Health and Hygiene, Knowledge, Attitude and Behavior: A Case Study at Hapania Mauza of Atghoria Upazila in Pabna District

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Abstract- Hygiene practice, knowledge and behavior are the driving force of health. Health is considered as the physical mental economic and social condition and satisfaction of a man and hygiene is the constitution to attain it. There are various types of diseases which directly or indirectly depend on hygiene practice. The people of the rural areas suffer from health and hygiene related diseases. This study attempts to assess the relationship among hygiene practice, behavior, attitude and knowledge about health. This study conducted a questionnaire survey on 78 respondents living in Happania mauza. It was observed socio-economic and environmental aspects were significantly associated with health. Simple statistical techniques were used for data analysis. It was found that most of the people were engaged in business and worked as day labour and their monthly income was from 5000-10000 taka. In the study area about 55 percent used ring slab and 52 percent of the respondents used soap for washing hand after using toilet and 61 percent people used shoe in while using latrine. About 21 percent of the respondents suffered from diarrhoea, 35 percent from dysentery and 44 percent suffered from skin diseases. This study used cross tabulation and multiple regressions to analysis the relationships among hygiene practice, behavior, attitude and knowledge about health. It was observed that there existed a strong relationship among hygiene practice and health. This study observes that the methods of hygiene practice were not maintained properly. Due to the poor level of knowledge of the respondents regarding sanitation, hygiene practices and health, the people of the study area often suffered from various types of infectious diseases.

Index Terms- Heath, Hygiene, Sanitation practice, Diseases, Cross tabulation, Regression.

I. INTRODUCTION

Bangladesh is an over populated country. In a developing country like Bangladesh, almost one-third of the population lives below the poverty line. About 39 percent of the total population of South Asia lives in poverty and they have an income of less than one US dollar a day. According to the Household Income and Expenditure survey of 2010, the rate of poverty in Bangladesh has dropped to 31.5 percent. Another report opined that 8.5 percent poverty declined in the last five years (Kabir, 2011). Due to lack of education, knowledge and basic awareness, people often have a poor understanding regarding the relationships among health, water, sanitation and hygiene. In some instances, people may still practice unhygienic habits even though this understanding does exist (Das *et al*. 2015). However maintaining good or acceptable personal hygiene is seldom perceived and acknowledged as protection against diseases (Asha, 2013 and Farah *et al*, 2015). Poor health and hygiene practice and inadequate sanitary condition play a major role in developing country like Bangladesh and increases the burden of infectious diseases (Vivas *et al*, 2010).

II. BACKGROUND

Personal hygiene is very important for protecting and maintaining health and addressing health problems and is also fundamental to the prevention of many diseases, particularly contagious diseases (Hossain, 2012). One of the main problems in underdeveloped and developed countries of the world is lack of safe water and sanitation. Majority of the affected population are found in informal settlements, urban and rural parts of the developing countries where the practice of open defecation, poor sanitation services, and use of unsafe water persist due to knowledge gaps and improper attitude towards health and hygiene and make people unable to practice basic hygiene (Job, 2014).

The global problem of access to safe water and sanitation continues to plague the poor countries of the world (Job, 2014). According to World Health Organization an estimated 2.6 billion people, comprising about 40 percent of the world's population live without adequate access to safe water and proper sanitation (WHO, 2010). In a developing country like Bangladesh various diseases are rampant due to lack of clean drinking water and sanitation (Amin *et al*, 2008). Bangladesh is a low-income country where round the year prevalence of waterborne diseases remains high. Researches indicate that washing hands without soap after defecation and before eating are common in Bangladesh (Rana, 2009).In Bangladesh, serving and eating foods with bare hands is quite common (Faruque *et al*, 2010). Outbreaks of food borne disease involves poor hygiene in restaurants (Todd *et al*, 2008) and eating food from street vendors are considered as high risk factors (Vollaard *et al*, 2004).

