https://doi.org/10.3329/cbmj.v14i2.83290

Awareness Regarding Safe Drinking Water among People Living in Rural Area of Bangladesh

*Kabir MH[1], Asgar N[2], Alam FS[3], Ansari M[4]

Abstract

This cross-sectional, descriptive study was conducted in a rural area of West Bhagalpur village under Bajitpur upazila of Kishoreganj district, Bangladesh, from July 2023 to June 2024, to determine the awareness regarding particular aspects of safe drinking water among the rural adults. A convenient non-probability sampling was adopted. A total of 125 participants were interviewed based on a semi-structured questionnaire. Out of 125 respondents, 44(35.2%) were male and 81(64.8%) were female; all were aged between 18 and 65 years. Regarding qualities for safe drinking water, most of them said 82(65.6%) colorless, odorless, free from turbidity, tasteless and other said 24(19.2%). The majority 103(82.4%) had shallow tube well, 14(11.2%) had deep tube well, 7(5.6%) had tap water, only 1 used pond water. Most of them were taking drinking water without purification direct from tube well 88(70.4%), followed by boiling and filters 16(12.8%) and rest of them purify their drinking water by disinfection 5(4%). For improvement of water supply, most of them recommended 23(46.93%) to provide subsidized filters, create awareness regarding hazards of impure water drinking and built more tube well and followed by built more tube wells 16(32.65%), create awareness 6(12.24%) and provide subsidized filters 4(8.16%). For storage of water most of them used jug 86(68.8%), followed by bucket 25(20%), mud pot 8(6.4%) and only 6(4.8%) used others containers. 121(96.8%) had no water-borne disease in the last 6 months, while 4(3.2%) had diarrhoea. Surprisingly, most of them said yes to store water for future use 84(67.2%), while 41(32.8%) declined. This study presented a comprehensive overview of the awareness regarding particular aspects of safe drinking water among people living in rural areas of Bangladesh.

CBMJ 2025 July: vol. 14 no. 02 P:149-153

Keywords: Safe drinking water, water-borne disease, storage of water, rural area, Bangladesh

Introduction

Globally, 4% of all deaths and 5.7% of the total burden of diseases in DALYs (Disability Adjusted Life Years) lost due to diarrhea and other water related infectious disease which is attributable to water, sanitation, and hygiene.[1,2] Unsafe water situation and poor sanitation facilities in Bangladesh accounts for estimated three-quarters of all disease burden3. People who live in an urban area can get more access to the safe water. Globally 78% of the total rural population has sustainable access to safe drinking water when compared with 85% of the urban population in 2006.[3] Acute scarcity of drinking water is prevalent in Bangladesh, even though the country is renowned for its profusion of water which comes from different rivers. After the first installment of a deep tube well in the 1940s, the number of tube well utilization has increased over a period of last two decades until 1993, when it became a suspect of arsenic contamination.[4] Over the decades, different health hazards, i.e., neurology, pulmonary diseases, skin lesions and cancer among the rural people have emerged due to ingestion of contaminated arsenic water. According to NGO forum report, only 74% of

1. *Dr. Md. Humayun Kabir, Associate Professor, Department of Community Medicine & Public Health, Jahurul Islam Medical College, Kishoreganj.
2. Dr. Nilufar Asgar, Associate Professor, Department of Community Medicine & Public Health, Jahurul Islam Medical College, Kishoreganj.
3. Dr. Fakir Sameul Alam, Associate Professor, Department of Community Medicine & Public Health, Community Based Medical College Bangladesh.
4. Dr. Mahmuda Ansari, Assistant Professor, Department of Community Medicine & Public Health, Popular Medical College, Dhanmondi, Dhaka.

Address of Correspondence:
Email: drmhkabir.net@gmail.com

the country's total population had access to the drinking water which is free from arsenic and pollutants. Drinking water contaminated with the arsenic particles has raised the health concern for inhabitants residing in arsenic affected areas, and evidence suggests that it may lead to water borne infections.[5]

