



Project Report

On

Factors associated with diarrheal diseases in under-five children: a cross-sectional study conducted among patients admitted in gastrointestinal department of Dhaka Shishu Hospital

Submitted To:

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Date of submission: 11-05-2021

LETTER OF TRANSMITTAL

Date: 11 May 2021

Dr. Sheikh Mahatabuddin

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Subject: Submission of project work Report.

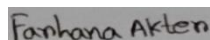
Dear Sir,

I am here by submitting my project work report on which is a compulsory requirement of the NFE Program curriculum. I have got the opportunity to work in Dhaka Shishu Hospital in Paediatric Gastroenterology, Hepatology & Nutrition department for 60 days, under the supervision of Sabrina Makbul, Senior Nutritionist, of Paediatric Gastroenterology, Hepatology & Nutrition department of DSH.

This project report gave me both academic and practical exposures. First of all I learned about clinical nutritional assessment of Diarrhea, facility-based management of children with severe acute malnutrition guidelines and counseling of children diet. Secondly, the internship gave me the opportunity to develop and enrich my theoretical knowledge I have acquired during the study period.

I am submitting this Project report for your kind consideration and also shall be highly obliged if you are kind enough to receive this report and provide your valuable judgment.

Sincerely yours,



.....

Farhana Akter

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CERTIFICATE OF APPROVAL

We are pleased to certify that the project report on conducted by **Farhana Akter** student ID No: **171-34-616** of the department of Nutrition and Food Engineering has been approved for presentation and defense/viva-voice. Under my supervision Farhana Akter worked in Dhaka Shishu Hospital as an intern.

We are pleased to hereby certify that the data and finding presented in the report are the authentic work of Farhana Akter. We recommended the report presented by Farhana Akter for further academic recommendations and defense/viva-voice. Farhana bears a strong moral character and a very pleasant personality. It has indeed a great pleasure working with her. We wish her all success in life.



20/07/2021

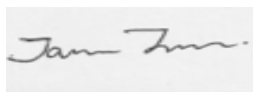
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ACKNOWLEDGEMENTS

Firstly, of all my gratitude and thanks to Almighty Allah's, the most merciful, kind and gracious guidance has made this work successful.

My Deep gratitude and sincere thanks to the honorable Dean Professor Dr. Ahmed Ismail Mustafa and the Associate Dean **Prof. Dr. Bellal Hossain** of Faculty of Allied Health Sciences who have given me the opportunity to attend this training program. I also very grateful to my respected teacher **Dr. Sheikh Mahatabuddin**, Associate Professor & Head of the department of Nutrition & Food Engineering.

My deep and sincere thanks to my academic supervisor **Tasmia Tasnim, Lecturer (Senior Scale), Department of Nutrition & Food Engineering, Faculty of Allied Health Sciences, DIU** for guiding me and for giving me the opportunity to initiate this report. More specifically, I would like to thank him for imparting his time and wisdom

I am very grateful to my internship supervisor, **Sabrina Makbul, Senior Nutritionist** of Paediatric Gastroenterology, Hepatology & Nutrition department of DSH for helping me with her valuable suggestions regarding internship. I am also grateful to **Shanta Roy, Dietician** of **DSH**. It would have been very difficult to prepare this report up to this mark without their guidance.

I would like to express my warmest thanks to **Ms. Fouzia Akter, Assistant professor**, and my batch advisor for her whole-hearted supervision during my organizational attachment period.

My gratitude goes to entire NFE department, under Faculty of Allied Health Sciences, Daffodil International University.

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Chapter One

1.1 Abstract:

Diarrhea is the leading cause of mortality among infants and children who are less than 5 years of age in both the developing and undeveloped countries. This is a cross-sectional study and focused on the causes linked to diarrheal diseases in children under the age of five. The study was done at the gastroenterology department of Dhaka Shishu Hospital located within Dhaka. Total 30 under-five years old children patient participated in the study.

Maternal education, family income, child hand washing before feeding and various other factors were investigated for their association with diarrheal cases. 43% of children's mothers were illiterate or had primary level education. 90% of children's mothers regularly washed hands but only 30% children washed hands with soap before meals. Our findings indicate that personal grooming and kitchen hygiene habits have a major impact on infant diarrhea. Diarrhea is associated with contaminated water, unimproved sanitation facility, and poor hygiene level in. In this project report, most of the child were under nutrition some mother were malnourished .Most of the parents were illiterate.

