

# Assessment of the Knowledge, Attitude and Practice Regarding Water, Sanitation and Hygiene among Mothers of Under-five Children in Rural Households of Saptari District, Nepal

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**Abstract Background:** Safe drinking water and basic sanitation are crucial to the preservation of human health, especially among children. Water, sanitation and hygiene related issues are still a burning issue in the context of developing countries. Saptari district of Nepal, water supply coverage is 83% and sanitation coverage is only 25 % which is lower than national coverage. This could lead to poor hygienic practice in the community and it may adversely affect the health of vulnerable under-five children. **Objective:** To assess knowledge, attitude and practice on Water, Sanitation and Hygiene (WASH) among mothers of under-five children in rural households of Saptari district of Nepal. **Methodology** Cross sectional study was undertaken in 21 Village Development Communities of Saptari district of Nepal. Multistage sampling method was used and 420 mothers of under-five children were interviewed about their knowledge, attitude and practice regarding water, sanitation and hygiene. **Results:** Out of 420 mothers, majority of participants had appropriate knowledge (74.8%) and poor knowledge (25.71%) on water, Sanitation and hygiene. 57.14% participants had positive attitude on water, sanitation and hygiene while (42.85%) had negative attitude. Regarding practice, (60%) participants did good practice and (40%) did poor practice. Almost 94.3% of the respondents used hand pump as a source of drinking water, (34.8%) used latrine for defecation. More than half (56.19%) of respondents washed hand with soap and water after defecation. A statistically significant difference in the level of knowledge, attitude and practice of participants was seen according to their educational level at  $p < 0.05$ . **Conclusion:** Present study showed that knowledge and attitude on safe practice of water, sanitation and hygiene among mothers were affected by their education level. Hence there is a need to spread information on the importance of proper practice on water, sanitation and hygiene in rural areas through available evidences based on BCC strategies and multiple dissemination channels.

**Keywords:** knowledge, water, sanitation, hygiene, attitude, practice, mothers, under five children

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## 1. Introduction

Water is an important resource for sustaining the ecosystem which supports human beings, animals, and plants. Contaminated water is a major cause of illness and death among human. [1] Poor water quality is a threat to health of humans worldwide. Various factors influence the contamination of water like rapid urbanization, chemicals from industrial discharge, population growth and factors resulting from climate change. According to 2012 report, 89% of the world's population had access to an improved drinking but 82% of the world's population lived in rural areas did not have access to safe water. [2] In 2010, 7.6

million under five years children died due to pneumonia, diarrhea and malaria. [3] Water, sanitation and hygiene related matter are still burning issue in the context of developing countries like Nepal as many of these diseases related to water, sanitation and hygiene lead to maximum number of deaths. Nepal has already achieved MDG target for safe drinking water supply coverage with current national coverage of 83% against a target of 73% by 2015. The MDG target for sanitation is yet to be achieved with current national coverage of 43% against a target of 53% by 2015. [4] In 2010, 72% people had access to clean drinking water in rural areas and only 52% people in rural area were accessible to hygienic sanitation. [5] National water supply coverage of Nepal is 83.59% and sanitation coverage is 70.28% of the total population. [6] According

to survey of Sabal Nepal, current latrine coverage of district is more than 27%. [7] Proper access to safe water and sanitation motivates to changes in hygiene behavior. Safe drinking water and basic sanitation are of crucial importance to the preservation of human health, especially among children. Water-related diseases are the most common causes of illness and deaths among the poor in developing countries. Girls and women have better educational and productive opportunities when they have water and sanitation facilities nearby, because they can safeguard their privacy in school and save time in fetching water. [8]

In the district there are no any studies conducted to assess the knowledge, attitude and practice on water, sanitation and hygiene among mothers' of under five children in rural area. The study focuses on mothers who had Under five years age children because disease related to water, sanitation and hygiene are the leading cause of under five mortality and morbidity. Mothers are directly linked with child's health as they are the one who take care of their children. This study shows the mothers knowledge and their practice on water, sanitation and hygiene of Saptari district.

