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Original Research Article

A Cross-Sectional Evaluation of the Level of Understanding and Adherence to Drinking Water and Sanitation Practices among the Inhabitants

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Abstract

Aim: Evaluate the level of understanding and adherence to drinking water and sanitation practices among the inhabitants of Bihar state.

Material and Methods: This retrospective study was conducted in the Department of Community Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar., India from February 2018 to January 2019. Sample size was calculated; total 7508 households were situated in rural and urban areas. As per CAWST (Center for Affordable Water and Sanitation Technology) training manual for large projects (>100 households) 5% of total sample should be taken. It came out to be 375 which were rounded of to 400. Simple random sampling was done to select the number of households. Participants who were above 18 year, available and willing to participate were included in the study. Simple random sampling was done to select number of households. Socio-economic status was estimated according to their Standard of living (SLI) as per NFHS-2.

Results: Among 400 households, 326 (81.5%) of participants had pucca house. 393 (98.2%) of households had family members <10. The distance of water source from the shelter was less than 100 ft. in all the 400 households. The water was available in all the seasons in all the 400 households. In 398 (99.5%) of household's latrine was present. All the participants acknowledge that polluted water causes diseases. 278 (69.5%) of participants knew about hardness of water and among them, 61 (50%) of the participants did not know about type of drinking water should be consumed. 398 (99.5%) participants had knowledge that hands should be washed before eating and 397 (99.25%) acknowledged that hand should be washed after eating as well. 320 (80%) of participants knew that hand should be washed with soap and water. 247 (61.8%) of participants knew about Swachh Bharat Abhiyan (SBA).

Conclusion: Most of the participants had right knowledge and practice about drinking water and sanitation. Most of the participants had knowledge about hygiene and sanitation but some of them are doing it in actual practice. Awareness should be created about hardness of water so that people can consume moderately hard water. People should be educated about proper disposal of waste water and garbage so that to make it sanitary and useful.

Keywords: Attitude, drinking water, household members, hygiene, knowledge, practices,

Introduction

The effects of poor sanitation seep into every aspect of life health, nutrition, development, economy, dignity and empowerment. With a little less than a year left to achieve the millennium development goals, 2.5 billion people are still devoid of improved sanitation facility. 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 the present 63% is likely to be missed. Globally, water and sanitation hygiene practice are responsible for 90% of diarrhoea-related mortality, which is much higher than combined mortality from malaria and HIV/AIDS. [1-3] Although piped water facility in the rural regions almost doubled in past two decades, there are still 171 million people in rural regions who use surface water as the primary source of water. Despite limited

improvement in drinking water facilities in rural regions, the trend of the sanitation is still on a slow track, with 66% of the total rural population not having toilet facilities. Limited access to safe drinking water and poor sanitation can lead to under nutrition, water borne diseases, gastro-enteropathy along with diarrhea and dysentery. These problems are predominant among preschool children in the developing countries. [4,5] Although majority of water borne infections could be treated using antibiotics, the persisting burden of water borne infectious disease and increasing antibiotic resistance has created dual pressure on public health professionals, pharmaceutical industry and policy makers. Interventions for reducing the proportion of people with limited access to clean drinking water can lead to significant economic benefits, which can help in achieving sustainable development. Although government agencies are providing the infrastructural support to improve sanitation condition in the developing countries, nevertheless there is a need for collateral personal hygiene and sanitary education to achieve improved outcomes. [6,7] Many communicable diseases can be effectively managed by improving the sanitation, hygiene and water usage practices. However, infrastructure development and policies alone are adequate to fill the existing gap of knowledge and practice of drinking water and sanitation.

