



Child drowning and associated risk factors: Findings from a qualitative study in Bangladesh

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Abstract

Background: World Health Organization (WHO) has classified drowning as a major public health problem. The most vulnerable victims of drowning are children from low and middle-income countries. Previously, it was the primary cause of death among children aged between 1 and 17 years in Bangladesh.

Aims: This study explored the surrounding circumstances and associated factors of child drownings in Bangladesh.

Methods: A qualitative phenomenological approach has been used to conduct the study. Bangladesh was chosen as the study area, and data were gathered using a semi-structured, open-ended questionnaire. Using convenience and snowball sampling methods, we have collected data from Dhaka and seven additional districts in Bangladesh. We reached a total of 44 individuals, where 22 agreed to participate in an interview (face-to-face and online interviews). The remaining 22 participants were selected in two focus group discussions via the web platform “ZOOM cloud meeting.”

Results: Our investigation revealed several factors associated with child drowning, including a lack of adequate parental supervision and monitoring, geographic locations and environment, seasonal factors, low living standards, peer pressure and risky behaviors, social stigma and prejudices, and natural disasters and calamities. According to our findings, a lower socioeconomic position is linked to a higher risk of nonfatal drowning. Moreover, this research also indicates a substantial nexus between child drowning fatalities and the socioeconomic conditions of the families of the victims.

Conclusion: The study adds to the existing body of knowledge by underlining the associated factors of child drowning fatalities in Bangladesh, which will aid in developing preventive policies. An essential aspect of any drowning prevention program for Bangladesh should be enhanced for community awareness of safe water rescue and resuscitation practices.

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KEYWORDS

associated factors, Bangladesh, child drowning, fatalities, potential interventions

1 | INTRODUCTION

Drowning is a major yet often neglected public health problem.¹ The most common cause of death for children worldwide is drowning,² affecting developed and developing countries.³ Overall, about half of a million deaths annually fall, with 57% involving children drowning.⁴ Inadvertent injuries, including drowning, are among the world's top causes of infant death.⁵ Death, sickness, and no malady are possible drowning outcomes. Nearly 110,000 people across Commonwealth countries died from drowning as per 2017.⁶ WHO Global Report on Drowning estimates that 320,000 people per year die from drowning in the world,⁷ and Western Pacific and South-East Asia regions account for more than half of all drowning deaths globally.³ Furthermore, drowning fatality rates are 15–20 times greater in Africa than in Germany or the UK, with the former highest rates in Europe.^{3,6} About 8% of all deaths worldwide were the result of drowning injuries in 2021.⁸

Drowning is the third most common cause of accidents, accounting for 7% of fatalities.⁸ All preconceptions and uncertainty have obscured the truth that drowning is a primary cause of child death in Low- and Middle-Income Countries (LMICs).¹ The fatal drowning rate among children in LMICs is six times higher than that of children in High-Income Countries (HICs).⁹ Across all ages, 91% of drowning deaths occur in LMICs.^{3,10} Children between 0 and 4 years of age are more likely to drown than older ones.¹ More than 50% of drownings occur in the West Pacific and Southeast Asian regions of the world.⁸ A report showed that almost 19,000 persons of all ages drown in Bangladesh annually. About 14,500 (77%) of them are under the age of 18 years. To put it another way, roughly 40 Bangladeshi children under 18 years drown per day.¹¹

Drowning is a multi-causal occurrence, with different risk variables between countries and areas due to socioeconomic and geographic changes.¹² There are a variety of possible circumstances involving with drowning. While swimming, sailing, and playing water sports might be priority areas in high-income nations, attention needs to be made to LMICs drowning in ponds, lakes, wells, dams, cisterns, and fishing operations.¹³ Apart from drowning in ponds, rivers, and drainage ditches in Bangladesh, drowning happens in domestic water containers such as tubs, buckets, and drums.¹⁴ As the monsoon season brings severe rains and flooding, more people perish by drowning.¹⁵ In Bangladesh, canals and rivers are commonly encircled and intersected. Children also swim and play in these ponds, canals, and rivers.¹⁶ There is a broad array of various environmental and behavioral conditions. Children in poor and middle-income countries are more likely to drown because of a variety of factors, including a lack of adult supervision, being male, living in close proximity to a body of water, and an inability to swim.^{4,15} Inadequate awareness of water safety, unsafe conduct near the water, and perceived risk are also the significant risk factors.^{16–21} Unprotected water bodies were

recognized as a reason for the high drowning rate and poverty is as a primary cause of child drowning in India.^{22,23} Ponds, ditches, and canals were frequently cited as drowning areas. Most drownings were reported to occur between noon and 1:00 p.m.¹³ Low socioeconomic status is more likely to lead to drowned fatalities, indicated by low family expenditure.¹⁴ Data showed that the nonfatal drowning rate decreases considerably with increased parental education, especially maternal education. Child care has been enhanced by better mother education and socioeconomic level.^{16,24,25}