1.2 Introductions:

Diarrhea cause more morbidity and mortality rate among children and infant those are 6 month to less than 5 years old worldwide. Diarrhea is the second leading cause of post-neonatal who are under 5 years death accounting for 2.5 million per year globally among the other infectious disease. (According to the UNICEF) .About 1.3 million children less than 5 years die per year from diarrhea related disease which is the second highest the cause of children death in a particular sector of population. The most of these deaths occurred in India, Nigeria, Afghanistan, Pakistan and Ethiopia. Currently, Sub-Saharan Africa and Southeast Asia feel the highest burden of diarrhea related diseases with about 83% of deaths from diarrhea occurs in just fifteen countries (SRYAHWA publication).Diarrhea instead at reason malnutrition through reduces food appetite, low energy intake, nutritional loss and mal-absorption. In this project report all the patients were osmotic diarrhea. Osmotic diarrhea is very common condition of diarrhea.^[1]

Osmotic diarrhea occurs when too many solutes the indigents of the food you eat in your gut and cannot be properly absorbed. This excess water causes your bowel movements to become more fluid than solid. When our body cannot absorb food

substances properly that is osmotic diarrhea. Osmotic diarrhea is more similar to secretory diarrhea.^[2]

Diarrhea is a common symptom in numerous gastrointestinal infections cases. Gastrointestinal infections can be caused by large number of bacteria, virus, and protozoa and various other causes. Rotavirus and protozoa are the major cause of childhood diarrhea. This accounts for 40% of hospitalization diarrhea children. (SRYAHWA publication) Children who are malnourished and exclusive breastfed for six months to two year and health are not bad. This situation increases the risk of severe diarrhea which is a risk factor the death of children. The environmental factors are also increase the risk of osmotic diarrhea.^[1]

1.3 In Bangladesh:

Diarrhea is a major public health problem in Bangladesh. Diarrhea is defined as loose or its passage watery stool three or more times in a day. It is the leading cause of the children death in less than 6 month to 59 months of age. It is responsible for 477293 deaths about 5.4 million people demographically and 7062 deaths between the age of 6 month to 59 month.^[3] In 2017, 9960 Bangladeshi children under the age of five died worldwide and 7062 died. In Bangladesh, less than 45000 children die of children die of diarrhea per year by contaminated water, says a report of World Health Organization.^[4] Rural and urban both area people are suffering from diarrhea in Bangladesh. Dhaka is with 14 million residents, megacities and also overcrowding urban city in the Bangladesh. There is a lack of safe water and sanitation. We found high rate of diarrhea illness in every year. In the Dhaka city a major part of the population those are living in the slum area. There are several risk factors that are responsible for diarrhea unqualified health care practices, poor sanitation, lack of nutritional knowledge, lack of household diarrhea management practiced, lack of clean water and unhygienic environment.^[5] Oral rehydration use of salt solution and zinc supplement reduce the number of deaths from diarrheal by 0.8%. Continuous in Bangladesh more than 25% of deaths from diarrhea under 5 years age, of which was 40% were malnourished. A total 60% of occurs before 6 month of age and 90% of one year of age. Lack of exclusive breastfeeding, including malnutrition, young age infection, and improper use of antibiotics increase risk factors for diarrhea.^[6] In the latest Bangladesh Demographic and Health Survey (2004) found that 67% children of under the age of five suffer from diarrheal illness and they received in ORS.^[7] Osmotic diarrhea is defined by more or three times per day of large amount liquid or semi liquid stool. Osmotic diarrhea occurs when ingested, weakly dissolved solutions in the gut interfere with normal water and electrical friction increases the ratio of lines such as lactose and C fecal water output to the salt load ratio. Intestinal movements can be loose or liquid that solids. Too low in a fiber diet, low fat diet can lead to osmotic diarrhea. Magnesia or maldigestion of certain food substance such as milk

(carry lactose) that are the common fact of osmotic diarrhea, cosmetically active solutes attract enough fluid into lumen to exceed the ability re- absorptive capacity of the colon. Fecal water output increases in proportionally to the load of this solution the food ingredients in your food that stay in your intestine and cannot properly absorbed in to the water body. This extra water slows down or slows down your intestines movements to be loose or more liquid than solid. Providing to reduce osmotic diarrhea low fiber diet, low fat and lactose free feeding practice, and properly maintain hygiene.^[2]

