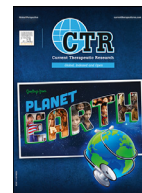




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Individual- and Community-Level Factors Associated with Diarrhea in Children Younger Than Age 5 Years in Bangladesh: Evidence from the 2014 Bangladesh Demographic and Health Survey

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ABSTRACT

Background: Diarrheal disease is among the leading causes of morbidity and mortality among children younger than age 5 years in Bangladesh.

Objective: The objective of this study is to assess the prevalence of diarrhea among children younger than age 5 years and its associated risk factors.

Methods: Data were sourced from the Bangladesh Demographic and Health Survey, a nationally representative study conducted in 2014. We used multilevel logistic regression models to identify factors associated with diarrheal disease.

Results: Children aged 6 to 11 months (odds ratio = 2.26; 95% CI, 1.50–3.42), and 12 to 23 months (odds ratio = 2.31; 95% CI, 1.62–3.31) were more likely to have diarrhea than older children. Other significant risk factors for diarrheal infection included households without access to drinking water (odds ratio = 1.39; 95% CI, 1.03–1.88) and mothers lacking mass media access (odds ratio = 1.32; 55% CI, 1.01–1.73).

Conclusions: Childhood diarrhea in Bangladesh was associated with individual- and community-level factors. The finding of this study suggests that diarrhea prevention programs in the country can effectively be delivered by targeting young children through expanding community-based education and increasing access to health information through mass media.

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Introduction

Diarrheal disease is the second leading cause of morbidity and mortality among children younger than age 5 years, with an estimated global account of 525,000 annual deaths.¹ Developing countries bear the majority of childhood diarrhea burden.^{1,2} In 2016, around 90% of childhood diarrhea infections occurred in developing countries throughout Asia, Africa, and Latin America.³ A report in 2014 suggested that more than two-thirds of childhood deaths in developing countries were attributed to diarrheal diseases.⁴ Sus-

tainable Development Goal (SDG) 3.2 has targeted to reduce the mortality rate in children younger than age 5 years to <25 per 1000 live births, whereas SDG 3.3 has targeted to eradicate waterborne and other infectious diseases by 2030.⁵ Overall, the SDG 3 aims to reduce disparities in access to health care services and ensure good health and well-being.⁵ Identifying disparities in the prevalence of preventable diseases is critical to inform relevant policies and strategies toward achieving these goals, particularly in developing countries.

Bangladesh has made substantial progress in improving the health of children over the past few years like improvements in nutritional status and overall morbidity reductions.⁶ However, childhood diarrhea was identified as among the leading causes of death in 2015.⁷ According to the United Nations Children's Emergency Fund, the mortality rate among children younger than age 5 years in Bangladesh has declined from 143 to 30 per 1000 live

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births from 1990 to 2018.⁸ Both mortality in children younger than age 5 years and childhood stunting (ie, low height compared with age) rates reduced significantly over the past 2 decades.^{8,9} However, trends in the prevalence of childhood diarrhea remained mostly unchanged during the same period.⁹ Furthermore, the reduction in childhood diarrhea has not been achieved equally across the various regions of Bangladesh because of difficulties in reaching some of the remote regions and differences in administrative structures.¹⁰

Several studies assess the prevalence and identified risk factors of childhood diarrheal diseases at a national, regional, and international level.^{10–12} Aligning with Bronfenbrenner's ecological model,¹³ the potential determinants of diarrheal diseases in children younger than age 5 years included individual- and community-level factors. In Bangladesh, children's access to food and health care is suboptimal, which resonates with community-level factors, and is often implicated in high childhood morbidities from malnutrition and diarrheal diseases.^{14–16} In contrast, children with better health care access and food security, as was found in urban rather than rural children, are less prone to diarrheal diseases and associated adverse outcomes.¹⁰ A recent study in Bangladesh reported substantial variation in the proportion of children experiencing diarrheal episodes across 7 large administrative regions.¹⁷ Other studies have identified that childhood diarrhea was associated with an incomplete immunization schedule,¹⁸ a lack of access to child health care,¹⁹ maternal age,²⁰ maternal religion,²¹ a lack of water for handwashing,²² and mud floors in the household.²³ Access to improved sanitation and water is associated with a lower risk of childhood diarrhea worldwide, and this association is more robust in developing countries.^{24,25} Additionally, maternal education was found inversely related to childhood diarrhea risks,^{16,26} and so was maternal access to mass media, including newspapers, radio, and television.¹⁶ Mothers who received a soft loan for business and other purposes had children who experienced fewer diarrheal diseases.²⁶ Furthermore, children living in crowded residential conditions tend to have an increased risk of diarrheal diseases.^{27–29}