## 2. Methodology

A Community based cross sectional study was conducted among mothers of under- five year's children in rural Saptari district of Nepal.

### 2.1. Sampling Procedure

To find sample size prevalence rate 24 % was considered with design effect 1.5 and 95% confidence level. Total 420 sample was taken from 21 VDCs of Saptari district.

For selecting the sample in the study, multi stage sampling technique was used. Saptari district has 114 VDCs (Village Development Committees) and each VDC has 9 wards. For selecting sample, in first stage 21 VDCs (18%) were randomly selected from the district and in second stage from each of the selected VDCs, wards were selected randomly. Each VDC has nine wards and among them two wards was selected randomly. A total of 189 wards of 21 VDCs, 42 wards were selected. In third stage, 10 samples were selected from each ward by using purposive sampling.

### 2.2. Data Collection Techniques and Tools

A household survey was based on semi- structured pre-tested questionnaire. Data was collected by self. Mothers of children below five years were informed about utility of the survey and written consent was obtained at each instance. The mothers were taken as a unit for study purpose and in case there were two under five children in the same house, it was considered as one unit. Information on socio-demographic characteristics, knowledge, attitude and practice regarding water, sanitation and hygiene were collected from the mothers of under five year children. Data collection was done from January to February 2015.

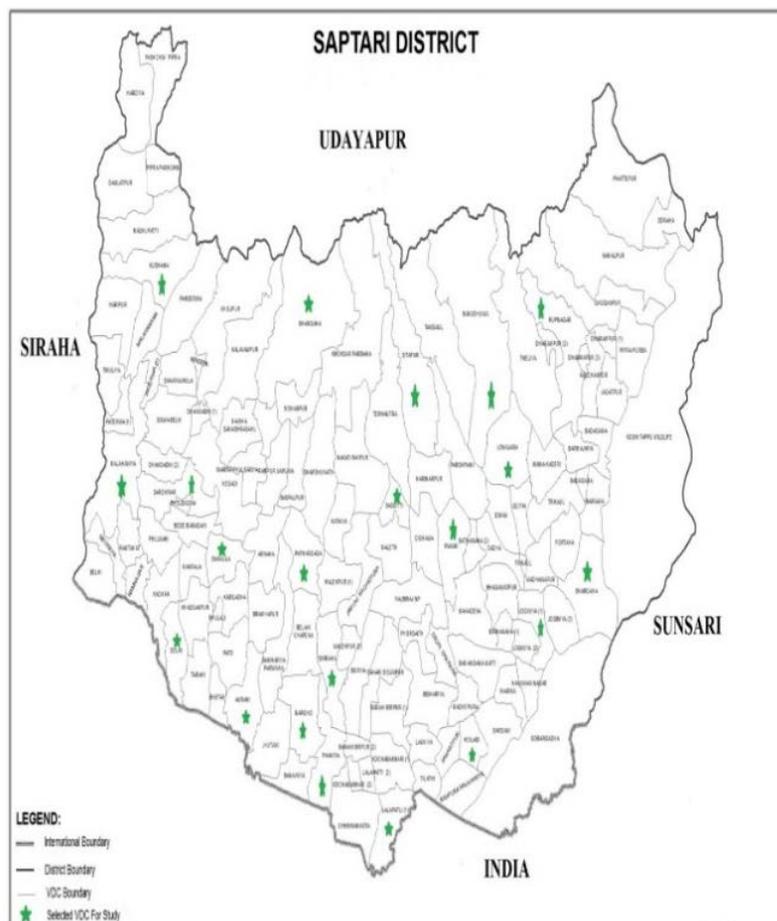


Figure 1. Map of study area

## 2.3. Statistical Analysis

Collected data were verified and coded prior to computerized data entry. Data entry was done using SPSS 16.0 version and was verified for any error. Statistical analysis was done using Chi square test and level of significance was set on value of  $p < 0.05$ .