Chapter Two

2.1 Causes that responsible for diarrhea:

There are many reasons behind in the diarrheal illness. Some causes are observed and some time some cause is not observed possible in some incident of diarrhea. One is the major common cause of diarrhea is infectious diarrhea. Virus, bacteria and parasites infection and food intolerance are major causes of diarrhea in Bangladesh. Infectious diarrhea is lasting less than 4 days and more than 14 days. Some infectious bacteria and virus don't go quickly without treatment. Some types of diarrhea go away within 4 days without doctor's consultant. Some diarrhea occurs in the environmental factors, socioeconomic conditions etc. ^[8]

2.2 There are three type of infection that is including in diarrhea:

- **Viral infections:**

In Bangladesh viral infection is a major cause that is responsible for diarrhea. There are many virus causes of making diarrhea. Rotavirus and Norovirus are the major type of virus that is responsible for diarrhea. Viral gastroenteritis is a common cause of acute diarrhea. ^[8]

- **Bacterial Infection:**

In Bangladesh bacterial infection is a major cause of diarrhea. Common type of bacteria *Campylobacter*, *Escherichia coli*, and *Shigella* is the major cause of making diarrhea. In Bangladesh (41-46) % acute diarrhea is responsible for *E.coli*. *E.coli* most important agent for childhood diarrhea those children age is under six month to 5 years old. Various types of bacteria can enter in body through the contaminated food and water cause of diarrhea. ^[8]

- **Parasitic infection:**

Parasitic infection is another type of infection that is responsible for diarrheal infection. Several types of parasites can enter in body through contaminated

food, water and enter in digestive tract. *Cryptosporidium enteritis*, *Entamoeba histolytica* and *Giardia lamblia* this are including in the parasitic infectious diarrhea.

Infections occur in the digestive tract that spread by foods or drinks are called food borne illness.^[8]

2.3 Other cause of diarrhea

Food Intolerances:

Most of the time we observed, children are suffering from the osmotic diarrhea that is occurs when food is not properly digest in the stomach. Food allergies and food intolerances is the major cause of diarrhea. People are face in the digesting problem in Carbohydrate such as lactose or proteins and some fructose presented foods.^[8]

Lactose intolerances:

Lactose intolerance is the very common condition of diarrhea. Which condition occurs after eating or drinking those foods is not tolerance in the stomach, that is contain lactose such as cow milk or any kind of dairy products,^[8]

Fructose intolerance:

Fructose intolerance in another condition of diarrhea, which occurs after eating or drinking foods that is not tolerance in the stomach. Those contain fructose, sugar such as fruits juice fruit pulp and honey, high fructose corn syrup and including artificial sweetness, sorbitol, sugar-free candies and also gum, and sugar alcohols.^[8]

Chapter Three

3.1 Health affects that cause by diarrhea:

Diarrhea disease may be negative impact in children heath. It can be negative effect in both physical development and mental development in the children. Childhood malnutrition resulting from any reason reduces physical development and work productivity in adults, its primary cause of childhood malnutrition, significant effect in the mental development and health, Electronic imbalances, kidney impairment, heart failure, dehydration, severe nausea and vomiting also defective immune system responses also the cause of diarrhea. ^[9]

❖ Dehydration:

Dehydration is the common complication of diarrhea. It is more danger in children than younger. Diarrhea is a major cause of dehydration. Dehydration is when your

body loses large amounts of electrolytes and losing fluids that is dehydration. Dehydration is the life threatening risk.

Severe dehydration: at least two of following signs observed when dehydration is occurs in a body

- Lethargy/ unconsciousness of children
- sunken eyes of children
- unable to drinking
- skin pinch goes back very slowly

Some dehydration: at least two of following signs observed when dehydration is occurs in body

- restlessness, irritability of children
- sunken eyes of children
- drink unenthusiastically, thirsty

Some time observed no signs of dehydration. ^[10]

❖ **Malabsorption:**

Malabsorption refers in the disorders that unable to absorbed nutrients from food are not absorbed properly during digestive system in the small intestine. There are some causes of produce in Malabsorption as intestine infection, long time use antibiotic and diarrhea. Diarrhea is a major cause of Malabsorption. Sometime Malabsorption is responsible for malnutrition. When Malabsorption happen bad smelling and loose stool passing. That time change in appetite in the children, weight loss etc. ^[11]

