A Cross Sectional Study on Water, Sanitation and Hygiene Practices among Urban Slum Dwellers of Petlad taluka of Anand District

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Abstract:

Introduction: About 17.4% of urban population is residing in urban slums. Living condition is poor in slums. Many of the most serious diseases in cities are 'environmental' because they are transmitted through air, water, soil and food or through insect or animal vectors and slum dwellers are at most risks to get exposed to these agents as they do not have protection measures against these. The concentration of people in areas where the provision of water, sanitation, garbage collection and health care is inadequate creates the conditions where infectious and parasitic diseases thrive and spread. **Method:** A cross sectional study was done using pre-tested questionnaire in notified slums of Petlad Nagarpalika. Sample size calculated was 224 using formula $(1.96)^2*p*q/L^2$. Households were the sampling unit. Duration of study was 2 months i.e. January-February 2015. **Result:** In the present study, 251 households of 8 notified slums of Petlad town were taken. 96.4 % (n=242) respondents were permanent resident of slum. 28.7 % (n=72) had pucca & 61.8% (n=155) had semi-pucca house. 79.3 % (n=199) owned the house. Overcrowding based on number of persons per room was seen in 57.8 % (n=145) houses. 69.3 % (n=147) belonged to class 5 of Modified BG Prasad socio-economic classification of families. 99.6% (n=250) had tap as major source of drinking water, of which 84.9% (n=213) had water supply located within premises. 35.9% (n=90) went for open air defecation, while 12.7% (n=32) used Sulabh Sauchalaya. 51.4% (n=129) had latrines at home, out of which 45% (n=113) had water seal latrine, while 6.4% (n=16) had pit latrine. Among households having children, in 43.4% (n=62) families child went to open air defecation near house. 48.6% (n=122) disposed their household waste in open. 49.8% (n=125) knew about scheme for latrines implemented by government & 37.1% (n=93) knew about Swacch Bharat Abhiyan. **Conclusion:** Study shows that 35.9% study participants went for open air defecation, 54.6% having open drainage facility, 48.6% disposed of household waste in open.

Key words: Hygiene, Latrine, Open Air Defecation, Sanitation, Urban Slum, Water Facility

Introduction:

Access to improved drinking water, sanitation and hygiene is one of the prime concerns around the globe. According to 2011 census, 17.4% of total urban population resides in Slums.[1] Slums have problem of overcrowding, dilapidation, faulty arrangements and designs of buildings, narrowness of street, lack of ventilation, light, sanitation facilities or combination of these factors which are detrimental to safety, health and moral.

With urbanization, more and more people migrate to cities in search of job. Many of them do not have permanent job/work, moreover they have to change job/work and move to new place from time to time. Hence this people are forced to stay in outskirt / slum areas not having proper sanitation facilities. Also their houses are not good, lack basic sanitation facilities and water supply is not there. [2]

Living conditions in many urban slums are worse than those in the poorest rural areas of the country. This can be attributed to the slum's exceptionally unhealthy environment. Many of the most serious diseases in cities are 'environmental' because they are transmitted through air, water, soil

and food or through insect or animal vectors and slum dwellers are at the most risks to get exposed to these agents as they do not have protective measures against these. The concentration of people in areas where the provision of water, sanitation, garbage collection and health care is inadequate, creates the conditions where infectious and parasitic diseases thrive and spread. Around half the slum population is suffering from one or more of the diseases associated with inadequate provision of water and sanitation.[3,4]

Report of National Sample Survey 69th round states, 71% having tap as major source of drinking water, 31% slum having no latrine facility & no drainage system, 38% had no garbage disposal arrangement.[5] With these backgrounds in mind present study was conducted to assess Water, Sanitation & Hygiene (WASH) practices among urban slum dwellers.

Objectives:

- To assess water facility in urban slums.
- To assess sanitation facility in urban slums.
- To assess hygiene practices of people living in urban slums.