In our current research, the variation in the prevalence of childhood diarrhea was studied using hierarchical factors, including 7 administrative divisions (Barisal, Khulna, Rangpur, Sylhet, Rajshahi, Chittagong, and Dhaka), local place of residence (urban and rural areas), and the demographic characteristics of the children. Acknowledging that hierarchical factors may play substantial roles in childhood diarrhea occurrence, a multilevel (hierarchical) approach to the statistical modeling of potential risk factors is prudent. Therefore, the current study examines individual- and community-level factors for childhood diarrhea using a multilevel modeling framework. The multilevel technique examines the covariates systematically at distinct levels of hierarchy that affect the occurrence of childhood diarrhea in Bangladesh. The study also aims to inform regional childhood diarrhea prevention policies and formulate regionally tailored guidelines in Bangladesh.

Methods

Source and study population

Bangladesh is a tropical country located in the northeastern part of South Asia. According to the Population and Housing Census of 2011, Bangladesh is the most densely populated country in the world (among countries larger than 10,000 km²), and the population of the country is estimated to be about 157.9 million.⁹ We used data from the Bangladesh Demographic and Health Survey (BDHS), a nationally representative cross-sectional survey conducted during June through November 2014. The [Figure 1](#) shows the study design and data screening of BDHS 2014.

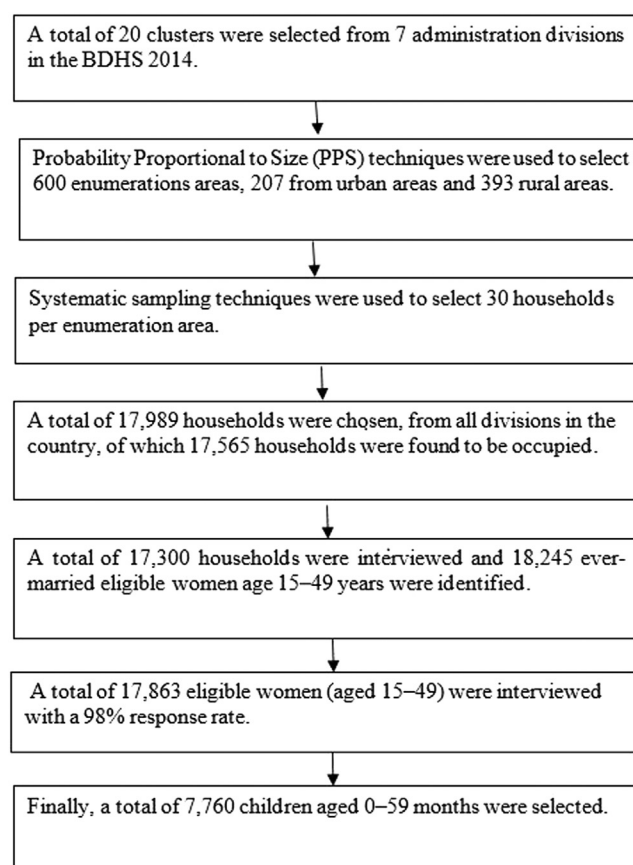


Figure 1. Study design and data screening within the Bangladesh Demographic and Health Survey (BDHS), 2014. PPS = probability proportional to size.

The survey was conducted using a 2-stage stratified sampling approach. In the first stage, 600 enumeration areas (207 urban and 393 rural) were selected using probabilities proportional to their size. In the second stage, an average of 30 households was selected from each enumeration area using a systematic random sampling technique. Thus 17,989 residential households were chosen from all divisions in the country. Then, a total of 17,300 households were interviewed, and 18,245 ever-married women aged 15 to 49 years were identified as eligible participants. Finally, a total of 17,863 ever-married women were interviewed at a response rate of 98%.³⁰

Study variables and definitions

The outcome variable was the occurrence or nonoccurrence of diarrhea among children younger than age 5 years, as reported by the child's mother. Diarrhea was defined as the passage of 3 or more loose stools in a day in the preceding 2 weeks during the conduct of the survey. No data on clinical examinations was collected.