People who took high arsenic contaminated water had developed arsenic-induced skin lesions. These skin lesions were prominent on the upper chest, arms and legs. Features of developing keratosis of the palms and soles were also frequent. In Bangladesh, groundwater with arsenic contamination was detected in 59 of the 64 districts, and 249 of the country's 463 sub-districts.[6] A recently published report found that 38,500 people succumbed to death and about 70 million inhabitants confront a direct threat to develop the arsenic related illness. About 1.4 million tube-wells were encountered to hold arsenic above the normal level, and some of the inhabitants were using the contaminated tube-wells due to lack of alternative water source.[7] However, individuals' decision to avoid arsenic exposure was positively affected by the socioeconomic status, i.e., education and income level. The incidence of experiencing diarrhoea and other water borne infectious diseases was seemed to be higher despite having a low case fertility rate.[2,7] As arsenic contamination co-exists with the other pollutants, ~90% of the children below the age of 5 years had suffered from diarrhoea due to ingestion of unsafe water.[8,9] Mostly, the poor households and urban slums were exposed to drinking water contaminated by arsenic particles, coupled with lack of access to alternative safe water sources.[10] This study was designed to to determine the awareness regarding particular aspects of safe drinking water among people living in the rural area of Bangladesh.

Methods

This cross-sectional, descriptive study was conducted among the rural adult people of West Bhagalpur village under Bajitpur upazila of Kishoreganj district, Bangladesh, between July 2023 and June 2024. The sample size was 125 respondents. A self-administered, semi-structured questionnaire was developed for collection of required data. The study was conducted by face-to-face interview using that questionnaire form. After compilation of data, the obtained data was checked and verified. Data was analyzed by MS-Excel program from the Master Sheet. Descriptive statistics were used to present the study findings. Data was expressed as frequency and percentage. The result was shown in tabulated form. This study was approved by the Ethical Review Committee of Jahurul Islam Medical College, Kishoreganj.

Results

We interviewed a total of 125 rural adult people. Out of 125 respondents, 44(35.2%) were male and 81(64.8%) were female; all were aged between 18 and 65 years. Regarding qualities for safe drinking water, most of them said 82(65.6%) colorless, odorless, free from turbidity, tasteless and other said 24(19.2%). The majority 103(82.4%) had shallow tube well, 14(11.2%) had deep tube well, 7(5.6%) had tap water, only 1 used pond water. Most of them were taking drinking water without purification direct from tube well 88(70.4%) and followed by boiling and filters 16(12.8%) and rest of them purify their drinking water by disinfection 5(4%). For improvement of water supply, most of them recommended 23(46.93%) to provide subsidized filters, create awareness regarding hazards of impure water drinking and built more tube well and followed by built more tube wells 16(32.65%), create awareness 6(12.24%) and

provide subsidized filters 4(8.16%). For storage of water most of them used jug 86(68.8%), followed by bucket 25(20%), mud pot 8(6.4%) and only 6(4.8%) used others containers (Table-I). 121(96.8%) had no water-borne disease in the last 6 months, while 4(3.2%) had diarrhoea. Surprisingly, most of them said yes to store water for future use 84(67.2%), while 41(32.8%) declined.

Table-I: Participants' opinion on safe drinking water (n=125)

Variables	Frequency	Percentage
Qualities of safe drinking water		
Colorless	6	4.8
Odorless	5	4
Free from Turbidity	5	4
Tasteless	3	2.4
All of the above	82	65.6
Others	24	19.2
Source of water		
Rain	0	0
Pond	1	0.8
Shallow Tube well	103	82.4
Deep Tube well	14	11.2
Tap water	7	5.6
Others	0	0
Boiling		
Filters	16	12.8
Chemical disinfectant	5	4
Others	88	70.4
Recommendations by the participants		
Provide filters	4	8.16
Create awareness	6	12.24
Built tube wells	16	32.65
All of above	23	46.93
Water storage method		
Jug	86	68.8
Bucket	25	20
Mud pots	8	6.4
Others	6	4.8

Discussion

Evidence showed that Bangladesh faces a significant challenge in providing safe drinking water to its population due to widespread groundwater contamination and aquifer depletion.[11] Knowing of safe drinking water, most of them said yes 102(81.6%) and rest of them said no 23(18.4%). Qualities for safe drinking water said 82(65.6%) colorless, odorless, free from turbidity, tasteless and other said 24(19.2%). Having sources of water majority 103(82.4%) had shallow tube well, 14(11.2%) deep tube well, 7(5.6%) tape water, rest only 1 pond water. Purification of drinking water taking without purification direct from tube well 88(70.4%) followed by boiling and filters 16(12.8%) and rest by disinfection 5(4%). Only 22(17.6%) had water purifier. Water storage methods adopted were: jug 86(68.8%), bucket 25(20%), mud pot 8(6.4%), and 6(4.8%) used others containers. Believe in saving water, maximum said yes 84(67.2%) and not believing 41(32.8%). Having of tube well at home 95(76%) had tube well and no tube well 30(24%). Any unpleasant odor while drinking water maximum said no 114(91.2%) and a few said yes 11(8.8%). Suffering from water borne diseases in last six months in their family maximum said none 121(96.8%) and only few had the problems of diarrhoea 4(3.2%). In another study, quality of drinking water indicates water acceptability for human consumption. Water quality depends on water composition influenced by natural process and human activities. Water quality is characterized on the basis of water parameters (physical, chemical, and microbiological), and human health is at risk if values exceed acceptable limits.[12,13] Improvement of water they recommended that maximum 23(46.93%) provide subsidized filters, create awareness regarding hazards of impure water drinking and built

