

Original Research Article

## Practice on Water, Sanitation and Hygiene among Mothers of Under-5 Years Children in Urban Slum of Butwal Sub-Metropolitan City, Nepal

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Received: 29/10/2015

Revised: 20/11/2015

Accepted: 20/11/2015

### ABSTRACT

**Background:** Water, sanitation and hygiene is still a burning issue in the context of developing countries like Nepal as many diseases related to it are causing the maximum number of child's death.

**Aim and Objective:** The objective of this research study was to assess the practice on water, sanitation and hygiene among mother of under-5 year's children in slum area of Butwal sub-metropolitan city, Rupandehi district, Nepal.

**Methodology:** The descriptive cross-sectional study was carried out in January- February 2015 among 206 mothers of under-5 year's children residing in the urban slum area of Butwal sub-metropolitan city, Nepal. Systematic random sampling procedure with pretested semi structured questionnaire following interview technique was used to collect information. Collected data was coded and entered in the EpiData 3.1® and exported to Statistical Package for Social Science (SPSS®) version 17.0 for analysis.

**Results:** Most of the respondents (87.9%) used improved source of water and the practice of purifying water before drinking was very low (18%). The study showed 42.7% of the households used to dispose solid waste directly into the river. Open defecation practice was considerably high as 48.1% respondents defecate in river bank. Place of defecation was significantly associated with education ( $p=0.004$ ) and income ( $p<0.001$ ). Only 43.9% respondents used improved but not shared latrine among those who were using latrine and 62.6% respondents used to wash their hands with soap and water after defecation.

**Conclusion:** Practice of drinking water purification was found quiet low and there was significant lack of knowledge about proper hand washing steps. The practice of open defecation was high and household's solid and liquid waste was poorly managed.

**Keywords:** Water, Sanitation, Hygiene, Slum areas.

### INTRODUCTION

According to National Sanitation Foundation of the USA; "Sanitation is a way of life. It is the quality of living that is expressed in clean home, clean firm, clean business, and clean community. Sanitation covers the whole field of controlling the environment with a view to prevent disease and promote health". [1] Hygiene is

commonly known as cleanliness or conditions and practices that serve to promote or preserve health. Improved housing, improved nutrition and improved hygiene with improved access to safe water, sanitation and good hygiene are the essential components for the war against infectious diseases and bases for clean

environment, socio-economic development and sound public health. [2]

Improving drinking water condition and sanitation facilities remains a major concern globally. [3] There has been significant progress in the Water, Sanitation and Hygiene (WASH) sector since 1990, the MDG baseline year. However, 748 million people still rely on unimproved sources of drinking water, almost a quarter of which rely on untreated surface water, and 2.5 billion people lack access to improved sanitation including one billion who practice open defecation. [4]

Diarrheal disease, nearly 90% of which has been attributed to suboptimal water, hygiene, and sanitation is one of the largest causes of morbidity and mortality in children under five years of age in low and middle-income countries, where it kills more children than HIV, malaria, and measles combined. [5] Every 20 seconds, a child around the world dies as a result of poor sanitation. About 80% of all disease of the developing world is related to unsafe water and inadequate sanitation. [6] Out of 2.5 billion diarrheal cases occurring every year among under-five children, more than half occur from Africa and South Asia. The total death toll due to diarrhea is about 1.5 million every year globally. [3]

Improving the access to safe drinking water and adequate sanitation, as well as promoting good hygiene, are key components in the prevention of diarrhoea. It also indicated that access to adequate sanitation reduced the incidence of disease and brings relative comfort and ease to the daily routine of toilet use, thereby enhancing the quality of life. [7] The United Nation Habitat have described sanitation and hygiene challenges in slums in terms of poor basic services results in lack of access to sanitation facilities as well safe water sources. This is due to the lack of waste collection services, poor rain

water drainage system, poor infrastructure and absence the of an electricity supply. [8]

The Millennium Development Goal (MDG) number 7, for the year 2015, is aimed at reducing the proportion of people without sustainable access to safe drinking water and basic sanitation facilities by half, focusing mostly on the provision of infrastructure to meet the demands of communities in developing countries. [7] In Nepal, NDHS 2011 showed that 89% of populations use an improved drinking water and 39% of populations with access to improved sanitation, 38.4% of people defecate in open areas. [9]

The objective of this study was to assess the practice on water, sanitation and hygiene among mothers of under-5 year's children in slum area of Butwal sub-metropolitan city, Nepal.

