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Original Research

Healthcare in Crisis: Accessibility Challenges for Flood-Affected Rural Communities in Sunamganj District of Bangladesh

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Abstract

Background: Climate change has intensified the frequency and impact of flash floods, endangering millions of lives through livelihood disruption, property damage, and a surge in waterborne diseases. In response to the devastating flash floods in Sunamganj district of Bangladesh, the Sajida Foundation, a nonprofit organization, implemented a post-flood rehabilitation program to address healthcare needs.

Objective: This study aims to explore the challenges and lessons learned from the healthcare response provided during the rehabilitation program in Sunamganj.

Methods: The study utilized a mixed-methods approach, including qualitative interviews and quantitative analysis of patient data collected from health camps conducted during the rehabilitation effort. Descriptive statistics were employed to analyze healthcare service utilization, satisfaction, and disease patterns among the affected population.

Results: The analysis revealed that 71% of patients seeking treatment were female, with the most prevalent diseases being diarrhea (32%), fever, cold, and cough (27%), generalized weakness (21%), hypertension (11%), and skin diseases (9%). Fever, cold, and cough were particularly common among children (7%), while the most vulnerable age group was 20–60 years (53%). Key challenges identified included shortages of healthcare services, medical supplies, and healthcare providers. Strengthening healthcare systems, ensuring adequate medical supplies, and fostering community resilience are critical to improving healthcare outcomes in flood-affected areas.

Conclusion: The study highlights significant gaps in healthcare accessibility during post-flood rehabilitation efforts. It emphasizes the need for a multi-sectoral and data-driven approach to emergency healthcare response and long-term rehabilitation. Lessons from this study can inform policy and programmatic strategies for future emergency response initiatives.

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Background

Bangladesh is considered the most flood-prone country globally. Annual large-scale rainfall and overflowing rivers lead to widespread flooding, with each year surpassing the previous in flood records and associated damages (Hossain, Sohel, & Ryakitimbo, 2020). Floods are natural phenomena influenced by meteorological, hydrological, and geographical factors. Both atmospheric and terrestrial water sources contribute to flooding, characterized by storage volumes and release durations. Flash floods result from heavy rainfall in upstream areas, causing rapid runoff into lowlands and devastating physical infrastructure, crops, and communities (Bronstert et al., 2020). These floods are especially prevalent in low-lying areas like riverbanks, washes, and depressions, typically occurring within six hours of intense rainfall. Sudden onset of flash floods and swift currents pose grave dangers, often catching individuals off guard and leading to severe infrastructure and public health consequences (Pandey & Vishwakarma, 2019). Floods caused by heavy rainfall differ from river overflows caused by prolonged moderate rain. Flash floods often cause extensive damage to property, livelihoods, and water, sanitation, and hygiene (WASH) systems (Ba, Nam, & Hung, 2022).

Flood responses in Bangladesh have been continuously evaluated, with successes and room for improvement (Rawlani & Sovacool, 2011). Due to its proneness to flooding, Bangladesh has developed a range of strategies to mitigate the impact. In emergencies, the government mobilizes the military, distributes relief supplies, and establishes temporary shelters (Islam, Chu, Liew, & Smart, 2020). Several non-government organizations (NGOs), including BRAC, SAJIDA, and the Red Cross, have provided immediate relief, food, water, medical assistance, and longer-term rehabilitation. However, challenges remain in coordinating efforts between government agencies, local authorities, and NGOs in Bangladesh (Gain, Mondal, & Rahman, 2017). With better communication and preparedness, the immediate response to floods has improved. Still, the long-term sustainability of flood protection systems and the resilience of vulnerable communities need to be improved. Moreover, the accuracy and reach of flood forecasting and early warning systems are still challenged, especially in remote areas. In May 2022, heavy monsoon rains and upstream water from India inundated a vast portion of Bangladesh's Sylhet division, creating a humanitarian crisis (reliefweb, 2022). The lack of a forecast left residents unprepared, severely impacting all aspects of life. The Flood Forecasting and Warning Center (FFWC) reported that 84% of Sylhet and 90% of Sunamganj districts were submerged, with the housing sector alone suffering damages of approximately USD 176 million (Ministry of Disaster Management and Relief: Government of Bangladesh, 2023). WASH services for 4.2 million people were disrupted, with over 106,000 water points and 283,000 latrines damaged, further escalating health risks (Ministry of Disaster Management and Relief: Government of Bangladesh, 2023). Floodwater, often contaminated and stagnant, triggered disease outbreaks, with water borne disease such as diarrhea and typhoid emerging as the most prevalent ailment and a major cause of mortality (Erickson, Brooks, Nilles, Pham, & Vinck, 2019; Iqbal, Bux, & Sahitia, 2023; Minamiguchi, 2008).