## 2.4. Scoring System

One mark awarded for every correct answer, no (0) mark was awarded for each wrong answer. The scores were added and the mean score calculated. Respondents that scored below the mean value were categorized as having poor knowledge, negative attitude and poor practice while those that scored above the mean value were categorized as having good knowledge, positive attitude and good practice.

## 3. Ethical Consideration

Ethical approval was obtained from the Institutional ethics committee K.S Hegde Medical Academy (KSHEMA), Nitte University. Permission for the study was obtained from the District Public Health Office (DPHO) of Saptari district. Consent was obtained from each mothers to voluntary participate in the study. Data were treated confidentially during all stages of the research.

## 4. Results

Socio-demographic characteristics of respondents such as age, religion, educational level, guardian occupation, and monthly income.

**Table 1. Socio demographic characteristics of respondents**

Socio-demographic Characteristics(n=420)	Frequency	Percentage
Age (in years)		
≤ 20	251	59.76
> 20	169	40.24
Religion		
Hindu	377	89.76
Muslim	43	10.24
Education Status		
Illiterate	56	13.33
Primary level	165	39.28
Secondary	160	38.09
Intermediate level and above	39	9.28
Occupation of their guardian		
Professionals	86	20.47
Clerical/shopowner	70	16.66
Skilled worker	139	33.09
Unskilled worker	61	14.52
Un-employed	64	15.23
Monthly income		
≤ 14000	95	22.62
14000-21000	204	48.57
>21000	121	28.81

These characteristics are useful to see what influences they have on their knowledge, attitude and practice of WASH. The respondents were in the age group of 16-27 years, with mean age of 20.58 years.

## 4.1. Knowledge of Mothers Regarding Water, Sanitation and Hygiene

For assessing knowledge regarding water, sanitation and hygiene each participants were asked question related drinking water treatment method, causes of worms in children, causes of diarrhea, knowledge of preparing ORS, hand washing and importance of use of toilet. About treatment of drinking water, only 11.42% know that water can be treated by boiling, 20.95% recognize that water can be treated by filtering. Regarding causes of worms, 27% identify it can be manifested by consumption of uncooked food and walking without sleeper. About 54% participants recognize diarrhea occurs due to consumption of unhygienic food, 52.14% were aware that using toilet is safe from different types of diseases, 28.81% have knowledge of hand washing and 60.48% know the process of ORS preparation.

## 4.2. Attitude of Mothers Regarding Water, Sanitation and Hygiene

Mothers' attitude was assessed by administering question on type of water to be used in preparation of baby food, benefits of hand washing, hand washing after use of toilet and use of soap in hand washing after defecation. About 44.28% mothers opined that boiled water can be used in preparation of baby food, 83.57 % distinguish hand washing make free from disease, 98.33% had explain that hand should be washed after using toilet and 56.19% know soap is necessary for hand washing.

**Table 2. Knowledge of mothers regarding water, sanitation and hygiene**

Knowledge(n=420)	Frequency	Percentage
Drinking water can be treated by		
Boiling	48	11.42
Use of filter	88	20.95
Used any medicine (chlorine)	51	12.14
No need of any measure	233	55.47
Causes of worm infestation in children		
Eating sweet	58	13.81
Dirty water	14	3.33
Stale food	68	16.19
Uncooked food	144	27.14
Flies food	19	4.52
Walking without sleeper	117	27.86
Importance of toilet		
To keep surrounding clean	62	14.76
Free from odour	77	18.33
Safe from diseases	219	52.14
All the above	62	14.76
Causes of diarrhoea		
Dirty environment	31	7.38
Pathogen from stools	44	10.48
Use of unhygienic food	230	54.76
Drinking unsafe water	105	25
All the above	9	2.14
Due to evil	1	0.24
Knowledge on hand washing		
Yes	121	28.81
No	299	71.19
Knowledge of preparing ORS		
Yes	254	60.48
No	166	39.52

### 4.3. Practice of Mothers Regarding Water, Sanitation and Hygiene

Mothers' practice was assessed by asking question related to source of drinking water, waste management, place of defecation, disposing of young children stool, hand washing and cleaning of milk feeding bottle. Study shows that majority (94.28%) of participants used hand pump as source of drinking water. As for solid waste management, (35.67%) respondents had prepared compost and one third (33.33%) had buried in soil and about liquid waste 54.52% had feed it to their cattle, 14.01% of them throw haphazardly. For defecation, 34.76% respondents use toilet and 30.95% participant's rinsed stool of three years children's in the toilet. Majority 56.19% had washed their hands after defecation with soap and water. As for cleaning baby feeding bottle or cup, 45.03% mothers clean it with soap and boiled water.