Though drowning is a serious public health issue, it has not received the same attention as other significant causes of infant death. Immaturity and defeatism may be partly responsible for the failure of public awareness campaigns.¹ Drowning has become a leading cause of children's death due to this carelessness. However, the overall rate of drowning remains consistent. It is no secret that drowning deaths are sporadic. Structure and culture have a significant role in this.¹⁴ Previous Bangladeshi research on drowning has mainly focused on death and trends¹ rather than a comprehensive analysis of the problem. In Bangladesh, as in other developing countries, sociodemographic and economic factors may influence child drowning, but the evidence is insufficient. Understanding these various risk variables is vital for developing effective preventative programs. Most of the available literature on child drowning contains descriptive quantitative analysis and, however, lacks thematic qualitative analysis. Against this backdrop, this study explored an in-depth understanding of surrounding circumstances and associated factors of each drowning child fatality occurring in Bangladesh. In addition, this paper seeks to fill the knowledge gap on drowning deaths in prior research and provide updates on related factors for child drowning fatalities in Bangladesh.

2 | MATERIALS AND METHODS

The study was carried out using a qualitative phenomenological method. To get a complete picture of the prevalence and associated factors of child drowning fatalities in Bangladesh, two data collection methods, such as In-depth Interviews (IDI) and Focus group discussions (FGD) have been adopted. Given the descriptive nature of the investigation, a qualitative approach seemed appropriate.²⁶ Study participants can provide extra information to researchers by maintaining notes throughout interview sessions. "Analyzing participants' views using qualitative research methods is possible, resulting in new knowledge and insights regarding the subject."²⁷ Through our in-depth examination of this current issue, we aimed to establish guidelines for the reporting of qualitative studies. As per as qualitative research design, we have followed Standards for Reporting Qualitative Research (SRQR) guidance²⁸ for the

development of our manuscript, which is available as supporting information. We worked to preserve this adaptability of SRQR as a technique or method in our definitions of key concepts. Different techniques were utilized to obtain primary data sources to amass sufficient data for analysis. This study utilized both primary and secondary data to triangulate verification and interpretive techniques for comparable outcomes across the broadest range of possible contexts. Additionally, several literary works about drowning deaths were critically analyzed from various sources. Multiple sources analyses on child drowning fatalities were sought out by searching Google Scholar, PubMed, Scopus, Web of Science, published daily newspaper articles and so on. After gathering the essential data and papers, we thoroughly evaluated, analyzed, and finished the research with the necessary recommendations.

Moreover, the research team comprised nine members with diverse disciplinary backgrounds and expertise relevant to the study. The team was formed through a collaborative process involving individuals with complementary skills and knowledge in the fields of Sociology, Public Health, Pharmacy, Statistics, and Education Research. The characteristics and disciplinary background of the research team are available as Supporting Information.

2.1 | Study design

The research design of this study is explanatory, and qualitative data were gathered. Because it aids us in comprehending the meaningful and logical explanations of human behavior, thinking, and action based on subjective experiences, judgments, and opinions,²⁹ we employed the qualitative approach in our research. A series of questionnaires were constructed for pretest purposes to assess the reliability of the questionnaire. The supporting information contained the questionnaire of the study, aiming to enhance comprehension of the study's findings.

2.2 | Sampling strategy and study location

Data was gathered employing open-ended questionnaires. The convenience and snowball sampling methods were used to collect data from Dhaka and seven other districts in Bangladesh—Chapainawabganj, Dinajpur, Gopalganj, Feni, Barisal, Satkhira, and Mymensingh—which encompassed six of the seven divisions. Initially, we picked six respondents from each district for IDI and FGD.

2.3 | Sample size

We reached out to a total of 44 respondents, and 22 (10 males and 12 females) agreed to be interviewed (face-to-face and online interviews) (Table 1). Furthermore, the remaining twenty-two participants (e.g., local authorized personnel, health care providers,

polymakers, community leaders, fathers, mothers, and kids) were chosen for two FGDs (Table 2).

2.4 | Inclusion and exclusion criteria

The respondents were selected and recruited by following the following criteria: (i) Parents who have lost a child to drowning in the past; (ii) Guardians from diverse socioeconomic backgrounds and families; (iii) Educated and illiterate parents from various regions; (iv) Available children (12–15 years old) are qualified to speak about child drowning; (v) Consented to the interview.