To address these challenges, the Government of Bangladesh, UN agencies, the Red Crescent Movement, and various national and international organizations launched significant emergency relief efforts (reliefweb, 2022). Emergency medical care was provided, minimizing mortality and preventing further crises. Among these, Sajida Foundation, a value-driven nonprofit organization, initiated early relief efforts with other organizations to establish a comprehensive rehabilitation program in the most affected regions of Sunamganj. The program covered 13 villages in Sunamganj Sadar and Tahirpur Upazila, focusing on livelihoods, education, water supply, hygiene, livestock, and healthcare (Sajida Foundation, 2024). Priority was given to vulnerable households, including those led by women, the elderly, or disabled individuals. Strategies included restoring community infrastructure, teaching technical skills, and generating non-farm livelihoods (Sajida Foundation, 2024).

This study aims to systematically assess and document the healthcare support mechanisms, operational challenges, and key lessons learned during flood response efforts in Bangladesh. This includes evaluating the effectiveness of medical services, identifying gaps in health-seeking behavior, emergency healthcare delivery, and capturing best practices to inform future disaster preparedness and response strategies.

Methods

Study design and setting

We adopted a cross-sectional design for this study, ensuring a comprehensive snapshot of the community at a single point in time. Initially, a need-based assessment survey was systematically conducted in purposively selected flood-prone upazilas (sub-districts) of Sunamganj **(Figure 1**).

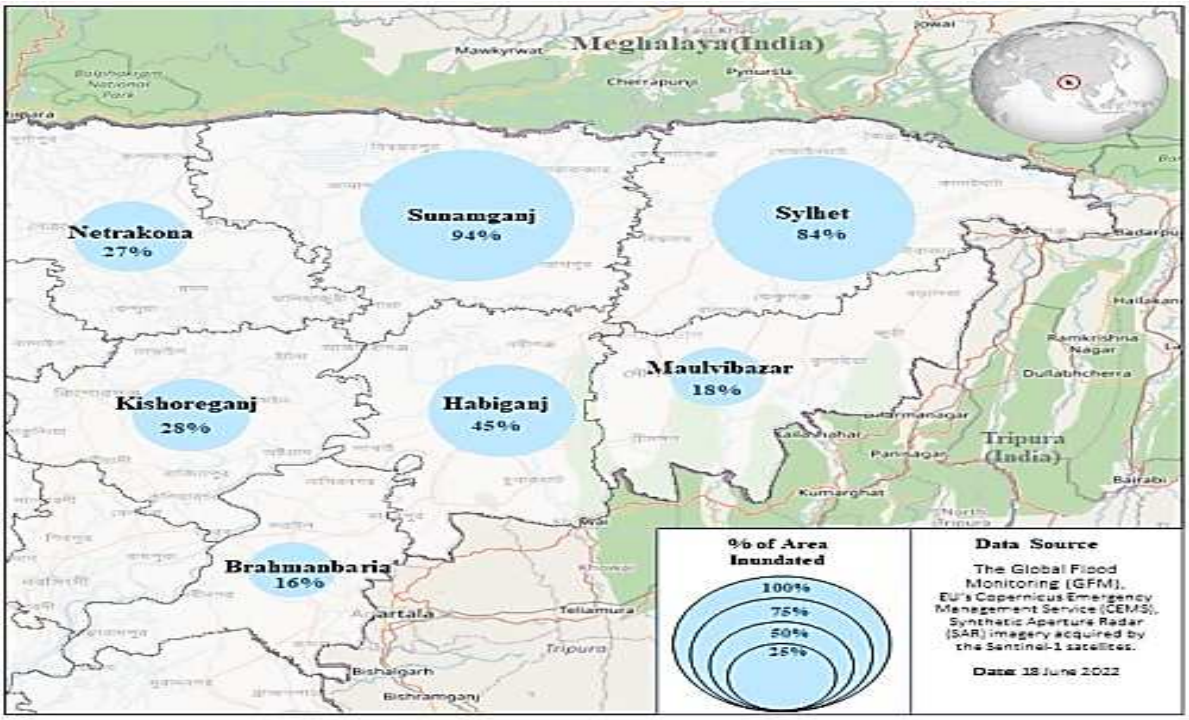

Figure 1. Flash flood-affected areas in 2022 in the part of Bangladesh.

