

Original Research Article

Water and sanitation hygiene practices among household members living in urban slum in Gwalior city: a cross sectional study

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ABSTRACT

Background: Population inhabit in urban slum of developing countries face sanitation, water supply and cleanliness related issues. We contemplated knowledge, attitudes and practices identified with drinking water and sanitation offices among urban slum populace of Gwalior city, Madhya Pradesh, India.

Methods: It was a cross-sectional study comprising of individuals over 18 years of age residing at Muriya Pahar and Awadpura, Urban Slum, Gwalior (Madhya Pradesh) from September 2019 to December 2019. Total 120 individuals were interviewed using simple random sampling technique. Basic information about socio-demographic profile and existing drinking water and sanitation related knowledge, attitude, and practices was collected using a modified version of previously validated questionnaire and analysed.

Results: Thirty five percent (35%) of the participants were following bleach/chlorine methods of water treatment while twenty five percent (25%) of the participants felt that water available to them was clean and did not require any additional treatment. Forty percent (40%) of the participants surveyed, did not have access to toilets inside their households.

Conclusions: There is a requirement for mediation to instruct people about drinking water treatment techniques, sanitation, and hand washing rehearses.

Keywords: Attitude, Drinking water, Hygiene, Knowledge, Practices, Sanitation

INTRODUCTION

The impact of poor sanitation seep into each part of life-health, nutrition, development, economy, dignity and strengthening.¹ Although Millennium Development Goals (MDGs) have been succeeded by Sustainable Development Goals (SDGs), 2.5 million are still devoid of improved sanitation facility.^{2,3} The sanitation target 7C (target 7C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation) to reach 75% of global coverage by 2015 from 63% in 2015 was missed.⁴ The MDGs were succeeded by the Sustainable Development

Goals the SDGs for 2016-2030 period, including a self-standing goal SDG 6 regarding access to water and sanitation. MDG 7c and SDG 6 guide water and sanitation data that are collected worldwide and that determine what we know about access to water and sanitation. Around the world, water and sanitation hygiene practices are liable for 90% of diarrhoea-related mortality, which is much higher than combined mortality from malaria and HIV/AIDS.⁵⁻⁷ In spite of the fact that piped water facility in the rural regions nearly doubled in last two decades, there are still 171 million people in rural regions who utilize surface water as the primary source of water.⁸ Despite limited advances in drinking

water facilities in rural areas, there is still a poor trend in sanitation, with 66% of the total rural population lacking toilet facilities.⁹ Constricted access to safe drinking water and poor sanitation can contribute to diarrhoea and dysentery, waterborne diseases, gastroenteropathy, and under-nutrition. In developed countries, these problems are prevalent among preschool children.^{10,11} While most waterborne infections may be treated with antibiotics, dual burden has been created on public health practitioners, the pharmaceutical industry and policy makers by the continued burden of waterborne infectious diseases and increasing antibiotic resistance. Interventions to reduce the proportion of people with inadequate access to safe drinking water will bring substantial economic benefits that can contribute to achieving sustainable growth.^{11,12} While government agencies offer infrastructural support to improve sanitation in developing countries, there is a need to provide collateral for personal hygiene and health education in order to achieve better results.^{2,3,13} By improving sanitation, hygiene and water use practices, many communicable diseases can be effectively controlled.¹⁴⁻¹⁸ A huge proportion of the urban poor population live in slums that do not have limited access to basic amenities and are still in constant danger of abrupt eviction. Nonetheless, the strengthening of the system and policies alone is adequate to fill the existing void in drinking water and sanitation knowledge and practices. All measures considered to effectively minimize the impacts of inadequate water and sanitation practices include an appreciation of the current situation and the effect of existing arrangements in earthy settings at present. Therefore, the objective of this study was to understand the data, disposal, and practices found among the provincial population of Gwalior, India with drinking water and sanitation facilities.

