Article

Tides of Trouble: Exploring Health Disparities in Flood-Affected Populations in South-Eastern Part of Bangladesh

Mahfujur Rahman Himel1, Ashraful Alam2, Sabrin Sultana3, Syeda Nushrat Jahan Juthi1, Mohammad Nayeem Hasan2, Md. Emon Prodhan2, Hosneara Parvin4, Md. Aminul Islam5,\*, Md. Jakariya6, and Prosun Bhattacharya7,\*

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1 Department of Social Work, Shahjalal University of Science & Technology, Sylhet-3114, Bangladesh; [mrhimelsust@gmail.com](mailto:mrhimelsust@gmail.com) (M.R.H.); [syedajuthi1021@gmail.com](mailto:syedajuthi1021@gmail.com) (S.N.J.J.)

2 Department of Statistics, Shahjalal University of Science & Technology, Sylhet-3114, Bangladesh; [asrafrakib09@gmail.com](mailto:asrafrakib09@gmail.com) (A.A.); [nayeem5847@gmail.com](mailto:nayeem5847@gmail.com) (M.N.H.); [mdemonp10@gmail.com](mailto:mdemonp10@gmail.com) (M.E.P.)

3 Department of Banking and Insurance, University of Chittagong, Chittagong, Bangladesh;

[sabrinsultana1060@gmail.com](mailto:sabrinsultana1060@gmail.com)

4 Bachelor of Medicine, Bachelor of Surgery, Shaheed Suhrawardy Medical College, Dhaka, Bangladesh;

[dr.parvin369@gmail.com](mailto:dr.parvin369@gmail.com)

5  Advanced Molecular Lab, Department of Microbiology, President Abdul Hamid Medical College,

Karimganj, Kishoreganj, Bangladesh

6  Department of Environmental Science and Management, North South University, Bangladesh;

[md.jakariya@northsouth.edu](mailto:md.jakariya@northsouth.edu)

7 Department of Sustainable Development, Environmental Science and Engineering, KTH Royal Institute of Technology, Teknikringen 10B, SE 10044 Stockholm, Sweden

**\*** Correspondence: [prosun@kth.se](mailto:prosun@kth.se) (P.B.); [aminulmbg@gmail.com](mailto:aminulmbg@gmail.com) (M.A.I.)

**Abstract:** The destructive flood of 2024 in southeastern Bangladesh severely impacted the health and livelihoods of vulnerable communities, including pregnant women, children, the elderly, and low-income populations. This study aimed to explore the health concerns, healthcare disruptions, and coping strategies among flood-affected individuals and healthcare providers. A qualitative study was conducted with 16 participants, including flood-affected men and women aged 21-69 and healthcare professionals, using semi-structured interviews. The participants were selected based on their direct experience with the flood and its health impacts. Data were thematically analyzed to identify key concerns and coping mechanisms. The findings revealed significant health challenges, including outbreaks of waterborne diseases, skin infections, and psychological distress. The disruption of essential healthcare services due to damaged infrastructure further exacerbated these issues, particularly for vulnerable groups. Healthcare providers struggled to manage the rising demand for services while facing shortages of medical supplies and inadequate facilities. Affected communities relied on temporary shelters, home remedies, and stored food as coping mechanisms, though these were insufficient to meet their needs. The study highlights the urgent need for comprehensive disaster management strategies that prioritize healthcare infrastructure, especially in vulnerable regions. Improving access to medical services during floods, ensuring clean water and sanitation, and providing targeted care for vulnerable groups, such as pregnant women and children, are essential to mitigate future health crises.

**Keywords:** flood; health disparities; case study; Bangladesh

1. Introduction

The health impacts of floods can be classified as immediate, medium, and long-term. Floods can result in hypothermia, injuries, drowning, and animal assaults, among other critical health consequences. The evacuation of patients, loss of medical personnel, and the devastation of medical infrastructure, encompassing essential medications and supplies, are all associated with health risks [1]. Moreover, floods have the ability to disrupt the sewage system, contaminate the nearby water and food supplies, and raise the risk of infectious illnesses [2]. According to the World Health Organization, following floods, areas with inadequate access to clean drinking water and poor cleanliness have an increased risk of gastrointestinal disease [3]. Respiratory tract infections can be seen after the floods. In Pakistan, a study conducted by Baqir et al. found that, patients are experiencing viral flu, pneumonia, asthma, allergic bronchitis, and chronic obstructive pulmonary disease [4]. The main reasons for this infection are the loss of shelter and exposure to floodwaters and rain.