The survey aimed to identify and analyze the socioeconomic and infrastructural challenges households face in these areas. Data was collected using a structured Kobo Toolbox platform questionnaire administered to 2,500 households. The questionnaire was designed to capture specific indicators, including health, economic vulnerability, housing conditions, livestock ownership, and water and sanitation status. Households were selected through purposive sampling in coordination with local stakeholders to ensure the inclusion of the most affected and vulnerable populations. This methodological approach enabled us to gather detailed, context-specific data, which provided a robust evidence base to understand the impacts of seasonal flooding on community well-being.

Participant selection and interventions

The findings from the needs assessment provided critical insights that informed the design of Sajida Foundation's rehabilitation project, which focused on five key interventions. Healthcare emerged as the primary area of need, based on the identified vulnerabilities. A total of 2.500 households, experiencing severe impacts, were selected for the intervention based on specific criteria, including: The presence of chronic illnesses within the household; The occurrence of illness among individuals in the working community; A monthly income below USD 50; The absence of other post-flood support. Of the total households selected, 1.105 respondents who sought treatment through the rehabilitation project were included in this study. This selection process ensured that the study sample was representative of the most vulnerable populations, allowing for a targeted assessment of the impacts and effectiveness of the rehabilitation interventions.

Healthcare rehabilitation implementation

Healthcare support was delivered through a well-organized system that included health camps and outreach centers. Paramedics made household visits to identify individuals in need of care and referred them

to the nearest healthcare facility. Each health camp was coordinated by a Field Officer and supervised by a Team Lead to ensure everything ran smoothly. Medical consultations were provided by professionals with a Diploma in Medical Faculty (DMF), including doctors, who addressed a variety of health issues, such as common illnesses, child health, maternal and reproductive health, infectious diseases, waterborne illnesses, and chronic conditions like diabetes and hypertension **(Figure 2).**

After assessing the patients, the medical team prescribed and provided essential medicines, including oral rehydration salts (ORS), antibiotics (Ciprofloxacin, Metronidazole, Amoxicillin), blood pressure medications, pain relievers (Paracetamol), antihistamines, cough syrups, iron, zinc, multivitamins, and topical treatments like antifungal creams, iodine, and chlorhexidine. The choice of medications was based on the common health issues seen in the flood-affected areas and followed the World Health Organization (WHO) guidelines and Bangladesh's national list of essential drugs. This ensured that the most frequent conditions, such as waterborne diseases, respiratory infections, chronic illnesses, and maternal and child health concerns, were effectively treated.

For patients who needed more advanced care, a referral system was in place to direct them to hospitals for emergency or specialized treatment. This organized and coordinated approach to healthcare helped ensure that vulnerable, flood-affected communities in Sunamganj had access to the care they needed. By combining household visits, on-site consultations, and a clear referral process, the project was able to provide more comprehensive and accessible healthcare to those who needed it most.