To identify the risk of diarrhea, we used data at the individual and community levels according to the hierarchical nature of the BDHS data. Individual variables were related to information of the child, their mother (respondent), and the household, whereas the community variables were related to divisions and the places of residence of the respondents. Variables were selected for analysis based on existing literature and contemporary evidence from the study area.^{6,8–20,27,31–35}

There are almost 700 nongovernment microcredit organizations in Bangladesh. Microcredit organizations provide small loans to marginalized women in Bangladesh to support entrepreneurship and alleviate poverty.³⁶ In this study, we considered 5 major mi-

microcredit organizations (Grameen Bank, Association of Social Advancement (ASA), A Centre for Human Development (PROSHIKA), Bangladesh Rural Advancement Committee (BRAC), and Bangladesh Rural Development Board (BRDB)) to assess associations between the memberships of microcredit organizations and the incidence of childhood diarrhea. Mothers were grouped as those who were and were not a member of any microcredit organization. Through developing awareness, mothers' access to mass media such as newspapers, radio, and television may help to reduce their children's illness.³⁵ The original BDHS categorizes access to media into 4 groups: 0 = not at all, 1 = less than once a week, 2 = at least once a week, and 3 = almost every day, whereas in the current study mothers were grouped into 2 levels: those not having access to any media, and those having access to at least any 1 of the 3 aforementioned media. The BDHS data also contains a wealth index score as a proxy for household wealth status, which was generated using principal component analysis, combining variables related to household assets (televisions and bicycles), dwelling characteristics (source of drinking water and sanitation facilities), and construction materials (roof, ceiling, and floor). The details of the calculation of the wealth score are available in the BDHS 2014.³⁰ According to BDHS, wealth index analysis were used principal component analysis and classified the population into three groups as low, middle and high. Accordingly, 40% of participants were grouped as low income, another 40% classified as middle income and 20% in high income group.

The Joint Monitoring Programme of the World Health Organization/United Nations Children's Emergency Fund categorized the source of drinking water as improved (piped water, tube well or borehole, protected well, protected spring, rainwater, and bottled water) and unimproved (unprotected well, unprotected spring, river/irrigation channel, tanker truck, cart with small tank).³⁷ Similarly, the source of sanitation facilities was classified as improved (flush toilet: flush to the piped sewer system, flush to a septic tank, flush to a pit latrine, flush to somewhere else; pit toilet latrine, ventilated improved pit latrine, pit latrine with slab) and unimproved (no facility: bush/field, composting toilet, bucket toilet, pit latrine without a slab, hanging toilet/latrine, and other). The number of adults per living room was used to define household crowding. Households were classified as those with up to 2 adults (non-crowded or standard) or more than 2 adults per living room (overcrowded). Household floor material was categorized as made of mud, or other. Place of residence was defined as urban or rural. Bangladesh is demarcated by 7 administrative divisions or regions. The 7 divisions were recorded as Barisal, Khulna, Rangpur, Sylhet, Rajshahi, Dhaka, and Chittagong.

Statistical analysis

Respondents and their children's socioeconomic and demographic characteristics were descriptively analyzed. Pearson χ^2 tests were used to find the association between diarrheal disease among children younger than age 5 years and their parents' socioeconomic, demographic and community variables. We then performed a multilevel logistic regression analysis to identify the associations of these predictors with diarrheal disease according to the hierarchical nature of the BDHS data.³⁸ Three multilevel models were developed. In Model I, division was considered as the second level; in Model II, place of residence was considered as the second level; and in Model III, both division and place of residence were considered as the third-level source of variation. We used the Akaike information criterion and the Bayesian information criterion to select the best fitting model. A higher correlation among the predictor variables hinders the validity of regression models. Therefore we used the variation inflation factors (VIF) to check the possible collinearity among the set of predictor variables used in

the models. The test ensures that the models are properly specified and functioning correctly. Most research consider the acceptable threshold of VIF to be <10 , indicating the absence of collinearity among tested variables.³⁹ All statistical analyses were performed using SPSS version 25.0 (IBM-SPSS Inc, Armonk, NY), and the lme4 package of the statistical software R (R Foundation for Statistical Computing, Vienna, Austria). In all these analyses, a P value < 0.05 was considered statistically significant.