The life and health of the expectant mothers and their children had been put in jeopardy by the flood. The death rate for both mothers and fetuses was relatively high. The rate of maternal death was three times higher than the nation's average incidence of maternal death [5]. Moreover, health hazards during catastrophes might be exacerbated by forcing women to attend to their hygiene-related health needs in unsafe settings due to a lack of sufficient hygiene facilities [6]. Additionally, various vulnerabilities and health risks of People living with human immunodeficiency virus (PLHIV) will increase in a disaster situation like flooding if access to human immunodeficiency virus (HIV) prevention, treatment, care, and support are not addressed and ensured [7]. Moreover, Kamal et al., showed that in comparison to normal times, women experienced higher rates of pregnancy-related complications, urinary infections, and malnourishment during floods [8]. Conversely, inadequate reactions from the Organizations qualified to reduce vulnerability brought on by disasters intensified the sufferers' pain. According to Goudet et al., Pregnant women residing in urban slums of Dhaka detected flooding as a fundamental cause of malnutrition in infants and young children, elucidating the intricate relationship among floods, food scarcity, maternal malnutrition, reduced breastfeeding rates, diarrheal diseases in children, and child malnutrition [9]. Our study can help researchers and healthcare providers grasp the reproductive health needs of women during floods. This understanding can, in turn, pave the way for developing more efficient strategies to offer proper care to women in flood-prone areas.

Mental health issues, following flooding, are thought to be at least as significant as the effects on physical health [10,11]. The prevalence of mental health disorders following flooding is influenced by a number of factors, such as pre-existing mental health conditions, socioeconomic status, and the intensity of the flood. It has also been observed that people with lower incomes are more likely to suffer from severe mental health breakdown that follows a flood [12]. French et al., found that Nineteen individuals have experienced flooding, with more than fifty percent of them going through a continually occurring event [13]. When flooded people were compared to unaffected participants, mental health results were higher. After adjustment, there was no significant difference in the prevalence of depression between repeat flooded participants and single flooded participants. The subjects' degrees of anxiety or post-traumatic stress disorder (PTSD) did not differ. A number of variables, including the vulnerable population, the nature and intensity of the flood, and the nation's social support system, have affected the victims' rates of mental diseases [14]. Moreover, Axinn et al., addressed that having experienced trauma in life greatly raises the likelihood of mental health conditions like PTSD, and these events have a stronger effect on women's mental health than on men's [15]. Therefore, Interventions are needed to help minimize the impact of flooding on people’s mental health

In the event of flood, the individuals affected by it have limited access to healthcare, and the victims suffer in various ways. A study by Salami et al. [16], showed that Victims acknowledged government efforts to provide aid, but some expressed disappointment with how it was carried out. In spite of their awful experiences during the flood, victims still had to endure lengthy hours in line, travel great distances to receive relief supplies, and fight to prove they were victims in order to be eligible for government assistance. Saha concludes that it is challenging for residents of flood-prone towns to get healthcare [17]. But when there are floods, the difficulties become more severe. In addition to the financial barrier to accessing healthcare facilities, other contributing factors were the transit infrastructure and the non-operational sub-centers. Furthermore, families afflicted by disasters confront several obstacles in their efforts to become resilient. Therefore, healthcare professionals must evaluate the family's resilience and assist them in identifying both their strengths and weaknesses in order to support the family's resilience [18]. It is clear that immediate improvements in the amount and quality of sub-center facilities as well as staffing are required to enhance the state of the health services in flood-prone areas. It is necessary to establish additional public health measures, such as giving food, drink, and shelter, particularly during floods.

Flood has some social and economic impacts. For instance, victims may suffer psychologically from experiencing property damage and losing priceless personal items [19], interruption of public services, and foregone production [20]. The economic impacts include, an increasing number of businesses will have to abruptly stop operations; services will not be offered; unanticipated drops in tax revenue will force local budgets into imbalance; and public services will not be supported. There will also be more extensive infrastructure to restore following a flood disaster [21]. Effective risk mitigation demands an extensive knowledge of how disasters affect society as well as the efficacy of available mitigation strategies.