**Table 3. Attitude of mothers on water, sanitation and hygiene**

Attitude (n=420)	Frequency	Percentage
Water used to prepare baby food		
Boiled water	186	44.28
Plain water	234	55.71
Importance of Latrine		
To keep surrounding clean	62	14.76
Free from odour	77	18.33
Safe from diseases	219	52.14
All the above	62	14.76
Benefits of hand washing		
To be clean	49	11.67
Free from diseases	351	83.57
Free from odour	20	4.76
Hands washing after using toilet		
Yes	413	98.33
No	7	1.67
Soap is necessary in hand washing after defecation		
Yes	236	56.19
No	184	43.80

There was a significant difference in the level of knowledge of mothers towards WASH according to their education level at  $p < 0.05$  respectively while no significant difference was found with age, religion, occupation and income status. (Table 5) A statistically significant difference was observed in the level of attitude of mothers towards WASH according to religion and educational

status at  $p < 0.05$ . No significant difference was found with age, income and occupation with respect to their level of attitude towards WASH. (Table 6) The study found there was a significant difference in the level of practices of mothers toward WASH according to their age, income, occupation and educational status at  $p < 0.05$  whereas no significant difference was observed with religion. (Table 7)

**Table 4. Practice of mothers on water, sanitation and hygiene**

Practice (n=420)	Frequency	Percentage
Sources of drinking water		
Well	24	5.71
Hand pump	396	94.29
Liquid waste management		
Kitchen gardening	125	29.76
Feed to cattle	229	54.52
Throw haphazardly	66	15.71
Solid waste management		
Burn	67	15.96
Bury	140	33.33
Prepare compost	154	35.67
Throw haphazardly	59	14.04
Place for defecation		
Using toilet	146	34.76
Open place	274	65.23
Disposing of young children(<3yrs) stool		
Rinsed in toilet	130	30.95
Left in open	19	4.52
Throw outside	224	53.33
Buried on soil	47	11.19
Used to wash their hands after defecation		
Only water	17	4.05
Soap and water	236	56.19
Ash and water	167	39.76
Feeding milk to the baby(<6months) with bottle or cup		
Yes	229	54.52
No	191	45.48
Wash bottle or cup regularly		
Yes	131	57.21
No	98	42.79
Clean the feeding bottle or cup		
Soap and boiled water	59	45.03
Boiled water only	45	45.35
Soap and un boiled water	13	9.92
Plain water	14	10.68
Reason for not cleaning regularly		
No time	74	75.51
Not needed	24	24.48

**Table 5. Association between socio-demographic characteristics and level of knowledge of mothers towards water, sanitation and hygiene**

Characteristics	Category	Knowledge Level (N (%))		Total N (%)	Chi-square	p-value
		Good (n=312)	Poor (n=108)			
Age	≤20	185(73.70)	66(26.29)	251 (59.76)	0.110	0.740
	>20	127(75.14)	42(24.85)	169 (40.24)		
Education level	Illiterate	11(55)	9(45)	20 (4.76)	15.672	0.001*
	Primary level	103(66.02)	53(33.97)	156 (37.14)		
	Secondary level	104(80)	26(20)	130 (30.95)		
	Intermediate and above	94(82.46)	20(17.54)	114 (27.14)		
Occupation	Unemployed	74(68.51)	34(31.48)	108 (25.71)	3.151	0.369
	Professional	126(77.78)	36(22.22)	162 (38.57)		
	Clerical/shop owner	51(72.86)	19(27.14)	70 (16.66)		
	Skilled worker	61(76.25)	19(23.75)	80 (19.04)		
Income	≤14000	66(69.47)	29(30.53)	95 (22.61)	1.626	0.444
	14001-21000	153(75)	51(25)	204 (48.57)		
	>21000	93(76.85)	28(23.14)	121 (28.80)		