## **MATERIALS AND METHODS**

A descriptive cross-sectional study was carried out in January- February 2015 on slum area of Butwal sub-metropolitan city, Nepal. A total of 206 mothers of under-5 year's children residing in the urban slum and giving informed consent were included in the study. Systematic random sampling procedure with sampling interval of 3 and pretested semi structured questionnaire following interview technique was used to collect information. Data was collected by a modified version of previously validated questionnaire. The WHO and United Nations Children's Fund (UNICEF) 'Core questions on drinking-water and sanitation for household surveys' was contextually modified and used. Collected data was coded and entered in the Epi Data 3.1® and exported to Statistical Package for Social Science (SPSS®) version 17.0 for analysis.

Approval was taken from Department of Public Health, Eternal University and District Water Supply and Sanitation Division Office Yogikuti, Rupandehi. Verbal informed consent was

obtained from the individuals after the study's purpose was explained to them. Those individuals with mental or physical challenges making it difficult for them to participate in the study were excluded from the study. Confidentiality of the participants was maintained by assigning a unique code to each of the participants.

## RESULTS

### Socio-demographic information of respondents

Among 206 mothers interviewed, more than half (53.9%) respondents were of age group 25-35 years and the mean age was 29.28 years (SD: 6.262). Relatively advantaged Janajatis was the major ethnic group (29.1%) and Hindu was the dominant religion (76.3%). More than one-fifth of the respondents (21.4%) were illiterate. Majority of respondents (73.3%) were unskilled worker and 82.5% of respondents belonged to nuclear family. Similarly, 41.3% respondents have low family monthly income (< NRs 5000).

Table 1: Information regarding Drinking water

Variables	Frequency	Percentage
<b>Source of Drinking water (n=206)</b>		
River/Stream	25	12.1
Stand Pipe/Tap	181	87.9
<b>Time to fetch drinking water (n=206)</b>		
≤ 5 minutes	21	10.2
5 – 15 minutes	118	57.3
≥ 15 minutes	67	32.5
<b>Purification of drinking water (n=206)</b>		
Yes	37	18.0
No	169	82.0
<b>Method of Purification (n= 37)</b>		
Boiling	2	5.4
Filtration	27	73.0
Chlorination	4	10.8
SODIS	4	10.8
<b>Water used to dilute/mix in baby's food (n=206)</b>		
Boiled water	24	11.7
Filtered water	22	10.7
Tap water	148	71.8
Others	12	5.8

### Information regarding Drinking water

Stand pipe/tap was the major source of drinking water (87.9%). About one third of the respondents (32.5%) had to spend more than 15 minutes to fetch the

drinking water daily. Majority of the respondents (82%) did not purify water before drinking however among the respondents who were purifying water, 73% were adopting filtration method. High proportions of respondents (71.8%) were using direct tap water to dilute baby's food. (Table 1)

### Information regarding solid and liquid waste Management

The study revealed majority of the respondents (61.2%) threw the household liquid waste haphazardly. Similarly, 42.7% respondents disposed their household solid waste directly into the river. (Table 2)

Table 2: Information regarding liquid and solid waste Management (n=206)

Characteristics	Frequency	Percentage
<b>Liquid waste management</b>		
Kitchen gardening	15	7.3
Cattle feeding	18	8.7
Throw haphazardly	126	61.2
Collecting in pit	47	22.8
<b>Solid waste management</b>		
Municipal waste collection	118	57.3
River outfall	88	42.7

### Association between socio-demographic variables and solid waste management practice

A highly significant association was found between age ( $p < 0.001$ ), educational status ( $p < 0.001$ ), monthly family income ( $p < 0.001$ ) and solid waste management practice. No other variables were significantly associated with practice of solid waste management. (Table 3)

### Information regarding use and maintenance of latrine

The study shows almost half of the respondents (48.1%) defecate in river bank and the major reason for not constructing latrine was lack of suitable place (71.1%). 43.9% households have improved but not shared latrine. Nearly two-third of respondents (63.5%) used to clean their latrine on daily basis. (Table 4)

**Table 3: Association between socio-demographic variables and solid waste management practice**

Socio-demographic variables (n=206)	Solid waste management		$\chi^2$ -value	p-value
	Municipal collection	River outfall		
<b>Age (years)</b>				
<25	36 (61.0)	23 (39.0)	15.751	<0.001**
25-35	72 (64.9)	39 (35.1)		
>35	10 (27.8)	26 (72.2)		
<b>Occupation</b>				
Unskilled worker	85 (56.3)	66 (43.7)	0.227	0.634
Others***	33 (60.0)	22 (40.0)		
<b>Ethnicity</b>				
Upper caste and advantaged Janajatis	69 (60.5)	45 (39.5)	1.098	0.295
Others****	49 (53.3)	43 (46.7)		
<b>Education</b>				
Illiterate	5 (11.6)	38 (88.4)	46.288	<0.001**
Literate	113 (69.3)	50 (30.7)		
<b>Income</b>				
<5000 (NRs)	33 (38.8)	52 (61.2)	20.148	<0.001**
≥5000 (NRs)	85 (70.2)	36 (29.8)		

