

Original Research Article

Health-seeking behavior and associated factors during the first episode of childhood diarrhea and pneumonia in a coastal area of Bangladesh

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ABSTRACT

Background: Pneumonia and diarrhea are the leading causes of under-five (U5) child mortality in Bangladesh. Seeking appropriate care in timely manner may prevent U5 child mortality due to pneumonia and diarrhea, and thus, it is important to understand perception and barriers of health-seeking behavior of parents during childhood pneumonia and diarrhea in order to develop healthcare policies, and design programs to improve health care utilization practices in disadvantaged areas. The study aimed to explore the factors affecting health-seeking behavior during the first episode of childhood diarrhea and pneumonia.

Methods: In a cross-sectional study, survey interviews with 392 mothers, and two focus group discussions (FGD) with fathers (n = 16) were conducted in two villages of Teknaf Upazila in a coastal district in Bangladesh.

Results: Logistic regression analysis indicated that during childhood diarrhea, mother's age, household monthly income, monthly health expenditure and mother's knowledge regarding danger signs, and during childhood pneumonia, mothers' education level, monthly household income, monthly expenditure for treatment, household size, and knowledge regarding danger signs were the predictors of mothers' health-seeking behavior. Results from FGDs indicate that financial problems, low education, distance to health facilities, poor transport facilities hinder the ability to seek timely care during childhood diarrhea and pneumonia.

Conclusions: Policies and programs should be in place to address barriers of health-seeking behaviors to reduce child mortality due to diarrhea and pneumonia in coastal areas.

Keywords: Health-seeking behavior, Diarrhea, Pneumonia, Childhood, Mothers

INTRODUCTION

According to the Bangladesh Demographic and Health Survey 2017- 2018 (BDHS), the under-five (U5) mortality rate was 45 death per 1000 live births in Bangladesh.¹ However, pneumonia and diarrhea still remained the leading causes of U5 child mortality.^{1,2} Despite these figures, Bangladesh is one of the twelve lower-middle-income countries that achieved millennium development goal-4 of reducing child mortality by two-

thirds between 1990 and 2015.³ Meanwhile, the government of Bangladesh has pledged to ending preventable U5 child deaths by 2035 (United nations children's fund).⁴ In addition, to reach the sustainable development goal 3 (target 3.2), it is necessary to reduce U5 child mortality as low as 25% per 1000 live birth. The government of Bangladesh has been underscoring research evidence-based interventions to improve health facility services and coverages, and address barriers of seeking timely healthcare.^{1,5}

Nowadays, epidemiologists and social scientists are giving more priority to the study of health-seeking behavior to address the leading causes of child mortality.³ Seeking appropriate care in time may prevent U5 child mortality due to pneumonia and diarrhea.⁶⁻⁸ Along with gathering health facility-based information such as health services delivery, it is also essential to understand perceptions and barriers of health-seeking behavior of parents during childhood pneumonia and diarrhea in order to develop healthcare policies, and design programs to improve health care utilization practices in disadvantaged areas.^{9,10} Several studies were carried out regarding childhood health-seeking behavior in urban slums and rural areas, but to date, there has been limited research conducted to explore the factors that influence health-seeking behavior during childhood pneumonia and diarrhea in coastal areas. Bangladesh is a disaster-prone country, and its coastal areas experience frequent natural adversity such as cyclones, and thus, the healthcare-seeking practices of people from coastal areas might be different from other parts of the country.^{11,12} Therefore, this study aimed to perform a triangulation (qualitative inside quantitative) of quantitative data (survey method) with qualitative data (focus group discussions) in order to explore factors contributing to health-seeking behavior during the first episode of childhood diarrhea and pneumonia in a coastal area in Bangladesh.