Method:

Study Setting- The present cross sectional study was conducted in 8 urban slums of Petlad taluka of Anand district.

Table 1: Socio-demographic profile of households of urban slum of Petlad (n=251)

Socio-demographic Character	Frequency (%)	Socio-demographic Character	Frequency (%)
Gender		**House type**	
Male	195 (77.7%)	Pucca	72 (28.7%)
Female	56 (22.3%)	Semi-pucca	155 (61.8%)
Religion		Kaccha	24 (9.6%)
Hindu	236 (94%)	**Main fuel used**	
Muslim	7 (2.8%)	LPG	126 (50.2%)
Christian	8 (3.2%)	Kerosene	31 (12.4%)
Highest Education in family		Biofuel	94 (37.5%)
Illiterate	11 (4.4%)	**Treatment of drinking water**	
Primary	52 (20.7%)	None	71 (28.3%)
Secondary	114 (45.4%)	Filter	161 (64.1%)
Higher Secondary	36 (14.3%)	Boiling	13 (5.2%)
Graduate	29 (11.6%)	Chlorination	6 (2.4%)
Post-graduate	9 (3.6%)	**Government Socio Economic Status**	
Type of family			
Joint	110 (43.8%)	APL*	35 (13.9%)
Nuclear	80 (31.9%)	BPL#	210 (83.7%)
3-generation	61 (24.3%)	None	6 (2.4%)
*APL - Above Poverty Line, # - Below Poverty Line			

Materials- Pre-tested questionnaire was used which was translated in Gujarati, so uniformity was maintained.

The study was started after taking permission from Human Research Ethics Committee and Petlad Nagarpalika. List of urban slums were obtained from Nagarpalika and 8 urban slums from all parts of Petlad town were selected with help of map of Petlad town. 2 slums from each direction, total 4 directions- north, south, east and west. Hence 8 slums were selected. In each urban slum depending on number of households randomly 10% of households were decided to be covered. For randomization alternate house were interviewed. Houses from first to last row of the slum were covered.

Sample size- Sample size was calculated using formula $(1.96)^2*p*q/L^2$, where p=% of population living in urban slums not having latrine at home i.e. 30%, [5] q=100-p i.e. 70 & L=20% of p i.e. 6%. Thus sample size obtained was 224. Data was collected from 251 households.

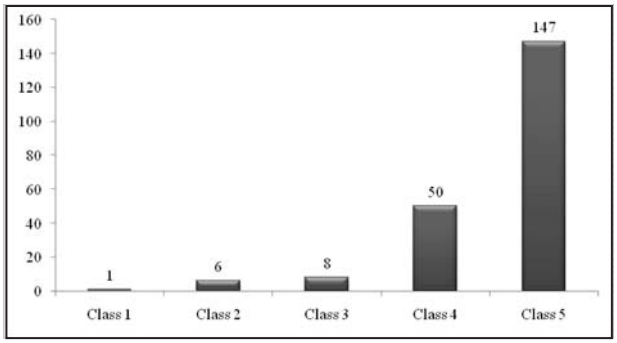
Statistical Analysis- Frequencies of data obtained, mean of age, Chi-square were calculated using Microsoft Office Excel 2007 and Statistical Program for Social Sciences 16.0 version.

Results:

In the present study, 251(n) households of 8 notified slums of Petlad town were taken. Head of the households were the respondents. Out of 251 respondents 77.7 % (n=195) were male and 22.3 % (n=56) were female. Average age of respondents was 54.45 (SD=12.887). 96.4 % (n=242) respondents were permanent resident of slums. 28.7 % (n=72) had pucca and 61.8% (n=155) had semi-pucca house. 79.3 % (n=199) owned the house as shown in **Table 1**. Overcrowding based on number of persons per room was seen in 57.8 % (n=145) houses.

39 persons didn't provide their monthly income. Out of remaining households, 69.3 % (n=147) belonged to class 5 of Prasad socio-economic classification of families as shown in Figure 1.