The value inside parentheses indicates percentage

\*\*statistically highly significant at p<0.01 \*\*\* Clerical, Shop owner, Farmer, Skilled worker, Semi skilled worker

\*\*\*\*Dalit, Disadvantaged Janajatis, Disadvantaged non-Dalit Terai caste groups and Religious minorities

**Table 4: Information regarding use and maintenance of latrine**

Characteristics	Frequency	Percentage
<b>Place of defecation (n=206)</b>		
Latrine	107	51.9
River bank	99	48.1
<b>Reason for not constructing latrine (n=99)</b>		
Poor financial status	28	28.9
No place	71	71.1
<b>Types of latrine (n=107)</b>		
Non improved	46	43.0
Improved not shared	47	43.9
Improved shared latrine	14	13.1
<b>Cleaning latrine (n=107)</b>		
On daily basis	68	63.5
On weekly basis	25	23.4
Rarely	14	13.1

### Association between socio-demographic variables and place of defecation

A highly significant association was found between educational status (p=0.004),

monthly family income (p<0.001) and place of defecation. However, no other variables were significantly associated with place of defecation. (Table 5)

### Information regarding personal hygiene

Maximum number of respondents (88.4%) used only water to wash hands before meal and 62.6% used soap and water to wash hands after defecation. 81.6% respondents used to brush their teeth daily while few of the respondents reported bathing daily (11.2%). Only 51.5% respondents were aware about proper hand washing steps and out of them just 43.3% demonstrated correctly. (Table 6)

**Table 5: Association between socio-demographic variables and place of defecation**

Socio-demographic variables (n=206)	Place of defecation		$\chi^2$ -value	p-value
	Latrine	River bank		
<b>Age (years)</b>				
<25	35 (59.3)	24 (40.7)	2.630	0.268
25-35	52 (46.8)	59 (53.2)		
>35	20 (55.6)	16 (44.4)		
<b>Occupation</b>				
Unskilled Worker	81 (53.6)	70 (46.4)	0.655	0.418
Others***	26 (47.3)	29 (52.7)		
<b>Ethnicity</b>				
Upper caste and advantaged Janajatis	64 (56.1)	50 (43.9)	1.803	0.179
Others****	43 (46.7)	49 (53.3)		
<b>Education</b>				
Illiterate	14 (32.6)	29 (67.4)	8.180	0.004**
Literate	93 (57.1)	70 (42.9)		
<b>Monthly family income</b>				
<5000 (NRs)	29 (34.1)	56 (65.9)	18.418	<0.001**
≥5000 (NRs)	78 (64.5)	43 (35.5)		

The value inside parentheses indicates percentage

\*\*Statistically highly significant at p<0.01 \*\*\* Clerical, Shop owner, Farmer, Skilled worker, Semi skilled worker

\*\*\*\*Dalit, Disadvantaged Janajatis, Disadvantaged non-Dalit Terai caste groups and Religious minorities

**Table 6: Information regarding personal hygiene**

Variables	Frequency	Percentage
<b>Materials used for washing hand before meal (n=206)</b>		
Only water	182	88.4
Soap water	18	8.7
Ash water	6	2.9
<b>Materials used for washing hand after defecation (n=206)</b>		
Only water	38	18.4
Soap water	129	62.6
Ash water	9	4.4
Mud water	30	14.6
<b>Awareness regarding hand washing steps (n=206)</b>		
Yes	106	51.5
No	100	48.5
<b>If Yes, Please demonstrate (n=106)</b>		
Correct	46	43.4
Incorrect	60	56.6
<b>Brushing teeth (n=206)</b>		
Once in a day	168	81.6
Twice a day	20	9.7
In alternate days	18	8.7
<b>Bathing (n=206)</b>		
Daily	23	11.2
Alternate days	47	22.8
Weekly	136	66.0

**Association between socio-demographic variables and steps of hand washing**

A significant association was found between occupation (p=0.028),

educational status (p<0.001) and steps of hand washing. However, no other variables were significantly associated with steps of hand washing. (Table 7)