Malnutrition

Malnutrition is also life threatening risk in the diarrhea patient .Children who die from diarrhea often suffer from underlying malnutrition, which makes it more risky to diarrhea. Each diarrhea episode turns out, making them malnutrition worse. Diarrhea is a major cause of malnutrition in children under five year's age. These children are suffering from malnutrition them also facing other health complication stunting, wasting, underweight, marasmus, and kwashiorkor. ^[10]

❖ **Electrolyte imbalance**

When our body lose lots of electrons that time we face an electrolytic imbalance. Diarrhea can last several days, and leave the body lose lots of water and salts that

are necessary for survival. Our body loses of sodium, Potassium, and Magnesium (that play a key role in vital bodily functions). [12]

❖ **Nausea and vomiting:**

There are many cause of vomiting .One of the main cause of diarrhea when your body is suffering from diarrhea you also face nausea and vomiting is the common symptoms of diarrhea. Most of the time nausea, vomiting and diarrhea occur together. Vomiting is the one of the common cause of dehydration, body lose fluids. [13]

❖ **Kidney fails and organ damage**

When our body suffering from diarrhea our body face dehydration that is why we loss of water stools, not enough blood/ fluid is supplied to the kidneys. Drink plenty of fluids to replace what's lost from the body. Diarrhea plays a vital role as responsible for acute renal failure. If the body is infected with diarrhea a long term severe amount of excretory fluid can cause a severe loss, that condition is called hypovolemia, hypovolemia which reduce the blood supply to the kidney, which is the reason of damage kidney. [14]

3.2 Osmotic diarrhea common cause:

Osmotic diarrhea occurs significantly active, the presence of poorly absorbed solvents in the intestine lumen that inhibit normal water and electrolyte absorption. Some antibiotics, certain blood pressure medication, chemotherapy, high dose radiation therapy, gallbladder remover. Osmotic diarrhea causes fluid retention in the bowel. Stool volume greater than 200ml per day, relived by fasting, stool sodium level 30, stool potassium level 30 stool osmotic Gap greater than 50 m. osmoles/kg and stool osmolality hypotonic Some records such as lactose and citrate of magnesia or maldigestion of certain food substances such as milk are common cause of osmotic diarrhea. An increased osmotic load on the stool can be measured. This kind of diarrhea ceases with fasting.

Ingredients that often cause osmotic diarrhea

- Food allergy
- Food intolerance such as lactose that found in the dairy products
- Some carbohydrate that found in the fruits.
- Carbonated drinks
- legumes
- Artificial sweetness such as aspartame.
- Some medication and medical treatment also include cause of osmotic diarrhea. [2]

Chapter Four

4.1 Materials and methods

Study site

The study was done at the gastroenterology department of Dhaka Shishu Hospital located within Dhaka city. It is Dhaka's largest children's hospital, with referrals coming from all over the country, especially those who succumb to malnutrition for various reasons.

Methodology

This is a cross-sectional study and focused on the causes linked to diarrheal diseases in children under the age of five. A structured questionnaire was created using questions that had previously been used in related experiments. The standardized questionnaire was used to collect data on variables related to socioeconomic, cultural, behavioral and health-related variables. There were face-to-face administrative questionnaires and an assessment tool used to collect information.

Data collection procedure

The methods of data collection on the socioeconomic, environmental, behavioral factors and health-related based were collected using structured questionnaires. Data were collected by interviewer administered interview and some observation with the help of semi structured questionnaires. The questionnaires were prepared by our respected teacher (Tasmia Tasnim). One B.Sc nursing supervisor (who is trained data collector) was help me collect the data in the hospital, and also help in my trainer. Most of the data I was collect in the observation of the patient and the data were collected using face to face question on the caregiver, under the supervisor and trainer to elaborate the childhood illness, and ask the mother if children had diarrhea in the last few days and also asked the number of stool passing per day. The supervisor and trainer had been monitoring on the objectives of the study, method of collecting data how to fulfill the questioner and the ethical aspect in the approaching the participants of the patient and their caregivers which should be polite and respectful manner. In this study all of the children I were found in the osmotic diarrhea the child age is Six month to less than five years old. Eventually the data were coded, entered and analyzed. ^[15]

Ethical consideration:

There were participants were asked to enroll and were told that they had the right not to respond to questions that they did not want to and could stop at any stage of survey they wanted it to. Purpose the study was intended for respondents, and was taken from orally informed consent was obtained from participants. The confidentiality of the information was maintained by keeping anonymous personal identifiers. The children were found with osmotic diarrheal disease during word to word visit for data collection was associated with health benefits for advanced treatment, and also a proper diet plan for diarrheal children variable research.^[16]