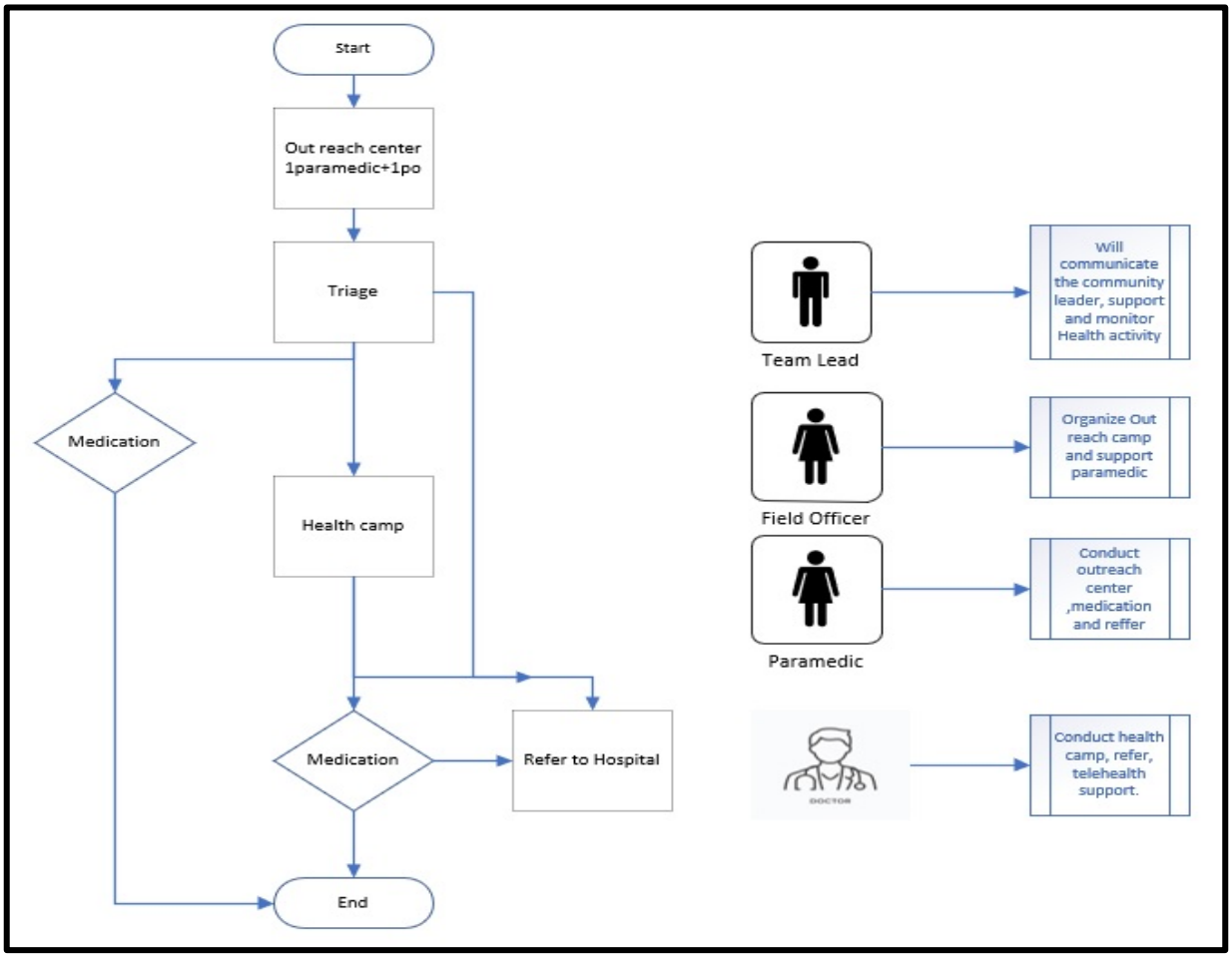

Figure 2. Healthcare support approach taken as a program intervention

Data collection

Data for this study were collected from health camp records, which included detailed information on patient numbers, diagnoses, and treatments provided. These records were used to assess the overall health

needs of the affected population and the services delivered through the health camps. Trained field staff collected the data in a structured manner, ensuring consistency and accuracy in documenting patient visits, diagnoses, and prescribed treatments. The data provided insights into the primary health concerns within the community, including common illnesses, waterborne diseases, and noncommunicable diseases, along with patient treatment outcomes.

Data analysis

Descriptive statistics were used to give a clear summary of the key features of the data collected. Frequency distributions were calculated for categorical variables to understand the proportions of different health conditions, treatment types, and demographic characteristics in the sample. This approach helped to highlight the main trends and patterns in the data. The analysis was conducted using IBM SPSS Statistics.

Ethical consideration

This study collected informed consent from the study participants. Permission to conduct this study was obtained from the Directorate General of Health Services, Ministry of Health and Family Welfare of Bangladesh (Sajeda/development-program/2022-126). In addition, special permission was obtained from the Civil Surgeon's office, the District Commissioner's office, and the local Mayor's office before collecting data from the selected villages.