METHODS

Study design and settings

It was a cross-sectional study, designed as a mixed-methods approach, and both quantitative and qualitative data were collected from a rural coastal area, named Teknaf Upazila in Bangladesh. Teknaf is an Upazila (sub-district) of Cox's Bazar district, which is one of the coastal districts in Bangladesh. Teknaf Upazila encompasses 388.68 square kilometers and has a population of 264,389 population. The reported U5 child mortality rate was 8.4 per 1000 live birth in 2015.¹³

Study population

Mothers is commonly the first person to come in contact with child to take care when child is sick in Bangladesh, and therefore, we recruited and interviewed mothers.^{6,14,15} We used the formula developed by Charan and Biswas to determine sample size and assumed that 50% of mothers sought healthcare during child illness.¹⁶ Thus, we needed 384 participants. Following a two-stage stratified cluster sampling process, at first, we made a list of 441 households from two villages in Teknaf Upazila. Afterward, we recruited 408 households purposively that had at least one U5 child. When a household had more than one eligible mother (who had at least one U5 child), we selected a mother randomly (drawing a name from a jar) to take part in this study in order to avoid confounding effect due to the same income-expenditure flow and decision-maker in a household. Among the 408 mothers, 16 were treated as non-respondents since they

could not provide information due to shortage of time, and thus, in total 392 mothers participated and completed the survey questionnaires. As fathers contribute to household income and thus, they have important role in decision making to get health care for sick child.¹⁴ Therefore, along with the quantitative survey, we conducted two focus group discussions (FGDs) with the fathers of U5 children from the households participating in our study.

Study variables and operationalization

In this study, the dependent variable was seeking care by mothers during childhood diarrhea and pneumonia. Participants' basic characteristics, such as age, education level, household monthly income, household size, household expenditure for treatment per month, and mothers' awareness regarding childhood danger signs were treated as independent variables. Some levels of few variables were merged into a label due to the presence of a low number of cases. Questionnaires were adapted from previous studies conducted in rural Bangladesh.^{6,14,15} Mothers were asked about the frequency, type, and order of treatment sought at home or outside the home during the first, second, and third episode to understand healthcare-seeking practices of mothers during self-reported childhood presumed pneumonia and diarrhea. We categorized the commonly available treatments into five groups (self-care, traditional care, para-professional, qualified allopath, and informal/ unqualified care), and operationalization of these treatments was described elsewhere.¹⁷

Data collection

Trained local female assistants were recruited with consideration of cultural and gender sensitivity to administer a semi-structured survey questionnaire to mothers. The researchers supervised the data collection sessions to ensure the quality of data. Semi-structured discussion guidelines were followed during the FGDs to avoid inhibited discussion. The survey questionnaire and the FGD guidelines were pre-tested outside the study area to ensure proper sequence, appropriateness of language, and consistency of the questionnaire and guidelines. Detailed notes were taken in each session and all FGDs were recorded with consent from all participants. Each FGD session was conducted using a local dialect. Participation in this study was voluntary. Signed consent was obtained from each participant and oral consent was obtained from those who were illiterate prior to taking part in this study.

Data analysis

All statistical analyses of survey data were conducted using IBM SPSS (version 23, Chicago IL), and $p < 0.05$ was considered significant for all statistical tests with a 95% confidence interval. The basic characteristics of participants were presented as frequencies and percentages. Logistic regression was run to examine

associated factors of health-seeking behavior of mothers during self-reported childhood diarrhea and pneumonia. Data from FGDs were transcribed on the same day of sessions and all transcripts were translated into English. These transcripts were read out several times and randomly matched by the supervisors to ensure data consistency. Afterward, a code list was developed, and all the transcripts were manually coded to process content analysis under common themes.

RESULTS

Quantitative data: survey interview

The basic characteristics of the participants is represented in (Table 1). The majority of the participants were in the age range of 25 to less than 35 years (48.2%) and 61% did not have education above primary level.

Table 1: Background characteristics of the participants (n=392).