METHODS

A cross-sectional, community-based study was carried out from September 2019 to December 2019 in the Muriya Pahar and Awadpura, Urban Slum, Gwalior (M.P.), India. 120 households were enrolled randomly by simple random sampling and one member from each household was selected as participant and interviewed. The participants aged 18 years or above lived in urban slum. A pretested semi structured questionnaire was used which included data about socio demographic profile, water facility and its related issues, water treatment and storage practices, sanitation and wellbeing related issues. Participants were explained about the study objectives and those who were eligible and giving a written informed consent were included in this study. Participants who were less than 18 years or physically and mentally challenged were excluded. The ethical clearance was approved from the Institutional Ethical Committee, GRMC, Gwalior, Madhya Pradesh. Confidentiality of identity of all the participants in all forms was maintained.

Socio demographic information including age, gender, educational status, marital status, annual family income, type of family, number of family members, and occupation status. Water facility information included sources of drinking water, people that were responsible for arranging water in family, periods of water shortage, distance of water source from house, water supply timings and water storage practices.

Water treatment and storage practices: Information included participants' attitude towards water treatment practices. Water safety, impacts of unsafe drinking water on health, and the practices that were acquired to make water safe to drink related points were included.

Sanitation and related health problems: Information included toilet facilities, hand washing, waste disposal facilities and amount of water being utilized in the house for different purposes (drinking, cooking, and ablutions, washing garments, housekeeping, and miscellaneous).

Statistical analysis

Descriptive analysis was performed using univariate statistics to report means and standard deviations (SDs) for the continuous variables and frequency distribution of the categorical variables. All analysis was performed using SPSS version 20.

RESULTS

The average age of participants was 38 years (SD=10.9), Majority of them were females (77.5%), 70% of them were married and 69.2% of them were living in joint families with average family size of 4 (SD=2). 26% of the participants had middle (6-8th grade) and 46% had primary (1-5th grade) levels of education. 49 % participants were unemployed while 47% were unskilled workers with average annual household income of Indian National Rupee (INR) 252 (SD=0.54) (Table 1).

The major sources of water procurement were public tap/stand pipe (56%) and piped water into dwelling (20%). 15% of the participants were dependent on private water supply and 85% participants were dependent on government/public supply. 85% of the participants fetched water within premises and majority of them (90%) required <5 min for fetching water from the water outlet. Majority of the participants (71%) fetching water were women in the age group of 15-60 years. Majority of the participants (90%) reported meeting the daily need of water quantity. 11% of the participants reported shortage more twice in a year and 49% of the participants reported more than 3 times in a year. 65% of the participants indicated April-June as water shortage months while 18% suggested July-September. Over half of the participants (60%) reported morning and evening supply of water with uncleanness (32%) as one of the predominant problems (Table 2).

Majority of the participants (72%) perceived that the quality of water being used was safe, 88% of the participants agreed that quality of water can affect health status, 58% of them stored drinking water in wide mouthed closed container and most of them cleaned water container daily (66%). Forty two percent (42%) of the participants were following bleach/chlorine methods of water treatment while 35% of the participants felt that treated water did not taste good and 25% believed that water was already clean/safe. Over one third of the participants (38%) agreed that unsafe drinking water can cause diarrhoea, whereas 11%, 20%, and 20% of the participants reported common cold, fever, and vomiting respectively as potential consequences of drinking unsafe

water. Water supply timing was the biggest challenge faced by the majority (68%) of the participants (Table 3). 8% percent of the participants did not have access to toilets inside the households. 63% of the participants had access to septic tank type of toilets.

The majority of the participants agreed that hands should be washed before meals, while only around half (49%) felt that hands should be washed after defecation. Results showed that 20% of the participants used plain water and 40% used water with ash to clean their hands while majority of the participants washed their hands to prevent infection (38%) or for hygiene maintenance (41%).

Table 1: Sociodemographic profile.

Variables	Frequency	Percentage
Age (years); Mean=40.60; SD=10.99		
Gender		
Male	27	22.5
Female	93	77.5
Type of family		
Joint	83	69.2
Nuclear	37	30.8
Total number of persons in a family; Mean=2.1; SD=0.83415		
1-2	36	30
3-4	36	30
≥5	48	40
Annual household income (INR)* Mean=2.1; SD=0.54077		
≤5000	12	10
5001-10000	84	70
100001-20000	24	20
Marital status		
Married	84	70
Single	24	20
Widow/widower	12	10
Highest education level of participant		
No formal education	18	15
Primary (1-5th grade)	46	38.33
Middle (6-8th grade)	32	26.66
High school (9-10th grade)	15	12.5
Intermediate (11-12th) or equivalent	9	7.5
Graduate or postgraduate	0	0
Occupation		
Unemployed	49	40.83
Skilled worker	24	20
Unskilled worker	47	39.16

Table 2: Existing water facilities and associated issues reported by participants.