2.5 | Data collection and instruments

From June 25 to August 5, 2021, 11 highly trained male and female data collectors conducted face-to-face and online interviews, adhering fully to COVID-19 safety criteria throughout the face-to-face data collection process. Before the interview, a form of informed permission was signed. Additionally, permission was secured to record the interview. Face-to-face interviews were conducted with respondents who lacked access to technological equipment, were illiterate, or were geographically out of date. Two FGDs were held with various socioeconomic groups, children, educated and illiterate guardians, local authorized personnel, health care providers, and community leaders (Table 2). These respondents were chosen because they interact with mothers, fathers, and children and are most likely to contribute meaningful information. The FGD comprises 10–12 individuals, and representatives from each group were chosen based on their willingness and aptitude for actively engaging in conversations. Four invigilators monitored FGD (including 2 FGDs), introducing the research topic, ensuring that each group covered each item on the agenda thoroughly, and encouraging positive interaction among the participants. The discussions, which lasted almost an hour, were held in the indigenous tongue (Bengali). The researchers documented each session using both physical and assistance of the web platform “ZOOM cloud meeting.” The discussions focused on drowning as a cause of mortality in children. They elicited information about the variables associated with drowning, the locations of drowning, and participants' perspectives on prevention. Each participant in the study was asked for their consent after being provided with detailed information. The confidential nature of all the gathered data was maintained, and in addition, the study's guidelines and ethical protocols were approved by the human ethics committee of the Institutional Ethical Review Committee (SUB-IRC) of the State University of Bangladesh.

2.6 | Quality assurance and data analyzing

The interviews were recorded in audio, transcribed, and translated into English as necessary. The qualitative data acquired from the

TABLE 1 Sociodemographic information of Respondents for In-depth interviews (IDI).

Respondents	Age (years)	Sex	Literacy knowledge	Region	Socioeconomic status	Family structures/ marital status
A1	34	Male	Yes	Dhaka	High	Nuclear
A2	45	Male	No	Chapainawabganj	Low	Extended
A3	28	Female	No	Dinajpur	Low	Extended
A4	33	Male	Yes	Satkhira	High	Nuclear
A5	50	Female	No	Gopalganj	Middle	Widow
A6	39	Female	No	Chapainawabganj	Low	Divorced
A7	48	Male	No	Mymensingh	Low	Nuclear
A8	29	Female	No	Dinajpur	Middle	Nuclear
A9	44	Female	Yes	Feni	Middle	Extended
A10	65	Male	No	Dhaka	Low	Extended
A11	40	Female	Yes	Chapainawabganj	Low	Widow
B1	33	Male	No	Dinajpur	High	Nuclear
B2	47	Male	No	Mymensingh	Low	Extended
B3	27	Female	Yes	Chapainawabganj	High	Nuclear
B4	30	Female	No	Dhaka	Middle	Nuclear
B5	45	Male	No	Gopalganj	Middle	Extended
B6	55	Male	Yes	Dinajpur	Middle	Divorced
B7	36	Female	No	Gopalganj	Low	Extended
B8	29	Female	Yes	Feni	Middle	Divorced
B9	34	Female	No	Barisal	Middle	Divorced
B10	52	Female	Yes	Satkhira	Low	Widow
B11	42	Male	Yes	Barisal	Low	Extended

Source: Field survey, 2021 (Developed by authors).

TABLE 2 Respondents of two focus group discussions (FGD).

Respondents	Respondents in each group	Age range (years)
1. Mothers of under-2 children [3 members]	Group-1: 12 members	23–44 years
2. Mothers of over-2 children [3 members]		29–55 years
3. Fathers [03 members]		38–60 years
4. Children [03 members]		12–15 years
5. Community leaders: [10 members]	Group-2: 10 members	29–60 years
a. Local authorized personnel (03 members)		
b. School Teacher (01 member)		
c. Chairman, Union Council (male –01)		
d. Law and policy maker (2 members)		
e. Local Health care provider (3 members)		

Source: Field survey, 2021 (Developed by authors).

interviews were thematically analyzed using an inductive approach described by Braun and Clarke.³⁰ Thematic analysis is an approach used to thoroughly examine qualitative data in a structured manner. Initially, the data is transcribed, and then it undergoes a process of coding. Through this coding process, themes and sub-themes are identified, aligning with the research objective. This process in five

phases was implemented as follows: Authors learned the data by rereading the material and identifying original topics (Phase 1). The authors produced initial themes by the systemic coding of the complete data set with intriguing aspects (Phase 2). Authors then examined and approved the individual topic coding (Phase 3). Two authors separately classified qualitative data into topics (Phase 4).

The researchers met to compare each topic's contents and refine all remaining problems (Phase 5).³⁰ To verify that we collect the interviewee's information, we have returned the data repeatedly to check if the interpretation of the data is valid. The analysis of data was done by using NVivo V.12.0. Interviews and subjects were similar, and methodological types were analyzed exclusively.

3 | RESULTS

The authors have discussed the results using the thematic analysis mentioned in the methodology sections. Data were obtained from selected respondents from varied socioeconomic backgrounds, ages, gender, education skills, and geographic areas to answer the study questions. The researchers manually coded each transcript to answer study questions and began evaluating and translating the findings. The resulting data interpretation is explored in this chapter in the context of a single overall framework and subthemes.