Variables	N	%
Age (years)		
15-<25	170	43.4
25-<35	189	48.2
35-≥45	33	8.4
Education		
Illiterate	56	14.3
Primary (completed or incomplete)	239	61.0
Secondary (completed or incomplete) or above	97	24.7
Occupation		
Housewife	375	95.7
Others (day labor/service/business)	17	4.3
Household monthly income (BDT)**		
≤2500-<5000	33	8.4
5000-<8000	137	34.9
8000-<1000	81	20.7
1000-≥12000	141	36.0
Expenditure for healthcare/month (BDT)		
100-<500	124	31.6
500-<1000	209	53.3
1000-<1500	39	10.0
1500-≥2000	20	5.1
Household size		
≤4	210	53.6
≥5	182	46.4

** BDT: Bangladeshi Taka (currency), US \$1 ≈ 84.0 BDT.

Out of 392 mothers, 139 (35.5%) (Table 2) and 101 (25.7%) (Table 3) mothers reported that their children suffered at least once from diarrhea and presumed pneumonia, respectively in the preceding 12 months. Each eligible mother responded for the same or other US children who suffered from multiple episodes of diarrhea

and/or presumed pneumonia within the last 12 months. Table 2 shows that mothers sought healthcare for a maximum of three episodes of childhood diarrhea within the last 12 months and made a maximum of three visits during each episode of diarrhea. The majority of mothers (32.4%) sought self-care or home remedies in the first visit during 1st episode of childhood diarrhea. However, the proportion of mothers who obtained care from informal providers increased sharply in the second (47.6%) and third visit (50.0%). Table 2 also shows that among the 139 mothers, 52 (37.4%) sought healthcare for the 2nd episode and 5 (3.6%) for the 3rd episode of childhood diarrhea. Among the 52 mothers who sought care for 2nd episode of childhood diarrhea, 42.3% in the first visit, and 6.4% in the second visit sought self-care.

On the other hand, mothers sought healthcare for a maximum of two episodes of presumed childhood pneumonia, and in each episode, mothers made a maximum of three visits (Table 3). During the 1st episode of presumed pneumonia, out of 101 mothers, 33.7% of mothers did not acquire healthcare from health facilities, whereas 32.7% of mothers sought care from qualified healthcare providers in the first visit. The proportions of mothers who obtained healthcare from informal providers were higher in both the second visit (27.7%) and third visit (28.6%) compared to the first visit (14.9%) during 1st episode of childhood presumed pneumonia. The percentage of mothers who sought care from qualified service providers increased gradually over the third visit during 1st episode of childhood presumed pneumonia. Among the 101 mothers, 31 (30.7%) mothers also sought treatment for the 2nd episode of illness due to childhood presumed pneumonia. During the 2nd episode of presumed pneumonia, the maximum number of mothers sought care from qualified service providers in every visit. Furthermore, we also assessed mothers' awareness regarding danger signs of childhood illness and found that out of 392 mothers, more than one-third of them (37.0%) were not conscious of any danger signs. In this study, for the purpose of logistic regression, self-care, traditional treatment, and informal health services were grouped into inappropriate treatment, and healthcare from para-professionals and qualified service providers were categorized into appropriate treatment. Since the majority of the mothers who reported childhood diarrhea and presumed pneumonia, made the first visit/action to seek healthcare, thus, the association was analyzed with the health-seeking behavior of mothers in their first action. Following univariate analysis, only correlated variables with the dependent variables (treatment, formal and informal) were included in the multiple logistic regression (Table 4). Mothers' age ($p<0.05$), monthly household income ($p<0.01$), monthly expenditure for treatment ($p<0.01$), and knowledge regarding danger signs ($p<0.01$) acted as determinants for mothers to seek healthcare during childhood diarrhea.

Table 2: Types of healthcare providers visited by mothers for children with diarrhea within last 12 months.