Safe water is one of the most important felt needs in public health in developing countries in the twenty first century (Sah *et al*, 2013). According to a World Health Organization (WHO) estimate, 1.5 million children die from diarrheal diseases each year worldwide, with 88% of these deaths occur due to inadequate sanitation, lack of hygiene practices, and poor quality drinking water (Lipson, 2010). Awareness about safe drinking water, sanitary latrines, and of hygiene and related health issues are crucial factors in habituating practice in a particular context (Nath *et al*, 2010). This actually indicates that washing hands with soap can reduce risk of diarrhea substantially (Curtis and Carincross, 2003; Ejemot *et al*. 2008) and use of sanitary latrine also reduces incidence of water borne diseases (GED, 2009).

Bangladesh has been facing a number of challenges in the water, sanitation, and hygiene sectors. Hygiene practice becomes difficult in many parts of the world, including Bangladesh. This is due to lack of safe water and proper washing materials such as soap (Centers for Disease Control, 2011). Lack of awareness about the benefits of using safe latrine, poverty, lack of space, and preference for open defecation are also mentionable barriers to health and hygiene (UNDP, 2009). All these factors impede the universal coverage of use of sanitary latrine in the country (Rana, 2009).

Knowledge regarding poor hand washing practices is particularly important and most strongly associated with the risk of diarrhea (Asha, 2013, and Farah *et al*, 2015). Diarrheal disease has been considered as a serious global problem (WHO, 2008) and leading cause of child mortality around the world (Boschi-Pinto, 2008) and proper hygienic behavior can play an important role in the prevention of diseases related to water and sanitation. An average of 65% of death caused by diarrheal diseases could be reduced if good hygiene practice accompanies the provision of water and sanitation. Diarrhoea can be significantly reduced through improvements of the quality of drinking water, sanitation facilities, hygiene knowledge and practices (Wong *et al*, 2007, Fewtrell *et al*, 2005 and Luby *et al*, 2004).Around 2.4 million deaths could be prevented annually by good hygiene practice and providing reliable sanitation and drinking water (Prüss-Üstün, 2008). Evidence shows that hand washing can reduce the occurrence of diarrheal diseases by 14-40% (Hoque, 2003). Different studies showed that hand washing can decontaminate hands and prevent cross-transmission (Kaltenthale *et al*, 1991, 1998). The effectiveness of hand washing with soap can reduce diarrheal risk up to 47% (Curtis and Cairncross, 2003). Many studies carried out in Bangladesh suggested that hand washing is one of the factors which decreases the incidence of diarrhea in intervention areas significantly (Stanton and Clemens, 1987 and Alam *et al*, 1989).

Several underlying factors such as availability, affordability and negligence are associated with these unhygienic practices. Furthermore, most of the people are not much aware about the route of transmission of waterborne diseases which increase the risk notably. Even many people lack knowledge about potential risks of taking uncovered and inappropriately preserved food items, not washing hands with soap before eating, providing food to children without washing hands with soap, and not washing hands with soap after defecation (Rana, 2009).

III. Aim and Objectives

The aim of the research is to assess human knowledge, attitude and behavior in the study area to examine the interrelationships among health, hygiene, knowledge, attitude and resulting human behavior.

The objectives of the study are:

a) To identify the present condition of health and hygiene, knowledge, attitude and behavior of human in the study area;
b) To examine the underlying causes of diseases;
c) To analyze the behavioral aspects of the respondents in this respect.

IV. Data Sources and Research Methodology

Both quantitative and qualitative data have been used in this study. Primary data were collected through questionnaire survey. The questionnaires contained information on household, socio-economic information, sanitation system, hygiene practice, location and situation of water sources, different diseases that occurred among respondents during the last 2 years. The sample size was determined following the steps: Population size (N) = 400, Error level (e) = 10%, Confidence level= 95% and z-score (z) =1.96. Data for the study were collected by questionnaire interview conducted on 78 respondents who lived in the study area. Secondary data were collected from different published and unpublished materials and books. Microsoft word, Microsoft Excel, SPSS, Arc View GIS software were used for data analysis. Both descriptive and inferential statistical tools were used to analyze the data. To examine the relationship among knowledge, attitude, behavior and hygiene practice regarding health, cross tabulation and multiple linear regression were used. A model of the relationship between explanatory variables and a response variable was developed by fitting the following linear equation:

Multiple Linear Regression: $Y = a + b1X1 + b2X2 + b3X3 + ... + btXt + u$ (Penn State Science, 2017)

Where:

Y = the variable are used to predict (dependent variable)
X = the variable that are used to predict (independent variable)
a = the intercept
b = the slope
u = the regression residual

Hapania Mauza is a small administrative unit under the Atgharia Upazila in Pabna district. Total population in the study area was 1989 where male was 51.41% and female 48.59%. The density of population was 871 per sq km. Average literacy rate was 26.4% male and 16.8% female. There is only a government primary school in the study area (BBS, 2011).

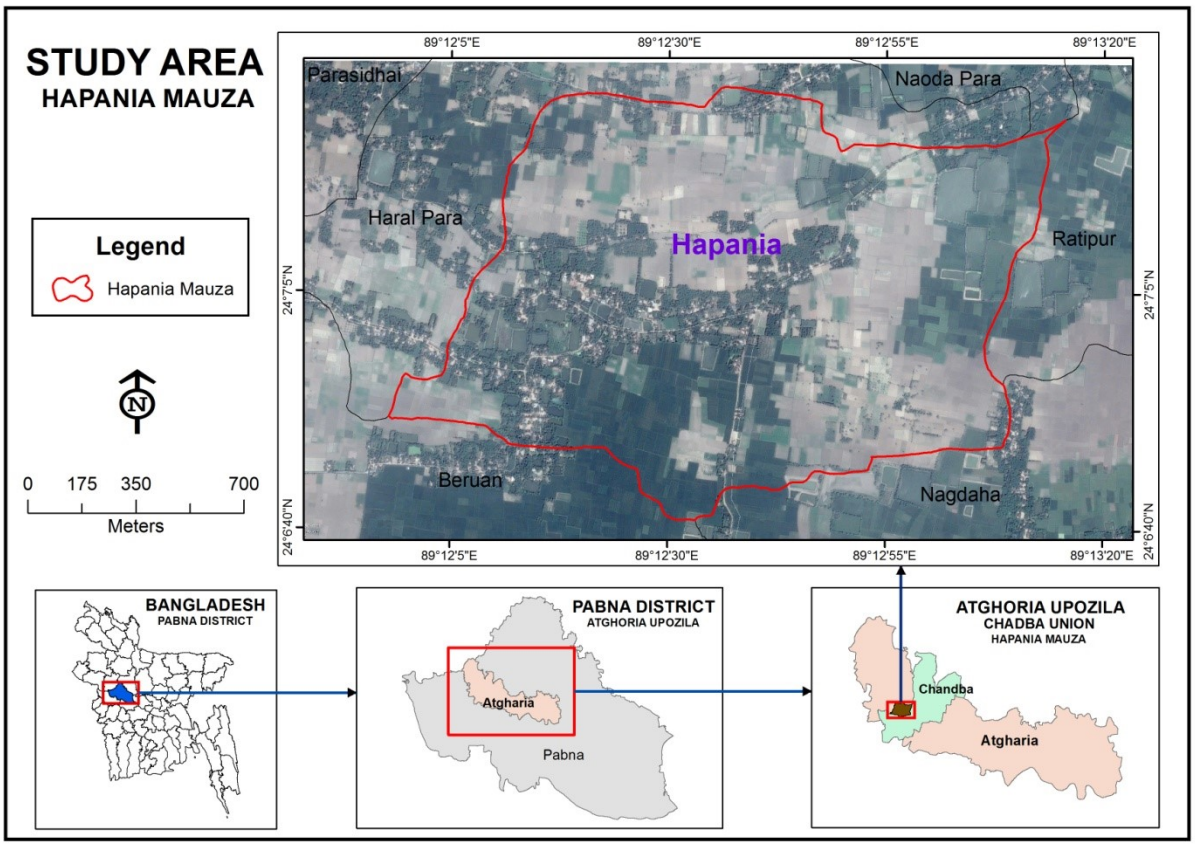

Figure 1: Map of Study Area.
(Source: BCA data and Google earth, 2016, Compiled by Author)