3.1 | Demographic profile of the respondents

The demographic profile is a main indicator of people's strength and capacity to get involved in the study. Table 1 indicates that the respondents' age range of IDI is between 27 and 65 years, and the mean was 40 years. There were almost equal numbers of women ($n = 12$) and men ($n = 11$) involved in IDI. People from different sections of society have been included in FGD (Table 2).

In Table 2, we have two FGD groups here marked according to how various respondents classified the issues being discussed. In this case, there were a total of 12 members who made up group-01. This included mothers with under and over two children, fathers, and kids of varying ages. On the other hand, group-02 was formed by ten members, which included a different group formed by municipal authorities, legislators, health care providers, policymakers, and community leaders. Here, we provide information on a range of perspectives and their associated beliefs. Critical opinion leaders in the healthcare industry have provided their insightful feedback for use in policymaking and other contexts.

3.2 | Associated factors of child drowning fatalities

3.2.1 | Lack of parental monitoring and supervision

According to the study's findings, child drowning deaths in Bangladesh are attributed to a lack of parental supervision and surveillance. If a family has more children, the parents' attention may be divided, resulting in accidents like nonfatal drowning. All of the groups viewed children as weak and reliant on parental care, particularly mothers. A father (B5) related the tragic story of how his 4-year-old kid drowned:

"My family and I were fighting to make a comfortable living for ourselves. My youngest child, Rana, was four years old. At one point in the day, I was out in the field, and no one was home; her mother was in the kitchen, busy with cooking. Little Rana was playing next to her. She went to the tube well to get water when she needed it for cooking. After she had returned, she was shocked to see that Rana was not around.... As soon as they had searched around for 10–15 min, they came across Rana's floating body was in a pond."

When guardians are busy with their household chores or work, the majority percent of child drowning occurs in that specific moments. Added this tone, a 52-year-old widowed respondent from Satkhira (B10) shared her harrowing experience:

"While I was stitching Kantha (quilt), my 3-years-old kid was playing next to me. Unexpectedly, I realized that my son was not in sight... It took less than 10 min for him to be discovered in a local pond, just 25 meters from home."

Unprotected water was recognized as a contributing factor to the high drowning rate. However, parents were given responsibilities for preventing drowning rather than society or the proprietors of bodies of water. Many of the attendees had strong thoughts to express:

"Workaholic mothers fail to keep an eye on their children. Children are not taught to walk on designated paths; instead, they rush in packs and get knocked down."

3.2.2 | Geographic locations and environment

Bangladesh is a landlocked country which is situated on the banks of several rivers. There are around 230 rivers in Bangladesh, both large and trimmed, and several reservoirs, ponds, and rivers can be observed. More rivers can be found in the southern region of Bangladesh, where there are also more canals. There are numerous rivers and reservoirs, particularly in the Khulna and Barisal divisions. Many houses are located near waterways such as rivers and lakes in southern region. This is because the area relies primarily on agriculture and natural resources. As a result of its geographic location, Bangladesh is one of the world's most drowning-prone countries. Satkhira district resident (A4) bemoaned his sluggish experience:

"Aside from the ones just next to my house, there are plenty more to be found around. People in this area make a living by fishing in ponds. He was kicking a ball around with his 6-year-old brother near the

neighborhood pond. Mahin, my kid, fell into the water while attempting to retrieve the ball and drowned.....We discovered Mahin's body in the pond around thirty minutes later."

The majority of participants (including those who took part in interviews and FGD) made similar statements during the research. "Dhan (rice), Nadi(river), and canal" are three components that combine to form the partition known as "Barisal" (Southern region). Most cottages in this rural area are located near bodies of water, making it difficult for fishermen's families to keep an eye on their children. Because of this, the number of drowning children is worrisome. There is a kid drowning pandemic in these areas due to the natural geography of the region. Following the views of another B11 respondent,

"Barisal and southern Bangladesh are geographically located in a region with high child drowning rates, and I believe this is a contributing cause. Here, in every year, we watch numerous children perish."

In addition to this, the respondents also spoke about the geographically lower locations (mainly in Bangladesh's southern region) that are frequently submerged in water. Therefore, the children in these locations are more at risk than those in Bangladesh's higher regions due to their geographical location.

3.2.3 | Seasonal factors

Because Bangladesh has a tropical climate, monsoon rains can cause flooding and raise water levels in rivers, canals, ponds, and ditches, putting children and others at risk of drowning. Floods can be seen in Bangladesh's North Bengal region at specific times of the year (monsoon season). Hundreds of farmlands, particularly in Rangpur and other low-lying districts, have been damaged, and residences have been washed away. News of drowning deaths is heard every day in flood-prone locations. This and other real-world data have been provided to us by some of our responders. A participant from Dinajpur (B1) described such an incidence as follows:

"During the majority of the year, there is little water in our location. Cultivating these fields is how we make a living. All of the Rangpur division is submerged in water during monsoon seasons. My 7-year-old daughter Tania drowned in August of last year. The mother of Tania's friend was unwell, so one afternoon Tania went to the nearby pond to get water for cooking. Suddenly, the girl tripped and fell into the water. She could not swim, and she nearly drowned a few times.... The search for her began about 30/40 min later, and a pitcher was found floating in the water."