Results

Socio-economic and demographics characteristics of the respondents

The demographic profile of the affected population reveals diverse age groups **(Table 1)**, with a notable concentration in the 20-60 age range (53%). Also, females constitute the majority at 71%, while males represent 29%. Table 1 further presents regarding monthly income, before the flood, 80.0% earned up to USD 50, with the remaining 20.0% falling in the USD 51-100 range. After the flood, 90.0% maintained a monthly income up to USD 50, and 10.0% reported income between USD 51-100. These statistics emphasize the vulnerability of a predominantly low-income population to the impacts of flooding.

Most of the respondents, comprising 85.97%, perceive non-brick-built houses favorably. This suggests a prevalent positive perception towards houses constructed without traditional bricks. A smaller portion of respondents, accounting for 14.03%, have a perception favoring semi-brick-built houses. This indicates a notable but comparatively less prevalent positive view towards houses incorporating some degree of brick construction.

Most respondents, accounting for 67.96%, perceive items as fully damaged. This indicates a prevalent perception that the items are beyond repair or unusable. A substantial portion of respondents, representing 32.04%, perceive items as partially damaged. Most respondents, 64.07%, perceive tubewell water as a source. This indicates significant usage of underground water through tubewells. A substantial portion of respondents, accounting for 35.93%, perceive river water as a source. This suggests a recognition of natural water bodies, such as rivers, as a potential water source. The study findings are organized to reflect the multifaceted impact of the crisis. It begins by examining age, gender, and economic consequences, such as loss of income, house damage, and increased household expenses.

Table 1. Socio-economic and demographic characteristics of the respondents (*n=1105*)

Criteria	Frequency	Percent (%)
Age groups (in years)		
0-5	123	11.0
06-10	100	9.0
11-15	92	8.0
16-19	72	7.0
20-60	586	53.0
61-70	81	7.0
≥ 71	49	4.0

Gender		
Female	785	71.0
Male	320	29.0
Monthly income (before flood)		
USD ≤ 50	884	80.0
USD 51-100	221	20.0
Monthly income (after flood)		
USD ≤ 50	994	90.0
USD 51-100	111	10.0
House Type		
Non-brick-built House	950	85.9
Semi-brick-built House	155	14.1
The house condition after being affected by the flood		
Fully Damaged	751	67.9
Partially Damaged	354	32.1
Sources of drinking water		
Tubewell	708	64.1
River	397	35.9

Health-seeking behavior and perception regarding the provided health services

This analysis highlights the health-related impacts, emphasizing the increased disease burden and the challenges of accessing healthcare during emergencies. Most respondents, constituting 57.10%, perceive quacks favorably **(Table 2).** This suggests a significant positive perception towards unconventional healthcare practitioners. A considerable portion of respondents, representing 26.06%, have a positive perception of paramedics. This indicates a substantial but comparatively lower prevalence of favorable views towards paramedics. A smaller group of respondents, making up 16.83%, holds a positive perception of MBBS doctors. This suggests a relatively lower prevalence of favorable views towards traditional medical practitioners.

The most commonly reported diseases were diarrhea, fever, cold and cough, generalized weakness, hypertension, and skin diseases. Among these conditions, diarrhea was the leading cause of morbidity, accounting for 354 cases (32%) of all reported illnesses. This high prevalence indicates that diarrheal disease remains a major public health concern and may reflect challenges related to water quality, sanitation, hygiene practices, and access to safe drinking water within the affected communities. Fever, cold, and cough were the second most frequently reported health problems, with 298 cases (27%). The substantial number of cases suggests the widespread occurrence of respiratory infections, which may be associated with environmental conditions, seasonal variations, overcrowding, or limited access to preventive healthcare services. Generalized weakness was reported in 232 cases (21%), highlighting its considerable impact on individual health and daily functioning. This condition may be linked to underlying illnesses, nutritional deficiencies, chronic infections, or other health-related factors affecting overall well-being. Hypertension accounted for 122 cases (11%), indicating a significant burden of non-communicable diseases within the population. The presence of hypertension underscores the need for regular health screening, lifestyle modification programs, and appropriate management strategies to prevent long-term cardiovascular complications. Meanwhile, skin diseases were identified in 99 cases (9%), reflecting ongoing dermatological health concerns. These conditions may be associated with environmental exposures, personal hygiene practices, infectious agents, or limited access to healthcare services. Overall, the findings demonstrate the coexistence of communicable and non-communicable diseases, emphasizing the need for comprehensive public health interventions and targeted disease prevention strategies.