Haer et al., suggested three recommendations [22]. First, even when it reaches fewer people, people-centered flood risk communication is anticipated to be more successful than top-down communication. Second, it is anticipated that discussing flood risks and flood-resilience strategies will have a greater impact on communication than discussing risk alone. Third, the usage of social media, for example, should encourage the spread of the benefits of communication through social networks. In another study, talked about strategy such as proactive investments—Infrastructure investments, technological advancements, capacity expansions, shift in system, management practices, and behavior, as well as risk transfer (insurance) options, offer opportunities to lower future relief and recovery costs and boost fiscal stability and community long-term well-being in the face of rising climate variability and flood risk due to climate change [23].

The recent flood in Feni in 2024 pointed out severe turmoil in healthcare access, particularly for pregnant women, lactating mothers, children, and the elderly. The psychological impact on these populations, especially in terms of stress, anxiety, and trauma, remains underexplored. This study addresses this gap by focusing on the intersection of healthcare access, reproductive health, and mental health challenges during the 2024 flood in South-Eastern Bangladesh.

2. Materials and Methods

2.1. Study Design

Following a qualitative research approach and case study design this research was conducted at Feni, a district of south-eastern Bangladesh, which experienced the worst flood ever in between August to September 2024. According to reports, this flood was the epicenter of one of the worst floods the nation has ever experienced, which was allegedly caused by a neighboring country's dam [24].

2.2. Study Participants and Sampling

Participants in this study were chosen purposely from selected healthcare centers in flood-affected parts, of Parshuram, Fulgazi and Chhagalnaiya sub-district of Feni district. Participants included healthcare providers and flood-affected men and women with significant experience who could contribute their experiences. The study's inclusion criteria considered men and women who were affected by flooding and were between the ages of 21 and 69. Professionals in reproductive health and healthcare were also included. As of sample size in qualitative research is not determined by a set of rules, the sampling procedure in this study was carried out repeatedly until data saturation was achieved, which indicates that no more new information or insights were arising from the interviews.

2.3. Data Collection Tools and Technique

This study's collection of data included in-depth, semi-structured face to face interviews conducted between August and September 2024. As the study participants were selected purposively, a brief and unambiguous explanation of the study's goals was given to the participants before the interviews for their consent to participate in the study. One or two open-ended questions were asked at the beginning of the interview, such as what the participants thought the day of the flood occurrence was like or what difficulties they encountered. To obtain full information, specific questions were then posed. On average, 45 minutes passed throughout each interview. During the interviews, a tape recorder for recording the data and the participants' emotions, facial expressions, and body language were closely observed and documented.

2.4. Data Analysis

The Granheim approach was utilized to do a thematic content analysis on the interview data [25]. The analysis of the participants' statements was considered the actual content, while the interpretation and assessment of their answers was considered the latent content [26]. Every interview was recorded, and it was immediately transcribed verbatim. Every interview was rapidly analyzed, allowing the knowledge gained to guide the data collection procedure in the following interviews. To be more precise, each interview was read several times by the led author and the 4th coauthor to fully comprehend its content. Condensing and abstracting techniques were used to isolate codes and give them specific names. Similar codes were grouped together to form subcategories. Based on the similarity of their content, these subcategories were then further classified into larger groups in the following stage. The implementation of a systematic process facilitated a rigorous analysis of the data, hence enabling the identification of noteworthy themes pertaining to the difficulties faced by participants affected by floods

2.5. Ethical Consideration

This study followed strict ethical standards to protect participants' rights and well-being. Informed consent was obtained after explaining the purpose of the study. Participants' data were anonymous and securely stored to maintain confidentiality, ensuring that no participants were exposed to any harm during the interviews.

3. Results

3.1. Participants Profile

The study included 16 participants (Table 1) who were divided into two main categories: healthcare providers and flood-affected men and women. The flood-affected participants were aged between 21 and 69 and provided diverse insights into the health and socioeconomic impacts of the 2024 flood. This group included men and women from various backgrounds such as farmers, homemakers, and teachers who experienced loss of livelihood, property damage, and limited access to essential healthcare. Pregnant women and mothers also highlighted the severe disruption in prenatal care and childcare services.