Variables	Frequency	(%)
Source of drinking water		
Piped water into dwelling	24	20
Piped water to yard/plot	8	6.66
Public tap/stand pipe	68	56.66
Tube well/borehole	11	9.166
Tanker-truck (municipal/private)	9	7.5

Continued.

Variables	Frequency	(%)
Water supplier in your community		
Government/public	102	85
Private	18	15
None	0	0
Time consumed in bringing water from source		
5 min	109	90.83
<30 min	10	8.33
>30 min	1	0.83
Distance of source		
Within premises	106	88.33
Outside households	14	11.66
Individual fetches the water from the source for your household majority of times		
Girls <15 years	9	7.5
Women 15-60 years	86	71.66
Men 15-60 years	25	20.83
Men >60 years	0	0
Women >60 years	2	1.66
Do you feel the quantity of water you collect fulfils yours daily requirement?		
Yes	109	90.83
No	8	6.66
Not sure	3	2.5
How many times in a year do you face drinking water scarcity?		
Once	10	8.33
Twice	14	11.66
Thrice	21	17.5
No shortage	16	13.33
More than 3 times	59	49.166
Which periods of year do you face maximum water shortage?		
January-March	12	10
April-June	78	65
July-September	22	18.33
None	2	1.66
Always	6	5
What are the timings of water supply?		
Morning	21	17.5
Evening	9	7.5
Morning and evening	73	60.83
Round the clock	10	8.33
Irregular	7	5.83
What are the problems you usually face in the water supply?		
Irregular	16	13.33
Unclean	39	32.5
Too far	2	1.66
Dirty water	24	20
Saline	8	6.66
None	31	25.83

Table 3: Perceptions and practices-related to drinking water storage and safety among the study participants.

Variable	Frequency	Percentage
Where do you store drinking water?		
Narrow mouth open container	12	10
Narrow mouth closed container	38	31.66
Wide mouth closed container	70	58.33

Continued.

Variable	Frequency	Percentage
How often do you clean storage container?		
Before fetching water	4	3.33
When it is dirty	6	5
Every day	80	66.66
Every week	22	18.33
Every month	8	6.66
Do you think the water you use is safe for the household to drink?		
Yes	86	71.66
No	19	15.83
Do not know	15	12.5
Do you think quality of water can affects health?		
Yes	106	88.33
No	2	1.66
Do not know	12	10
What are the effects of using unsafe drinking water on human health?		
General fever	24	20
Common cold	14	11.66
Diarrhoea	46	38.33
Vomiting	24	20
Cholera	0	0
Malaria/dengue	12	10
Do not know	0	0
Other diseases	0	0
Do you know any person who has suffered due to use of unsafe drinking water?		
Family member	24	20
Friends 7	32	26.66
Do not know	11	9.166
None	33	27.5
What do you usually do to the water to make it safer to drink? Anything else?		
Nothing	14	11.66
Boil	16	13.33
Add bleach/chlorine	42	35
Strain it through a cloth	27	22.5
Use a water filter (ceramic, sand, composite, etc.)	21	17.5
What are the reasons for not treating water?		
Water is already clean/safe	30	25
Do not know how to do it	10	8.33
Expensive	19	15.83
Treated water does not taste good	43	35.83
What are the biggest challenges you face in procuring drinking water?		
Timings	82	68.33
Distant source	18	0.15

Table 4: Existing sanitation facilities and related practices followed by the participants.

Variables	Frequency	Percentage
Kind of toilet/latrine facility used		
Household	46	38.33
Community	48	40.00
Open field defecation	5	4.16
Shared	1	0.83
What kind of toilet facility/facility for defecation used in your household?		
Flush/pour flush to piped sewer system	18	15
Septic tank	76	63.33
Elsewhere	4	3.33
No facilities bush or field	2	1.66
What, in your opinion, are the critical times of hand washing?		
Before food	61	50.83
After food	18	15
After defecation	59	49.2
After weaning child	10	8.3
After house cleaning	19	15.8

Continued.