V. Socio-Economic Condition and Knowledge about Health

In the study area 19.23 percent respondent are illiterate, 47.44 percent have primary education, and 17.95 percent have passed SSC and only 6.41 percent completed graduation degree (Table-1). In Bangladesh during the year of 2014 the literature rate was 71 percent (Bd news 24, 2015). Although the increase of per capita income in Bangladesh has increased significantly, the income of the population has hardly increased. It can be observed from Table-2 that 65.38 percent population income is in between 5000-10000 taka. About 5.13 percent people have an income below 5000 taka and 21.79 percent has income between 10000-15000 taka. Only 5.13 percent respondents have income up to 20,000 taka (Table-2). The national per capita income of Bangladesh is about 125999 taka (BBS, 2017). In the study area female are generally engaged in household activities and male are in outside activities. Table-3 exhibits that about 29.49 percent of the respondents are house wife, 24.36 percent are worker, 15.34 percent are engaged in small business such shop keeper, vegetable seller in local market, rice traders etc. On the other hand, about 21.79 percent are farmer and only 5.13 percent are service holder (Table-3).

Table-1: Educational Status of the Population in the Study Area

Education status	Count	Percentage
Illiterate	15	19.23
Primary	37	47.44
SSC	14	17.95
HSC	4	5.13
Honors	5	6.41
Masters	3	3.85
Total	78	100.00

Table-2: Monthly Income

Income (Bangladeshi Taka)	Count	Percentage
<5000	4	5.13
5001-10000	51	65.38
10001-15000	17	21.79
15001-20000	2	2.56
20001-25000	3	3.85
30000+	1	1.28
Total	78	100.00

Table-3: Occupational Status of Population		
Occupation Status	Count	Percentage
Service Holder	4	5.13
Businessman	12	15.38
Worker	19	24.36
Housewife	23	29.49
Farmer	17	21.79
Other	3	3.85
Total	78	100.00
Sources: Questionnaire Survey, 2016		

VI. Toilet Types and Hygiene Practice

In the study area about 55.13 percent of the respondent use ring slab toilet made with fence using bamboo, straw palm leaves, bananas leaves etc. and 33.33 percent use pucca toilet made with bricks and cement (Table-4). The table -1 also depicts that 8.97 percent respondents use kuccha toilet made with soil and corrugated tin. One research indicates that about 57.95% of the households have good hygiene and sanitation system in (DPHE, 2010). About 2.56 percent uses neighboring toilet and sometime defecate in open field. Among the respondents 52.56 percent use soap, 25.64 percent use ash, 2.56 percent use only water for cleaning purpose (Table-5). In a study on 50 sub-districts it is found that about 88.1% people use soap, 8.85% people use only water and 3.15% people donot wash their hand after defecation (Rabby and Dey,2013). It can be observed that they usually use damp soil or ash for cleaning their hand. Table -6 revaled that 61.54 percent respondents use shoe during defecation time. About 32.05 percent use shoe occasionally and 6.41 percent never used shoe while defacating.

Table-4: Different Types of Toilet		
Toilet Types	Count	Percentage
Ring slab with fence	43	55.13
Pucca	26	33.33
Kucha	7	8.97
Others	2	2.56
Total	78	100.00
Table-5: Hand Wash Practice after Toilet		
Hand Wash by Using	Count	Percentage
Soap	41	52.56
Ash	15	19.23
Soil	20	25.64
Only water	2	2.56
Total	**78**	**100.00**
Table-6: Shoe Use Practice in Toilet Time		
Shoe Use	Count	Percentage
Yes	48	61.54
No	5	6.41
Occasionally	25	32.05
Total	78	100.00
Sources: Questionnaire Survey, 2016		

VII. Different Diseases

In the study area most of the people suffered from fever (93.59%), cold and cough (100 %), blood pressure (35.90%). Figure-2 shows that diarrhoea (21.79%), dysentery (55.13 %), skin diseases (44.87%) acidity (55.13%) are common diseases among the respondents in Hapania mauza. To receive treatment about 53.32% of the people go to quack doctor for treatment. People also took traditional herbal treatment. About 30% people went to government hospital for treatment.

