Research Article

Prevalence of water borne diseases and wash practices in rural and urban population of Chennai

Shruthi Dhanasekar[1], Bhavani Yamasani[2], Seetharaman Palpandian[1], Srilekha Ethirajulu[1], Sowmya Bhaskaran[1], Suchithra Ramachandran[1]

[1]Department of Community Medicine, ACS Medical College, Chennai, Tamil Nadu, India, [2]Department of Community Medicine, Sri Padmavathi Medical College, Tirupati, Andhra Pradesh, India

Correspondence to: Bhavani Yamasani, E-mail: svims.faculty@gmail.com

Received: May 27, 2016; **Accepted:** November 04, 2017

ABSTRACT

Background: Poor water and sanitation facilities unequally affect women and girls. More than 30% of marginalized women are violently assaulted every year as the lack of basic sanitation forces them to travel long distances to meet their needs. **Objective:** To study the prevalence of waterborne diseases in the rural and urban population. **Materials and Methods:** Our study was conducted in both rural and urban population of Chennai district and areas covering the ACS Medical College. **Results:** Out of 205 respondents, 42% of population belongs to the upper middle class and 22% belongs to a lower middle class. 90% of the population were nuclear family and 10% were joint family. In our study, 55% of the population were between 46 and 59 years (urban) and 52% were between 21 and 30 years (rural) of age. Informants were mostly adult females (86.4%). Waterborne diseases in household were found to be 12.2% out of which 36% was in urban and 64% in rural population. **Conclusion:** Our study initiates the awareness programs related to water treatment, water quality and importance of flush toilets should be carried out in the rural areas to improve the status of public health and minimizes the prevalence of waterborne diseases.

KEY WORDS: Diseases; Population; Sanitation; Waterborne

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 (WHO, 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, and typhoid. According to the WHO (2014), every year more than 3.4 million people die as a result of water-related diseases, making it the leading cause of morbidity and mortality around the world. Most of the victims are young children, the vast majority of whom die of illnesses caused by organisms that thrive in water sources contaminated by raw sewage. Developing countries carry a heavy burden of waterborne diseases, the heaviest being diarrheal diseases when compared to developed countries. In India, 128 million people lack safe drinking water. According to the World Bank estimates, 21% of the communicable diseases in India are related to unsafe water.[1] Further, according to the Ministry of Drinking Water and Sanitation, nearly 24% of the habitations in India do not have full access to drinking water supply.[2] As a result, 1,600 children die every day before reaching the age of 5, many due to preventable communicable diseases. According to UNICEF, in India as of 2010, around 51% of population still

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2017.0530204102017	

defecates in open areas, while only 34% of the population uses improved sanitation facilities.[3] The current study was undertaken to study the prevalence of waterborne disease in relation with water treatment and sanitation in rural and urban population.

MATERIALS AND METHODS

The study was conducted in both rural and urban population of Chennai district and areas covering the ACS Medical College. All the adults willing to participate in the survey were included for the study with formatted consent prepared by our department. Based on the literature with an allowable error of prevalence minimum sample size was calculated to be 201 and it was decided to study a sample of 205 in our study. Majority of the participants were between 31 and 60 years age group considered for the study with both the sexes and from the rural and urban communities in and around the ACS Medical College, Chennai. Ethical clearance for this study was accorded by Institutional Ethical Committee, ACS Medical College, Chennai, Tamil Nadu.

RESULTS

The majority of participants in this study belonged to age group of 31–45 years. Of the participants, 106 were from rural communities, and the rest was from urban communities. Large proportion of them belonged to the nuclear family. Of the study subjects, 90.7% were Hindus, 7.8% were Christians, and 1.4% were Muslims. Majority of participants belonged to upper middle socioeconomic class according to modified BG Prasad's SES classification 2015 [Table 1]. Out of 205 respondents, 42% of population belongs to upper middle class and 22% belongs to lower middle class. 90% of the population were nuclear family and 10% were joint family. In our study, 55% of the population were between 46 and 59 years (urban) and 52% were between 21 and 30 years (rural) of age. Informants were mostly adult females (86.4%). With an incidence of 67.3% of population used water for hand wash and 32.6% used soap with water for hand wash in our study.