Variables	Frequency	Percentage
Material used for hand washing?		
Water and soap	60	60.00
Water only	20	20.00
Water and ash	40	40.00
Reasons for washing hands?		
Health: Prevent infection	46	38.33
Hygiene	50	41.66
Appears good	4	3.33
Because everyone does	20	16.66
Where is the waste water discharged?		
Open drainage	60	50.00
Closed drainage	48	40.00
Community drainage	7	5.8
On the roads	2	1.66
No fixed pattern	3	2.5
To the field	0	00

50% of the participants reported that they discharge their waste in open drainage (Table 4).

DISCUSSION

Water is one of the valuable normal assets and is a basic component of our life. Clean water and ideal sanitation facilities can forestall the event of different infectious illnesses and help in checking the related bleakness and mortality. The current study was conducted in urban slum in Gwalior city of India to comprehend the current water and sanitation facilities, recognitions and practices. Larger part of the members utilized open tap/stand pipe for water acquisition and the greater part of them had water supply inside their family unit premises. Females aged 15 to 60 years were the essential capable individuals for bringing water, which is consistent with other study.¹⁸ About half of the participants reported water shortage more than thrice in a year. A previous study on water quality of groundwater resources showed that the water quality index of bore well, dug well and hand pump declined in post monsoon season which may account for water shortage. In addition, contamination in provided water was one of the prevalent issues, reported by one-fourth of the members while the dominant part of the members felt that the nature of water being utilized was safe.¹⁹ Majority of the members knew of the impacts on wellbeing because of the nature of water and half of them concurred that the utilization of perilous drinking water may prompt at least one irresistible illness. Regardless of the information, 45% of the members were not following any technique for water treatment and among them and half of the members felt that water was perfect, henceforth, no further treatment was vital.

One-fourth of the all the members were without latrines inside their family premises; leaving them with the choices of utilizing community latrines, open defecation or imparting the latrines to different family units which thus advances the expansion in occurrence of water-borne ailment. In spite of the fact that, most of the members knew and revealed hand washing at dining, just half the members felt that hands ought to be washed after

defecation. It was likewise seen that a couple of members utilized plain water for hand washing after defecation. This is again consistent with another study.²⁰ This sort of training may offer ascent to maladies of the feco-oral course, increment in the money related burden regarding emergency clinic confirmations and related clinical costs. School participation of kids would be influenced as their job changes from reading to think about an older wiped-out individual in the family; not-withstanding kids becoming sick due to comparable hand washing practices. On surveying the need of water, sanitation, and cleanliness, a large portion of the members wanted filtered water. A large portion of the members worried on the need of sanitary instructions.

Limitations

By and by, there are a few restrictions related with our study. Firstly, it included little sample size and the study design was cross-sectional while better results could be reproduced with larger population size. Further the study was restricted to one topographical area so the conclusive evidence of the same beliefs and practices being done in all the urban slums cannot be summed up.

CONCLUSION

Altogether our study indicates the upgraded awareness with evolving environment and society systems through and through. There is also related and upregulated zeal of maintaining hygiene, being it for water or for the environment, even in the urban slums. Although such indicators favour the upcoming improvement in the sanitation and disease-free habits, there is still a grey area which shades and limits our growth in the matter of hygiene and practices. Our study recognizes the requirement for intercession program to teach the populace with respect to sanitation, water treatment strategies, and hand washing rehearses. There is additionally a need for creating practical water testing gadgets to record occasional varieties in water quality in provincial territories. Besides, as a practical tool to

employ correct practices, repeated trainings should be programmed in such slums and hygiene practices be promoted using media, of which, the urban slum population has the access. Certain parameters like handwashing after defaecation, accessibility to potable drinking water with quality check, and safe water being availed to such populace is an essential need of the urban slum, and efforts and measures need to be implemented in the same direction. After all, it's the health of the population that makes the backbone of our nation.