Figure 1: Distribution of households of urban slums of Petlad based on Socio economic status (B G Prasad Classification) [6] (n=212)



99.6% (n=250) had tap as major source of drinking water, of which 84.9% (n=213) had water supply located within premises. 84.1% (n=211) had water storage facility and 80.5% (n=202) told of adequate water supply throughout the year.

35.9% (n=90) went for open air defecation while 12.7% (n=32) used Sulabh Sauchalaya. 51.4% (n=129) had latrines at home of which 45% (n=113) had water seal latrine while 6.4% (n=16) had pit latrine as shown in **Table 2.** 108 households had no children. In remaining households, children in 45.5% (n=65) families went to open air defecation near house as shown in **Table 2.** Out of 251 households, 143 households had children of which 58 had toilets. Of those 58 households, 94.8% (n=55) household children utilized latrine for defecation.

56.2% (n=141) had bathing facility within premises while in 24.7% (n=62) it was outside premises. Open drainage facility was there in 54.6% (n=137). 48.6% (n=122) disposed their household waste in open. 93.4% (n=114) said this happened because of unavailability of common dustbin. Door to door waste collection facility was available in 20.3% (n=51) households. 11.6% (n=29) had domestic animal in house. 37.1% (n=93) participants informed of having mosquito breeding site within slum, while 15.9% (n=40) informed of mosquito breeding site within house. In 40.6% (n=102) households mosquito breeding site was found within 10 mt of house. 90.8% (n=228) washed their hand before cooking, 92.4% (n=232) before eating and 97.2%

Table 2: Place of defecation of households at urban slums of Petlad

Adult (n=251)		Children (n=143)	
Defecation place	**Frequency (%)**	**Defecation place**	**Frequency (%)**
Open	90 (35.9%)	Latrine	55 (38.5%)
Sulabh Sauchalaya	32 (12.7%)	Open near house	65 (45.5%)
Water seal latrine	113 (45.0%)	Open in defecation fields	23 (16.0%)
Pit latrine	16 (6.4%)		

Table 3: Hand washing practice performed by households at urban slums of Petlad

Hand washing	After Defecation		Before Cooking		Before Eating	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Water	61	24.3	107	42.6	108	43
Soap+Water	183	72.9	121	48.2	124	49.4
None	7	2.8	23	9.2	19	7.6

Table 4: Association between literacy & hand washing practice among households of urban slums (n=251)

Literate	Hand washing					
	Before cooking		Before eating		After defecation	
	No	Yes	No	Yes	No	Yes
Yes	1	10	1	10	0	11
No	22	218	18	222	7	233
Fischer Exact	1.000		0.587		1.000	

(n=244) after defecation as shown in Table 3. 49.8% (n=125) knew about scheme for latrines implemented by government & 37.1% (n=93) knew about Swacch Bharat Abhiyan.

No statistical significance was seen between education and hand washing following defecation, before cooking, before eating and after defecation at 95% confidence interval as shown in Table 4.

No association was obtained through statistical analysis at 95% confidence interval between education and disposal of waste. No association was obtained through statistical analysis at 95% confidence interval between education and drinking water treatment.

Discussion:

Assessment of safe water availability, latrine facility at home and basic hygiene practice is of prime concern for anyone to intervene. In present study, most people residing are permanent residents of those slums since generations (96.4%). In present study, 61.8% had semi-pucca house while 9.9% had kaccha house. According to Government of India (GOI) [7], overall in India 16% houses in urban slums were semi-pucca, while 5% had kaccha house. Overcrowding based on number of persons per room was found in 57.85% participants home.

In present study, 4.4% participants were such who had never enrolled in the school, while a similar study on urban slum by Subbaraman et al.[8], the study showed that 35% had never enrolled in the school. Half of the participants (50.2%) in this study used LPG as cooking fuel, while 12.4% used kerosene and 37.55 used biofuel like wood, cow dung, coal, etc. According to Government of India report [7], in urban slums 51.3% used LPG, 14% kerosene and 34.7% biofuel. In present study, 84.9% household had water supply within premises, while according to Government of India report [7], 57% households in urban slums have water supply located within premises.