Ethical approval was obtained from the Human Research Ethics Committee of the Australian National University (approval No: 2019/893). The study was also approved by the National Research Ethics Committee of the Bangladesh Ministry of Health and Family Welfare.

Results

Maternal- and child-related characteristics

Table 1 describes maternal- and child-health-related characteristics of participants in this study. A total of 7760 mothers with their children between ages 0 and 59 months were included in this study. More than half (56%) of mothers have attended secondary or higher level of education, 60% of mothers had access to mass media, and 23% of them were members in microcredit programs. About 22.2% of mothers were classified as having high socioeconomic status, 36.3% as middle, and 41.5% as low. Pertaining to children: 52% were girls, and 60% were living in households with a floor made of mud. More than 19% of children belonged to households without access to improved water facilities, and 67% were from households with unimproved sanitation facilities. Only 14% of children were fully vaccinated, but 9% of them had a certificate of completion.

Community-level characteristics of participants

The majority of participants (74%) of this study were selected from rural areas of Bangladesh, and the remaining (26%) were from urban areas of the country. Study participants were selected from different regions/divisions of the country such as 5.7% from the Barisal division, 7.5% from Khulna, 9.9% from Rangpur, 9.9% from Sylhet, 10.3% from Rajshahi, 21.5% from Chittagong, and 35.2% were from Dhaka division.

Prevalence of diarrhea across different individual- and community-level factors

The overall prevalence of diarrhea among children younger than age 5 years was 5.7% in Bangladesh. The prevalence of diarrhea was almost the same between male and female children. Higher prevalence of diarrhea was observed among children between the ages of 12 and 24 months (8.5%) and in children without a health card (7.1%). Moreover, higher prevalence of child diarrhea was reported among children of mothers who were uneducated (6.1%), or young (aged 15–19 years) (6.3%), had no access to media (6.4%), had a lack of sanitation facilities (6.2%), and low socioeconomic status (6.0%). The highest prevalence of diarrhea was observed in Chittagong, followed by the divisions of Dhaka and Sylhet. Overall, children from the Chittagong (6.7%), Dhaka (6.5%), Barisal (6.5%), and Sylhet (6.1%) divisions were more likely to experience diarrhea than children from the Rangpur (2.7%), Khulna (3.6%), and Rajshahi (4.3%) divisions, which was statistically significant at $P < 0.05$ (Table 1).

Table 1
Descriptive analysis and bivariate results (χ^2 tests) of childhood diarrhea in Bangladesh; Bangladesh Demographic and Health Survey, 2014.