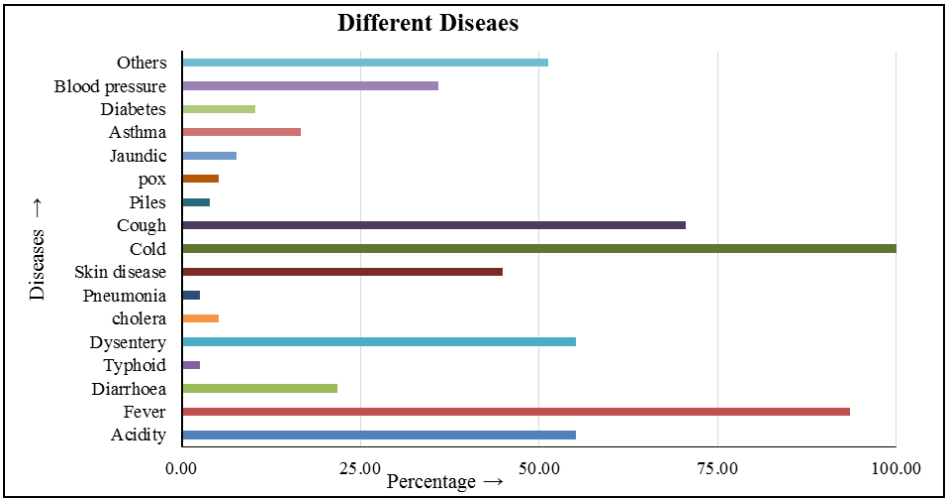

Figure 2: Common diseases of people in last two years at study area.
Sources: Questionnaire Survey, 2016

VIII. Relationship between Typhoid and Hygiene Practice

Typhoid is a waterborne disease. It is intricately related with hygiene practice and proper sanitation system. In Hapania Mauza, Kuccha toilet (14.3%) users suffered from typhoid more than the ring slab (2.3%) and pucca toilet users (Table-7). Table 7 depicts that the respondents use soap for washing hand before meal intake did not suffer from typhoid and about 3% of them suffered from this disease and they washed their hands with only water user. Respondents who used ash for cleaning hand suffered from typhoid (6.7%) and about 50% people who used only water had been affected by typhoid disease and strikingly, about 10% of the respondents who used soil for cleaning suffered from typhoid disease (Table -7). It can be summarized that people who washed their hands with proper cleaning materials suffered less from the disease than the respondents who used only water for cleaning purpose.

Table-7:Cross Tabulation Analysis between Typhoid and Hygiene Practice

			Typhoid	
			No	Yes
Toilet Types	Ring slab	Count	42	1
		% within Toilet types	97.7%	2.3%
	Pucca	Count	26	0
		% within Toilet types	100.0%	.0%
	Kucha	Count	6	1
		% within Toilet types	85.7%	14.3%
	Others	Count	2	0
		% within Toilet types	100.0%	.0%
Hand Wash Practice before Taking Food	Soap	Count	11	0
		% within Hand wash practice before taking food	100.0%	.0%
	Water	Count	65	2
		% within Hand wash practice before taking food	97.0%	3.0%
Hand Wash Practice after Toilet	Soap	Count	41	0
		% within hand wash practice after toilet	100.0%	.0%
	Ash	Count	14	1
		% within hand wash practice after toilet	93.3%	6.7%
	Soil	Count	18	2
		% within hand wash practice after toilet	90.0%	.10%
	Water	Count	1	1
		% within hand wash practice after toilet	50.0%	50.0%
Shoe Use	Yes	Count	48	0
		% within shoe use	100.0%	.0%
	No	Count	3	2
		% within shoe use	60.0%	40.0%
	Occasionally	Count	25	0
		% within shoe use	100.0%	.0%