Variables

The research looked at three areas for risk factors of diarrhea: socioeconomic aspects of the family, such as the mother's marital status, residency status, and the number of occupants in the home, the mother's and father's occupations, the presence of electricity and a refrigerator in the home, the type of bathroom, and the type of beds, as well as home kitchen and radio. Use of soap for hand washing, mother's hand washing at crucial moments, drinking water treatment, latrine supply, distance from water source, and type of drinking water source, child hand cleanliness, child finger nail status and method of disposal of solid waste from child feces are both environmental and behavioral variable.

4.2 Results

A total of 30 under (6-59) months children/mothers pair participated in the study with a 100% response rate. The majority of the interview respondents 27(90%) comprised mothers of the 12–23 months children and the remaining 12(2%) were care-givers older than 24 months. The majority of the mothers (90.4%) were married. Most mothers (79%) had one under-five child. According to the results of the study, 56% mothers and 87% of the fathers had education above secondary level. Regarding employment status of the mothers and husbands, all the mothers were housewives and 73% of the fathers were farmers or self-employed. The majority of households (76.4%) had less than 5 members. The majority of households had a family monthly income above 15000 BDT. Almost half of the households had more than 5 family members. Table 1 summarizes all information related to socio-demographic characteristics of the respondents.

Mothers' hand washing habits at crucial moments revealed that majority of children had habit of regular washing of hands but did not always use soap before having their meals. More than half of the mothers (60.2%) used soap to wash their hands sometimes. Household water treatment (of some kind) was used by 150 (24.6%) of the households. As shown in figure 1, the water treatment method mostly adopted is the filter followed by boiling method and lastly use of SODIS. In terms of latrine accessibility, all the households had their own toilet facilities. When investigating about the health characteristics of the children, almost all the respondents presented with watery diarrhea, were suffering from diarrhea less 5 days and did not take any medicine as the hoped the disease will cure by itself and the number of children under 5 was majorly one.

Table 1 socio-demographic characteristic of respondents

Questions	Responses	N (%)
Gender of the child	Male	17
	Female	13
Age (months of the child)	12-23	27
	24 and above	3

Number of family members in the house	<5	15
	5 and above	15
Educational level of mother/caretaker	1. Illiterate or Primary school	13
	1. Secondary school and above	17
Occupation of the mother/caretaker	Housewife	30
	Government employee	0
	Private gainful work or others	0
Educational level of the father	Illiterate or Primary school	4
	Secondary school and above	26
Occupation of the father	Government employee	8
	Self employed or others	22

Family monthly income in BDT (amount =_____)	< 1500	8
	>15000	22

Table 2 hygiene practice and environmental characteristics

Variables	Responses	N (%)
Do you wash your hand with soap after toilet	Never	0
	Sometimes	3
	Always	27
Hand washing habit before meal	Never	0
	Sometimes	7
	Always	23 (76%)
Finger nail status of the child (Observation)	trimmed	15
	untrimmed	15
Source of drinking water for the child	Pipe water	14
	Protected well	10
	Protected spring	5
Is there any means of house hold water treatment	Yes	18
	No	12
Use of soap for hand washing for the child	Never	0
	Sometimes	21
	Always	9
Does the family have a latrine?	yes	30
	no	0
what type of latrine do you use?	Yard toilet	8
	Pit latrine with slab	16
	Open pit	6