Material and Methods

This cross-sectional study was conducted in the Department of Community Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India from February 2018 to January 2019. Sample size was calculated; total 7508 households were situated in rural and urban areas. As per CAWST (Center for Affordable Water and Sanitation Technology) training manual for large projects (>100 households) 5% of total sample should be taken.[6] It came out to be 375 which were rounded of to 400. Simple random sampling was done to select the number of households. Participants who were above 18 year, available and willing to participate were included in the study. Simple random sampling was done to select number of households. Socio-economic status was estimated according to their Standard of living (SLI) as per NFHS-2.[7] The information was collected by holding the interview of households using the structured and pretested questionnaire. Informed consent was taken from the people who were willing to participate in the study and they were informed about the purpose of study and were also ensured about the confidentiality of their interview.

Statistical Analysis

Statistical analysis was done using SPSS 25 and valid conclusions were drawn.

Results

Table 1 shows sociodemographic characteristics of 400 households. It showed that 112 (28%) of participants belonged to age group 31-40 years followed by 97 (24.3%) belonged to 31- 40 years. Maximum number of participants i.e. 376 (94%) were females. Equal number of households was taken from rural and urban areas i.e. 200 from each. 91.5% of participants belonged to Sikh religion. In education wise distribution, 121 (30.3%) had studied up to high school, 82 (20.5%) had studied up to middle school. Majority of participants i.e. 233 (58.3%) belonged to general category. 255 (63.7%) of participants belonged to high socioeconomic status as per SLI (Standard of Living Index) Table 2 shows background characteristics of households. Among 400 households, 326 (81.5%) of participants had pucca house. 393 (98.2%) of households had family members <10. The distance of water source from the shelter was less than 100 ft. in all the 400 households. The water was available in all the seasons in all the 400 households. In 398 (99.5%) of household's latrine was present. Table 3 shows knowledge among households regarding drinking water and sanitation. Among 400 households, 399(99.75%) acknowledged that closed vessel should be used for storing drinking water. 305 (76.2%) of participants knew about the water pollution and among them source of information about water pollution was newspaper and television in most of the participants. All the participants acknowledge that polluted water causes diseases. 278 (69.5%) of participants knew about hardness of water and among them, 61 (50%) of the participants did not know about type of drinking water should be consumed. 398 (99.5%) participants had knowledge that hands should be washed before eating and 397 (99.25%) acknowledged that hand should be washed after eating as well. 320 (80%) of participants knew that hand should be washed with soap and water. 247 (61.8%) of participants knew about Swachh Bharat Abhiyan (SBA). Table 4 shows practice among households regarding drinking water and sanitation. Among 400 households, 252 (63%) participants use narrow vessels to store drinking water. Majority 214 (53.5%) of participants cleaned vessels before storing water in it. Most of the participants i.e. 380 (95%) covered the vessels which is used for storing drinking water. 380 (95%) of households dispose waste water in open. Maximum number of households, 376 (94%) were disposing solid waste by other methods. Among 376 households, majority 214 (56.9%) were disposing in open. 263 (65.8%), 193 (48.3%), 394 (98.5%), 273 (68.2%) of participants were washing hands before eating, after eating, after defecating and after waste disposal respectively. 333 (83.2%) of participants were using water and soap for washing hands. Most of the participants, 393 (98.2%) were using sanitary latrine for defecation. Table 5 shows relationship of

educational status with practice regarding hand washing before eating and after eating. Among illiterate majority 39 (53.4%) and 56 (76.7%) were not washing hands before eating and after eating respectively. Among graduates and postgraduates all were washing hands before eating. Households having higher educational status had higher knowledge regarding practice of washing hands before and after eating. Educational status wise difference in practice of hand washing before and after eating was highly significant statistically.