more tube well and followed by built more tube wells 16(32.65%), create awareness 6(12.24%) and provide subsidized filters 4(8.16%). Water Quality Index (WQI) is considered as the most effective method of measuring water quality. A number of water quality parameters are included in a mathematical equation to rate water quality, determining the suitability of water for drinking.[14] A usual WQI method follows three steps which include (i) selection of parameters, (ii) determination of quality function for each parameter, and (iii) aggregation through mathematical equation.[14]

Conclusion

This study presented a comprehensive study overview of the safe drinking water related knowledge, attitude and practices of rural adults. According to this study, their knowledge is not satisfactory. I was evident that in all spheres of water collection, storage, purification and in utilization there were no systemic planning among the respondents. Most of the respondents do not have any knowledge about biological purification of water. They also have lack of knowledge about sanitary disposal and hygiene. Hence, many of them are having water borne diseases like, diarrhoea, cholera, food poisoning and typhoid fever. Therefore, a large number of deaths and illness takes place both globally and in Bangladesh due to inadequate knowledge of safe water or inaccessibility to drinking water.[12] From the experience of this study, many respondents were willing to pay for good source of water. Therefore, both government organizations and NGO's should initiate projects related to install a safe water source for the rural households. These households are most likely able to pay the cost of installation on monthly payment basis.

References

1. *Murray CJL, Lopez AD. Global health statistics: a compendium of incidence, prevalence and mortality estimates for over 200 conditions. Cambridge: Harvard University Press.;1996.*
2. *Pruss A, Kay D, Fewtrell L, Bartram J. Estimating the burden of disease from water, sanitation, and hygiene at a global level. Environ health Perspect. 2002;110(5):537-42.*
3. *National Institute of Population Research and Training (NIPORT). Bangladesh demographic and health survey, 2007. Dhaka: NIPORT; 2011.*
4. *World Health Organization (WHO). Guidelines for drinking-water quality. 4th ed. Geneva: WHO; 2011.*
5. *Jakariya M, von Brömssen M, Jacks G, Chowdhury AMR, Ahmed KM, Bhattacharya P. Searching for a sustainable arsenic mitigation strategy in Bangladesh: experience from two upazilas. Int J Environ Pollution. 2007;31(3-4):415-30.*
6. *Ahmad JK, Goldar BN, Jakariya M, Misra S. Fighting arsenic, listening to rural communities: findings from a study on willingness to pay for arsenic-free, safe drinking water in Bangladesh. Washington, DC: World Bank; 2002.*
7. *Khan NI, Brouwer R, Yang H. Household's willingness to pay for arsenic safe drinking water in Bangladesh. J Environ Manage. 2014;143:151-61.*
8. *Khan JR, Hossain MB, Chakraborty PA, Mistry SK. Household drinking water E. coli contamination and its associated risk with childhood diarrhea in Bangladesh. Environ Sci Pollut Res Int. 2022;29(21):32180-9.*
9. *Hasan MK, Shahriar A, Jim KU. Water pollution in Bangladesh and its impact on public health. Heliyon. 2019;5(8):e02145.*
10. *Satapathy BK. Safe drinking water in slums: from water coverage to water quality. Econ Politic Weekly. 2014;49(24):50-5.*

11. *Hasan MK, Shahriar A, Jim KU. Water pollution in Bangladesh and its impact on public health. Heliyon. 2019;5(8):e02145.*

12. *Ahmed SA, Hoque BA, Mahmud A. Water management practices in rural and urban homes: a case study from Bangladesh on ingestion of polluted water. Public Health. 1998;112(5):317-21.*

13. *Akter T, Jhohura FT, Akter F, Chowdhury TR, Mistry SK, Dey D, et al. Water Quality Index for measuring drinking water quality in rural Bangladesh: a cross-sectional study. J Health Popul Nutr. 2016;35:4.*

14. *Bangladesh Bureau of Statistics (BBS) & UNICEF. Bangladesh MICS 2019: Water quality thematic report. Dhaka: BBS & UNICEF; 2021.*