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Sanitation Pattern and its Impact on Child in Relation to their Diarrheal Disease of two Upazilla under Satkhira District

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Abstract

The sanitation pattern is not so good in rural areas of Bangladesh. About 2.2 million children died of diarrhea disease around the world and these deaths represent approximately 15% of all child deaths under the age of five in developing countries. For this study, two rural areas of Satkhira District of Bangladesh were selected. The information was collected from households that had children under 5 years old. The majority of the locals are illiterate and impoverished. They have a low income and are not well aware of sanitation and children's diarrhea. Most people use tubewell water for drinking purposes and others use ponds, rivers and hand pump water for domestic purposes. Water, sanitation, and hygiene interventions reduce diarrheal disease on average by between one-quarter and one-third. New sanitary solutions are required, and the process of acquiring latrines and sewers must be facilitated and supported both legislatively and financially. Public authorities must continue to be responsible for the provision of water that is free of fecal contaminants. In the private domain, hygiene promotion should focus on the elimination of human stools from the domestic environment. We should ensure safe sanitation, clean water and a hygienic environment for children and their survival.

Key words: Bangladesh, Children, Diarrhea, Sanitation, Socio-economic

Introduction

Diarrhea is defined by the World Health Organization as the passing of three or more loose or watery stools per day or more frequently than is normal for the individual (WHO, 2007). Diarrheal disorders are the main cause of death among children aged five and under around the world (UNICEF, 2018). They account for more deaths than all other causes combined in some parts of the world (Petri *et al*., 2008; UNICEF, 2018). Childhood Diarrhea, which affects children aged five and under, accounts for roughly 63 percent of the global Diarrhea burden (Walker *et al*., 2012; Zhang *et al*., 2016) and is the second leading cause of infant death in underdeveloped countries (Platts-Mills *et al*., 2015; Kotloff, 2017) where poor sanitation, a lack of safe drinking water and lack of maternal education are major causes (Chakravarty *et al*., 2017; Squire and Ryan, 2017; Haq and Tasnim, 2008).

In 2010, 7.6 million children under the age of five died worldwide, with infectious diseases accounting for 64 percent (4.8 million). Pneumonia and diarrhea are the primary causes of death after the newborn period. Diarrhea is responsible for 10.5 percent of all deaths (0.8 million deaths, range: 0.6 to 1.2 million) (Liu *et al*., 2010), with the poorest populations in Sub-Saharan Africa and South Asia bearing the brunt of the burden (Bhutta and Black, 2013). Despite recent improvements in mortality, diarrhea remains one of the leading preventable causes of death in children. Recurrent or persistent diarrhea has substantial long-term impacts on growth, nutrition and cognition in addition to producing high mortality (Guerrant *et al*., 2008). With a total population of 143.8 million people (UNDP, 2004) and a population density of 878 people per square kilometer (BBS, 2004). Bangladesh is one of the world's most densely inhabited countries. The adult literacy rate (those aged 15 and up) is 48 per cent, with males accounting for 54 percent and females accounting for 41 percent (BBS, 2004). The country is primarily rural, with 49.8% of the people living below the national poverty level (BBS, 2001). Health and environmental issues as well as high mortality rates are major challenges in a poor country like Bangladesh, where half of the population lives in poverty. Poverty, malnutrition, low birth weight and environmental degradation continue to be major contributors to children's health vulnerabilities.

Bangladesh has seen a remarkable decline in child mortality over the previous 15 years. In Bangladesh, the Under Five Mortality Rate (U5MR) decreased from 151 per thousand live births in 1990 to 77 per thousand live births in 2001, falling short of the UN goal of 70 per thousand live births (WHO, 2003). Although Bangladesh's child mortality rate has decreased significantly over the last two decades, it remains high by any criterion (Pushkar and Pal, 2004). Childhood diarrheal disease affects children under the age of two years old as a result of a complex interplay of socioeconomic, environmental, behavioral and child feeding habits. Childhood diarrhea is linked to child feeding practices, mother education and sanitation according to research (Gizaw *et al*., 2017; Haq and Tasnim, 2008; Young and Briscoe, 1988). The purpose of this article is to identify the sanitation pattern in rural areas and its impact on the health of children (Under 5).

The health of children is influenced by socioeconomic, sanitary and educational variables. This article seeks to concentrate on such elements.

Materials and Methods

Selection of the study area

The study was conducted on December 2018 to March 2019. For this study, two rural areas were selected i.e. Labsa village at Satkhira sadar upazilla and Sonabaria village at Kalaroa upazilla under the district of Satkhira in Bangladesh. The information's were collected from the households that having children under 5. It was studied that age range from 25 year to 44 year and above for father of the children & 18 year to 39 year for mother of the children.