The healthcare providers, on the other hand, shared their experiences of dealing with the overwhelming health crises caused by the flood, particularly in maternal and reproductive healthcare. Informants included nurses, midwives, healthcare administrators, and community health workers who faced numerous challenges, including managing disrupted medical supplies, providing care in temporary shelters, and addressing an increase in waterborne diseases. This participant profile captures the varied yet interconnected experiences of those most affected by the flood, offering a comprehensive understanding of the disaster's impact.

**Table 1.** Profile of the participants.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant ID** | **Gender** | **Age** | **Occupation** | **Role in Study** |
| 1 | Male | 66 | Farmer | Flood-Affected Male |
| 2 | Male | 41 | Healthcare Administrator | Healthcare Provider (Doctor) |
| 3 | Male | 47 | Teacher | Flood-Affected Male |
| 4 | Male | 49 | Fisherman | Flood-Affected Male |
| 5 | Male | 69 | Local Shop Owner | Flood-Affected Male |
| 6 | Male | 43 | Construction Worker | Flood-Affected Male |
| 7 | Male | 29 | Farmer | Flood-Affected Male |
| 8 | Male | 28 | Social Worker | Voluntary Service Provider |
| 9 | Male | 35 | Shopkeeper | Flood-Affected Male |
| 10 | Female | 29 | Homemaker | Flood-Affected Female |
| 11 | Female | 45 | Midwife | Healthcare Provider (Reproductive Health) |
| 12 | Female | 23 | Homemaker | Flood-Affected Female (Pregnant) |
| 13 | Female | 34 | Nurse | Healthcare Provider (Outpatient Department) |
| 14 | Female | 37 | Community Health Worker | Healthcare Provider |
| 15 | Female | 21 | Student | Flood-Affected Female |
| 16 | Female | 39 | Midwife | Healthcare Provider (Reproductive Health) |

3.2. Health Implications and Socioeconomic Effects

The flood of August 2024 stands as a devastating event that exacerbated pre-existing vulnerabilities, bringing to light the dire consequences of extreme weather on human health and socioeconomic conditions. Respondents frequently described the unprecedented nature of this disaster, noting how rapidly the floodwaters overtook homes, destroyed livelihoods, and compromised their health. The combination of prolonged exposure to stagnant, polluted water and inadequate sanitation facilities led to a surge in waterborne illnesses, skin infections, and snakebites, often leaving communities overwhelmed and without access to timely medical care. One respondent vividly captured the impact:

"We had never experienced flooding in our lives. Water remained in our house for more than seven days, creating a terrible situation. The sanitation systems were severely compromised as dirty water filled our houses and streets.”

The socioeconomic repercussions were equally disastrous. Rural farmers, in particular, bore the brunt of the flood’s wrath. Investments in crops, livestock, and fishponds were submerged, resulting in not only the immediate loss of food security but also long-term financial instability. For many families, their entire livelihoods were swept away. One participant explained the tragic loss of both assets and hope:

"I had cultivated fish worth 22,000 taka in my pond and owned cows and hens, all of which are now lost to floodwater... My crops, which were almost ready to harvest, are now submerged. Insects and fish are now feeding on them. My whole life is damaged.”

In addition to the direct loss of property, the prolonged displacement and destruction of infrastructure left many families with no access to safe drinking water, functional sanitation, or healthcare, further exacerbating the crisis. The widespread socioeconomic disruption points to the urgent need for investment in climate-resilient infrastructure, early warning systems, and stronger social safety nets for the most vulnerable populations.

3.3. Disruption of Healthcare Access

The flood exposed severe gaps in the healthcare infrastructure, particularly in the ability to respond to large-scale environmental crises. Many respondents shared harrowing accounts of healthcare centers, including government hospitals, being either partially or fully submerged, leading to the suspension of critical services. The inability to access healthcare during such emergencies, especially in rural areas where hospitals were often the only source of medical aid, led to untreated injuries, worsening chronic illnesses, and preventable deaths. One respondent lamented the condition:

"My father's kidneys are damaged. He was in dying need of dialysis. However, the service in our district hospital was suspended for many weeks. As a result, my father endured immense suffering, with severe swelling in his legs.”

Medical camps were set up to address the rising number of patients suffering from flood-related diseases, but these were often overcrowded, under-resourced, and unable to meet the immense demand for services. One participant described the chaos of trying to receive care:

"We had tried to receive treatment from a nearby medical camp, but it was so crowded that we couldn’t get the proper medication.”