DISCUSSION

The global picture of water and health has a strong local dimension with some 1.1 billion people still lacking access to improved drinking water sources and some 2.4 billion to adequate sanitation.[4] India is facing a severe public health crisis with increasing waterborne diseases and a deteriorating quality of groundwater. In the developing countries, four-fifth of all the illnesses are caused by waterborne diseases with diarrhea leading to dehydration being the leading cause of childhood death.[3] The main waterborne diseases causing public health issue are diarrhea, dysentery, jaundice, and cholera. In which diarrhea, the third leading killer of children in India today, is responsible for 13% of all deaths in children <5 years of age and kills an estimated 300,000 children in India each year.[5] A large-scale community study performed in an Indian urban slum showed incidence as high as 2 per 1,000 population per year for children under five, and 5.1 per 1,000 population per year for children under 10 years old.[6] The overall prevalence of waterborne diseases in our study over the past 6 months was found to be 12.2% done at an urban and rural population with the sample size of 205. In our study, the major source of domestic supply and drinking water was tap water which was 47.8% and 43.9%, respectively [Tables 2 and 3]. According to National

Table 1: Sociodemographic profile (age and gender distribution of informants)

Parameter	Number subjects (%)		
	Urban	Rural	Total
Age group (years)			
<21	8 (53.3)	7 (46.7)	15 (7.3)
21–30	28 (47.5)	31 (52.5)	59 (28.7)
31–45	31 (50.8)	30 (49.2)	61 (29.7)
46–59	21 (55.3)	17 (44.7)	38 (18.5)
>59	11 (34.4)	21 (65.6)	32 (15.6)
Gender			
Male	11 (39.3)	17 (60.7)	28 (13.6)
Female	88 (49.7)	89 (50.3)	177 (86.4)
Socioeconomic status			
Upper class (>5774)	21 (50)	21 (50)	42 (20.4)
Upper middle (2887–5774)	43 (50)	43 (50)	86 (41.9)
Lower middle (1732–2886)	19 (40.4)	28 (59.6)	47 (22.9)
Upper lower (866–1731)	13 (52)	12 (48)	25 (12.1)
Lower (<866)	3 (60)	2 (40)	5 (2.4)
Type of family			
Nuclear	89 (48.1)	96 (51.9)	185 (90.5)
Joint	10 (50)	10 (50)	20 (9.7)
Religion			
Hindu	86 (46.2)	100 (53.8)	186 (90.7)
Muslim	0 (0)	3 (100)	3 (1.4)
Christian	13 (81.3)	3 (18.8)	16 (7.8)

Table 2: Prevalence of waterborne diseases

Waterborn disease	Prevalence (%)
Diarrhea	4.39
Typhoid	2.93
Jaundice	4.88
Total	12.2

Table 3: Water-related information

Parameter	% of total		
	Total	Urban	Rural
Source of domestic water supply to majority of households	Tap water 98 (47.8)	35 (39.4)	63 (59.4)
Source of drinking water supply to majority of households	Tap water 90 (43.9)	32 (32.3)	58 (54.7)
% of households with water supply inside house	98 (47.8)	43 (43.4)	55 (51.9)
% of households using any treatment method for drinking water	100 (48.7)	32 (32.3)	68 (64.2)
% of households with garbage dumps near source of water	176 (85.0)	75 (75.8)	101 (95.)

Table 4: Sanitation related information

Parameter	% of total		
	Total	Urban	Rural
% of households with own toilet facility	151 (73.6)	69 (69.7)	82 (77.4)
% of households with safe wastewater disposal	86 (41.9)	37 (37.4)	49 (46.2)
% of households with drainage facilities	139 (67.8)	64 (64.7)	75 (70.7)
% of households with proper refuse disposal	48 (23.4)	24 (24.2)	24 (22.7)

Table 5: Hygiene related information

Information	Percentage
After defecation/using the toilet	97.6
Before/after eating	92.2
Before food preparation	97.6
Before feeding the child	64.3
Material used for hand washing (soap with water)	32.7

health profile 2011, in India, 43.5 of households are using tap water, 11.0% well water and 33.5% hand pump water for the purpose of drinking.[7] In Haryana, the corresponding figures are 68.8%, 3.0%, and 12.0%. In our study 47.8% of household had a water supply inside house, and 48.7% of household drank treated water.[8] A study conducted in a rural block of Haryana, out of 408 household only 10% of household used treated water. In our study, 73.6% of household have own toilet facility, 67.8% with own drainage facility and 4.39% follow open defecation [Table 4]. Nepal population and housing census -2011 stated that 60% population in the Makwanpur district had access to latrines out of which 42.7% of the population had latrines with septic tank, 15.4% had ordinary latrine and only 1.2% with a proper flushing type of toilets.[9,10] In our study, 67.3% of population used water for hand wash, and 32.6% used soap with water for hand wash [Table 5]. A survey on water handling and sanitation practices in rural community of Madhya Pradesh shown only 8% households in Ichhawar and 22% in Astha washed hands with water and soap, 22% households in Ichhawar and by 54% households in Astha block washed with just water.[1,7] In our study, waterborne diseases in the household were found to be 12.2% out of which 36% was in urban and 64% in rural population [Table 6]. The prevalence of waterborne diseases can be controlled with proper awareness programs related to water treatment, water quality and importance of sanitation the rural areas to improve the status of public health which is in agreement with previous literatures.[8]