Description of the sites

Satkhira sadar upazilla (Satkhira district) has an area of 400.82 square kilometers and is located between 22°37' and 22°50' north latitudes and 88°55 ' and 89°10' east longitudes. It is surrounded on the north by Kalaroa upazilla, on the south by Debhata and Assasuni upazillas, on the east by Tala upazilla, and on the west by the West Bengal state of India. Total population 410355; Males 211986, Females 198369; Muslims 351303, Hindus 57340. The average literacy is 50.67%; males 55.90%; females 45.09%. Sanitation 40.62% (rural 32.28% and urban 70.13%) of dwelling households in the upazilla use sanitary latrines and 36.27% (rural 39.66% and urban 24.28%) of dwelling households use non-sanitary latrines; 23.11% of households do not have latrine facilities. Labsa village is the nearest village to Satkhira sadar upazilla (Satkhira sadar upazilla-Banglapedia).

Kalaroa upazilla (Satkhira district) has an area of 232.64 square kilometers and is located between 22°48 ' and 22°57' north latitudes and 88°54 ' and 89°09' east longitudes. It is surrounded on the north by Sharsha, Jhikargachha, and Manirampur upazillas, on the south by Satkhira Sadar and Tala upazillas, on the east by Keshabpur, Manirampur, and Tala upazillas, and on the west by the West Bengal state of India. Total population: 221596; males 112258, females 109338; Muslims 207633, Hindus 11578, Buddhists 1816, Christians 15, and others 554. Average literacy is 45.59%; male 50.59%, female 40.47%. Sonabaria village is 6 km from Kalaroa upazilla. Sanitation: 25.97% (rural 51.43% and urban 61.70%) of dwelling households in the upazilla use sanitary latrines and 39.06% (rural 41.23% and urban 21.99%) of dwelling households use non-sanitary latrines; 34.97% of households do not have latrine facilities (Kalaroa upazilla-Banglapedia).

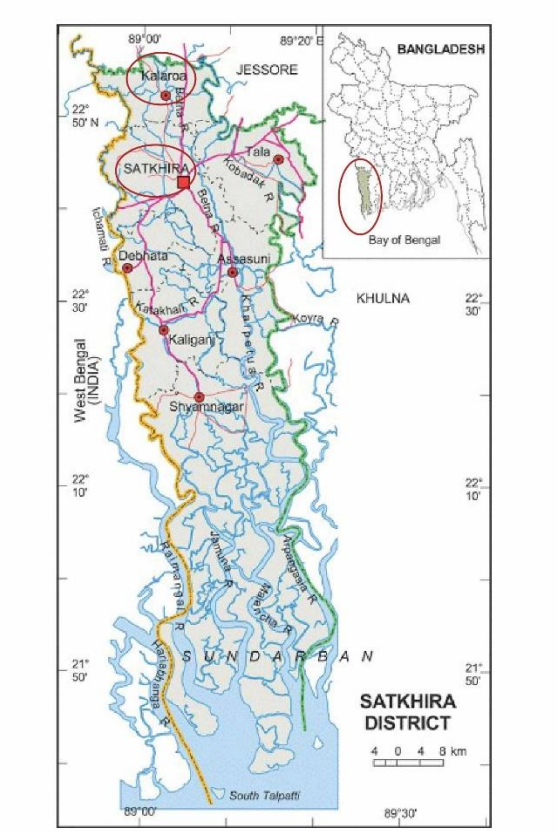

Fig. 1. Map of Satkhira District.

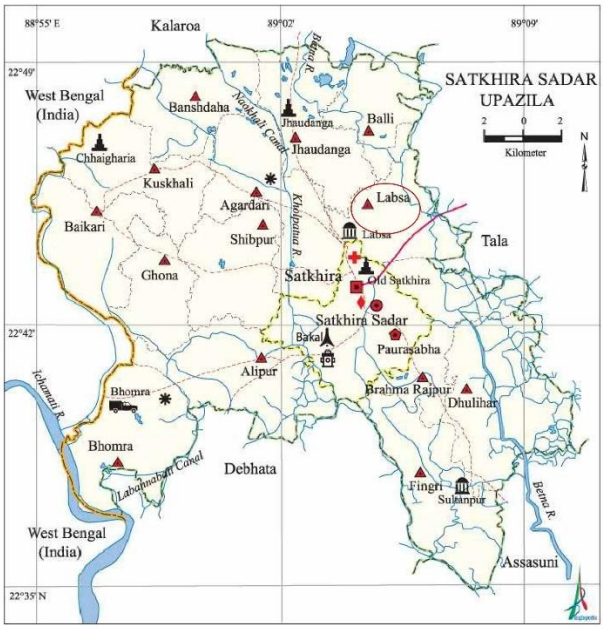

Fig. 2. Map of Satkhira sadar upazilla. (Study area 1)

