-centres were selected randomly and out of them 2 anganwadis from each sub-centre were selected randomly by lottery technique; a total of 12 anganwadis were selected. From each anganwadi, 40 households were chosen by simple random sampling technique to get a total sample size of 480. The study was carried out by investigator through house to house visit. A pre-tested semi-structured, schedule was used as a tool for the study. Information was collected by interviewing the available adult family member at the time of visit, and also, by physical examination of storage facilities.

Orthotolidine test was carried out for qualitative assessment of drinking water at the household level by adding 0.1 ml of the Orthotolidine reagent to 1 ml of water. Orthotolidine test is used to assess both free and combined chlorine status of water. This reagent consists of analytical grade Orthotolidine, dissolved in 10% solution of hydrochloric acid. When the reagent is added to water containing chlorine, it turns yellow and intensity of the colour varies with concentration of chlorine. The yellow colour produced within 10 seconds indicates presence of free chlorine and after 15 - 20 minutes denotes both free and combined chlorine (Park, 2013).

Statistical Analysis

Data so collected were compiled & analysed using statistical software (SPSS version 20.0). Data was presented as percentages (%) and proportions.

RESULTS AND DISCUSSION

A total of 480 households were visited for the study. Informants were mostly adult females (96.4%). The most common occupation of head of household was farming (54.7%) followed by labour (30.8%), shop and service. The literacy level of head of majority of households was till matriculation (50.8%) and around 9.6% of them were illiterate.

Table 1 shows distribution of different sources of water used in households for various purposes. In majority of households (62.5%) well water was being used for drinking & cooking purposes while piped water was being used mainly for washing clothes and bathing in two third of households. One of reason of this may be that well water is available easily and throughout day while piped water is intermittent and irregular in supply.

Another reason can be sociocultural beliefs regarding drinking water practices and doubt about safety of piped supply. Others studies in Haryana also found similar findings (Chawla *et al.*, 2006; Kumar *et al.*, 2009).

Table 1: Distribution of different water sources* used in households for various purposes. (N= 480) Water source Wells Piped water Hand pump Total Purpose 300 (62.5) 80 (16.6) 100 (20.9) 480 (100)

Washing utensils	239 (49.8)	204 (42.5)	37 (7.7)	480 (100)	
Washing clothes & Bathing	& 114 (23.8)	320 (66.6)	46 (9.5)	480 (100)	

*More than one water sources were used by households. Percentages are shown in parenthesis.

According to National health profile 2011, in India, 43.5 of households are using tap water, 11.0% well water and 33.5% hand pump water for purpose of drinking. In Haryana, the corresponding figures are 68.8%, 3.0% and 12.0% (National health profile, 2011).

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Knowledge about	No. of informants/Households (N=480) (%)						
Importance of Covered drinking water	480 (100)						
Usage of ladle to draw water	309 (64.4)						
Unsafe water can cause diarrhea	161(33.5)						
Boiling or filtering water can prevent water borne diseases	309 (64.3)						
Practices regarding							
Stored in earthen pitchers	444 (92.5)						
Covered drinking water	465 (96.8)						
Ladle used to draw water	146 (30.5)						
Any household Purification method used (boiling/chlorination/filtration/others)	48 (10.0)						
Diarrheal episodes in any family member in past 6 months	128 (26.7)						

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Table 2 shows that all informants acknowledged about importance of covered drinking water in prevention of diseases but covered drinking water was found in 96.8% of households. Around two third of informants (64.4%) did know about importance of ladle to draw water while ladle was actually being used in less than one third (30.5%) of households only. Similarly, Bhattacharya *et al.*, (2011) found only 38% of household used handled jug to take out drinking water from vessel and most of the respondents interviewed took out water by dipping glass held in hand (Bhattacharya *et al.*, 2011). This practice of drawing water increases the risk of microbial contamination of drinking water by contact with potentially contaminated hands. Various studies have shown that chronic diarrhea was a consequence of poverty, poor hygiene and environmental contamination (Bhattacharya *et al.*, 2011; Pokhrel *et al.*, 2004). We found that only 33.5 % of informants had knowledge that unsafe water can cause diarrhea. This figure

was higher as compare to 20% found by Bhattacharya *et al.*, (2011) in their study (Bhattacharya *et al.*, 2011). The common reason cited for cause of diarrhoea, were 'heat', spicy food, excessive sweets,

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ingesting mud or mosquitoes. Similar findings were also revealed by other studies (Bhattacharya *et al.*, 2011). It has been estimated that diarrheal morbidity and mortality can be reduced by an average of 6-20 per cent with improvements in water supply (WHO, 2004).

Around two third (64.3%) of informants were aware that boiling or filtering water can prevent water borne diseases but it was being practiced in only 10 % of households. In India, approximately 72.7 per cent of the rural population does not use any method of water disinfection (NFHS-3, 2005-06). Bhattacharya *et al.*, (2011) also found 72% of household don't follow any treatment and drink it as it is (Bhattacharya *et al.*, 2011). This could be due to unawareness or ignorance. One in every fourth household had history of diarrheal episodes in past 6 months among family members.

Water Quality Assessment

In present study, water was not found to be potable in around 20% of households. Orthotolidine test results were found negative in 100% of households indicating absence of both free and combined chlorine in drinking water. This indicates that water disinfection techniques are not adequate at level of production in this area. Remedial measures like adequate disinfection of drinking water sources including well disinfection need to be performed with community involvement.

Conclusion

In conclusion, water handling practices and quality assessment in most of the households were not satisfactory in the present study. As most of the people in study area were unaware of the close linkage between unsafe drinking water and diarrhea, thus showing an urgent need of health education in this area. The United Nations has recognized access to water as a basic human right, stating that water is a social and cultural good, not merely an economic commodity (UN, 2011). Provision of safe drinking water is one of the eight elements of primary health care to achieve goal of 'Health for All' (WHO, 1978). An integrated approach to bridge the existing knowledge-practice gap should be formulated based on four principles of primary health care –Equitable distribution, appropriate technology, community participation, inter-sectoral coordination. Treatment of chemically and biologically contaminated water sources in rural areas should be done by appropriate technologies for provision of safe potable water; Community participation is required to create awareness regarding safe water practices. Level of awareness can also determine the consumption patterns, which in turn ascertain the demand for infrastructure. The measures taken should suit local conditions, requirements and socio-cultural environment. Media can play a huge role in Behavior change communication on the importance of safe water and hygiene among community especially in children and mothers. Continued efforts are needed to reduce urban-rural disparities and inequities associated with poverty; to promote global monitoring of drinking water quality and to look beyond the MDG target towards universal coverage.

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