

A summative learning project on

**A Qualitative Study on the Knowledge, Perceptions, and Practices
Regarding Heatwaves Among Mothers of Young Children in a Slum of
Dhaka, Bangladesh**

To whom the report is submitted:

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Purpose of the study

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Abstract

Heat waves are a global concern that affects millions of people's health and well-being worldwide. Bangladesh is no exception, and the resource-constrained slum community suffers from its impact on a massive scale due to poor housing, a lack of essential services, and the unavailability of affordable health facilities. Mothers and children are the most vulnerable groups. This study aims to explore the knowledge, perception, and practice regarding heat waves and their associated impacts on mothers of young children in a slum in Dhaka City, Bangladesh.

Employing a qualitative approach involving 12 in-depth interviews with mothers of young children and 4 key-informant interviews with valuable community stakeholders, the knowledge, perception, and practices among mothers were captured. Participants were selected through purposive sampling to capture the diverse experiences of the mothers. The interview guidelines were focused on how much they know about heatwaves, and their relation to climate change, their perception of how heatwave affects their life, and their coping mechanism and health-seeking behavior for the heatwaves. Thematic data analysis highlighted patterns and unique insights from their lived experience.

The findings reveal that while mothers are aware of the increasing heat, their understanding of its causes and health implications is limited. Many reported heat-related illnesses in children along with themselves, such as dehydration, fever, and heat rash, but financial and logistical constraints often hindered healthcare access. Coping mechanisms included using cooling solutions and increasing water intake, but these measures were insufficient to mitigate the severe impacts of extreme heat.

This study underscores the urgent need for targeted interventions, including awareness campaigns, affordable healthcare access, and community-level support systems to address the challenges of heatwaves in urban slums. The insights gained can inform policies to improve resilience and reduce health vulnerabilities among marginalized populations in rapidly urbanizing areas.

Keywords: Heatwaves, health impacts, urban slums, mothers, young children, Dhaka, qualitative research

1. Introduction

Background

Heat waves are defined as “a period where local excess heat accumulates over a sequence of unusually hot days and nights,” according to the World Meteorological Organization (WMO), and it has a devastating impact on human health, agriculture, livelihood, and economics (WMO, 2023). World Health Organization (WHO) reported that the frequency, duration, and severity between 2000 and 2016 increased the number of people exposed to heat waves by around 125 million (WHO, 2020). Simultaneously, NASA reports that the earth is getting warmer rapidly, and the average temperature has increased by 1.5 in 2023, indicating a devastating impact on planetary health, the environment, and economics (NASA, 2024). Global damages from anthropogenic excessive heat from 1992 to 2013 were probably between \$16 trillion and \$50 trillion, and regions with the worst income decile experienced losses of 8% of GDP per capita annually, which is two times higher than the upper-income countries as found by study (Callahan & Mankin, 2022).

While the entire world is experiencing the effect of global warming, Southeast Asian countries like India, Pakistan, and China are facing some of the worst effects of heatwaves as morbidity and mortality both are rising (Dimitrova et al., 2020; Dong et al., 2021). Heatwaves are not new events for Bangladesh; however, the frequency, duration, and intensity are in the rising direction (Prothom Alo, 2024). Bangladesh has experienced one of the worst heatwaves, reaching the warmest temperature in the last 76 years, has been reported more than 40 death by heat stroke, and overburdened health facilities with heat-induced diseases such as diarrhea, fever, cardiovascular disease, stress, exhaustion and strokes (The Daily Star, 2024, The Diplomat, 2024). Dhaka, the capital of Bangladesh and one of the most densely populated cities in the world is experiencing adverse effects of climate change coupled with its unplanned urban growth (Mahbub et al., 2021). Another study on the risk of heat waves among metropolitans in Bangladesh reported that Dhaka has the largest population, around 12.5 million, and is at risk of extreme heat exposure due to its heat-vulnerable areas. Compared to surrounding areas, this excessive heat in urban areas is defined as The Urban Heat Island (UTI) effect (Adnan et al., 2024).

Now, Mega City Dhaka, a melting pot of people from all classes and diversity, shelters many informal settlements and a large body of slum dwellers. While urban residents are already overburdened with heat, it is worth mentioning the condition of slum dwellers who are already living in the worst possible conditions with poor housing, no ventilation, lack of water, sanitation, and electricity, and exposure to cooking heat as well (Rashid et al., 2013). In urban slums, the issue is exacerbated by the occurrence of urban heat islands (UHI). UHI arises when heavily populated regions hold onto more heat because of the abundance of concrete, asphalt, and insufficient green areas (Mukhopadhyay et al., 2021). A study on Climate change, human rights, and social justice mentioned different layers of disparities among countries (rich and poor), among economies (strong and weak), among population subgroups (wealthy, middle class, poor, men, women, children, elderly, workers) and each group experience, coercive and adapts the climate change effects differently. Extreme weather events like heat waves adversely affect the weaker group compared to the stronger one (Levy & Patz, 2015). Similar findings were established by other studies where women and children were the worst affected groups by heat waves (Schapiro et al., 2024).