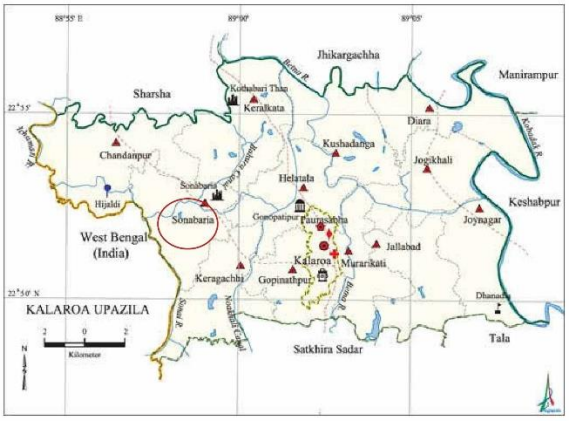

Fig. 3. Map of Kalaroa upazilla (Study area 2)

Respondents selection criteria & sample size

Interviewing collected details information's about sanitation factors, socio-economic conditions of parents of the 82 households in related to their child's diarrheal disease. Among the members of a family, we selected children under 5 and their parents. Following participants were present:

- Children with age group 0-60 months.
- Child's mother with age group 18-39 year.
- Child's father with age group 25-44 year.

The study was conducted in two rural areas under the district of Satkhira in Bangladesh through 82 households & 105 children under 5.

Primary data collection

A common questionnaire was used to collect information's on sanitation factors, socio-economic conditions of parents in related to their child's diarrheal disease. Information's were collected for four months at labsa village of Satkhira sadar upazilla and Sonabaria village of Kalaroa upazilla under the district of Satkhira.

Results and Discussion

Sanitation factors

The study was conducted at two villages in Bangladesh. Maximum villagers are illiterate & poor. They have low income and not a good aware about sanitation and child's diarrhea. Most of the mothers are housewife. They take care of their children. Fathers earn money to maintain their family. All people use tube well water to drink, use pond, river & hand pump's water for domestic purposes, mother cover their food, wash hand before cooking and feeding their children.

In Table 1 & Table 2, we present the relationship between child's breast feeding, hand wash before eating, drinking water, depth of tubewell, distance of tubewell from latrine, sources of bathing water and defecation in relation to their diarrheal disease.

Table 1 shows that maximum mothers are in the 20-24 years age group, father are in the 25-29 years age group and children are in the 3 to 4 years age group at Labsa village of Satkhira sadar upazilla under the district of Satkhira.

Table 2 shows that maximum mothers are in the 20-24 years age group, father are in the 30-34 years age group and children are in the 3-5 years age group at Sonabaria village of Kalaroa upazilla under the district of Satkhira.

Child's diarrhea

In the Study area 1, 18 numbers of children are suffered of diarrhea from out of 40. So, 45 percent of children are affected of diarrhea due to insanitation practices at Labsa village of Satkhira sadar upazilla. And in the Study area 2, 34 (thirty-four) children are suffered of diarrhea from out of sixty-five (65). So, 52 per cent of children are affected of diarrhea due to insanitation practices at Sonabaria village of Kalaroa upazilla. The cumulative percentage of child's diarrhea with time are as follows.

In study area 1 Child's diarrhea is 2% for 48 hours, 5% for 1 week, 13% for 2 weeks, 22% for 3 months, 30% for 6 months and 45% for 1 year. In study area 2, Child's diarrhea is 3% for 48 hours, 6% for 1 week, 15% for 2 weeks, 26% for 3 months, 35% for 6 months and 52% for 1 year (Fig. 4).

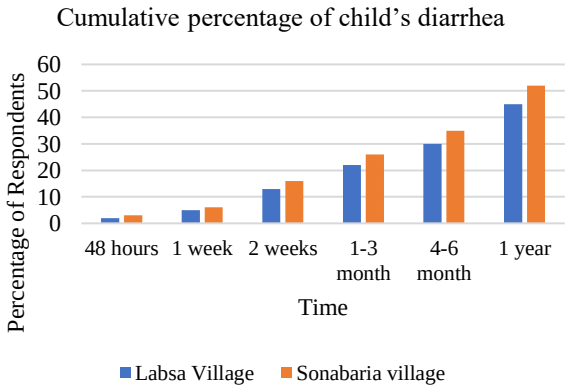

Fig. 4. The cumulative percentage of child's diarrhea with time at Labsa village of Satkhira sadar upazilla (Study area 1) and Sonabaria village of Kalaroa upazilla (Study area 2).