Sources: Questionnaire Survey, 2016

Table- 8 espoused the dependency of typhoid with hygiene practice. One unit of increase in the number of user respectively "Yes" or "No" by for washing their hand increased the probability of Typhoid 0.038 unit where p = 0.215. Soap, Ash, soil and water had higher probability of typhoid occurrence (0.052 unit where p = 0.078). Regular use of shoe by the respondents' also decreased one unit of the probability of Typhoid (Table- 8). If the educational status is raised, then the probability of typhoid disease decreases by 0.005 units.

Table -8 : Regression Analysis between Typhoid and Hygiene Practice						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.027	0.109		-0.252	0.802
	Hand wash practice before taking food	0.038	0.031	0.155	1.250	0.215
	Hand wash practice after toilet	0.052	0.029	0.298	1.786	0.078
	Shoe use	-0.041	0.028	-0.237	-1.442	0.154
	Education	-0.005	0.018	-0.040	-0.285	0.776
	Occupation	-0.001	0.015	-0.010	-0.087	0.931
a. Dependent Variable: Typhoid						

IX. Relationship between Dysentery and Hygiene Practice

Dysentery is closely related with hand wash practice before eating. In Hapania Mauza 62.7% respondents suffered from dysentery and they used only water before taking food. And among soap users only 9.1% suffered from dysentery (Table: 9). Table: 9 also represents the relationship between toilet types and dysentery. Other types of respondents such respondents who defecated in the open space, respondents who used kuccha toilets and ring slabs and pucca toilets suffered from dysentery during the last two years. It indicates that the pucca toilet users suffered less from dysentery than other types of toilet user. Types of hand wash practice after toilet and occurrences of dysentery disease are closely related. About 36 % of the total respondents who used soap suffered from dysentery. About 66.7% of the respondents used ash for cleaning purpose and they were affected by dysentery. On the other hand 80% of the respondents who used soil suffered from dysentery. About 100% of the people who used only water for cleaning purpose suffered from dysentery. In the study area, respondents who never used shoe (80%) suffered from dysentery. Respondents who used shoe occasionally (76%) and who never used suffered from dysentery on a regular basis 41.7% (Table-9).

Table-9:Cross Tabulation Analysis between Dysentery and Hygiene Practice				
			Dysentery	
			No	Yes
Toilet Types	Ring slab	Count	14	29
		% within toilet types	32.6%	67.4%
	Pucca	Count	19	7
		% within toilet types	73.1%	26.9%
	Kucha	Count	2	5
		% within toilet types	28.6%	71.4%
	Others	Count	0	2
		% within toilet types	.0%	100.0%
Hand Wash Practice before taking food	Soap	Count	10	1
		% within Hand wash practice before taking food	90.9%	9.1%
	Water	Count	25	42
		% within Hand wash practice before taking food	37.3%	62.7%
Hand wash Practice after Toilet	Soap	Count	26	15
		% within Hand wash practice after toilet	63.4%	36.6%
	Ash	Count	5	10
		% within Hand wash practice after toilet	33.3%	66.7%
	Soil	Count	4	16
		% within Hand wash practice after toilet	20.0%	80.0%
	Water	Count	0	2
		% within Hand wash practice after toilet	.0%	100.0%

Shoe Use	Yes	Count	28	20
		% within shoe use	58.3%	41.7%
	No	Count	1	4
		% within shoe use	20.0%	80.0%
	Occasionally	Count	6	19
		% within shoe use	24.0%	76.0%
Sources: Questionnaire Survey, 2016				

One unit of increase of the hand wash practice before taking food (respectively using soap and only water) increased the probability of Diarrhoea by 0.163 units (Table-10). Higher educational status had a bearing on the chance of dysentery (0.225 unit where p = 0.00). Table-10 indicates that there is a very low impact of toilet types on dysentery occurrence.