\*- Significant

**Table 6. Association between socio-demographic characteristics and level of attitude of mothers towards water, sanitation and hygiene**

Characteristics	Category	Attitude Level N (%)		Total	Chi-square	p-value
		Positive (n=240)	Negative (n=180)			
Age	≤ 20	143(56.97)	108(43.02)	251 (59.76)	0.007	0.931
	>20	97(57.39)	72(42.60)	169 (40.23)		
Education level	Illiterate	6(30)	14(70)	20 (4.76)	22.766	0.001*
	Primary level	75(48.08)	81(51.92)	156 (37.14)		
	Secondary level	76(58.47)	54(41.53)	130 (30.95)		
	Intermediate and above	83(72.81)	31(27.19)	114 (27.14)		
Occupation	Unemployed	57(52.78)	51(47.22)	108 (25.71)	3.191	0.363
	Professional	90(55.56)	72(44.44)	162 (38.57)		
	Clerical/shop owner	46(65.71)	24(34.29)	70 (16.66)		
	Skilled worker	47(58.75)	33(41.25)	80 (19.04)		
Income	≤14000	51(53.68)	44(46.31)	95 (22.61)	4.607	0.100
	14001-21000	110(53.92)	94(46.07)	204 (48.57)		
	>21000	79(65.28)	42(34.71)	121 (28.80)		

\*- Significant

**Table 7. Association between socio-demographic characteristics and level of practices of mothers towards water, sanitation and hygiene**

Characteristics	Category	Practices Level N (%)		Total	Chi-square	p-value
		Good (n=252)	Poor (n=168)			
Age	≤20	139(55.37)	112(44.62)	251 (59.76)	5.551	0.018*
	>20	113(66.86)	56(33.14)	169 (40.23)		
Education level	Illiterate	10(50)	10(50)	20 (4.76)	19.898	0.001*
	Primary level	74(47.44)	82(52.56)	156 (37.14)		
	Secondary level	93(71.54)	37(28.46)	130 (30.95)		
	Intermediate and above	75(65.78)	39(34.22)	114 (27.14)		
Occupation	Unemployed	42(38.88)	66(61.11)	108 (25.71)	32.159	0.001*
	Professional	106(65.43)	56(34.57)	162 (38.57)		
	Clerical/shop owner	55(78.57)	15(21.43)	70 (16.66)		
	Skilled worker	49(61.25)	31(38.75)	80 (19.04)		
Income	≤14000	34(35.78)	61(64.21)	95 (22.61)	43.743	0.001*
	14001-21000	121(59.31)	83(40.68)	204 (48.57)		
	>21000	97(80.16)	24(19.83)	121 (28.80)		

\*- Significant.

## 5. Discussion

Overall 74.28% of mothers had good knowledge, 57.14% of mothers had positive attitude and 60% of mothers had good practice on WASH. A similar study conducted in Jhapa district of Nepal show 76.92% had good knowledge on WASH. [9] National water supply coverage of Nepal is 83.59% and sanitation coverage is 70.28% of the total population. As for district comparison in Saptari district drinking water supply coverage is 83% and sanitation coverage is only 25%. [6] According to survey of Sabal Nepal latrine coverage of district is 27%. [7]

Mothers who have primary level education, two third (66.02%) of mothers had good knowledge, in secondary level educated mothers, four fifth (80%) of mothers had good knowledge and in intermediate and above educated mothers four fifth (82.06%) of mothers had good knowledge on WASH. Mothers' education level and their knowledge on WASH had significant relationship ( $P < 0.05$ ). Study shows that knowledge is not associated with mothers' religion, age group, occupation, income status

Regarding treating of drinking water, 33% had knowledge on the modern method (filtering, chlorination) and 11% had knowledge on traditional methods (boiling) as in comparison to similar study in Pakistan showed that

14.5% used boiled water and similar study done in India showed that 14.35% of respondent boiled the water. [14,17] Worm infestation in children is a big health problem as it causes malnutrition. In the study minority of the respondent explain that worm can be manifested due to stale food (16.19%).