Table 1: Sociodemographic characteristics

Socio-demographic Characteristics		No.(n=400)	%
Age	<20	6	1.5
	21-30	69	17.2
	31-40	112	28
	41-50	97	24.3
	51-60	76	19
	61-70	40	10
Sex	Male	24	6
	Female	376	94
Area	Urban	200	50
	Rural	200	50
Religion	Sikh	366	91.5
	Hindu	33	8.2
	Christian	0	0
	Muslim	1	0.3
	Others	0	0
Education	Illiterate	73	18.3
	Can read only	11	2.8
	Can read & write	47	11.8
	Primary	34	8.5
	Middle	82	20.5
	High school	121	30.3
	Graduate	28	7
	Post graduate	4	1.0
Caste	ST	0	0
	SC	101	25.3
	OBC	66	16.4
	General	233	58.3
	Others	0	0
Socioeconomic status (SLI) Standard of Living Index	Low	29	7.2
	Medium	116	29
	High	255	63.7

Table 2: Background characteristics of households

Background characteristics		No.(n=400)	%
Type of House	Kutcha	22	5.5
	Pucca	326	81.5
	Semi Pucca	52	13
Households' member	<10	393	98.2
	>10	7	1.8
Distance from shelter	<100 ft.	400	100
	>100 ft.	0	0
Availability of drinking water	Yes	400	100
	No	0	0
Presence of latrine	Yes	398	99.5
	No	2	0.5

Table 3: Knowledge among residents regarding drinking water and sanitation

Type of vessels used for storage water	No.(n=400)	%
Covered	399	99.75
Uncovered	0	0.00
Don't Know	1	0.25
Ever heard of water pollution	No.(n=400)	%
Yes	305	76.2
No	95	23.8
Source of information about water pollution	No.(n=305)	%
People	77	25.2
Newspaper	90	29.5
Television	89	29.2
Radio	13	4.3
Others	36	11.8
Polluted water causes disease	No.(n=400)	%
Yes	400	100
No	0	0.0
Heard of hardness of water	No.(n=400)	%
Yes	122	30.5
No	278	69.5
Type of drinking water consumed	No.(n=122)	%
Soft Water	41	33.6
Moderately Hard Water	20	16.4
Don't know	61	50
Hand washing before eating	No. (n=400)	%
Yes	398	99.5
No	2	0.5
Don't Know	0	0.0
Hand washing after eating	No.(n=400)	%
Yes	397	99.25
No	3	0.75
Don't Know	0	0.0
Cleaning of hands	No.(n=400)	%
By washing with sand	4	1
By washing with water	76	19
By washing with soap and water	320	80
Heard about Swachh Bharat Abhiyan	No.(n=400)	%
Yes	247	61.8%

Table 4: Practice among households regarding drinking water and sanitation

Mouth of vessels used	No.(n=400)	%
Wide open	110	27.5
Narrow open	252	63.0
Both of above	38	9.5
Any other	0	0.0
Cleaning of vessels	No.(n=400)	%
Yes	214	53.5
No	12	3.0
Sometimes	174	43.5
Covering of drinking water	No.(n=400)	%
Covered	395	98.8
Uncovered	05	1.2
Waste water disposal	No.(n=400)	%
Open	380	95.0
Closed	20	5.0
Solid waste disposal	No.(n=400)	%
Dugged pits	7	1.8
Burn the waste	17	4.2

Other methods	376	94.0
Other methods of solid waste disposal	No.(n=376)	%
Open dumping	214	56.9
Community dustbins	86	22.9
Vehicle of municipal corporation	76	20.2
Washing Hands(Yes)	No.	%
Before eating(n=400)	263	65.8
After eating(n=400)	193	48.3
After defecating(n=400)	394	98.5
After disposal of waste(n=400)	273	68.2
Material used for hand washing	No. (n=400)	%
Water only	67	16.8
Water and soap	333	83.2
Others	0	0.0
Defecation practice	No. (n=400)	%
Open field	7	1.8
Near water source	0	0.0
Sanitary toilet	393	98.2

Table 5: Distribution of households regarding practice of hand washing before eating in relation to educational status