Another female widow participant (A11) from Chapainawabganj district's northern part shared the following with us:

"It happened this year (July); you may have read about it in the newspaper. To see her grandma for the first time, my 7-year-old daughter Shimu visited her grandmother's residence. The location receives rain-water each year; therefore, lots of people go swimming in it. My daughter is with her grandmother, too. After taking a bath and not being able to swim, Shimu drowned in deep water. Shimu drowned before she could see her elderly grandmother.....After a while, it became clear that Shimu had drowned. Later, divers arrived and recovered the baby's body."

Interviews and FGD have revealed that children in the North Bengal region of Bangladesh are more likely to drown in seasonal water. As the monsoon flooding persists across Bangladesh, torrents of cascading water continue to inundate houses, farms, and other physical infrastructure, including schools. In FGD, a community leader (Chairman, Union Council) expressed the following view:

"Miles after miles, all that left is water; the ground beneath it is no longer discernible. This may sound like the beginning of a movie, but it is a simple story about a family's experience with a natural disaster in Bangladesh's northern region. The Rangpur Division is one of the Bangladesh's most flood-prone regions."

3.2.4 | Poor living standards

How we live our lives are heavily influenced by socioeconomic and financial factors. It is common knowledge that children in small households are better behaved and closely watched. Children from large families, on the other hand, often suffer from poverty. With the help of FGD and interviews, we learned a lot about these previously unknown facts. A divorced woman (B8) told of her misfortune:

"A long time ago, my husband left me. There were three of us in my family; we are a very low-income household. For the time being, I am employed at a sugar refinery to help my family and pay the bills. In the yard with the other kids, my two-year-old son Monir was having a blast playing. That evening, I was still at work. Without anyone's noticing, he crawled towards the ditch and fell into it at some point... Monir's dead body was discovered in the ditch 10-20 min later, floating in filthy water."

The likes of these occur frequently, and it is hard to ignore. Being poor and impoverished, the guardians of the family are always busy

with their several work. Another respondent (A10), also from a poor extended family, shared his story:

“Our family is quite large, with five sons and four daughters. We are living in Dhaka's most notorious densely populated slum. I am the sole provider for the household. Without care, we cannot provide for the children's necessities, and my son Samir (age 3) drowned and died because we are impoverished. His journey ended with him drowning there in the evening. We have the impression that Samir is not in his usual environment. The body of Samir was recovered in the drain water.”

This shows how poverty and large families harm children's well-being, according to many people who responded. Drowning is one of the leading causes of death in children for the underprivileged. Respondents from FGDs had uttered in response to this tone:

“A large extended low-income family do not meet the basic rights of children. As a result, those guardians have inadequate oversight and surveillance. Thus, children from impoverished or large households are more likely to drown.”

When both parents work, the children have more freedom to pursue their hobbies, especially in large households with numerous children. Poor children in rural and slum areas are especially at high risk because of these circumstances.

3.3 | Groundbreaking discoveries

3.3.1 | Peer pressure and risky behaviors

Child drowning death is a lamentable occurrence. It is usually visible in our country. Peer pressure and risky behaviors are just two of the numerous factors that contribute to children drowning. It is prevalent in both rural and urban areas. Favorite recreational pursuits include spending the day at the beach, pool, or boating. While all of these activities are enjoyable, they have the potential to turn tragic in an instant. Our investigation discovered a plethora of such fascinating facts. In keeping with this, one of our participants (A7) described how her kid drowned:

“In the evening, my son Fardin (age 10 years) and five of his friends went for a walk. After exploring several locations, they made their way to a pond near to Club Mosque. There he boarded a boat with Bahauddin, Ujjal, Ashiq, and Ruman. After reaching the center of the pond, the boat sank... There was no one around except pals at the time. Responding to their pleas, onlookers rushed to the scene, rescuing Fardin from

the river and transporting him to a nearby doctor. He was pronounced dead by the physician.”

Occasionally, it is demonstrated that many children enjoy recreational activities with their peers and friends in ponds and rivers. Additionally, they engaged in several risky behaviors with their buddies. One of our FGD respondents shared the following anecdote about her son drowning last year:

“Shravan (age 12 years) and twenty other guys had embarked on a picnic on the Titus River via boat. The teenagers began leaping into a beel (branch of the River) of the river upon seeing the new water. At approximately 2 p.m., Shravan jumped off the boat into the Laiskar Beel in Amirpara. Thus, Shravan drowned for the third time after jumping twice. When his buddies began searching for Shravan and were unsuccessful, the incident was later reported to the area's local fishermen..... Firefighters arrived on the scene and, with the assistance of residents and fishermen, they cast the net and found Shravan's body.”