Table 1. Diarrheal disease of children in relation to their Sanitation factors at Satkhira sadar upazilla (Study area 1).

Parameter		CHILD					ST	ST%	SDT	SDT%
Age	Month	0-12	13-24	25-36	37-48	49-60				
Number	Person	7	5	16	5	7	40			
	Person (diarrheal affected)	2	3	7	2	4			18	45
Breast feeding	Present	7	4	13	3	-	27	67	12	44
	Past	-	-	3	2	7	12	30	5	42
	None	-	1	-	-	-	1	3	1	100
Hand wash before eating	Only water	4	3	12	4	5	28	70	14	50
	Soap	3	2	4	1	2	12	30	4	33
Drinking water	Direct	2	2	7	-	3	14	35	10	71
	Direct + reserving	1	-	-	2	-	3	8	2	67
	Reserving	4	3	9	3	4	23	57	6	26
Depth of tubewell	80-120ft	-	-	1	-	-	1	3	1	100
	121-160ft	1	1	3	-	1	6	15	3	50
	160ft+	6	4	12	5	6	33	82	14	42
Distance between tubewell & latrine	0-10ft	-	-	2	-	-	2	5	2	100
	11-20ft	-	1	1	1	-	3	8	3	100
	21-30ft	4	3	5	2	2	16	40	8	50
	30ft+	3	1	8	2	5	19	47	5	26
Sources of bathing water	Tubewell	4	4	10	1	2	21	53	6	29
	Pond	3	1	5	1	2	12	30	9	75
	River	-	-	1	3	3	7	17	3	43
Defecation of child	Latrine	-	-	8	3	4	15	37	4	27
	Commode	1	1	1	-	-	3	8	2	67
	Open place	6	4	7	2	3	22	55	12	55

ST : Total no. of children is conducted for study at Satkhira sadar upazilla.
ST% : The percentage of children at Satkhira sadar upazilla.
SDT : Total no. of children are suffered from diarrhea at Satkhira sadar upazilla.
SDT% : The percentage of children are suffered of diarrhea at Satkhira sadar upazilla.

Breast-feeding

The practice of child for breast-feeding plays an important role on their diarrheal disease. In the study area 1, It was found that 67% of children are drinking breast milk at present, 30% of children drank breast milk in past and 3% of children never drank breast milk. Where maximum child was between 25 to 36-months age. We found that 44% of children are affecting by diarrhea, which are drinking breast milk at present, 42% of children are affecting by diarrhea, which drank breast milk in past and 100% of children are affecting by diarrhea, which never drank breast milk in their life. In study area 2, I found that 37% of children are drinking breast milk at present, 46% of children drank breast milk in past and 17% of children never drank breast milk. And where most of the child age up to 24 months. In the study area 2, it was found that 38% of are affecting by diarrhea, which are drinking breast milk at present, 57% of children are affecting by diarrhea, which drank breast milk in past and 73% of children are affecting by diarrhea, which never drank breast milk in their life.

Defecation

Defecation practice of child has a great impact on their diarrheal disease. In the study area 1, it was found that 55% of children use open place for their defecation and 8% of children use commode for their defecation 37% of children use latrine for their defecation. We found that 27% of children are affecting by diarrhea, which use latrine for their defecation, 67% of children are affecting by diarrhea, which use commode for their defecation, and 55% of children are affecting by diarrhea, which use open place for their defecation. In study area 2, We found that 58% of children are affecting by diarrhea out of 74% of children who use open place for their defecation and 35% of children are affecting by diarrhea, which use latrine for their defecation out of 26% of children who use latrine for their defecation.

Table 2. Diarrheal disease of children in relation to their Sanitation factors at Kalaroa upazilla (Study area 2).