Mothers, typically the functioning fuel of a household, are constantly under stress to keep themselves healthy to prevent, protect, and keep their children and other family members healthy (Goodwin et al., 2005). This role is more evident in low-income countries like Bangladesh, where children's health is directly associated with mothers' health and caregiving. From neonatal to adulthood, mothers are the primary caregivers of any disease. Thus, their socio-demographic factors, sound knowledge, perception, and practice for any disease influence the health-seeking behavior of the children and other family members (Abegaz et al., 2019). Climate events like heatwaves are also similar, where better mothers' education provides better adaptation and protection, lowering the risk (Rabia et al., 2024). Another research found that knowledge, perception, and practice are essential factors in determining risk perception, preparedness, and adaptive strategies for individuals likely to experience adverse weather events (Palinkas et al., 2021). Heatwaves or other climate events impact health, income, finances, and many important aspects of life (Mohammad, 2014; Yasmin, 2016). Mothers are the drivers of each household, especially in the slum area, where reproductive, productive households are where mothers manage every duty, and their coping mechanism with the additional burden of extreme weather events should be understood for future recommendations and policy.

Literature Gap

Heatwaves are being recognized as a pressing concern in real time because they threaten planetary and public health. However, studies primarily focus on the broader population threats or the macro-level impact of micro-changes constantly occurring. Several studies address the spatiotemporal patterns of heatwaves, but there is a notable lack of research exploring their effects on urban residents, especially considering their socioeconomic contexts. This gap is evident not only in Bangladesh but also at the global level. Fewer studies have been conducted on mothers' knowledge, attitudes, and practices regarding heat waves and other climate events.

Furthermore, existing literature frequently fails to highlight practical coping strategies and community-oriented solutions. Although various policies and interventions aimed at enhancing heat resilience have been suggested, they rarely reflect the experiences of those most impacted. For instance, strategies for urban heat resilience often do not consider how residents of slums adjust their behaviors, manage resources, or tap into informal support networks during heat waves (Berger et al., 2022). This lack of insight hinders the creation of effective, contextually relevant interventions.

Justification

Gaining an understanding of local views and experiences is essential for creating interventions that are effective and culturally sensitive. In resource-challenged areas such as the urban slums of Dhaka, the observations of mothers provide crucial insights into the health effects of heatwaves, the obstacles to adapting, and possible solutions. This research tackles a significant public health issue by concentrating on a demographic frequently neglected in climate studies. Mothers have a key role in household decisions and are uniquely positioned to recognize the difficulties and opportunities for enhancing resilience to heat waves. By investigating their knowledge, perceptions, and practices, this study seeks to guide focused interventions that cater to the needs of the most at-risk individuals.

Additionally, tackling the health effects of heatwaves supports global efforts for climate adaptation and public health. As urbanization increases and climate change worsens, the insights derived from this research can aid broader initiatives to safeguard vulnerable groups from the compounded dangers of environmental and socio-economic pressures (IPCC, 2021).

Research aim and research question

Aim: The study aims to understand the knowledge, perception, and practice of mothers of young children regarding heat waves and their impact on their lives.

Primary research Question: What are the heatwave-related knowledge, perception, and practices among mothers of children (0 to 10 years old) in a slum of Dhaka city, and how are these influencing the health risk and health-seeking behavior of their households?

Specific Objectives:

1. **Knowledge:** What do mothers in slums know about climate-induced heatwaves?
2. **Perception and practice:** How do they perceive and cope with heatwaves' health and other impacts?
3. **Recommendations:** What are their recommendations for improving resilience to heatwaves?

Conceptual framework

Based on the literature and research questions, the following framework has been developed (Figure 1): sociodemographic factors influence the independent variables' knowledge, attitude, and practices. KAP, on the other hand, directly impacts the health-seeking behavior of the community people along with socio-demographic and healthcare access. Health-seeking behavior eventually influences the health outcome. This framework was inspired by the studies explored during the literature review (Wang et al., 2021; Helldén et al., 2021)

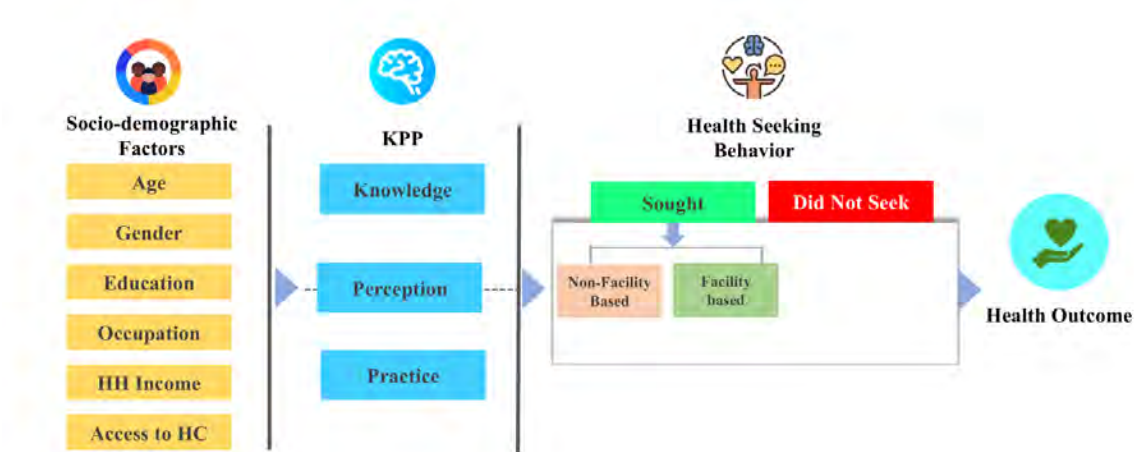


Figure: A conceptual framework of KPP on heatwaves and their impacts on heat-related health outcome