Apart from the boys drowning deaths, a widow respondent (A5) from Gopalganj district lamented her daughter's tragic story:

“Three children, including Riyamoni, went to pick up water lilies on a palm boat on the beel (branch of the River) near to the house..... When the boat sank, the residents raced to its aid. Riyamoni was one of them, having been brought to the hospital by her relatives. She died on the way to the hospital.”

Risky actions, unconsciousness, peer pressures, and influences have strongly correlated with kid drowning deaths. Additional information was provided by a participant (A1) on this subject:

“It happened that Shakil (age eight years) went out in the afternoon to play in the field with his pals. They went down to the amateur fishing club in the evening to bathe..... Shakil later became unable to swim and drowned in the deep water.”

3.3.2 | Social stigma and prejudices

Among young children, drowning is the most common cause of damage and death. Drowning is the leading cause of death among children of different ages, followed by birth abnormalities. We live in a society full of myths and prejudices. These stereotypes have persisted for a long time, and many people still hold them. In remote parts of Bangladesh, there are numerous myths about drowning

children. There was much startling information in our research. This information was submitted by the respondent (B2) from Mymensingh:

“Myths abound in Mymensingh district among the local tribal population. The death of a child or someone else is seen as an act of the gods in the culture.”

People in isolated or mountainous locations have been overcome by a notion that has been passed down through generations. There is a high rate of infant death as a result of racial and religious bias. Our Feni district respondent (A9) had a point when she said,

“It is true that these mythologies are widespread throughout the Rangamati region, particularly the Chittagong Hill Tracts regions. People who live in hilly areas are more likely to believe in these rural legends than in flat land. Most of the time, when children are in danger of drowning, people do nothing because their religious and societal beliefs are so deeply ingrained that they receive the drowned child with open arms and believe that the Goddess of water has taken them to paradise with love.”

Many instances occur in the plain regions that do not make it into the media or newspapers as an additional point of information. One of our FGD's participants from the district of Chapainawabganj said the following:

“There is a local myth about a beel (a small branch of river) named Damus Beel that goes back hundreds of years. Every year, during the rainy season, the water in this area becomes stagnant and ultimately drowns everything in its path. Neighbors say this beel will result in the death of at least one person each year, especially a child. Moreover, this myth has been going on for many years.”

Consequently, many of these isolated occurrences may have been spread throughout Bangladesh. Our participants have made it evident that social prejudice and fanaticism are too accountable for the high infant mortality rate.

3.3.3 | Natural disasters and calamities

Drowning is a well-known consequence of natural disasters such as hurricanes and earthquakes, which generate tidal waves (tsunamis) and flooding. The majority included infants and were caused by drowning as a direct result of flooding. Mortality was highest in places next to catastrophic levee breaches, where water was rushing, and in areas with increased water depth. As one of the participants (B3) put it:

“Children are particularly vulnerable to natural catastrophes such as flooding, not only because of the immediate danger of drowning, snake bites, and diarrhea but also because of the threat of long-term health and educational consequences, as well as protection risks.”

The most significant concern of parents during a flood is that their children would drown in the swollen floodwaters and neighboring bodies of water. Each year, over 19,000 children die in Bangladesh due to drowning, with an average of 53 children dying daily, according to the 2016 Bangladesh Health and Injury Survey. This scenario deteriorates significantly during the flooding season. According to one of the FGD participants, the community leader (school teacher) expressed her opinion invaluable perspective:

“In the last five years (2016–2021), 69 individuals have drowned in floods alone in Kurigram district (Northern region). There are 58 children among them. This year, flooding in the district killed nineteen people. The alarming statistic is that there are fourteen children. Six are female, and eight are male.”

As with previous severe floods, the disruption of services causes people to suffer from hunger and illness. Displaced individuals seek jobs for themselves and their children in cities, eventually settling in overcrowded and hazardous slums. As a result, the future of children remains grim.

4 | DISCUSSIONS

Several prior studies have described drowning mortality and trends,^{1,31} but no population-based qualitative studies have characterized nonfatal drowning or investigated the associated factors linked to child drowning deaths in Bangladesh. This community-based research study offered the chance to close the knowledge gap in previously released data. Even though drowning is the most significant cause of death for children in Bangladesh, little effort is being made to improve the safety of children. The FGD and interviews shed light on community opinions and understanding about drowning as a cause of child death and ideas and hurdles to effective prevention. This study uncovered several contributing factors to drowning deaths among Bangladeshi children. According to our results, natural water features such as ponds, ditches, rivers, lakes, and dams are the most common places for Bangladeshi children to drown. As a result, we investigated a variety of factors associated with child drowning deaths, including a lack of adequate parental supervision and monitoring, geographic location and environment, seasonal factors, low living standards, peer pressure and risky behavior, social stigma and prejudices, and natural disasters and calamities (e.g., flood, extreme rainfall, storm surges, and tsunamis or cyclones).