Educational status	Practice of hand washing before eating(n=400)		Practice of hand washing after eating(n=400)	
	Yes	No	Yes	No
Illiterate	34 (46.6%) [12.9%]	39 (53.4%) [28.5%]	17 (23.3%) [8.8%]	56 (76.7%) [27.1%]
Can read only	10 (90.9%) [3.8%]	1 (9.1%) [0.7%]	7 (63.6%) [3.6%]	4 (36.4%) [1.9%]
Can read and write	28 (59.6%) [10.6%]	19 (40.4%) [13.9%]	10 (21.3%) [5.2%]	37 (78.7%) [17.9%]
Primary	14 (41.2%) [5.3%]	20 (58.8%) [14.6%]	6 (17.6%) [3.1%]	28 (82.4%) [13.5%]
Middle	58 (70.7%) [22.1%]	24 (29.3%) [17.5%]	57 (69.5%) [29.5%]	25 (30.5%) [12.1%]
High	87 (71.9%) [33.1%]	34 (28.1%) [24.8%]	72 (59.5%) [37.5%]	49 (40.5%) [23.7%]
Graduate	28 (100%) [10.6%]	0 (0.0%) [0.0%]	20 (71.4%) [10.4%]	8 (28.6%) [3.9%]
Postgraduate	4 (100%) [1.5%]	0 (0.0%) [0.0%]	4 (100%) [2.1%]	0 (0.0%) [0.0%]
Total	263 (65.8%) [100%]	137 (34.2%) [100%]	193 (48.3%) [100%]	207 (51.7%) [100%]
Chi square	$X^2 = 45.104$ df = 7 p = 0.000		$X^2 = 77.007$ df = 7 p = 0.000	

Discussion

Similar study conducted among 480 households in a rural block of Haryana by Bharti et al. showed the similar results i.e. most of participants were adult females (96.4%). [8] As per NFHS-4, a large majority of households in Punjab have household heads who were Sikhs (60%). [7] According to NFHS-4, more than two-fifths (43%) of Punjab's household heads do not belong to scheduled castes, scheduled tribes, or other backward classes, 38% belongs to schedule caste. This difference in caste wise distribution of households may be due to regional variation. More than two third of population of Punjab lives in pucca house as per NFHS 4. [9] Similarly a study conducted in Udupi district by Reshma et al. showed that 297 (99%) households also had members less than 10 and Approx 95% of houses were having distance of water source from shelter less than 100 ft. and availability of water in all seasons respectively. [10] In our study 76% of households knew about water pollution and majority of them came to know from newspaper and television. Similar study conducted in Vhembe district, South Africa by Sibiya JE et al. showed that most of the respondents had knowledge about waterborne diseases which they got it from school, television and radio. [11] A similar study was conducted by Shah RB showed that majority of people (76.92%) had knowledge of usage of soap and water for hand washing before meal. [12] Our study showed practice of method of waste water disposal, 380 (95%) dispose water in open, 20 (0.5%) dispose water by kitchen garden. This is because in infield practice area open drains were present and participants had no knowledge regarding reuse of waste water. Similar study conducted in Ghaziabad district by Swain P showed that 64.15% had open drainage. [13] Similar study conducted in Saptari district and Tamil Nadu showed that 98.3% respondents wash their hands after defecation, 53.4% were washing hands before eating. [14, 15] Our study had shown distribution of households regarding practice of hand washing before eating and after eating respectively in relation to their educational status. In our study the results showed that households who could read only had higher practice of hand washing before eating and after eating than who could read and write. This might be

due to the small sample size or they might be having higher knowledge. Results were found statistically significant. According to Global Hand washing partnership (international stakeholder) mentioned that hand washing with soap and educational achievement are closely linked. [16]

Conclusion

Most of the participants had right knowledge and practice about drinking water and sanitation. Most of the participants had knowledge about hygiene and sanitation but some of them are doing it in actual practice. Awareness should be created about hardness of water so that people can consume moderately hard water. People should be educated about proper disposal of waste water and garbage so that to make it sanitary and useful.

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