Parameter		CHILD					KT	KT%	KDT	KDT%
Age	Month	0-12	13-24	25-36	37-48	49-60				
Number	Person	9	5	15	18	18	65			
	Person (diarrheal affected)	4	3	12	9	6			34	52
Breast feeding	Present	7	4	9	4	-	24	37	9	38
	Past	-	-	4	11	15	30	46	17	57
	None	2	1	2	3	3	11	17	8	73
Hand wash before eating	Only water	7	4	12	14	15	52	80	30	58
	Soap	2	1	3	4	3	13	20	4	31
Drinking water	Direct	4	3	6	9	5	27	42	18	67
	Direct + reserving	4	1	3	5	11	24	36	11	46
	Reserving	1	1	6	4	2	14	22	5	36
Depth of tubewell	80-120ft	2	1	5	2	4	14	22	8	57
	121-160ft	5	3	7	13	9	37	57	19	51
	160ft+	2	1	3	3	5	14	21	7	50
Distance between tubewell & latrine	0-10ft	1	-	1	3	2	7	11	6	86
	11-20ft	2	1	5	3	3	14	22	10	71
	21-30ft	-	1	-	2	2	5	8	2	40
	30ft+	6	3	9	10	11	39	60	16	41
Sources of bathing water	Pond	2	1	8	13	14	38	58	24	63
	Tubewell	7	4	7	5	4	27	42	10	37
Defecation of child	Open place	9	5	11	13	10	48	74	28	58
	Latrine	-	-	4	5	8	17	26	6	35

KT: Total no. of children is conducted for study at Kalaroa upazilla.
KT%: The percentage of children at Kalaroa upazilla.
KDT: Total no. of children is suffered from diarrhea at Kalaroa upazilla.
KDT%: The percentage of children are suffered of diarrhea at Kalaroa upazilla.

Socio-economic conditions of parents (mother)

Socio-economic conditions of child's parents at Labsa village of Satkhira sadar upazilla and at Sonabaria village of Kalaroa upazilla under the district of Satkhira play an important role to their child's care and health. In Table 3, We present the relationship between mother's education, awareness by media, cleanliness after defecation and using sources of water for cooking in relation to their child's diarrheal disease.

Education

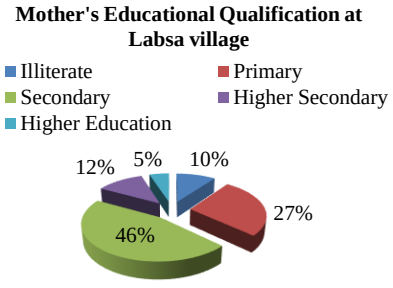

Fig. 5. The percentage of mother's education at Labsa village of Satkhira sadar upazilla (Study area 1).

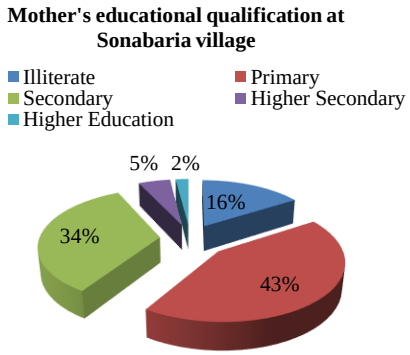

Fig. 6. The percentage of mother's education at Sonabaria village of Kalaroa upazilla (Study area 2).

In the study area 1, It was found that 10% of child's mother are illiterate, 27% of child's mother are primary level educated, 46% of child's mother are secondary level educated, 12% of child's mother are higher secondary level educated and 5% of child's mother are higher educated (Figure 5). In the study area 2, 16% of child's mother are illiterate, 43% of child's mother are primary level educated, 34% of child's mother are secondary level educated, 5% of child's mother are

higher secondary level educated and 2% of child's mother are higher educated (Figure 6).

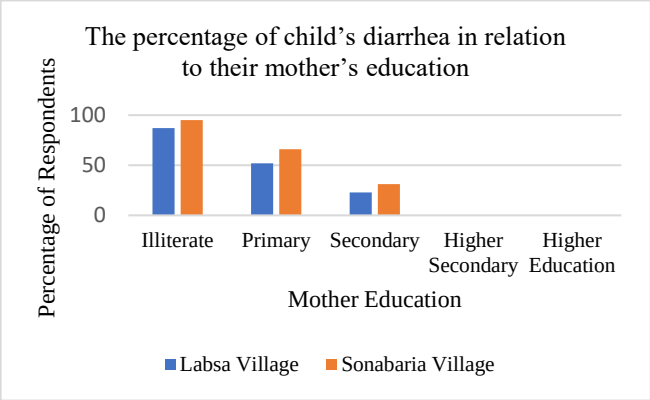

Fig. 7. The percentage of child's diarrhea in relation to their mother's education time at Labsa village of Satkhira sadar upazilla (Study area 1) and Sonabaria village of Kalaroa upazilla (Study area 2).