Variable	n	%	Prevalence (95% CI)
Overall	7760		5.7 (5.2–6.2]
Individual-level characteristics			
Age of child, mo*			
0–5	657	8.5	5.9 (4.1–7.7)
6–11	857	11.0	6.7 (5.0–8.4)
12–23	1633	21.0	8.5 (7.2–9.9)
24–35	1563	20.1	5.1 (4.0–6.2)
36–47	1535	19.8	4.0 (3.0–5.0)
48–59	1515	19.5	4.3 (3.3–5.3)
Sex			
Male	4051	52.2	5.7 (5.0–6.4)
Female	3710	47.8	5.6 (4.9–6.3)
Immunization status*			
Incomplete	6671	86.0	4.5 (4.0–5.0)
Complete	1089	14.0	8.1 (6.5–9.7)
Child health card†			
No	659	8.5	7.1 (5.1–9.1)
Yes	7102	91.5	5.1 (4.6–5.7)
Mother's age, y			
15–19	1135	14.6	6.3 (4.9–7.8)
20–29	4789	61.7	5.6 (5.0–6.2)
30–49	1836	23.7	5.6 (4.6–6.7)
Mother's education†			
No education/primary	3435	44.3	6.1 (5.3–6.9)
Secondary or higher	4325	55.7	5.3 (4.6–6.0)
Mother's access to mass media†			
No access	3000	38.7	6.4 (5.5–7.9)
Access	4761	61.3	5.2 (4.6–5.8)
Mother's microcredit membership†			
Not a member	5990	77.2	5.4 (4.8–6.0)
Member	1770	22.8	6.6 (5.4–7.8)
Mother's religion			
Others	137	1.8	5.1 (1.4–8.8)
Hindus	520	6.7	5.8 (4.0–7.8)
Muslim	7104	91.5	5.7 (1.8–9.6)
Drinking water source			
Unimproved	1540	19.8	6.0 (4.8–7.2)
Improved	6221	80.2	5.6 (5.0–6.2)
Washing facility			
No	1860	24.0	5.5 (4.5–6.5)
Yes	5901	76.0	5.7 (5.1–6.3)
Sanitation facility*			
Unimproved	5202	67.0	6.2 (5.5–6.9)
Improved	2558	33.0	4.7 (3.9–5.5)
No. of adults per room			
More >2 adults	5395	69.5	5.8 (5.2–6.4)
≥2 adults	2366	30.5	5.4 (4.5–6.3)
Household floor material			
Not mud	2905	37.4	5.2 (4.4–6.0)
Mud	4855	62.6	6.0 (5.3–6.7)
Socioeconomic status			
Low	3221	41.5	6.0 (5.2–6.8)
Middle	2819	36.3	5.6 (4.8–6.5)
High	1720	22.2	5.2 (4.2–6.3)
Community-level characteristics			
Division*			
Barisal	444	5.7	6.5 (4.2–8.8)
Khulna	580	7.5	3.6 (2.1–5.1)
Rangpur	768	9.9	2.7 (1.6–3.9)
Sylhet	771	9.9	6.1 (4.4–7.8)
Rajshahi	797	10.3	4.3 (2.9–5.7)
Chittagong	1668	21.5	6.7 (5.5–7.9)
Dhaka	2733	35.2	6.5 (5.6–7.4)
Place of residence			
Rural	5777	74.2	5.7 (5.1–6.3)
Urban	1984	25.6	5.6 (4.6–6.6)

* $P < 0.001$.† $P < 0.05$.

The association between individual- and community-level factors with the prevalence of diarrhea among children younger than age 5 years

Table 2 presents the results of multilevel logistic regression analysis, including adjusted odds ratios (ORs), and 95% CIs. Model

I was adjusted for individual-level explanatory variables, and division as a community-level variable; Model II was adjusted for individual-level explanatory variables, and place of residence as a community-level variable; and Model III was adjusted for individual-level variables, and division and place of residence as community-level variables. Considering Bayesian information crite-

Table 2
Multilevel logistic regression for childhood diarrhea in Bangladesh; Bangladesh Demographic and Health Survey, 2014.