83.2% of the respondents praised the efforts, while 16.8% stated Appraisable due to the effective implementation of the Provided Health Services. It has been observed that drugs were sufficient to treat 89% of the patients seeking health care, and only 10% of the patients needed referral to a higher facility. However, the drug list can be vital for flood rehabilitation projects, including flood emergencies.

Table 2. Health-Seeking Behavior, Disease Prevalence, and Perception of Healthcare Services Among Flood-Affected Populations *(n=1105)*

Criteria	Frequency	Percent (%)
Preferred professionals		
Quack	631	57.1
Paramedic	288	26.1
MBBS Doctor	186	16.8
Diseases		
Diarrhea	354	32.0
Fever, Cold, and Cough	298	27.0
Generalized Weakness	232	21.0
Hypertension	122	11.0
Skin Disease	99	9.0
Perception of provided care		
Satisfactory	919	83.2
Appraisable	186	16.8
Referral Status		
Treatment completed	983	89.0
Referred	122	11.0

Disease-wise vulnerable age groups

Diarrhea was most prevalent among children aged 0-10 years (5.2%), representing 57 cases, followed by 20-60 years (1.5%) with 17 cases, and 61+ years (1.1%) with 12 cases (Table 3). Fever, cold, and cough were the most frequently reported diseases, affecting 32.2% of the overall population, with the highest incidence in the 0-10 years group (12.4%), followed by 11-19 years (8.1%), and 20-60 years (6.9%). Generalized weakness significantly impacted the adult (20-60 years), accounting for 17.9% of cases (198 cases).

Skin disease and hypertension exhibited notable prevalence among older adults. Skin disease was reported in 20.9% of the population, with the highest concentration among the 20-60 years group (14.6%). Among individuals aged 61 years and above, 4.1% experienced skin disease. Hypertension predominantly affected the 20-60 years group (9.2%), followed by the 61+ group (1.6%), highlighting a higher vulnerability to chronic conditions in older populations.

Table 3. Age-specific distribution of disease categories among flood-affected populations *(n=1105)*

Disease Categories	All Age (%)	0-10 Yr (%)	11-19 Yr (%)	20-60 Yr (%)	≥61 Yr (%)
Diarrhea	97 (8.8)	57 (5.2)	11 (1.0)	17 (1.5)	12 (1.1)
Fever, Cold, and Cough	356 (32.2)	137 (12.4)	90 (8.1)	76 (6.9)	53 (4.8)
Generalized Weakness	302 (27.3)	27 (2.4)	27 (2.7)	198 (17.9)	48 (4.3)
Skin Disease	231 (20.9)	4 (0.4)	5 (1.8)	20 (14.6)	43 (4.1)
Hypertension	119 (10.8)	0 (0.0)	0 (0.0)	102 (9.2)	18 (1.6)

Adult (20-60 years); Older adult (≥61 years)

Discussion

The study highlights significant impacts on adults and females, pregnant women, and individuals with disabilities, with most households earning up to USD 50 monthly post-flood, indicating severe economic strain. Structural vulnerabilities are evident, with two-thirds of the homes fully damaged. Health issues like diarrhea, fever, and generalized weakness are prevalent, emphasizing the need for better water and sanitation facilities. There is a significant gap in access to healthcare in the community, which is highlighted by the community's reliance on unqualified healthcare providers. A high level of satisfaction with the project's healthcare services demonstrates its success. It is imperative to tailor healthcare strategies to address the unique healthcare needs of children and older adults because of age-specific vulnerabilities.