Mother's educational qualification has a great impact on their child's diarrheal disease. In study area 1, we found that 87% of children are affecting by diarrhea, whose mother are illiterate, 52% of children are affecting by diarrhea whose mother are primary level educated, 23% of children are affecting by diarrhea, whose mother are secondary level educated and there is no child's diarrhea, whose mother are higher secondary and higher level educated. In study area 2, we found that 95% of children are affecting by diarrhea, whose mother are illiterate, 66% of children are affecting by diarrhea primary level educated, 31% of children are affecting by diarrhea, whose mother are secondary level educated and there is no child's diarrhea, whose mother are higher secondary and higher level educated (Figure 7).

Cooking food

Cooking water has a great role on child's diarrheal disease. In the study area 1, it was found that 97% of child's mother use tubewell water for cooking and 3% of child's mother use pond's water for cooking. We found that 45% of children are affecting diarrhea, which mother use tubewell water for cooking and 100% of children are affecting by diarrhea, which mother use pond's water for cooking. In the study area 2, It was found that 52% of child's mother use tubewell water for cooking and 48% of child's mother use pond's water for cooking. We found that 46% of children are affecting diarrhea, which mother use tubewell water for cooking and 58% of children are affecting by diarrhea, which mother use pond's water for cooking (Table 3).

Table 3. Socio-economic conditions of mother of diarrheal affected children at Satkhira sadar and Kalaroa upazilla.

Parameter		Area	MOTHER					SMT	KMT	SMT%	KMT%	SDT	KDT	SDT%	KDT%
Age	Year		18-21	22-25	26-29	30-34	35-39								
Number	Person	SSU	6	15	6	2	3	32				15			
		KU	5	24	14	4	3		50				26		
Awareness by enjoying media	Enjoying media	SSU	4	12	5	3	1	25		78		11		44	
		KU	4	19	11	3	3		40		80		18		45
	Enjoying no media	SSU	1	3	2	-	1	7		22		4		57	
		KU	1	5	3	1	0		10		20		8		80
Source of water for cooking	Tubewell	SSU	6	14	6	2	3	31		97		14		45	
		KU	3	16	6	1	1		26		52		12		46
	Pond	SSU	-	1	-	-	-	1		3		1		100	
		KU	2	8	8	3	2		24		48		14		58
Cleanliness after defecation	Soap	SSU	3	8	4	2	1	18		56		5		27	
		KU	4	18	6	-	-		28		56		10		36
	Ashes	SSU	1	4	2	1	0	8		25		5		62	
		KU	1	4	5	1	1		12		24		8		67
	Soil	SSU	0	3	2	0	1	6		19		5		83	
		KU	-	2	3	3	2		10		20		8		80

SMT: Total no. of child's mother is conducted for study at Satkhira sadar upazilla.
SMT%: The percentage of child's mother at Satkhira sadar upazilla.
SDT: Total no. of children are suffered of diarrhea for family at Satkhira sadar upazilla.
SDT%: The percentage of children are suffered of diarrhea for family at Satkhira sadar upazilla.
KMT: Total no. of child's mother is conducted for study at Kalaroa upazilla.
KMT%: The percentage of child's mother at Kalaroa upazilla.

KDT: Total no. of children are suffered of diarrhea for family at Kalaroa upazilla.
KDT%: The percentage of children are suffered of diarrhea for family at Kalaroa upazilla.
SSU: Satkhira sadar upazilla
KU: Kalaroa upazilla.

Socio-economic conditions of parents (father)

Socio-economic conditions of child's parent (father) at Labsa village of Satkhira sadar upazilla and at Sonabaria village of Kalaroa upazilla under the district of Satkhira play an important role to their child's care and health. In Table 4, We present the relationship between father's awareness by enjoying media (Radio or TV or both), using different types of latrine and using drinking water reserving pot in relation to their child's diarrheal disease.

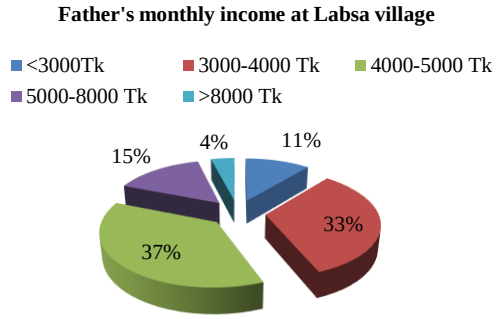

Fig. 8. The percentage of father's monthly income at Labsa village of Satkhira sadar upazilla (Study area 1).