Variable	Model I*	Model II†	Model III‡
Individual-level characteristic			
Age of child, mo			
0–5	1.07 (0.63–1.84)	1.07 (0.63–1.84)	1.07 (0.63–1.83)
6–11	2.26 (1.50–3.41) [§]	2.27 (1.50–3.42) [§]	2.26 (1.50–3.42) [§]
12–23	2.31 (1.61–3.30) [§]	2.31 (1.62–3.31) [§]	2.31 (1.62–3.31) [§]
24–35	1.25 (0.81–1.85)	1.26 (0.85–1.85)	1.26 (0.85–1.85)
36–47	1.22 (0.83–1.80)	1.23 (0.83–1.81)	1.23 (0.83–1.81)
48–59 (RC)	1.00	1.00	1.00
Child gender			
Female	0.85 (0.69–1.05)	0.85 (0.69–1.05)	0.85 (0.69–1.05)
Male (RC)	1.00	1.00	1.00
Child immunization			
Incomplete	0.97 (0.71–1.32)	0.96 (0.71–1.31)	0.96 (0.7–1.31)
Complete (RC)	1.00	1.00	1.00
Child health card			
No	0.94 (0.63–1.43)	0.97 (0.65–1.46)	0.97 (0.65–1.45)
Yes (RC)	1.00	1.00	1.00
Mother's age, y			
15–19	1.31 (0.91–1.90)	1.29 (0.89–1.86)	1.29 (0.89–1.87)
20–29	1.23 (0.93–1.62)	1.22 (0.9–1.61)	1.22 (0.93–1.61)
30–49 (RC)	1.00	1.00	1.00
Mother's education			
No education/primary	1.23 (0.97–1.57)	1.24 (0.98–1.58)	1.25 (0.98–1.58)
Secondary or higher (RC)	1.00	1.00	1.00
Mother's access to mass media			
No access	1.32 (1.01–1.73)	1.33 (1.00–1.75)	1.32 (1.01–1.73)
Access (RC)	1.00	1.00	1.00
Mother's microcredit membership			
Not a member	0.91 (0.70–1.18)	0.93 (0.71–1.21)	0.93 (0.71–1.21)
Member (RC)	1.00	1.00	1.00
Mother's religion			
Others	0.73 (0.22–2.41)	0.77 (0.23–2.52)	0.76 (0.23–2.51)
Hindus	1.05 (0.70–1.60)	1.03 (0.68–1.56)	1.03 (0.68–1.57)
Muslim (RC)	1.00	1.00	1.00
Drinking water source			
Unimproved	1.37 (1.01–1.86)	1.38 (1.02–1.88) [§]	1.39 (1.0–1.88)
Improved (RC)	1.00	1.00	1.00
Washing facility			
Yes	0.94 (0.54–1.63)	0.92 (0.53–1.59)	0.92 (0.53–1.60)
No (RC)	1.00	1.00	1.00
Sanitation facility availability			
Improved	0.94 (0.68–1.30)	0.95 (0.69–1.31)	0.94 (0.68–1.30)
Unimproved (RC)	1.00	1.00	1.00
No. of adults per room			
>2 adults	1.11 (0.87–1.42)	1.08 (0.85–1.38)	1.08 (0.85–1.39)
≤2 adults (RC)	1.00	1.00	1.00
Household floor material			
Not mud	0.91 (0.63–1.31)	0.90 (0.62–1.30)	0.90 (0.60–1.30)
Mud (RC)	1.00	1.00	1.00
Socioeconomic status			
Low	0.85 (0.48–1.52)	0.85 (0.50–1.28)	0.84 (0.47–1.50)
Middle	0.86 (0.57–1.29)	0.84 (0.40–1.51)	0.85 (0.56–1.27)
High (RC)	1.00	1.00	1.00
Community-level variables			
Place of residence			
Rural		0.96 (0.74–1.24)	
Urban (RC)		1.00	
Division			
Barisal	1.18 (0.80–1.75)		
Khulna	0.71 (0.45–1.12)		
Rangpur	0.52 (0.32–0.85)		
Sylhet	1.13 (0.79–1.63)		
Rajshahi	0.84 (0.55–1.28)		
Chittagong	1.39 (1.00–1.95)		
Dhaka (RC)	1.00		
AIC	2944.7	2951.1	2951.1
BIC	3131.8	3103.6	3103.6

AIC = Akaike information criterion; BIC = Bayesian information criterion; RC = reference category.

* Adjusted for individual and community level (division). Values are presented as adjusted odds ratio (95% CI).

† Adjusted for individual and community level (place of residence). Values are presented as adjusted odds ratio (95% CI).

‡ Adjusted for individual and community level (division and place of residence). Values are presented as adjusted odds ratio (95% CI).

§ $P < 0.001$.

|| $P < 0.05$.

tion, Model II and Model III performed equally well. As Model III is simpler in the sense that the model has fewer parameters, we will use outputs of this model as our main analysis, noting that ORs for the 3 models are similar throughout. All predictor variable used in the analysis were considered while checking possible collinearity. The aim was to exclude the predictor variables from the regression models because those may have higher correlation with other predictor variables. From the results of the analysis, we observed the minimum VIF for the variable mother's religion was 1.06, and the maximum VIF for the variable household floor material was 2.99. For all predictor variables included the models, the value of VIF is less than the threshold value of 10, indicating no multicollinearity among the predictor variables. Hence, none of the initially selected predictor variables was excluded from the regression analyses. Accordingly, the age of the child, mother's access to mass media, and source of drinking water were associated with childhood diarrhea. The odds of diarrhea also changed with the age group of the child, with higher odds in the younger age groups of 6 to 11 months (OR=2.34; 95% CI, 1.55–3.54) and 12 to 23 months (OR=2.38; 95% CI, 1.66–3.41). The odds of diarrheal infection in children whose mothers did not have access to media were elevated (OR=1.32; 95% CI, 1.01–1.73), as were those of children who lived in households with an unimproved water source (OR=1.39; 95% CI, 1.03–1.88).