2. Methodology

2.1 Study Design

This study applied a qualitative approach, which helped capture expressive information in the participants' natural settings. The design allowed for the flexibility of collecting in-depth information and understanding the participants' life experiences.

2.2 Study Site

One of the critical steps in this research was selecting the study site. Korail slum, the central and biggest slum of Dhaka city, is surrounded by an affluent neighborhood. The slum is very demanding for low-income communities in Dhaka, as work opportunities are comparatively better there. Also, the slum is characterized by overcrowded tin-roof housing and limited infrastructure (Biplob et al., 2011). Therefore, Korail Slum was selected for data collection regarding heatwave-related knowledge, perception, and practice among mothers of young children.

2.3 Study Population

The study population consisted of mothers of young children (0 to 10 years old) living in the Korail slum of the Dhaka urban area. Female slum residents between 18 and 45 who had lived in their current households for at least one year were also considered the target group for qualitative data collection. Participants with communication disabilities (cognitive, hearing, or speech) were omitted.

2.4 Sampling Technique

Considering the period of the study and the relevant challenges of reaching the participants, purposive sampling was used. A specific area named Bou Bazar under the Korail slum, which is also heavily crowded was selected to retrieve the sample. With the help of an informant, initial visits were made to build rapport with the participants, and their timetables were noted so that suitable interview times could be fixed. According to the set schedule, the data collectors reached the desired household of the participants to collect the data. Similar approaches were followed to conduct the key informants' interviews. They were reached before the interview, and the interviews were conducted upon their agreement to give the interview at their preferred time and place.

2.5 Sample Size

In total, 16 interviews were conducted, 12 of which were in-depth interviews (IDI) with the mothers of young children, and 4 were key informant interviews (KII). An observation checklist was also used to assess their residents and surroundings.

2.6 Data Collection Tool Development

For the data collection, a total of three types of tools were prepared: first, IDI guidelines focusing on the heatwave-related knowledge, perceptions and impacts, practice and coping mechanisms, and recommendations for better management were focused; second, KII guidelines tailoring the questions to understand the key informant's knowledge, attitude and perception on the heatwave impacts and recommendations for better management along with understanding their personal experiences and how they contribute to the community; third, an observation

checklist for cross-checking the information the respondents provided were correct focusing on their housing materials, air circulation, availability of cooling devices, WASH situation, and community facilities for managing heat.

2.7 Data Collection

In-depth interviews were conducted with 12 mothers of young children to understand their insight. The interviews took place in the household (rooms they live in with their families) so that the interview and relevant observation could be done simultaneously. Besides the IDI, 4 key informant interviews were conducted with a pharmacy owner, a house owner, a tenant manager, and a health center supervisor. Key informant interviews took place to capture their insight. They were also interviewed where they were available; for example, the pharmacy owner and the health supervisor were at their workplaces during the interview. The landlady and the tenant manager were at their residence during the interview. Interviews were recorded on electronic devices, and extensive field notes were taken for further observations.

2.8 Data Analysis

Recorded interviews were transcribed in Bangla and then translated into English, preparing them for analysis. Information from the observation checklist was also documented in an Excel sheet, and summary insights were derived from there. Information on IDIs and KIIs was categorized into groups, themes, and sub-themes to understand the pattern, focusing on similarities and differences among the responses. Meaningful quotes from the participants were also identified.

2.9 Ethical Considerations

The institutional review board approved the study proposal (Project reference number: MPH-2024-004)). The participants were approached with an approved consent form and information sheet. After explaining the purpose, anonymity, and confidentiality, written consent was collected from each participant upon providing them with the information sheet. They were also assured they could withdraw from the interview if they felt compelled.

3. Results and Findings

In this study, saturation was obtained with 16 participants. The demographic characteristics of the interviewees are presented in Table 1. The details are available in the Annex.

Table 1: Demographic characteristics of the participants

Characteristics	Category	n (%)
Age	Between 18-25	5(42)
	Between 26-33	6 (50)
	Between 34-41	1(8)
Sex	Female	12(100)
	Male	0(0)
Occupation	Housewife	5 (42)
	House helper	5(42)
	Office Assistant	1(8)
	Garments worker	1(8)
Years of schooling	No formal schooling	2 (17)
	between 6 to 10 years	6 (50)
	between 1 to 5 years	4 (33)
Number of children	1	6(50)
	2	4 (33)
	3 or more	2 (17)
Gross monthly household income	10,000 or below	2 (16)
	between 11,00 to 20,000	5 (42)
	More than 20,000	5 (42)
Years living in Korail slum	1 to 5 years	3 (25)
	6 to 10 years	3 (25)
	11 to 15 years	4 (33)
	16+ years	2 (17)

The study primarily focused on exploring the knowledge, experiences, and practices to cope with heat waves among mothers of young children living in an urban slum in Bangladesh. As the umbrella themes are already decided here, the data analysis followed a deductive approach (Pandey, 2018) rather than an inductive. Codes and sub-codes were assigned under these four broader themes, and recurring examples were found to present the result. The umbrella themes, codes, and sub-codes are presented in Table 2 (see Annex).