CONCLUSION

Our study is indicating that awareness will be in need in rural and urban population related to drinking water treatment, sanitation and hygiene mechanisms to condemn the prevalence the waterborne diseases for improving public health.

Table 6: Association of risk factors with waterborne diseases (statistical analysis)

Risk factor	Number of people diseased	Odds ratio	Chi-square test	*P* value
Type of family				
Joint	5	2.75 (0.90–8.37)	2.20	0.14
Nuclear	20			
Socioeconomic status				
Upper	16	1.07 (0.4–2.5)	0.0023	0.9
Lower	9			
Religion				
Others	3	1.40 (0.37–5.19)	0.02	0.89
Hindus	22			
Drinking water source				
Others	21	1.45 (0.47–4.47)	0.15	0.69
Can	4			
Garbage dumps nearby house				

(*Contd...*)

Table 6: (*Continued*)

Risk factor	Number of people diseased	Odds ratio	Chi-square test	*P* value
Yes	23	2.03 (0.45–9.1)	0.40	0.52
No	2			
Washing hands before eating				
No	2	1.03 (0.22–4.83)	0.13	0.71
Yes	23			
Drawing water from container				
Without handle	24	2.18 (0.27–17.27)	0.12	0.72
With handle	1			
Water supply inside toilet				
No	11	1.07 (0.46–2.49)	0.002	0.96
Yes	14			
Buying outside foods				
Yes	16	1.1 (0.46–2.63)	0.000	1
No	9			

ACKNOWLEDGMENTS

Authors acknowledge the valuable suggestions received from Prof. KK. Dutta Gupta, Prof Daisy Dharamraj, and Dr. Christina Mary Paul, Associate professor, ACS Medical College and Hospital, Chennai.

REFERENCES

1. Bhattacharya M, Joon V, Jaiswal V. Water handling and sanitation practices in rural community of Madhya Pradesh: A knowledge, attitude and practice study. Indian J Prev Soc Med 2011;42:93-7.
2. Bharti, Malik M, Kumar V. Knowledge, Attitude and practices regarding water handling and water quality assessment in a rural block of Haryana. Int J Basic Appl Med Sci 2013;3:243-7.
3. WHO. Drastic Consequences of Diarrhoeal diseases. WHO; 2014.
4. Fonyuy BE, Innocent L. Prevention practices from water borne diseases within households in the bamendankwe municipality-North West Cameroon. Glob J Med Res Dis 2014;14:25-35.
5. Million Death Study Collaborators, Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, *et al.* Causes of neonatal and child mortality in India: A nationally representative mortality survey. Lancet 2010;376:1853-60.
6. Sur D, von Seidlein L, Manna B, Dutta S, Deb AK, Sarkar BL, *et al.* The malaria and typhoid fever burden in the slums of Kolkata, India: Data from a prospective community-based study. Trans R Soc Trop Med Hyg 2006;100:725-33.
7. Leclerc H, Schwartzbrod L, Dei-Cas E. Microbial agents associated with waterborne diseases. Crit Rev Microbiol 2002;28:371-409.
8. Chawla S, Gupta M, Kaur A. Sanitation practices and safe drinking water technology in rural homes of Mewat (Haryana). Indian Res J Ext Educ 2006;6:1-3.
9. Sedhain P. Water, sanitation, socioeconomic status and prevalence of Waterborne Diseases: A cross-sectional study at Makwanpur district, Nepal. Master's Thesis Public Health 2014.
10. Fonyuy BE. Prevalence of water borne diseases within households in the bamendankwe municipality-North West Cameroon. J Biosafety Health Educ 2014;3:1-7.

How to cite this article: Dhanasekar S, Yamasani B, Palpandian S, Ethirajulu S, Bhaskaran S, Ramachandran S. Prevalence of water borne diseases and wash practices in rural and urban population of Chennai. Int J Med Sci Public Health 2017;6(12):1718-1721.

Source of Support: Nil, **Conflict of Interest:** None declared.