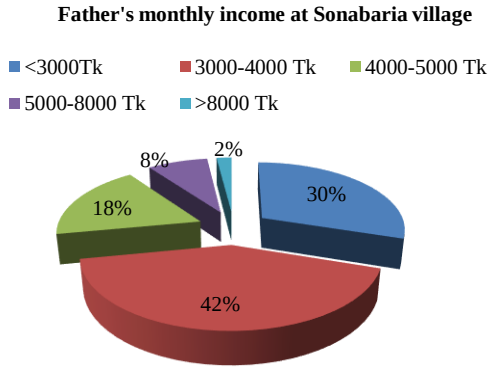

Fig. 9. The percentage of father's monthly income at Sonabaria village of Kalaroa upazilla (Study area 2).

In the study area 1, it was found that 11% of child's father having income <3000 Tk per month, 33% of child's father having income 3000-4000 Tk per month, 37% of child's father having income 4000-5000 Tk per month, 15% of child' fathers having income 5000-8000 Tk per month and 4% of child's father having income above >8000 Tk per month (Figure 8). In the study area-2, it was found that 30% of child's father having income <3000 Tk per month, 42% of child's father having income 3000-4000 Tk per month, 18% of child's father having income 4000-5000 Tk per month, 8% of child's father having income 5000-8000 Tk per month and 2% of child's father having income above >8000 Tk per month (Figure 9).

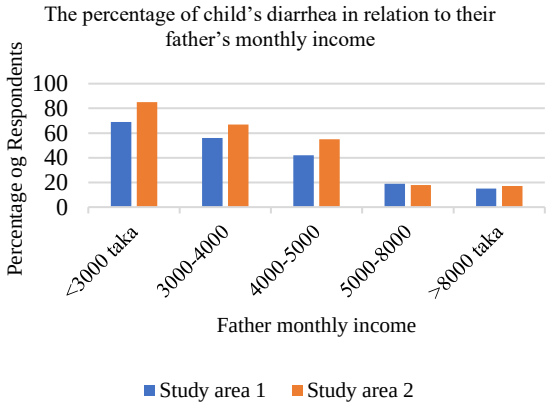

Fig. 10. The percentage of child's diarrhea in relation to their father's monthly income.

In study area 1, Father's monthly income has a great effect on their child's diarrheal disease. 69% of children are affecting by diarrhea, whose father having income of less than 3000 Tk per month affected by diarrhea. Father having income above 8000 Tk 15% of children affected by Diarrhea. In study 2 found that 85% of children are affecting by diarrhea, whose father having income <3000 Tk per month, 67% of children are affected by diarrhea and 55% of them have Diarrhea, whose father having income 3000-4000 and 4000 – 5000, respectively (Figure 10).

Table 4. Socio-economic conditions of fathers of diarrheal affected children at Satkhira sadar and Kalaroa upazilla.

Parameter		Area	FATHER					SFT	KFT	SFT%	KFT%	SDT	KDT	SDT%	KDT%
Age	Year		25-29	30-34	35-39	40-44	45 +								
Number	Person	SSU	13	9	4	3	3	32				15			
		KU	13	22	8	6	1		50				26		
Enjoying by media	Television/ TV+ Radio	SSU	10	6	3	2	2	23		72		9		39	
		KU	9	15	6	5	-		35		70		15		42
	Radio	SSU	1	1	-	-	-	2		6		1		50	
		KU	1	2	-	-	-		3		6		2		67
	None	SSU	2	2	1	1	1	7		22		5		71	
		KU	3	5	2	1	1		12		24		9		75
Latrine quality	Hygienic-1	SSU	6	2	1	1	-	10		31		4		40	
		KU	4	9	2	-	-		15		30		7		47
	Hygienic-2	SSU	3	2	-	-	1	6		19		2		33	
		KU	2	3	2	1	-		8		16		4		50
	Hygienic-3	SSU	3	1	-	1	-	5		16		2		40	
		KU	2	4	2	1	-		9		18		4		44
	Unhygienic	SSU	1	2	2	-	-	5		15		3		60	
		KU	2	2	1	1	1		11		22		7		63
	None	SSU	-	2	1	1	2	6		19		4		67	
		KU	3	4	1	3	-		11		22		7		63
Water reserving pot	Zinc + Tin	SSU	10	6	2	2	2	22		68		10		45	
		KU	8	10	3	2	-		23		46		11		47
	Plastic	SSU	1	1	1	1	-	4		13		2		50	
		KU	2	8	2	1	1		14		28		8		57
	Mud	SSU	2	2	1	-	1	6		19		3		50	
		KU	3	4	3	3	-		13		26		7		54