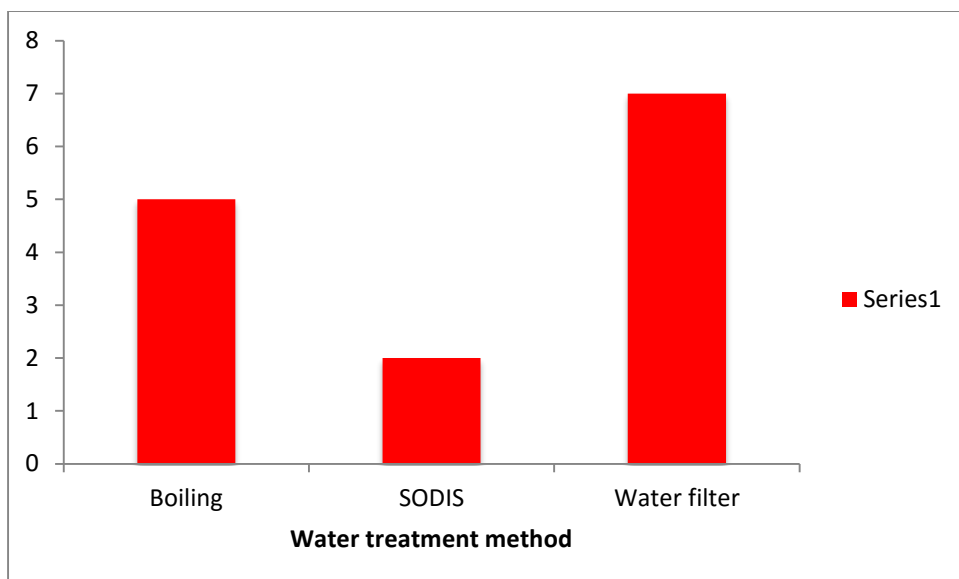


Figure 1 water treatment methods adopted by households

Table 3 health characteristics of respondents

Variables	Responses	N (%)
Type of diarrhea that the child has	Watery	30
	Bloody and mucus	0
	Other specify _____	0
For how long the diarrhea last?	Less than or equal to 7 days	25
	Greater than 7 days	5
Did the child take medication for diarrhea?	Yes	0
	No	30
If No, Why?	Expensive	0
	Distant shops	0
	It will cure by itself	30

Chapter Five

Discussion

Diarrhea has been identified as a significant cause of morbidity and mortality of children in developed countries. The current study was undertaken to investigate which factors are most prevalent among children under 5 years of age suffering from diarrhea. Diarrheal morbidity affects 3.2 children under the age of five worldwide last year (Kosek et al., 2003). It appears that not having the regular habit of washing hands with soap by the children, being male child, having age between 12-23 months and using pipe water as source of drinking water.

Previous many studies that were conducted in different geographical settings had also looked at factors associated with prevalence of diarrhea. A Bangladeshi study had indicated that maternal education, family income and child hand washing before feeding are the risk factors of diarrhea in rural areas.

It was seen that Ethiopia (Birke2008) and Rwanda (Sinharoy2016), the use of soap for hand washing less frequently by mothers before feeding their children was linked to a higher risk of diarrheal morbidity in children. Children whose mothers still wash their hands with soap before feeding them had a lower chance of being diarrheic than those whose mothers did not. Other related studies have shown that hand washing before feeding children is beneficial. Other related findings have shown that hand washing before serving children plays an important role in preventing diarrhoea and other diseases. Researchers discovered that girls aged 6–11 and 12–23 months had more diarrhoea. This difference in diarrhoea with baby age may be explained by the fact that children between the ages of 6 and 12 begin supplementary feeding, have immature immunity, begin creeping, and are at a greater risk of ingesting infected products, putting them at risk for diarrhoea. The higher diarrhoea prevalence in children aged 12-23 months in our study could be due to their increased exposure to the external environment, play in unsanitary places, eat alone with unclean hands, and start cleaning themselves after defecation, all of which put them at risk for diarrhea ((Mandal et al., 2011).

Low socio economic situation had always been held responsible for high prevalence of diarrhea (Kamal and Hasan, 2015) as poor setting promote ingestion of fecal infected water or food accelerates the spread of disease toxins in unhealthy environments. A study by Khan et al

(2018) displayed that majority of children who had higher episodes of diarrhea belonged to households with income less than 10,000 BDT.

Because of a lack of hygiene, the disease is more common in children under the age of five in developed countries. Inadequate sanitation is responsible for almost 90 percent of diarrheal disease. Hand washing habits of mothers and children were found to be very good in our research. Both mothers were required to wash their hands before and after feeding their children, as well as after both self and infant defecation. Both mothers washed their hands before and after feeding their children, as well as after self and infant defecation, demonstrating good personal hygiene. However, babies who did not use soap before feeding were more likely to have diarrhea than those who did. Cross contamination during feeding is caused by children's natural practice of touching anything. Just a water wash has been shown to be ineffective in removing microbes.

Conclusion

Our findings indicate that personal grooming and kitchen hygiene habits have a major impact on infant diarrhea. Maintaining good personal hygiene and improving kitchen sanitation practices can reduce the risk of diarrhea. As a result, an interventional program to minimize the risk of diarrhea should be implemented in this environment.

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