Discussion

This study identified a high prevalence of diarrhea among children younger than age 5 years in Bangladesh. The highest prevalence of diarrhea was observed in the Chittagong division, followed by the divisions of Dhaka and Sylhet. A previous study in Bangladesh also found that the prevalence of diarrhea was significantly higher in the Chittagong division¹⁰ and lower in Rangpur.⁴⁰ This could be due to Chittagong being a major port city and riverine area that is prone to floods and natural disasters, which increases the risk of diarrheal diseases.⁴⁰ The increased prevalence of diarrhea in Dhaka might be related to the high population density, heavy traffic, seasonal floods, natural hazards, and a high number of slum dwellers.⁴¹ Moreover, this prevalence was higher than findings from Pakistan, Nepal, India, and China. This could be due to the socioeconomic and health system difference between the countries.^{42,43}

This study revealed that children younger than age 2 years have a higher chance of diarrhea than children older than age 2 years. This finding is consistent with national and international study findings.^{27,34,44–46} Children at this age are often exposed to a wide range of individual and environmental factors that cause diarrheal disease when they start weaning, crawling, and exploring their environment.⁴⁷ Previous studies have reported that pathogens such as *Escherichia coli*, *Shigella*, *Salmonella*, *Campylobacter*, *Yersinia*, and *Clostridium* spp are the common causes of diarrhea among young children.^{48,49} Exclusive breastfeeding for the first 6 months of the child's life, and continuation of breastfeeding until age 2 years, in addition to an appropriate weaning process starting from liquid/fluid foods to semisolid and solid foods, are vital to decrease incidences of diarrhea in this age group.⁴⁸ Also, targeted dietary supplementation is essential to aid the development of children's immune systems.⁴⁹

Mothers' access to the mass media was significantly associated with reduced prevalence of diarrhea among children younger than age 5 years. This finding is in line with previous studies that suggest that access to information was associated with lower levels of diarrhea in children.^{35,50} This is due to mass media's ability to create awareness and reach to remote areas of the country. The common sources of mass media information are national television broadcasts and radio programs. Thus, health-related informa-

tion through these channels can reach a wider population in the local language. Increasing access to information through mass media can raise awareness for health-seeking behavior of mothers of children younger than age 5 years. This is because when people are exposed to information, they can easily adopt the recommended practices. It is especially helpful for rural and less advantaged portions of the population where there is limited Internet availability and limited sources of information.

This study was based on the nationally representative BDHS, from more than 5 years ago. Outdated data are a limitation of the study. Information related to child diarrhea was by the mothers; thus, there might be some inaccurate information in the absence of clinical data and inherent recall bias. Some missing information was observed in some of the variables, such as the duration of breastfeeding, the size of the child at birth, and antenatal visits, and these variables were not included in the model.

Conclusions

Our study shows that individual- and community-level factors substantially contribute to the high prevalence of diarrhea among children younger than age 5 years in Bangladesh. The prevalence of diarrhea was higher among young children (younger than age 2 years), in children of mothers without sanitation facilities, and who did not have access to mass media. The result of this study suggests that health workers, community leaders, division health offices, and the government ought to apply health education interventions and mass media awareness targeted at young children and remote rural areas to aid less-privileged and illiterate mothers and increase their access to education and mass media. Policy-makers should focus on intervention programs that increase the awareness of the community about diarrheal illnesses and preventions through available media in the country. We also recommend future researchers investigate the effect of access to information and sanitation services through prospective and randomized control designs to best recommend the effect of these variables on diarrheal incidences among children younger than age 5 years.

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Conflicts of Interest

The authors have indicated that there is no conflict of interest regarding the content of this article.

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