Lack of parental monitoring and surveillance in Bangladesh is one of the most common contributing factors to child drowning deaths. Any child who spends time near water should have a responsible adult always on hand to watch them. While working or taking care of home responsibilities, rural mothers are not always available to watch over their children. The link between insufficient supervision and drowning deaths among children under the age of 5 has been emphasized in several prior studies,^{10,15} including research in Bangladesh, which revealed that insufficient supervision was related to 70% of drowning deaths among this age group. It was found that mothers and other family members in large families are less concerned about their children's safety and are more reckless than in smaller families.¹⁵ By raising the educational attainment of parents, especially mothers, the fatal drowning rate has dropped dramatically. A mother's educational standing significantly impacts providing adequate child care since educated moms are more knowledgeable about child care aspects.¹⁴ Saudi Arabian researcher found that a mother's educational degree has a favorable impact on her child's healthcare knowledge and abilities.²⁴ The findings corroborate an Indian study, which found that educated mothers' heightened concern for child health issues that was associated with a decreased likelihood of child accidents.²⁵

Geographically lower areas (especially in Bangladesh's southern region) are regularly submerged in water; therefore, children in these areas are at greater risk than those in Bangladesh's higher regions because of their physical location. This research was done to learn more about how poverty influences a child's chance of drowning. There are several risks for disadvantaged children in rural and slum regions. According to our findings, a lower socioeconomic position is linked to a higher risk of nonfatal drowning. Moreover, this research also indicates a substantial nexus between child drowning fatalities and the socioeconomic conditions of the victim's family toward death. Low educational and poor socioeconomic status were linked to an increased risk of child drowning. Similar findings have been observed in earlier Bangladeshi studies.^{14,16} Deaths by drowning have several causes, and the risk variables vary throughout countries and regions due to social, economic, and geographic changes.¹² According to our findings, children of widows, divorcees, illiterate and elderly mothers have a higher chance of drowning death. Similar findings were reported in the prior study, which found that children of widows, divorced, or separated mothers were at greater risk (18%) than controls (3%).¹⁴

Our research indicates that children are more likely to drown in seasonal water in Bangladesh's North Bengal regions. This analysis also revealed that drowning deaths among children were more common during the annual monsoon season (June to October). This result validates past research indicating consistent patterns of drowning mortality in Bangladesh throughout this period.¹ Since Bangladesh is currently suffering from catastrophic monsoon flooding, cascading water has continued to drown children and ruin houses, farms, and other critical physical infrastructures. As far as this article is concerned, it is groundbreaking because it reveals that reckless behavior, inattention to one's surroundings, peer pressure,

and other variables have all been closely connected to child drowning deaths in Bangladesh. As our participants demonstrated, social prejudice and fanaticism are much too often responsible for the high infant death rate in various places. Additionally, the majority involved children caused by drowning due to flooding, natural catastrophes, and tragedies. Child drowning victims are particularly vulnerable to storms and flooding, significantly affecting the local population yearly.³¹ Mortality was most significant in locations next to catastrophic levee breaches, where water flowed rapidly, and in areas with increased water depth. Similarly, our data imply that families that provide superior child care in Bangladesh have a larger overall sense of responsibility, putting their children at a lower risk of nonfatal drowning.¹¹

5 | RECOMMENDATIONS AND SUGGESTED PREVENTIVE MEASURES

Many drowning deaths among children can be prevented with long-term and comprehensive efforts to establish safety measures.¹⁵ Several aspects need to be considered for the suitability and feasibility of their implementation in Bangladesh, even though several established drowning prevention measures exist. Because of the limited resources available in an LMIC, prevention strategies must be realistic and feasible. They must also consider local environmental and social background variables. In HICs, many current child drowning prevention methods were created, such as lifeguards and swimming lesson plans. It is likely that some of these strategies will fall short of Bangladesh's goal of reducing drowning deaths, as treatments developed in high-income countries are not always easily transferrable to low- and middle-income countries.¹⁰ HICs and LMICs differ geographically, socially, culturally, and behaviorally when it comes to drowning, making it difficult or impossible to use current preventative techniques in LMICs. It is thought that the high number of drownings is linked to several different factors. Prevention techniques and actions to reduce drowning risks should be tailored to the child's developmental stage to maximize their effectiveness and location and resource factors. Children under the age of five have therefore been recommended for drowning prevention in LMICs like Bangladesh to adopt environmental modifications such as fencing water bodies, playpens, increased supervision, and personal protective equipment. The construction of fences could be a vital technique to limit the access of children under 5 years to smaller water bodies, especially ponds. It is also recommended to improve adult supervision by providing children with competent child care in LMICs to reduce drowning among children under 5 years.³ Using community creches in low-resource rural areas of Bangladesh to increase proper supervision is an effective drowning prevention measure among preschool children.¹