3.1 Knowledge of “heat wave” and “climate change”

- **Limited familiarity with technical terms like “heatwaves”**

Most participants (80%) were unfamiliar with bookish terms or some of the most popular terms related to heat waves, weather patterns, and climate change. A few of the participants stated that in the slum area, they did not hear much about “heat waves.” However, their villages call them “*Khora*,” or drought. Heatwave days were primarily addressed as “excessive heat” or “extreme hot days.” Two participants mentioned the following quotes.

30-year-old house helper: *“I did not hear the word heat wave, but when it is very hot on summer days, we call it drought. Here in Dhaka, we call the unbearable summer days excessive heat.”*

Mother of three children, 33-year-old house-help: *“I am unfamiliar with the heatwave, Dabdaho, or tapprobaho. In the village, we used to call it a drought. Here, we call it extreme hot days.”*

- **Limited Understanding of the relation between “increasing heat” and “climate change”**

Similar to the term “heatwave,” Most of them (90%) failed to understand the term “Climate change.” However, “changing weather patterns,” “environmental change,” and “seasonal changes” these terms were familiar, as were. On the other hand, all the participants who had few years of schooling or no formal education could differentiate between urban and rural temperature differences. They all identified that more people, buildings, factories, and cars make the metropolitan area warmer than the rural area where housing was not dense, trees and open fields were available, and most importantly, had proper ventilation and air circulation around their village homes.

29-year-old office assistant and mother of a 10-year-old boy: *“In the city, there’s population, no trees, no wind, and no open space. The village has trees, and the breeze touches the body. There are no trees in Dhaka, and fewer are in the slums. There is no wind here.”*

Similar reasons were identified for why the slum area was warmer than other city residential areas. The quote below from the 29-year-old mother, who has been living in the slum for more than 20 years, explains that the slum was in a much better situation regarding temperature and housing when there were fewer people and houses and more trees and open spaces.

29-year-old housewife with one child aged 1.5 years: *“I think it’s because of overcrowding and the lack of trees. Earlier, maybe around 4 lakh people lived in Korail, and it was empty. There was a field where we used to play. Now, they cut down trees to build houses.”*

- **Source of information:**

None of the mothers of young children could recall anything they were taught about climate change or heatwaves back in school. Most (80%) completed at least class 5, and two did not have formal schooling. Moreover, they claimed they did not receive any education/information regarding heatwaves and their health impact and did not purposefully watch the news or weather forecast. TV or mobile phones were used only for watching entertainment content. The participants who worked as house helpers in the neighboring affluent area and spent a significant chunk of their day interacting with household members learned from their employers about heat, cold, rain, or other calamities.

As the following quote by 38 years old housekeeper and mother of three children expresses:

: *“I am busy all day working, and when I get home and finish household chores, I watch some fun stuff on the TV like music, drama, or movies. However, I learned about the weather from the Aunt and Uncle’s vehicle, and I work at their home every morning.”*

However, the key informants, a 48-year-old pharmacy owner with higher secondary education and a 45-year-old health supervisor with a Master’s degree, clearly showed that they knew about climate change and heat waves. The other two key informants, the landlady, and the tenant manager, both in their fifties, informed us that they watched the weather news. The health supervisor explained why the summer of 2024 was extreme and had several heat waves, as below.

Health supervisor, 45 years old female: *“Due to climate change. It’s also because of El Niño or the heating of ocean water due to gases. That’s why Southeast Asia is experiencing more heat.”*

3.2 Experience and perception regarding heat waves

- **Impact on physical and mental health**

Among all the 16 participants, 14 expressed that the summer was excessively hot this year, and they did not experience any more extreme summer than this year. Two respondents claimed that the year 2022 was hotter for them, and coincidentally, both of them were pregnant during 2022, and compared to the summer they experienced during pregnancy, this year was much bearable. All the respondents reported one or more family members, including themselves, fell sick during the excessively hot days. According to the participants, diarrhea, fever, skin rashes, cold, and asthma were some of the most frequently prevalent diseases during the excessively hot days. Along with the diseases, there were some other physical discomforts they experienced, such as excessive sweating, breathing difficulty, fatigue, weakness, thirst, and irritability due to the excessive heat. The first key informant interviewed, a 48-year-old male and pharmacy owner, confirmed that these diseases are most prevalent and chronic diseases like hypertension and others worsened during the excessive heat. As he quoted,

“During the hot season, diarrhea and fever are more common. People also get heatstroke, blood pressure rises, discomfort increases, and other illnesses worsen.”