The response highlighted the stark reality of inadequate preparedness in health systems to deal with disasters of this magnitude. The severe shortage of essential medicines, doctors, and medical supplies led many to resort to traditional remedies, which sometimes worsened their health conditions. This theme emphasizes the need for disaster-resilient healthcare infrastructure, mobile health clinics, and improved emergency response mechanisms in flood-prone areas.

3.4. Effects on Vulnerable Groups

While the entire population was severely affected, certain vulnerable groups, including the elderly, pregnant and lactating women, and children, faced disproportionate challenges. These populations, already struggling with pre-existing health vulnerabilities and inadequate access to resources, were placed at an even greater disadvantage by the flood.

3.4.1. Impacts on Older Adults

Older adults were among the most vulnerable due to their limited mobility and heightened dependence on healthcare services. The challenge of evacuation, compounded by the destruction of homes and sanitation systems, led to many elderly individuals going without necessary medications or basic care. As one elderly participant explained:

"I couldn't leave our house and shift. As a result, I went without food and necessary medications for days... There was no access to sanitation facilities, too."

Another respondent shared,

“I have been battling high blood pressure and diabetes for years, but during this flood, it's been impossible to get my regular medications. On top of that, my skin has broken out with rashes from the dirty water, and there is no doctor to look at it. The camps are so crowded and for someone my age, these conditions are unbearable. I am barely surviving.”

The floodwaters not only heightened the risks of disease but also isolated the elderly, making it difficult for them to access care or seek help. This underscores the need for tailored disaster-response strategies that account for the unique vulnerabilities of older adults, ensuring their timely evacuation and continuous access to healthcare services.

3.4.2. Consequences on Lactating Mothers and Pregnant Women

Maternal health services were critically disrupted during the flood, with damaged road and submerged healthcare centers preventing many pregnant women from receiving necessary prenatal or postpartum care.

“I'm supposed to do deliver in just a few weeks, but now, trapped in the flood. I could not get the prenatal care I need. The water is filthy, the camps are overcrowded and spatially there is no privacy or proper care for a person like me. I'm scared for my baby. Every day, it feels like a fight just to stay fine and safe.”

Lactating mothers faced additional challenges, as their access to clean water and food was severely compromised. One new mother described her struggles:

"I struggled to find clean water and adequate food. This harshly affected my ability to breastfeed... I only depended on the relief food and water and remained hungry if not available.”

This group’s health was further jeopardized by a lack of sanitation and increased exposure to infections. Given the critical importance of maternal and infant health during disasters, these findings point to the need for dedicated maternal health interventions, including mobile clinics, specialized shelters for pregnant and lactating women, and targeted nutritional support.

3.4.3. Child Vulnerabilities in Floods

Children were among the most severely impacted by the flood due to their vulnerability to malnutrition, waterborne diseases, and the loss of educational infrastructure. Educational institutions, often turned into shelters, were destroyed, depriving children of safe learning spaces and exacerbating the impact on their overall well-being. Many children contracted diseases like diarrhea from drinking contaminated water, as one participant recounted:

"My daughter fell ill from drinking water stored in a tank. She did not know it was filled with flood water. She began vomiting and suffered from diarrhea.”

The flood’s impact on children highlights the urgent need for child-centered disaster management plans that ensure access to clean water, food, and continued education during crises.

3.4.4. Psychosocial Effects of Flooding

The mental health consequences of the 2024 flood were profound, particularly among poor and marginalized communities. The flood triggered high levels of stress, anxiety, and trauma, as many survivors faced the loss of homes, loved ones, and livelihoods. Displacement, financial ruin, and the scarcity of basic resources contributed to a widespread sense of hopelessness. One survivor encapsulated the emotional toll:

"The flood took away everything like a nightmare, and we are feeling completely abandoned."

The lack of mental health services in flood-affected areas meant that these emotional scars often went untreated, further compounding the trauma experienced by survivors. Vulnerable groups, such as pregnant women, children, and the elderly, were particularly affected. These findings point to the need for comprehensive disaster response programs that include mental health support, alongside physical and economic recovery.