Various communicable diseases like diarrhea, malaria etc occur due to lack of management of water and proper sanitation. In the study, the results illustrate that more than half (54.3%) of mothers had knowledge on diarrhea as compare to another study of Pakistan, which showed that 46.5% had knowledge on diarrhea. [14]

In relation to the importance of hand washing, 83.57% inform proper hand washing prevent from disease. As compared to another study from Kenya and India, hand washing is important for preventing from communicable diseases 88% and 83.41% respectively. [15,20] About source of drinking water, 94.3% respondent used hand pump and only (5.7%) used well water. In contrast similar study from Nepal, Cameron, and India reported that 22.22%, 37.35%, and 62.5% respectively used well water. [9,12,13] Similar study done in Jhapa district showed that only 40% used hand pump water for drinking. [9]

Mothers who have primary level education, about half (48.08%) of mothers had positive attitude, in secondary

level educated mothers, three fifth (58.47%) had positive attitude and in intermediate and above educated mothers, three fourth (72.81%) had positive attitude on WASH. Mothers' education level and their attitude on WASH had significant relationship as knowledge ( $P < 0.05$ ). Study shows that attitude is not associated with mothers' religion, age group, occupation, and income status

Regarding using the latrine for defecation, study explain only 34.8% respondents used latrine, as compared to a related study from Nepal, Vietnam, Ghana and India reported that 32%, 30%, 40% and 31.8% respectively used the latrine for defecation. [9,10,11,16] As shown the result of study, latrine using proportion is not good because remaining of them go for open defecation and open defecation spread different communicable diseases.

There are various critical times for hand washing like before cooking food, before serving food, after using the toilet, after touching solid and liquid waste, after cleaning child stool etc. So this study showed that 95% of respondent wash their hands before eating, 95% before serving food, 35.5% before feeding their child, 98.3% after defecation, and 73.1% after cleaning child stool. Among all, only 56% respondents used soap and water for hand washing after defecation. Similar study from Nigeria shows that 62.3% respondent wash hands before cooking, 88% after defecation and 56.3% after urination. Among the entire respondent, only (27.3%) used water for hand washing. [18] It shows hand washing practices of the respondent is better. As for hand washing, soap is the best material in rural area. The study showed that majority (56.9%) used soap and water for hand washing as compare to different study of Kenya, Ghana and Bangladesh result demonstrate that 44%, 20%, 30% respectively used soap and water for hand washing after defecation. [10,11,19] In this study as about practice of respondents, it shows that age, education status, occupation and income status had statistically significant relationship with respect to mothers WASH practices ( $p < 0.05$ ). Religion shows there is no any significant relationship with WASH practices.

## 6. Conclusion

This study found that most mothers in Saptari district were  $\leq 20$  years of age and belong to low socio-economic and having less education. This is most common phenomenon in many other communities. Study result showed that knowledge on WASH is not affected due to religion, occupation or income level. Respondent's knowledge was affected due to education level. High education level respondent had good knowledge. Attitude of respondent was not changing due to high income it only can be change by education. Higher education level respondent had good attitude.

About practice on WASH, participants practice was not related to religion it affects due to age, occupation, education level and income status. If the income level is high then practice will also increase. In the district most of the respondents went for open defecation they don't had latrine facilities. Hand washing practice will be increase due to higher education and occupational level. A majority of respondents with knowledge of WASH used soap and water for hand washing at some of critical time.

Sanitation and hygiene practice was not change due to having good knowledge on WASH. So for increasing the knowledge of respondents, we have to increase education level.

## List of Abbreviations Used

BCC: Behavior Change Communication ODF: Open Defecation Free, VDC: Village Development Committee, WASH: Water, Sanitation and Hygiene.

## Competing Interests

No competing interest.

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