Here are some more quotes on the health impact of the heatwaves:

21-year-old housewife and mother of a boy aged 2.5 yrs: *“Yes, I had difficulty breathing. Sweating excessively also caused me to catch a cold.”*

33-year-old house help and mother of three children: *“My children caught a cold because of the extreme heat in school.”*

29-year-old office assistant and mother of a single child: *“Heat-related illnesses such as diarrhea, fever, and heatstroke are common, especially among children and the elderly.”*

The above quotes explain how their health and daily life were affected by extreme heat. Along with physical irritability, 9 out of 12 mothers stated that they and their family members were mentally restless, affecting their sleep, thinking, decision-making, and regular interaction with partners, children, and neighbors. Three of the interviewed mothers specifically mentioned that wives were subject to domestic violence by their partners because the excessive heat made them

exhausted, stressed, and ill-tempered. The following quotes depict how their mental health was affected during the heat waves.

Mother of two children and 28 year old house helper: *"It was tough. It was hard to sleep at night because of the heat. I couldn't make decisions properly and felt irritated."*

21-year-old house helper and mother of two children: *"People got angry easily. Some even hit their wives. Others poured water on their heads to cool down. The heat made everyone more irritable."*

A 29-year-old mother with a 1.5-year-old child described increased mental stress during the heat, noting that her husband's mood was irritable, especially after work.

"There was a lot of tension during the heat, and his mood was irritable, especially after work."

- **Impact on earning and financial management**

Alongside the mental and physical health of the participants and their family members, their financial condition was also affected by heatwaves, compared to those who worked inside buildings (house help, garment or office workers), those who worked outside (day laborers, rickshaw/van pullers, construction workers) suffered more. Some stopped working due to excessive heat, and some could not go to work because of the unbearable sunlight and heat outside. Being sick frequently also reduced their earnings, while the summer-friendly food and beverages, medicine, and hospital costs added more challenges to their financial management.

Mother of two children, 21 years old house-help: *"Food would spoil quickly, and we had to cook multiple times. I also stopped working during the heat."*

28-year-old house helper and mother of two children: *"My husband couldn't go to work. He was too tired from previous days' work under the sun."*

- **Impact on HH/Community Facilities**

Inquiries were made about the essential services each household or Korail as a community had, such as the availability of electricity, water, sanitation with a proper drainage system, and increased pollution during summer. Most participants (80%) reported that the electricity was irregular during the summer, making them suffer greatly. Luckily, the installation of a water

pump near Bou Bazar by Dhaka WASA installed a new water pump, and the Bou Bazar community reduced water-related challenges faced by the community, allowing them to have plenty of water for cooking, cleaning, and other chores. Though a drainage system was available for all the participants' toilets and bathrooms, five respondents complained that it was feeble and worsened during rain. Also, the heat compelled the community people to bathe several times or for a longer time, and that caused longer queues in front of the bathrooms. The following quotes show some of the experiences the mothers had during the summer.

30-year-old house helper and mother of two children: *"It felt very hot. There was no electricity, and it was highly uncomfortable."*

Mother of two children, 21-year-old house helper: *"Everyone bathed multiple times daily, but there were long queues for the bathroom."*

A 33-year-old mother of three children and house helper said, *"The electricity is fine now, but earlier, it would go out hourly. Water was an issue before, but not this time. Earlier, people had to buy water; now, they've installed a pump, so there's no issue."*

3.3 Practice on heat management

- **Personal and household-level practice**

Food and drink were a primary component of coping with the excessive heat. Increasing fluid intake, avoiding sun exposure, and eating fresh and safe food were some adjustments the mothers and their families made during the summer. Home-made and store-bought drinks and juices, oral saline, and refrigerated water were in most demand, as reported by all respondents (100%). Also, bathing several times a day was another practice prevalent among slum dwellers of all ages. The mother remained vigilant in fighting the heat and its impact by being the home manager and caregiver to other family members. The quotes below show how the mothers helped themselves and their families to combat the heat.

A 20-year-old housewife: *"I couldn't eat rice during the heat; eating made me feel uncomfortable. I survived mostly on water, lemon juice, and oral saline."*

18-year-old stay-home mother: *“Everyone would dip their children in water. I also kept my child in water for a long time. Adults would keep wet clothes on themselves and wouldn’t change them.”*

28-year-old house helper: *“The illness or diarrhea primarily happened due to unsafe food and water, and food doesn’t digest well in the heat. I ensured they drank clean water, covered food, kept food fresh, avoided exposure to sunlight, and drank plenty of water.”*

29-year-old housewife: *“I ensured they (the husband and child) drank plenty of water, saline, coconut water, and fruit juices.”*

- **Community level practice**

The entire slum area was congested with dense housing and overcrowding, so the residents' practices were similar. Most respondents (10 out of 12 mothers with young children) said they used to go outside because the houses were extremely hot. There were no open spaces or shades to take shelter, so they used to sit beside the roads or at the shops there. Two respondents said they were uncomfortable being on the roadside, so they stayed home or visited a relative’s place where it was colder.

The following statements by the interviewees confirm the practices.