The findings indicate significant economic disruptions for the adult population and highlight gendered income vulnerabilities, emphasizing the urgent need for targeted economic recovery interventions. These results are consistent with other studies (Akter, 2021; Carson, Carson, Axelsson, Sköld, & Sköld, 2021; Sun, Mann, & Skidmore, 2022). The demographic analysis reveals that the most affected population falls within the 20-60 age range (53%). This highlights the potential disruption of economic activities and livelihoods in the aftermath of the flood. The predominance of female respondents (71%) further underscores gendered vulnerabilities, possibly due to pre-existing socio-cultural and economic disparities. The income analysis before and after the flood paints a stark picture of financial vulnerability, with 90% of households reporting a monthly income of up to USD 50 after the flood. This shift reflects the compounding economic strain caused by the disaster and underlines the need for targeted economic recovery interventions (Srivastava & Shaw, 2015).

The findings emphasize the need for sustainable housing solutions and improved water and sanitation facilities. The predominance of non-brick-built housing (85.97%) among respondents and the high percentage of fully damaged homes (67.96%) demonstrate the structural vulnerabilities of housing in flood-prone areas. These findings emphasize the necessity of promoting resilient housing solutions tailored to the socio-economic realities of the affected populations (Carroll, Morbey, Balogh, & Araoz, 2009; Maleki, Eslamian, Mustafa, & Madadi, 2022). The study identifies diarrhea (32%), fever, cold, and cough (27%), and generalized weakness (21%) as the most prevalent health conditions, underscoring the widespread impact of waterborne and respiratory illnesses during floods. The high incidence of diarrhea, particularly among children aged 0-5 (4.1%), highlights the critical need for improved water and sanitation facilities to mitigate such health risks.

The dependence on unqualified healthcare providers underscores a significant gap in the healthcare system, emphasizing the urgent need to strengthen primary healthcare infrastructure and improve community awareness. This finding is consistent with evidence from studies conducted in Bangladesh, which similarly highlight the challenges posed by insufficient regulation and the dependability on inadequately trained providers (Ahmed, Hossain, RajaChowdhury, & Bhuiya, 2011; Uddin & Mazur, 2015). Due to the successful implementation of health scoping strategies targeted at vulnerable populations, this program demonstrated an increased level of satisfaction among participants and a minimal number of referrals. The results of this study are consistent with those of other studies that have shown the effectiveness of targeted interventions in improving healthcare access and satisfaction for vulnerable populations (M. A. Haque et al., 2013; M. R. Haque, 2019). The health-seeking behavior of respondents reveals a concern about confidence in unqualified healthcare providers, with half favoring quacks. While professionals were consulted, the comparatively lower utilization of formal healthcare services points to gaps in accessibility and trust.

This highlights the importance of strengthening primary healthcare systems and raising community awareness about the value of qualified medical care. A key finding was that the community had relied on unqualified healthcare providers due to limited access to formal services. However, the healthcare interventions in the project were well received, with three-fourths of respondents expressing satisfaction. This positive response can be attributed to the availability of essential medicines, proactive outreach, and a functioning referral system, which was used by 10% of patients needing higher-level care. These results demonstrate the effectiveness of targeted health strategies in reaching vulnerable populations during disaster response.

The findings highlight the need for age-tailored healthcare strategies, focusing on pediatric care for children and chronic disease management for the adult population. Age-specific analysis highlights distinct vulnerabilities, with children aged 0-5 most affected by fever, cold, cough (7.0%), and diarrhea (4.1%). In contrast, generalized weakness (17.9%), skin diseases (14.6%), and hypertension (9.2%) were most prevalent among the adult population. These findings emphasize the need for age-tailored healthcare strategies, focusing

on pediatric care and chronic disease management (Paterson, Wright, & Harris, 2018). The findings underscore significant age-specific vulnerabilities within the population aligned with previous studies (Alderman, Turner, & Tong, 2012; Milojevic et al., 2012). Diarrhea and respiratory illnesses like fever, cold, and cough were predominantly observed in children aged 0-10 years, reflecting their heightened susceptibility to waterborne and respiratory infections. These conditions may be attributed to limited access to clean water and sanitation facilities and weak immunity among younger individuals. In contrast, generalized weakness was markedly high in the 20-60 years group, highlighting the physical and psychological toll of the disaster on the adult population.