Type of care	Episode																	
	1 st episode, N=139			2 nd episode, N=52			3 rd episode, N=5											
	First visit		Second visit		Third visit		First visit		Second visit		Third visit							
	N	%	N	%	N	%	N	%	N	%	N	%						
Self-care	45	32.4	--	--	--	--	22	42.3	3	6.4	--	--	4	80	--	--	--	--
Traditional method	7	5.0	1	0.8	2	4.2	1	1.9	--	--	--	--	--	--	--	--	--	--
Para-professional	37	26.6	52	42.6	17	35.4	12	23.1	21	44.7	1	11.1	1	20	1	25	1	33.3
Qualified allopath	9	6.5	11	9.0	5	10.4	5	9.6	6	12.7	--	--	--	--	--	--	1	33.3
Informal	41	29.5	58	47.6	24	50.0	12	23.1	17	36.2	8	88.9	--	--	3	75	1	33.4
Total	139	100	122	100	48	100	52	100	47	100	9	100	5	100	4	100	3	100

Table 3: Types of healthcare providers visited by mothers for children with presumed pneumonia within last 12 months.

Type of care	Episode											
	1 st episode, N=101			2 nd episode, N=31								
	First visit		Second visit		Third visit		First visit		Second visit		Third visit	
	N	%	N	%	N	%	N	%	N	%	N	%
Self-care	34	33.7	--	--	--	--	11	35.5	--	--	--	--
Traditional method	5	4.9	2	2.0	--	--	--	--	--	--	--	--
Para-professional	14	13.8	22	21.8	12	21.4	6	19.3	6	21.4	1	50.0
Qualified allopath	33	32.7	49	48.5	28	50.0	11	35.5	19	67.9	1	50.0
Informal	15	14.9	28	27.7	16	28.6	3	9.7	3	10.7	--	--
Total	101	100	101	100	56	100	31	100	28	100	2	100

On the other hand, mothers' education level ($p<0.05$), monthly household income ($p<0.05$), monthly expenditure for treatment ($p<0.05$), household size ($p<0.05$), and knowledge regarding danger signs ($p<0.01$) were the predictors of mothers' health-seeking behavior during childhood presumed pneumonia (Table 4). The odds ratio of mothers in the age of 35 to ≥ 45 years sought 4.30 times higher appropriate care in the first visit during childhood diarrhea than the mothers aged between 15 to <25 years. Mothers' unconsciousness of childhood danger signs had a negative effect on seeking healthcare during childhood diarrhea and presumed pneumonia.

Qualitative data: focus group discussions

In total, 16 fathers (eight in each session) participated in the two FGDs. Table 5 shows the characteristics of the participants who took part in the FGDs.

Healthcare sought during childhood diarrhea and presumed pneumonia.

The participants of FGDs reported that pneumonia and diarrhea were the most frequent diseases among U5 children in coastal areas along with fever and cold. Participants of FGDs affirmed that during childhood

diarrhea and presumed pneumonia, healthcare was commonly sought from pharmacies, village doctors, quacks, homeopaths, herbal practitioners (Kabirajs), non-governmental organization (NGO) health workers, an Upazila hospital (public health facility), and qualified doctors. The participants reported that mothers from poor families usually got treatment for their sick children from quacks, pharmacies, and homeopaths just because of the low treatment cost. Moreover, children were also brought to Upazila government hospitals while the illness was severe or moderate. More importantly, most often mothers sought self-care or home remedies during the first few days of sickness. One participant from first FGD stated that, "I usually ask my wife to get homeopathy and herbal treatment for our child when he experiences diarrhea. I prefer to home and herbal health services because these services are provided at minimum cost. In addition, children can also intake the homeopathy medicine so easily and it does not have any side effect." Another participant from second FGD remarked that, "People of this area usually go to the pharmacy shops, even my family goes to the pharmacy shops to get healthcare during childhood diarrhea and presumed pneumonia. Here, the cost of health service in Upazila hospital is too high and most of the time, doctors refer the patients to divisional city, even when it is treatable in this Upazila hospital."