Intervention for older children and teenagers should focus on each child individually because of the greater independence, limited supervision, and risk-taking behaviors associated with drowning in this age range. Teaching children in this age range to swim and stay

safe around water is an effective way to do this. Swimming, noncontact rescue, and water safety are part of the Swim Safe program, created for LMICs with few resources. It has been implemented successfully in Bangladesh. Noncontact, land-based reach and toss skills are taught to children as a safe rescue method, and they are told only to enter the water as a last resort if necessary. As of 2006, nearly 400,000 Bangladeshi children aged 4–12 years had taken part in the Swim Safe program, and evidence demonstrated that it is beneficial in preventing drowning.¹³ Evidence found that the likelihood of drowning decreased by 82% when young children were adequately supervised and by 90% when older children received swimming training.¹¹ Many people believe that it is the guardians' responsibility to ensure their children are aware of the dangers of drowning in the numerous locations highlighted. Government efforts promoting swimming training for children and encouraging communities to fence up ponds can prevent children's drowning. Effective family planning can help parents better manage their children, which reduces the risk of harm and death. To prevent drowning, the following measures can be implemented.

1. Encourage working mothers to leave their children in child care centers.
2. Increase the number of crèches available to care for young children.
3. Teach children to swim at a young age.
4. Educate the community about the importance of covering water-containing pots and buckets.
5. Secure funding to install barbed wire fences around open tanks and ponds.
6. Enhancing maternal education and child monitoring standing through literacy.
7. Increase awareness and launch drowning prevention campaigns.
8. Sensitizes public awareness of the issue and encourages government officials to help the community develop a safer environment for children, and
9. As child drowning deaths and family socioeconomic position are inextricably linked, Bangladesh's government should prioritize poverty reduction programs and offer an adequate budget to poor people.

Drowning prevention programs in Bangladesh should include measures to raise awareness about the dangers of children drowning. Moreover, an essential aspect of any drowning prevention program for Bangladesh should be enhancing community awareness of safe water rescue and resuscitation practices.

6 | LIMITATIONS AND FUTURE DIRECTIONS

Bangladesh has begun to identify drowning as a severe issue in the country's future. To fully grasp the scope of the issue and devise practical solutions, extensive study and programmatic work must

be completed. This study has some methodological limitations, and there may be chances of data bias, and the current study is not free of them because it relies entirely on qualitative data. So, no generalization and evidence based statistical findings was not possible. Nevertheless, despite the shortcomings of this investigation, the researchers gave it they are all to acquire solid results. However, future study can include large quantitative samples or mixed methods design. Large-scale research is needed on how to get rid from this problem. Many research gaps need to be addressed based on the literature on child drowning in LMICs, notably in Bangladesh. Future studies will concentrate on the following issues: a dearth of primary epidemiological data; lack of social (causal) explanations for childhood drowning events; lack of effectiveness and cost-effectiveness analyses of interventions; a paucity of policy analyses; and a notable absence of drowning prevention in child health programs. Countries and institutions must fill these knowledge gaps by carrying out relevant research.

7 | CONCLUSION

The current study examined several potentially associated risk factors of child drownings in Bangladesh. To prevent drowning deaths in Bangladesh, raising public awareness through social autopsy programs could be a significant step in raising awareness about the dangers of drowning. A child-friendly society relies on safety promotion at the local level. The government should prioritize the prevention of child drowning with several well-protection measures. All storage tanks and ponds should have wire netting as a minimum. Quarries and building sites should be required to comply with safety requirements, where the law should enforce. Maternal education has an apparent effect on child care, and improved child care helps prevent drowning. Increased economic status resulting from poverty alleviation efforts may also contribute to reducing child drowning in Bangladesh. Furthermore, raising community understanding of safe water rescue and resuscitation protocols should be vital for any Bangladesh drowning prevention effort.

AUTHOR CONTRIBUTIONS

Md. Al-Mamun: Conceptualization; data curation; formal analysis; investigation; methodology; software; validation; visualization; writing—original draft. **Morshed Alam:** Methodology; software; validation; visualization; writing—original draft. **Md. Jamal Hossain:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing—review and editing. **Mst. Rukaia Khatun:** Data curation; formal analysis; investigation; methodology; resources; validation; visualization. **Pranto Kumer Das:** Data curation; formal analysis; investigation; methodology; validation; visualization. **Falguni Alam:** Data curation; formal analysis; investigation; methodology; validation; visualization. **Md. Rabiul Islam:** Data curation;

methodology; resources; software; validation; visualization; writing—review and editing. **Foyez Ahmed:** Data curation; formal analysis; investigation; methodology; resources; software; validation; visualization. **Md. Monirul Islam:** Data curation; formal analysis; investigation; methodology; software; validation; visualization.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The article contains all the data necessary to support the results. All authors have read and approved the final version of the manuscript. The corresponding authors had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

TRANSPARENCY STATEMENT

The lead author Md. Al-Mamun and Md. Jamal Hossain affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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