**Table 7: Association between socio-demographic variables and steps of hand washing**

Socio-demographic variables (n=106)	Steps of hand washing		$\chi^2$ - value	p-value
	Correct	Incorrect		
<b>Age (years)</b>				
<25	11 (32.4)	23 (67.6)	2.885	0.236
25-35	26 (51.0)	25 (49.0)		
>35	9 (42.9)	12 (57.1)		
<b>Occupation</b>				
Unskilled worker	26 (36.1)	46 (63.9)	4.850	0.028*
Others***	20 (58.8)	14 (41.2)		
<b>Ethnicity</b>				
Upper caste and advantaged Janajatis	29 (46.8)	33 (53.2)	0.694	0.405
Others****	17 (38.6)	27 (61.4)		
<b>Education</b>				
Illiterate	5 (16.7)	25 (83.3)	12.170	<0.001**
Literate	41 (53.9)	35 (46.1)		
<b>Income</b>				
<5000 (NRs)	21 (46.7)	24 (53.3)	0.340	0.560
≥5000 (NRs)	25 (41.0)	36 (59.0)		

The value inside parentheses indicates percentage \*Statistically highly significant at p<0.05  
 \*\*Statistically highly significant at p<0.01 \*\*\* Clerical, Shop owner, Farmer, Skilled worker, Semi skilled worker  
 \*\*\*\*Dalit, Disadvantaged Janajatis, Disadvantaged non-Dalit Terai caste groups and Religious minorities

**DISCUSSION**

In this study most of the respondents (87.9%) used improved source of water which is almost similar to NDHS, 2011 (88.6%) but higher than the study conducted in urban slum of Pokhara, Nepal (68.2%); urban slums of South Delhi, India (45%) and Gondar city of Ethiopia (57.1%). [3,9-11] Majority of respondents (82%) did not purify water

which is almost similar to the NDHS, 2011 (84.2%) but higher than the findings of the study done in Urban slum of Pokhara, Nepal (64.2%) and urban slums of South Delhi, India (75%). [3,9,10]

42.7% of the households used to dispose the solid waste directly into the river which is almost similar to study conducted in urban slum of Pokhara, Nepal (43.3%). [10] It might be due to

irregularity of municipal vehicle to pick the waste. The practice of liquid waste management was found to be poor, as 61.2% households threw liquid waste haphazardly which is greater than the findings from urban slum of Pokhara, Nepal (52.4%).<sup>[10]</sup>

The study showed almost half (48.1%) of the respondents defecate in open place (i.e. river bank) which is much higher than study conducted in urban slum of Pokhara, Nepal (3.7%) but it is lesser than study conducted in Morang, Nepal (60%); Madhya Pradesh (71.0%); South Delhi, India (55.0%) and Gondar city of Ethiopia (67.0%).<sup>[3,6,10-12]</sup> In this study 43.9% respondents used improved but not shared latrine which is higher than the NDHS, 2011 (38.4%) but almost similar to the study conducted on South Delhi, India (45.0%) and lesser than the study conducted in urban slum of Pokhara, Nepal (74.0%).<sup>[3, 9,10]</sup>

Proportion of respondents who used soap and water to wash hands before meal was just 8.7% in this study, which is lower than the findings from Madhya Pradesh, India (22.0%).<sup>[12]</sup> Similarly, only 62.6% respondents used to wash their hands with soap and water after defecation which is higher than NDHS, 2011 (47.8%) but lower than findings from eastern Uganda(76.0%); urban slum of Pokhara, Nepal (71.4%) and Morang, Nepal (65.0%).<sup>[6,9,10,13]</sup>

In this study 81.6% respondents used to brush their teeth once daily which was higher than another study in urban slum of Pokhara, Nepal (70.1%) and study done by Water aid in Nepal (73.5%).<sup>[10,14]</sup>

## CONCLUSION

Practice of drinking water purification was found quiet low and there was significant lack of knowledge about proper hand washing steps. The practice of open defecation was high and household's solid and liquid waste was poorly managed. Government and non-

governmental organization should be involved in the construction of toilet with the full participation of people from this slum area and health education initiatives should be targeted to mothers.

## ACKNOWLEDGEMENT

I express my deep sense of gratitude and humble regard to Mr. Shankar Mani Jnawali, Division Chief, Water Supply and Sanitation Division Office, Rupandehi, Nepal. Furthermore, my appreciation goes to Dr. Pratap Thakur, Asst. Professor, Akal School of Public Health and Hospital Administration, Eternal University. My special thanks are reserved for all mothers who cooperated in this study.

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How to cite this article: Pathak G, Chalise M, Parajuli S et al. Practice on water, sanitation and hygiene among mothers of under-5 years children in urban slum of butwal sub-metropolitan city, Nepal. *Int J Health Sci Res*. 2015; 5(12):362-368.

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