Our findings highlight the need for targeted interventions to improve access to noncommunicable disease (NCD) management and dermatological care, emphasizing comprehensive healthcare strategies for both immediate and long-term care in disaster-stricken populations, aligned with other studies (Ganeshkumar, Saigal, Gopal, Shankar, & Kaur, 2022; Nurhasana & Hartono, 2021; Ryan et al., 2015). The prevalence of hypertension and skin diseases among older adults (61+ years) highlights the compounded effects of age and disaster exposure on chronic health conditions. The high prevalence of skin diseases among adults underscores the significant impact of prolonged exposure to floodwater and insufficient hygiene practices. Our findings align with previous studies, which have similarly highlighted the association between environmental factors and the increased incidence of skin conditions in vulnerable populations (Parker, Mo, & Goodman, 2022; Tempark, Lueangarun, Chatproedprai, & Wananukul, 2013). These observations call for comprehensive healthcare strategies that integrate immediate and long-term care for vulnerable age groups, ensuring resilience in disaster-stricken populations.

Self-reported data and potential sampling bias may affect its generalizability, such as recall bias or social desirability bias, or overrepresentation of specific demographic groups, and it may overlook long-term impacts and lack detailed reasons behind healthcare-seeking behaviors in this study. Additionally, without understanding the reasons behind healthcare-seeking behaviors, it may be challenging to develop effective interventions to improve healthcare access and trust. These limitations highlight the need for further research and more robust data collection methods to fully understand and address the disaster's impacts. However, the strengths of the study imply that it provides a detailed and comprehensive understanding of the flood's impact, which can inform targeted interventions and policymaking. The focus on different age groups and gender vulnerabilities allows for developing specific strategies to address the needs of these populations. The economic and health data can guide the allocation of resources and the design of recovery programs, while the assessment of structural vulnerabilities can lead to the promotion of resilient housing solutions.

Lessons learned and Recommendations

The study underscores the need for a multi-faceted approach to disaster healthcare response aligned with other studies (Hansson, Danielson, & Ekenberg, 2008; Mohapatra & Singh, 2003; Tariq & Van De Giesen, 2012; Wang et al., 2022):

- Strengthening healthcare systems: Ensure the availability of qualified healthcare professionals and enhance trust in formal healthcare systems by training and deploying paramedics and MBBS doctors in disaster-prone regions.
- Resilient water and sanitation infrastructure: Address the root causes of waterborne diseases through improved water purification and sanitation facilities, and distribute water purifying tablets and oral rehydration solutions during emergencies.
- Community-based health awareness: Implement targeted health education campaigns to reduce the use of unqualified healthcare providers and increase the utilization of formal healthcare services.
- Essential medicines and referral systems: Ensure the availability of essential drugs and establish robust referral systems during disaster response to enhance the quality of care and improve health outcomes.
- Age-specific healthcare interventions: Age-specific healthcare interventions are essential to address the unique needs of vulnerable populations. Tailored approaches, such as pediatric care for children, chronic disease management for adults, and specialized care for pregnant women and individuals with disabilities, are critical. These interventions are necessary to mitigate health risks and improve healthcare outcomes for these groups.
- Promoting resilient housing: Encourage the adoption of resilient housing designs to reduce structural vulnerabilities and mitigate the impact of future floods.

- Integrated disaster response plans: Develop comprehensive disaster response plans that integrate healthcare, housing, and economic recovery strategies to address the multifaceted needs of affected populations.
- Mental health support: Provide mental health support services to address the psychological impact of disasters on affected individuals, particularly those in vulnerable age groups.
- Community engagement: Involve community members in the planning and implementation of disaster response initiatives to ensure that interventions are culturally appropriate and effectively meet local needs.
- Monitoring and evaluation: Establish robust monitoring and evaluation systems to assess the effectiveness of disaster response interventions and make data-driven adjustments to improve outcomes.

Conclusions

This study underscores the devastating impact of climate change-driven flash floods on human life and healthcare access in Sunamganj, Bangladesh. Diarrhea was the most prevalent disease, with hypertension also significantly affecting the population. Age- and gender-specific health patterns highlight the need for tailored interventions. Flash floods severely disrupted housing, water sources, and healthcare access, compounding vulnerabilities. The Sajida Foundation's rehabilitation approach offers a valuable model for recovery, though barriers such as limited access to healthcare centers and quality medicines persist. These findings provide crucial insights for improving emergency healthcare responses and informing policies to mitigate the impact of floods on affected communities.

Conflict of interests

No competing interest was disclosed.

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