20-year-old housewife: *“Yes, everyone would go out onto the streets. I would sit outside with a mat, and others would do the same.”*

18-year-old housewife: *“No, I didn’t go outside because there were too many people. I went to my aunt’s house.”*

Another trend among the community was helping each other within their capacity. Six of the respondents who had refrigerators in their houses said they provided cold water to neighbors who didn't have it. Others also confirmed that getting cold water from a neighbor’s refrigerator helped them, as buying cold water from the shop was pricey (10 taka per liter). A 38-year-old mother and refrigerator owner said everyone was suffering from the heat, and she wanted to help them within her capacity.

“Yes, they were suffering too. I felt the need to be nice to others.”

The mother of a 10-year-old boy gave a similar statement.

“I lived on drinking only the cold water from the fridge and helped others who did not have a fridge in their home.”

- **Health-seeking behavior**

Two trends were noticed regarding health-seeking behavior among the residents. Family of all respondents have heat-related diseases and, depending on the severity, it was treated at home or taken to the health facility. If they suffer from dehydration, nausea, diarrhea, or even fever, the local pharmacy or chamber of quack doctors are visited for suggestions. If the patient’s situation worsened, they were taken to the nearby facilities named ALO clinic (situated in Jthe amai Bazar area and the only facility in the slum), the DNCC Hospital Mohakhali, or the Cholera Hospital (ICDDRB) and the farthest was Dhaka Medical college. The following quotes show their non-facility level and facility level health-seeking behavior during the heat waves.

a 20-year-old housewife and mother of one child: *“My husband had diarrhea and survived only on saline for days.”*

33-year-old house helper and mother of three children: *“When they had a fever or cold, I didn’t send them to school. I gave them sherbet, and oral saline, and bathed them frequently.”*

21-year-old house helper and mother of 2 children: *“My father had diarrhea for 12 days and had to be hospitalized. My grandmother had breathing issues, so she was admitted to Cholera Hospital. I went to Alok Clinic and the Cholera Hospital.”*

The key informants, particularly the pharmacy owner, the health supervisor from the Alo clinic, and the house managers, further explained the health-seeking behavior with the most common diseases and vulnerable groups.

A 48-year-old pharmacy owner: *“Children can’t tolerate the heat and become restless, crying. Elderly people also suffer a lot.”*

52-year-old tenant manager: *“Yes, I got sick. The tenants also got sick. The children were sick and crying. I ran to get water, applied it to their heads, and took them to the cholera hospital.”*

45-year-old health supervisor: *Most patients were children and elderly people who came for treatment. Hypertension increased. Pregnant women experienced more restlessness. we (the clinic) provided the initial treatment. If it didn't improve, I referred them for further care.*"

3.4 Recommendation for Better Heatwave Management

- **What Measures are needed for better management?**

Most respondents (13 out of 16) expressed concern regarding the highly dense housing, which has poor ventilation, lacks trees, and has limited open space. These factors make living in the slum challenging. Housing built with concrete and ventilation, open spaces/fields with trees, and broader roads could minimize the suffering.

33-year-old house helper: *"It would be less hot if the houses were made of brick instead of tin. We'd still pay rent, even if it increased by 500 Taka."*

21-year-old house helper: *"Planting trees would help reduce the heat. They could build roofs and install windows in houses to improve ventilation."*

One of the key informants shared her thoughts regarding a shared space with fans where children, the elderly, and pregnant women could come and rest when the houses were too hot to stay in. More tree plantations and free shades with free water points could help combat the heat.

a 45-year-old health supervisor: *"There should be a place where there is electricity so people can stay cool, access water, and have a reliable power supply."*

Interestingly, two participants, a 50-year-old landlady and another 19-year-old garment worker and mother of a young child said the increasing heat is a sign of the end of time, and nothing can be done to minimize it—the following statement was made.

50-year-old tenant manager: *"It is a sign of the Day of Judgment; the sun is coming closer to the earth."*

A 19-year-old housewife: *"More people, more houses, fewer trees, and lack of open spaces were why the slum felt hotter than my workplace (garments). However, the increasing heat is a curse from God, too. We are approaching the end of time."*

Who can provide the support?

There were two questions regarding who could make the required changes happen: the community's collective effort, the land and house owner, or the government and non-government organizations. None of the participants were confident enough about community effort as they were focused on their limited earnings and surviving each day. With their limited time and resources, they could not share any ideas that could make them more resilient against the excessive heat. Instead, external help from the landlords, house owners, government, and NGOs was indicated to drive the necessary changes. They expected more help from the house owner to construct better housing, from the government to reduce electricity, water, and gas bills, and from the NGOs and others to provide better health education and services. Four interviewees shared that if they could be provided with a constant supply of essential services (water, electricity, and gas) without cost, that might ease their burden. The following quotes from Participants 8 and 12 show that the slum dwellers did know it was hard to get the support or the support could make their life even more complicated as the well-structured house might have higher rent, leaving them no choice but to leave their affordable shelters.