3.5. Coping Strategies with Corresponding Recommendations

Communities deployed various coping strategies during and after the flood, but their effectiveness was limited by the magnitude of the disaster and the slow pace of relief efforts. Displaced families sought refuge in overcrowded shelters, while many others relied on stored food and improvised transportation to survive. However, the lack of disaster preparedness at the household level, combined with insufficient governmental and non-governmental aid, left many communities struggling. A participant explained the need for strategic disaster management:

"This crisis clearly demands urgent long-term planning. One night, everything seemed fine, but by midnight, the water inside our house had risen to chest level. We were fortunate enough not to drown."

Respondents emphasized the need for flood-resilient infrastructure, particularly in flood-prone areas. The construction of multipurpose community centers, equipped with healthcare, sanitation, and food supplies, was suggested as a long-term solution for improving disaster preparedness. The idea of community-based boat programs and mobile healthcare units was also put forward as a means of ensuring more timely and effective responses to future floods.

4. Discussion

The destructive flood of 2024 in southeastern Bangladesh has revealed critical gaps in healthcare and infrastructure, particularly in its impact on vulnerable populations such as the elderly, pregnant and postnatal women, and children. The findings of this study highlight the severe health consequences experienced by these groups, including a surge in waterborne diseases, skin infections, and psychological distress, especially in poorer communities. The disruption of essential healthcare services, amplified by the destruction of infrastructure, worsened the ability of flood-affected individuals to access medical treatment. These challenges were compounded by the inadequate coping strategies adopted by the community, such as reliance on home remedies and temporary shelters, which proved insufficient to address the scale of the disaster.

From an analytical perspective, these findings align with the broader literature on the health impacts of floods, particularly the role of compromised sanitation facilities and prolonged exposure to contaminated water. As Hartono et al., points out, the scarcity of clean water and inadequate sanitation during floods are major factors contributing to the spread of disease [27]. The situation in the 2024 flood mirrors these concerns, with waterlogged areas remaining submerged for days, creating breeding grounds for infections. The surge in waterborne diseases, such as diarrhea and skin infections, underscores the need for improved public health interventions during floods. This is consistent with Paterson et al., who found that floods often lead to a rise in both communicable and non-communicable diseases, highlighting the critical need for resilient healthcare infrastructure capable of responding to such crises [28].

A more nuanced analysis of the findings reveals that the health crisis brought on by the flood was exacerbated by the destruction of agricultural productivity and transportation systems, which are essential for both economic stability and access to healthcare. The devastation of farmland and fishponds not only affected food security but also had long-term economic consequences for flood-affected communities, aligning with Banerjee's [29] research on the impact of floods on agricultural yields. This connection between economic vulnerability and health outcomes is crucial, as it demonstrates that the effects of the flood extended beyond immediate health concerns to include long-term socioeconomic disparities.

The collapse of the transportation system, particularly in the rural setting of Feni, further intensified the healthcare crisis. The destruction of roads hampered relief efforts and made it nearly impossible for many people to access hospitals and medical centers. This is supported by Abdullah et al. [30], who emphasize that in flood-affected areas, the lack of accessible and affordable transportation discourages people from seeking medical treatment. Similar observations have been made in studies from other countries, such as Klipper et al. [31] in Jakarta, Indonesia, where healthcare systems become more vulnerable during floods, further compromising the ability to provide timely and adequate care.

One of the most striking findings of this study is the disproportionate impact of the flood on vulnerable groups, particularly pregnant and postpartum women, children, and the elderly. The increased exposure of these groups to the detrimental effects of the flood is consistent with global research, including Morisaki et al.'s [32] analysis of flood risk for vulnerable populations in Japan. This study found that the elderly and infants are particularly vulnerable to the impacts of flooding, a pattern that is clear in the case of the 2024 flood in Bangladesh. The exposure of pregnant and postpartum women to health risks, such as limited access to maternal healthcare, further emphasizes the need for targeted interventions during natural disasters. Abdullah et al. [30] also highlight the heightened risks to maternal health during floods in Bangladesh, underscoring the importance of ensuring access to essential services for women during such crises.

Furthermore, the mental health effects of the flood on low-income communities are particularly concerning. The worsening psychological conditions of individuals already facing economic hardship demonstrate the intersection between socioeconomic status and mental health. This aligns with the findings of Flores et al. [33], who identified similar patterns in flood-affected communities in the United States. The emotional and psychological toll of losing homes, livelihoods, and access to basic services compounds the physical health impacts, revealing the multifaceted nature of flood-related vulnerabilities.