SFT: Total no. of child's father is conducted for study at Satkhira sadar upazilla.
SFT%: The percentage of child's father at Satkhira sadar upazilla.
SDT: Total no. of children are suffered of diarrhea for family at Satkhira sadar upazilla.
SDT%: The percentage of children are suffered of diarrhea for family at Satkhira sadar upazilla.
KFT: Total no. of child's father is conducted for study at Kalaroa upazilla.
KFT%: The percentage of child's father at Kalaroa upazilla.
KDT: Total no. of children are suffered of diarrhea for family at Kalaroa upazilla.
KDT%: The percentage of children are suffered of diarrhea for family at Kalaroa upazilla.
SSU: Satkhira sadar upazilla
KU: Kalaroa upazilla.

Latrine

In this study, hygienic 1 latrine means pacca latrine including concrete slab and adequate rings or house system. Hygienic 2 latrine is not pacca latrine but including concrete slab and above 6 rings. Hygienic 3 latrine includes 4-6 rings. Unhygienic latrine includes 1-3 rings or floating latrine.

Different types of latrine play an important role on child's diarrheal disease. In the study area 1, 31% of child's father use hygienic1 latrine, and 19% have no latrine for defecation of their child. 40% of children are affecting by diarrhea, which father use unhygienic latrine. 60% of kids are affected by diarrhea due to father using unhygienic latrine 67% by diarrhea. In the study area 2, it was found that 30% of child's father use hygienic 1 latrine. 47% of children are affecting by diarrhea for hygienic 1 latrine, 53% of children are affecting by diarrhea, which father use unhygienic latrine, and 63% of them have no latrine for defecation of their child (Table 4).

Diarrhea is one of the deadliest diseases of childhood in the world. It has a synergistic relationship with malnutrition. In Bangladesh, 90% of pre-school children suffer from some degree of malnutrition and as in many other countries; diarrhea is one of the most important causes of malnutrition and child mortality. There is a high percentage of diarrhea related death amongst children under 5, which is estimated at 723 deaths every day.

Conclusions

Each year, about 4 billion episodes of diarrhea result in 2.2 million fatalities, the majority of whom are children under the age of five. This equates to one child every 15 seconds dying. In poor nations, these fatalities account for around 15% of all child deaths under the age of five. Interventions in water, sanitation and hygiene reduce diarrheal illness by one-quarter to one-third on average. New hygienic solutions are required and the process of acquiring latrines and sewers must be made easier and supported both legislatively and financially. Water that is free of fecal pollutants must continue to be the responsibility of public authorities. The removal of human stools from the residential environment should be the emphasis of hygiene promotion in the private sector. For a child's survival, we must provide safe sanitation, clean water and a sanitary atmosphere.

Recommendations

A number of methods to control the transmission of organisms in the community and from person to person can avoid acute diarrheal illnesses. The feces oral route is transmitted by Diarrheal illnesses. Hand washing is thus regarded a significant barrier to enteric infections transmission (Wolf *et al*., 2018). The risk of diarrheal illnesses by hand washing soap has been calculated at 42%–47% for studies in developing countries, the US and Australian children's care (Bennett *et al*., 2014). Therefore, parents and caregivers should effectively handwash soap before preparing meals, feeding their children and leaving the restroom (Oloruntoba *et al*., 2014; Centres for Disease Control and Prevention, 2016a, b).

Some of the activities linked to children diarrhea included early breastfeeding initiation, breastfeeding maintenance, complementary feeding, time to start complementary feeding, sanitation of complementary meals, and child vaccination. Breast milk, which is high in nutrients, has been shown to reduce the risk of infectious illnesses, especially acute diarrhea (Kramer *et al*., 2003; Bhandari *et al*., 2003).

Educated women are better able to break away from tradition to use modern methods of child protection (Cleland and Ginneken, 1988), as well as make independent decisions about their children's health, resulting in increased use of modern healthcare facilities (Caldwell, 1979).

After defecation, washing hands with soap, dirt, or ash reduces contamination compared to washing with water alone, yet rinsing with contaminated water can re-contaminate hands (Hoque, 2003). Sanitation prevents feces from contaminating water supplies and the environment in which people live, work, play, and travel on a daily basis. Several studies have found a strong link between better latrines and lower diarrheal illness rates (Meddings *et al*., 2004; Moraes *et al*., 2003; von Schirnding *et al*., 1991; Young and Briscoe, 1988).

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