Table 4: Predictors of seeking appropriate care by mothers during first episode childhood diarrhea and pneumonia.

Variables	Diarrhea		Presumed pneumonia	
	Odds ratio	95% CI	Odd ratio	95% CI
Mother's age (years)				
15-<25	Ref*		Ref	
25-<35	1.75	0.19-16.04	1.04	2.53- 4.30
35- ≥45	4.30	0.49- 37.46	1.62	0.40- 6.42
Mother's education				
Illiterate	Ref		Ref*	
Primary	0.52	0.16- 1.72	0.21	0.65- 0.71
Secondary or above	0.72	0.30- 1.70	0.61	0.24- 1.59
Household income/month (BDT)				
≤2500- <5000	Ref**		Ref*	
5000- <8000	0.00	0.00-0.00	0.70	0.01- 0.61
8000- <10000	0.10	0.03-0.31	0.29	0.11- 0.74
10000- ≥12000	0.92	0.36-2.35	0.64	0.19- 0.21
Expenditure for health treatment/month				
100-<500	Ref**		Ref*	
500 -<1000	0.04	0.00-0.39	0.70	0.14- 3.47
1000 -<1500	0.18	0.18- 1.58	2.14	0.45- 10.00
1500-≥ 2000	0.37	0.37- 6.68	5.00	0.58- 42.79
Household size				
≤4	Ref		Ref*	
≥5	0.62	0.30-1.29	0.39	0.16-0.9
Knowledge regarding danger signs				
Not aware	Ref**		Ref**	
Aware	0.05	0.01- 0.21	0.01	0.02- 0.10

CI= Confidence interval, *p<0.05, **p<0.01, Ref: Reference category was seeking inappropriate care, US \$1 ≈ 84.0 BDT

Table 5: Background characteristics of FGDs' participants.

Focus group discussion	N	Education	N	Occupation	N
FGD-1	8	Illiterate	1	Day laborer/ farming in other people's land	3
		Primary	2	Service	2
		Secondary or above	5	Business	3
FGD-2	8	Illiterate	2	Day laborer/ farming in other people's land	4
		Primary	1	Service	2
		Secondary or above	5	Business	2

Barriers to seeking care during childhood diarrhea and presumed pneumonia

Data from FGDs remarked that scarcities of quality health services, high cost of health services and unfriendly

behavior of service providers, distance and lack of transport, lack of money, lack of literacy, knowledge, and awareness acted as obstacles to seek healthcare for children. Respondents also mentioned that they were not satisfied with the health services provided by Upazila health complex (UHC), a government health facility at the sub-district level. A participant from the first FGD stated, "until and unless you do not climb a mountain, you will not understand the challenges involved in climbing. So, you will not be able to realize the difficulties people are facing in the UHC to obtain healthcare for sick children, until and unless you go to the UHC to get health services." In addition, a participant from the second FGD stated, "UHC does not take any risk and also does not provide any health service for moderate or severe sick children, rather providers refer to Cox's Bazar (Two hours distance by bus from Teknaf) or divisional health facility (five to six hours distance by bus from Teknaf), which is quite impossible for us every time."

DISCUSSION

The study attempted to explore factors associated with health-seeking behavior during first episode childhood diarrhea and presumed pneumonia. In this study, 35.5% and 25.7% of mothers reported that their children aged <5 years experienced diarrhea and presumed pneumonia,