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REFERENCES

1. Water Aid, Unilever Domestos, Water Supply and Sanitation Collaborative Council. We Can't Wait: A Report on Sanitation and Hygiene for Women and Girls. Available at <http://www.tinyurl.com/n2o4txo>. Accessed on 12 November 2020.
2. Water Aid, Unilever Domestos, Water Supply and Sanitation Collaborative Council; 2013. Available at <http://www.tinyurl.com/n2o4txo>. Accessed on 12 November 2020.
3. Jenkins MW, Freeman MC, Routray P. Measuring the safety of excreta disposal behavior in India with the new safe san index: reliability, validity and utility. *Int J Environ Res Public Health.* 2014;11:8319-46.
4. Hulton G. World Health Organization. Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage. Geneva: World Health Organization; 2012. Available at <http://www.tinyurl.com/l4asj6z>. Accessed on 12 November 2020.
5. UN Water. Sanitation Drive to 2015 Planners' Guide. Geneva: UN Water; 2012. Available at <http://www.tinyurl.com/msbtf8p>. Accessed on 12 November 2020.
6. Bethony J, Brooker S, Albonico M, Geiger SM, Loukas A, Diemert D, et al. Soil-transmitted helminth infections: Ascariasis, trichuriasis, and hookworm. *Lancet.* 2006;367:1521-32.
7. United Nations. The Millennium Development Goals Report 2013. New York: United Nations; 2013. Available at <http://www.tinyurl.com/njfqepm>. Accessed on 12 November 2020.
8. World Health Organization, UNICEF. Progress on Sanitation and Drinking-Water-2013. Update: Joint Monitoring Programme for Water Supply and Sanitation. World Health Organization, UNICEF; 2013. Available at <http://www.tinyurl.com/ozot7aq>. Accessed on 12 November 2020.
9. World Health Organization. World health statistics 2013: A wealth of information on global public health. Geneva: World Health Organization; 2013. Available at <http://www.who.int/gho>. Accessed on 12 November 2020.
10. Humphrey JH. Child undernutrition, tropical enteropathy, toilets, and handwashing. *Lancet.* 2009;374:1032-5.
11. Ustun A, Bos R, Gore F, Bartram J. Safer water, better health: Costs, benefits and sustainability of interventions to protect and promote health. Geneva: World Health Organization; 2008. Available at <http://www.tinyurl.com/npqy5n3>. Accessed on 12 November 2020.
12. Bartram J, Cairncross S. Hygiene, sanitation, and water: Forgotten foundations of health. *PLoS Med.* 2010;7:e1000367.
13. Mara D, Lane J, Scott B, Trouba D. Sanitation and health. *PLoS Med.* 2010;7:e1000363.
14. World Health Organization. Water Quality and Health Strategy 2013-2020. Geneva: World Health Organization; 2013. Available at <http://www.tinyurl.com/q486xp5>. Accessed on 12 November 2020.
15. World Health Organization. Cause-specific mortality: Regional estimates for 2008. Geneva: World Health Organization; 2011. Available from <http://www.tinyurl.com/7p2swfk>. Accessed on 12 November 2020.
16. Department of Health Research. Surveillance: National and international Initiatives. Kolkata: National Institute of Cholera and Enteric Diseases (NICED); 2014. Available at <http://www.dhr.gov.in/annualreport/201314/PDF/English%20pdf%20files/23.pdf>. Accessed on 12 November 2020.
17. Banerjee T, Shukla BN, Filgona J, Anupurba S, Sen MR. Trends of typhoid fever seropositivity over ten years in North India. *Indian J Med Res.* 2014;140:310-3.
18. Minh VH, Viet NH. Economic aspects of sanitation in developing countries. *Environ Health Insights.* 2011;5:63-70.
19. Nerkar SS, Tamhankar AJ, Johansson E, Lundborg CS. Improvement in health and empowerment of families as a result of watershed management in a tribal area in India. a qualitative study. *BMC Int Health Hum Rights.* 2013;13:42.
20. Rajankar PN, Gulhane SR, Tambekar DH, Ramteke DS, Wate SR. Water Quality Assessment of Groundwater Resources in Nagpur Region (India) Based on WQI. *J Chem.* 2009;6:905-8.
21. Ray SK, Zaman FA, Laskar NB. Hand washing practices in two communities of two states of Eastern India: An intervention study. *Indian J Public Health.* 2010;54:126-30.

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