According to Government of India report [7], 66% households in urban slums have latrine within premises. Amongst those who don't have toilet facility at home, 44.3% use public toilet while 55.7% defecate in open. A study by Khosla et al.[9] reported that 65% defecate in open in Delhi slums and a study by Joshi et al.[10] showed that 45% had toilets at their homes. In present study, 51.4% had latrines at home, 12.7% used public toilets, while 35.9% defecate in open. A study by Joshi et al. [10] showed that 75% didn't use any method of treatment for drinking water, while in our study only 28.3% didn't use any method of treatment for drinking water.

Perceiving that, alone education improves sanitation facilities is also not true which is evident from the study where it was found that even educated people went for open air defecation and threw waste in open. Usually it is perceived that as education increases does basic sanitation practice improves. But in our study possibly due to inhibiting environmental factors in slums sanitation practice didn't improve even with improved education.

Conclusion:

The present study is one of the studies done on assessment of Water, Sanitation and Hygiene practices in urban slums. As evident from the results, water facilities are satisfactory but sanitation facilities and hygiene practices are still unsatisfactory in urban slums. Though the condition of these slums is better compared to the report of Government of India about all slums throughout India, still Water, Sanitation and Hygiene conditions in these slums can be further improved.

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References:

1. Slums in India- A Statistical Compendium, 2015.Ministry of Housing & Urban Poverty Alleviation, Government of India. Accessed on May 28, 2016 Available from: http://www.indiaenvironmentportal.org.in/files/file/SLUMS_IN_INDIA_Slum_Compendium_2015_English.pdf
2. Essay on the Conditions of the Urban Poor in India [Internet]. [cited 2015 Jun 6]. Available from: http://www.yourarticlelibrary.com/essay/essay-on-the-conditions-of-the-urban-poor-in-india/5593/
3. Essay on the Growth of Slums in Urban Areas of India [Internet]. [cited 2015 Jan 6]. Available from: http://www.yourarticlelibrary.com/essay/essay-on-the-growth-of-slums-in-urban-areas-of-india/4687/
4. Essay on the Condition of People Living in Slums [Internet]. [cited 2015 Jan 6]. Available from: http://www.yourarticlelibrary.com/essay/essay-on-the-condition-of-people-living-in-slums-355-words/4708/
5. Key Indicators of Urban Slums in India. Ministry of Statistics & Programme Implementation, Government of India. 2013.
6. Dudala SR, Reddy KAK, Prabhu GR, "Prasad's socio-economic status of classification- An update for 2014," Int J Res Health Sci, vol. 2(3), pp 875-78
7. Slums in India- A Statistical Compendium. Ministry Of Housing & Urban Population Alleviation, National Building Organisation, Government of India. [Internet]. 2015. Available from: http://nbo.nic.in/Images/PDF/SLUMS_IN_INDIA_Slum_Compendium_2015_English.pdf
8. Subbaraman R, Nolan L, Shitole T, Sawant K, Shitole S, Sood K, et al. Social Science & Medicine The psychological toll of slum living in Mumbai , India : A mixed methods study. Soc Sci Med [Internet]. Elsevier Ltd; 2014;119:155–69. Available from: http://dx.doi.org/10.1016/j.socscimed.2014.08.021
9. Khosla R, Bhanot A, Karishma S. Sanitation: a call on resources for promoting urban child health. Indian Pediatr. 2005;42:1199–206.
10. Joshi A, Prasad S, Kasav JB, Segan M, Singh AK. Water and Sanitation Hygiene Knowledge Attitude Practice in Urban Slum Settings. Glob J Health Sci [Internet]. 2013;6(2):23–34. Available from: http://www.ccsenet.org/journal/index.php/gjhs/article/view/30833