Table -10 : Regression Analysis among Dysentery and Hygiene Practice

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.109	0.238		4.651	0.000
	Hand wash practice before taking food	0.060	0.079	0.077	0.762	0.449
	Hand wash practice after toilet	0.085	0.062	0.156	1.361	0.178
	Education	-0.225	0.045	-0.569	-5.029	0.000
	Toilet types	-0.002	0.061	-0.003	-0.029	0.977
	Hand washing before child feeding	-0.163	0.062	-0.264	-2.614	0.011
a. Dependent Variable: Dysentery						

X. Relationship between Diarrhoea and Hygiene Practice

In the study area soil and ash users were less affected by diarrhea (35% and 60%) and soap users suffered least 2.4% (Table-11). It indicates that hand washing after defecation is an important factor in hygiene practice which can help to eradicate diarrhoea disease in the study area and the country as a whole. Pucca toilet users suffer less ((3.8%) from diarrhoea than the ring slab users (20.9%). And kuccha toilet users suffered most 85.5% (Table-11).

Table-11:Cross Tabulation Analysis between Diarrhoea and Hygiene Practice

			Diarrhoea	
			No	Yes
Hand Wash Practice after Toilet	Soap	Count	40	1
		% within Hand wash practice after toilet	97.6%	2.4%
	Ash	Count	6	9
		% within Hand wash practice after toilet	40.0%	60.0%
	Soil	Count	13	7
		% within Hand wash practice after toilet	65.0%	35.0%
	Water	Count	2	0
		% within Hand wash practice after toilet	100.0%	.0%
Toilet Types	Ring slab	Count	34	9
		% within toilet types	79.1%	20.9%
	Pucca	Count	25	1
		% within toilet types	96.2%	3.8%
	Kucha	Count	1	6

		% within toilet types	14.3%	85.7%
	Others	Count	1	1
		% within toilet types	50.0%	50.0%
Element use for hand wash before taking food	Soap	Count	11	0
		% within use Hand wash practice before taking food	100.0%	.0%
	Water	Count	50	17
		% within Hand wash practice before taking food	74.6%	25.4%
Sources: Questionnaire Survey, 2016				

There is a strong relation between diarrhea and socio- economic conditions and hygiene practice. Table- 12 depicts that one unit increase in hand wash practice after defecation (only water, soil, ash and soap) increases 0.05 probability of diarrhea diseases and it is statistically significant (p = 0.0.456). With the increase of one unit of personal hygiene practice of mother after children cleaning (respectively soap, ash, soil, only water) decreases 0.120 unit probability of diarrhea. It can be observed that hand wash practices decreases diarrhea significantly.

Table -12 : Regression Analysis among Diarrhea and Hygiene Practice

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.200	0.250		0.798	0.427
	Hand wash practice before taking food	0.163	0.070	0.252	2.314	0.024
	Hand wash practice after toilet	-0.050	0.066	-0.110	-0.750	0.456
	Shoe use	0.126	0.064	0.281	1.953	0.055
	Education	-0.085	0.040	-0.260	-2.117	0.038
	Occupation	-0.028	0.034	-0.084	-0.825	0.412
a. Dependent Variable: Diarrhoea						

XI. Conclusions

Hygiene practice is the precondition of good health. But hygiene means not only follow the rule of sanitation system but also gaining awareness and knowledge about the rule of maintaining hygiene. There is a lack of proper knowledge among the respondents in the study area. People have little knowledge about the adoption of proper methods of hygiene practice. Therefore treatment facilities are not available in the study area. Most of the diseases in the study area are sanitation and hygiene practice related. To avoid these diseases it is indispensable to aware people and disseminates the ideas of proper ways of hygiene practices. The ideas related to hygiene practices may be disseminated in the study area through mass education and training. Local governments and people of the area of the study area may work hand in hand to speared health and hygiene related disease and eradicate infectious diseases from the study area.

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