The coping strategies employed by flood-affected communities, while a testament to their resilience, were inadequate in addressing the scale of the disaster. Relying on stored food, using home remedies for minor health issues, and seeking refuge in overcrowded shelters were short-term solutions that failed to meet the long-term needs of the population. Bulambo [34] emphasizes that coping strategies developed by communities can help them adapt to flood-affected areas, but the extent of the 2024 flood overwhelmed these localized efforts. This finding underscores the need for more comprehensive disaster management strategies that go beyond community-based coping mechanisms and include robust government intervention, infrastructure improvement, and the provision of essential services.

5. Strengths and limitations

This study has several strengths, including its comprehensive analysis of the 2024 flood's health impacts in southeastern Bangladesh, with a focus on vulnerable groups such as pregnant women, children, and the elderly. By examining both health outcomes like waterborne diseases and mental health issues alongside infrastructure damage, the study offers a multidisciplinary perspective, making the findings relevant for policymakers and healthcare providers. However, the study is geographically limited to one region, which may not reflect the experiences of flood-affected populations across the country. The reliance on qualitative data introduces potential biases, and the short time frame only captures immediate impacts, leaving long-term health consequences underexplored. Additionally, while healthcare access challenges are discussed, mental health interventions are not sufficiently addressed. Despite these limitations, the study provides valuable insights into the complex interplay of health, infrastructure, and socio-economic factors in disaster contexts.

6. Recommendations

However, to address the severe health and infrastructure challenges caused by the 2024 flood in southeastern Bangladesh, several recommendations are essential. First, strengthening public health infrastructure is critical, particularly by improving water, sanitation, and hygiene (WASH) facilities to prevent waterborne diseases. Flood-resilient healthcare facilities and mobile units are necessary to ensure continuous healthcare access during floods, supported by trained rapid-response medical teams. Specialized care for vulnerable groups such as pregnant women, children, and the elderly should be prioritized through mobile clinics and targeted programs. Disaster preparedness must be enhanced at the community level through training in first aid, hygiene, and flood-specific health precautions, alongside the development of local disaster management committees. Emergency healthcare protocols should be established, and early warning systems strengthened to reduce health impacts. Furthermore, flood-resilient transportation infrastructure, including elevated roads and alternative networks like boats, is vital for ensuring access to healthcare and relief. Addressing mental health through psychosocial support in disaster response, especially in poor communities, can mitigate the psychological toll of floods. Community volunteers must receive training in mental health first aid to deliver prompt assistance.

Agricultural and livelihood resilience can be strengthened by promoting flood-resilient practices, such as cultivating flood-tolerant crops and building elevated fishponds. Additionally, diversifying livelihoods and providing insurance schemes will reduce economic vulnerability. Long-term solutions include comprehensive disaster management policies that integrate flood risk reduction, climate adaptation, and infrastructure resilience. Investments in flood control infrastructure, such as levees and drainage systems, should be prioritized, along with floodplain management plans to regulate land use in vulnerable areas. Finally, enhancing coordination among stakeholders—government, healthcare providers, NGOs, and community organizations—is crucial for a coordinated disaster response. Decentralizing disaster response to local authorities and ensuring they have the necessary resources, and decision-making power will improve the effectiveness of relief efforts. Together, these recommendations offer a holistic approach to mitigating the impact of floods on health, infrastructure, and livelihoods, fostering long-term resilience in flood-prone regions like southeastern Bangladesh.

7. Conclusion

The 2024 flood in southeastern Bangladesh revealed critical vulnerabilities in healthcare access, infrastructure, and the well-being of marginalized populations, particularly the elderly, pregnant and postpartum women, and children. The findings underscore the widespread health consequences, including a surge in waterborne diseases, skin infections, and psychological distress, which were aggravated by damaged infrastructure and limited healthcare access. Coping strategies, such as reliance on temporary shelters and home remedies, proved inadequate to meet the scale of the crisis. This study highlights the urgent need for a comprehensive and integrated disaster management approach that not only strengthens healthcare systems and infrastructure resilience but also ensures targeted support for vulnerable groups. Addressing these challenges will be essential to reducing the disproportionate impact of future disasters and promoting long-term social and economic equity in flood-affected areas of Bangladesh.

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