respectively, in the last 12 months. The reported rate in our study is higher than the national prevalence of diarrhea (6%) and pneumonia (5%) among U5 children since the national survey captured recall of two weeks prior to the survey.² On the other hand, we captured 12 months recall preceding the survey in a rural coastal area. During the 1st episode of childhood illness, we observed that more than one-third of mothers sought self-care during the 1st episode of childhood diarrhea and presumed pneumonia. Mothers prefer to seek self-care because of failing to perceive the severity of illness- found in a study conducted in Indonesia.¹⁸ We also found that 67.6% and 66.3% of mothers sought care from outside of the home during the 1st episode of childhood diarrhea and presumed pneumonia. There is some evidence that getting healthcare from private and informal providers, such as pharmacy is more common in rural Bangladesh for children with diarrhea and pneumonia.^{19,20} Moreover, traditional treatment was also preferred by caretakers for children with diarrhea and presumed pneumonia due to locally available treatment and its low cost.²¹ In our study, data from FGDs also support that households prefer to obtain healthcare from pharmacies during childhood diarrhea or pneumonia since it is more affordable.

We observed that majority of mothers sought care from qualified service providers in both second and third visits during 1st episode of presumed pneumonia. On the other hand, on average, 50% of mothers sought health treatment for U5 children with diarrhea from informal service providers in the second and third visits during the 1st episode. The reason that might be responsible for this difference in the mother's health-seeking behavior, was that the prevalence of the diarrheal disease among the U5 children was high compared to pneumonia. As such, the mothers needed to seek healthcare frequently for childhood diarrheal diseases, which led to mothers' perception of diarrheal disease to be not as serious as pneumonia.^{21,22} Our findings show that a significant proportion of the mothers sought self-care in the first visit during childhood illness. The possible reason could be that mothers perceived that the disease would go away by itself.^{17,22} Moreover, mothers sought treatment outside of the home when home care did not cure the child fully.²³ A number of mothers sought treatment from para-professionals for children with diarrhea or presumed pneumonia, since para-professionals; village doctors were particularly key actors in the provision of health services in rural areas.^{24,25}

Our study results indicate that mother's age, household monthly income, expenditure for healthcare, and mother's knowledge about danger signs were significantly associated with health-seeking behavior during childhood diarrhea. In addition, including all the factors (except mother's age) and mother's education level were the determinants of health-seeking behavior during childhood presumed pneumonia. Mothers who have low educational levels likely to have low awareness and knowledge about

childhood danger signs and thus, delay perceiving the severity of the disease and subsequently, take the decision to seek appropriate care for children.^{23,26,27} Data from FGDs also emphasized that lack of financial resources, lack of accessibility, and poor quality of services hinder the ability to seek timely healthcare during childhood diarrhea and pneumonia. Several studies highlighted that the young age of mothers, household with low income, low education, poor knowledge about childhood danger signs, and distance to health facilities negatively influence seeking healthcare during childhood diarrhea and pneumonia.^{7,28-31} A qualitative study conducted in a rural area of Bangladesh found that three factors, distance from the healthcare facility, illness was not perceived as serious, and lack of money acted as barriers to seek timely care during childhood pneumonia,⁶ that shows similar to our study results. Our research results can be applicable and useful for countries where similar geographical settings and socio-economic conditions exist.

Limitations

Data were collected during a specific period, thus health-seeking behavior due to seasonal variation was not captured in this study. This study did not include the deference of health-seeking behavior considering child order factors and also in terms of severity of diseases. However, all the collected information was self-reported symptoms of pneumonia and diarrhea and involved the recall of the past 12 months which might be subject to recall and reporting bias.

CONCLUSION

Ensuring the need for health care for each episode of presumed childhood pneumonia are urgent to save the life of U5 children. The highest percentage of mothers had demand for healthcare from para-professionals and qualified allopath service providers during each episode of presumed childhood pneumonia. Whereas most of the mothers sought self-care or home remedy and care from informal service providers when U5 children suffered from diarrheal disease. Community level interventions are needed to improve mothers' knowledge about the danger signs of the U5 children for pneumonia and diarrhea. Policies and programs on health education and campaigns should be in place to address barriers to health-seeking behaviors in order to reduce child mortality due to diarrhea and pneumonia in coastal areas. More research such as facility-based survey is needed to more broadly understand the predictors of health-seeking behavior in coastal areas.

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