30-year-old house helper said, *“We have to buy water so they can make it free. But nothing is given for free.”*

a 29-year-old housewife: *“It can be developed, but not everyone can afford to live in such an upgraded place. People pay 4-thousand-taka rent, but many people will lose their homes if it is developed.”*

The pharmacy owner and the health supervisor, the other key informants, emphasized that restructuring slum housing might limit the suffering of the dwellers, and both the Government and NGOs have a lot to do regarding education, community mobilization, and awareness building. However, the other two key informants, the house owner and tenant manager, were hardly convinced that the landowners would be interested enough in upgrading their situation. The following quotes depict both of these views.

48-year-old pharmacy owner: *“Those who do not know should be educated. Also, ensure our basic amenities are secured to improve the quality of life. If NGOs and the government work together, our lives will improve.”*

50-year-old landlady: *“The government and NGOs can do many things if they want, but as for heat, if God does not provide peace, what can anyone do?”*

3.5 Observation Summary

The following table summarizes the information collected through the interviewer's observation checklist. It was found that most of the housing and roof material was tin, which is highly heat-trapping, with almost no ventilation and insulation. Most participants' living space was closer enough to the HH stoves, causing a higher indoor temperature. No green space, open space, or community building shade was seen. Most households had more than one fan, and all had an electricity connection. Most reported frequent power cuts but no water supply issues except long queues in front of shared toilets and bathrooms.

Table 3: Summary observation of different criteria

Category	Variables	Summary
Living area	1. Housing material	● Tin was the primary material for 9 participants; the rest had concrete/brick wall
	2. Roof material	● Tin was the primary material for 9 participants, and the rest had concrete
	3. Ventilation availability	● Only 4 participants' rooms had ventilation/windows, and 2 of these were openable
	4. Insulation presence	● 3 out of 9 upstairs living participants had cardboard placed for insulation
Surrounding Environment	1. Proximity to heat sources	● 7 out of 1 participant's room was near the HH stoves
	2. Presence of vegetation or green cover	● No trees or vegetation were observed
	3. Open space availability	● No designated space or field
	4. Density of housing	● All the participants lived in very highly dense housing
Heat Management Practices	1. Use of cooling devices	● 10 out of 12 participants had extra fans available
	2. Storage of water	● All of them had plenty of water storage option
	3. Electricity availability	● All the households have an electrical connection
	4. Shade structure	● No shade for resting was found
WASH situation	1. Toilet and bathroom condition	● All the participants had shared toilets and bathrooms
	2. Availability of drinking and other water	● All the households have available water
	3. Drainage system	● 10 out of 12 participants HH had a drainage system
Community and Public Infrastructure	1. Community heatwave shelters	● None was found
	2. Noticeable posters or signs	● None was found
	3. Community-level water distribution points	● None was found

4. Discussion

Knowledge gap on heat waves increases the overall risk

After analyzing all the data gathered from the insights of each mother and key informants, it was evident that there was a significant knowledge gap regarding heat waves and their risk implications among mothers of young children. Their education, socioeconomic setting, occupation, and relevant knowledge of living in a resource-constrained setting make it difficult to be vigilant about climatic change and specific events. A study conducted on slum dwellers reveals that the higher the knowledge score, the better the risk perception among the community members, which supports them in being better prepared with preventive measures to reduce the impact of heat-related diseases (Li et al., 2016). Another similar study conducted on outside workers in Hanoi, Vietnam, showed that better knowledge led the participants to report any health symptoms and have better risk perception (Lohrey et al., 2021). The young mothers were also unaware of the sources where they could get weather updates and necessary preventive information due to their literacy level and lack of time and interest. This is unlike the lower economic setting of communities in Australia, which consciously depended on weather updates to be prepared for the impact during and after heat waves (Akompab et al., 2013). Overall, the setting of the Korail slum and the knowledge gap regarding heat waves and relevant threats make mothers more vulnerable to protecting themselves, their children, and their families from the risks they impose.

Experiencing multifaceted impacts with poor resilience

It was also depicted that heatwaves/ excessively hot days, and the entire summertime bring unimaginable suffering in their lives. Heat-trapping housing, working outside in the sun, interrupted electricity, and lack of affordable and available health facilities nearby were some factors amplifying heat waves' impact on their lives. Diseases like fever, diarrhea, asthma, exhaustion, and other physical discomforts were reported by the majority of the participants from Korail. These findings are similar to the studies done in Pakistan, India, and China, where the student population suffered from similar diseases (Khan et al., 2020; Trahan et al., 2023; Xu et al., 2018). A significant amount of mental health issues were also prevalent among the mothers of young children in Korail, which is similar to the findings of a study done on extreme events and mental stress where it was found that sleep disorder, emotional irritability, stress, and

anxiety were prevalent among the residents (Deglon et al., 2023, Palinkas et al., 2021)). While both physical and mental health impact the income and finances of the household of the respondents in Korail, their productivity was threatened as well, and many of them, who primarily depend on physical labor for earning, could not go to work regularly or left their jobs altogether. Reduction in productivity directly impacted individuals' earnings, affecting their familiarity, as found in studies conducted in India, Austria, and China (Tran et al., 2013; Berger et al., 2022; Xu et al., 2024).

Mothers are overburdened and marginalized

From the insights gathered from the mothers of young children, it was evident that the mothers were fulfilling different roles to protect themselves and their families from the effects of heat waves. Most of the mothers were working to support the family financially; they were the household managers cooking, cleaning, and taking care of the children and husband, and the excessively hot days increased their workload as they had to take care of the food and drinks consumption, primary caregiver during the sickness of any family members and still being subject to domestic violence as their male counterpart was under physical and mental stress due to working under the heat. A report by UN Women titled “Tackling violence against women and girls in the context of climate change” captured that the extreme weather and climate events increased the vulnerability of women and female children both inside their houses and outside (UN Women, 2023). Another study conducted in the slums of Bangladesh found that the marginalization of female residents due to their low income, literacy, and financial condition, they were subject to discrimination and violence by their partner, which triples the burden of surviving in their social context (Intesar & Parvez, 2023). Similar to responses of mothers of young children living in the Korail slum who reported an increase in domestic violence by their partner, one study found that heatwaves did have a connection with increased intimate partner violence as hot weather influenced the anger, aggression, and irritability among people while cold weather had the opposite effect (Sanz-Barbero et al., 2018). Empowering mothers, despite their socio-economic status, coping and adaptation mechanism strategies should be developed considering their needs and opportunities that should be focused on by policymakers.

Perception of mitigation measures

Both mothers of young children and the key informants' group expressed several quick remedies for removing the overwhelming burden of heat in the slum area: fixing the housing structure and material, improving the greeneries, and reducing the price of essential services with improved supply would ease the suffering a bit. Various studies have been conducted on the low-cost, effective cooling mechanism, which could be a quick solution to reduce heat exposure and indoor heat. For example, the study conducted in the Slum of Ahmedabad, India, funded the housing material made the heat exposure far more extreme for the slum dwellers, and cooling roof technologies were there to reduce the temperature and health impact among the residents (Dutta et al., 2020). However, similar to the Koral residents who think they did not have the authority to do anything as they lived in a rented house and this similar concern was found among the low-income households of India and Austria as they couldn't upgrade the housing situation or engage in adaptive measures to what due t lack of agency over their housing (Berger et al., 2022). Therefore, upgrading slum housing should be a collective effort where the demand and necessity of the tenets be considered, and house and land owners, along with the policymakers and intervention implementers, work together to serve the best interest of the slum community (Andersen et al., 2023).

Implications

Intervention

This study will help the implementer identify the focus areas for possible intervention, from knowledge and awareness campaigns to health and climate change education to introducing community resilience-building strategies. In addition, interventions focusing on community-shaded areas, affordable cooling methods, and reducing heat impact among vulnerable groups can reply to this article as a primary information source. It could also be a guideline for identifying the root causes of why slum people cannot experience the full potential of life. Upgrading slum interventions should be undertaken with substantial importance.

Policy

This paper will also serve as an initial document for policymakers to understand what is lacking regarding heatwaves and climate change-related impacts on slum dwellers, especially mothers

and children. While developing the policy, gender roles, vulnerability, marginalized and isolated status from mainstream society, and socio-demographic factors should be considered individually. Also, the preparedness and adaptation plan for the slum community already living in a resource-constrained environment should be prioritized rather than a general policy for everyone. This study could be used as an advocate for urban green spaces and climate-resilient housing materials. The slum area requires immediate housing, and green space and policies should empower the tenants (who are the majority of slum residents) to upgrade the housing or greenery in collaboration with the land and house owners.

Future Research

The research benefits scholars by establishing a foundation for similar investigations in various cities and regions worldwide that typically experience heat waves. The researcher could extract the preliminary information from this research and focus on exploring gender-specific vulnerabilities and the longitudinal impacts of heat waves. Further studies on risk perception, coping strategies, and adaptability could also be explored. Furthermore, future research must develop a specific framework for the Korail slum to build community resilience against heatwaves and other extreme climatic events.

Limitations

Small sample sizes and a single-location focus may limit generalizability. This qualitative study focused on only female participants (mothers of young children) and one area (Bou Bazar) of the Korail slum. Therefore, there was limited scope to compare the findings with those of other participants (males, elderly, young people) or residents from different slums and socio-economic classes. Selecting a wider number of participants from diverse backgrounds might help to get broader insights, providing a holistic situation of heat-related knowledge, practice, and perceptions.

Potential recall bias in participant responses should be another limitation of the study. Though it was practical to investigate their lived experiences after the heatwave days or summer days had passed, by the time the data was collected (The last week of November and the first week of December), the weather was comparatively more incredible than the April to August period. The

interviewers could move inside the slum and households comfortably during that time, but they had to push the participants to think of the excessively hot days. It was not challenging for them to remember their experience as the slum community experienced additional temperature due to Heat Island Impact, and the majority of the year is a warmer environment than cooler.

Another limitation could be that the interviews were conducted in the local language, and the respondents also used their local dialect for response. The interviewers failed to interpret some of the local words they had used, and later, the transcriber could have missed translating the local word to appropriate English. The interviews were transcribed in English for further analysis and data interpretation, and the entire process might have missed a few crucial notations by the respondents, which could have added more valuable insight to the research.

5. Conclusion

Urban slums are known for their resource and service constraint setting, which makes them affordable for low-income people. Ironically, due to its location, housing structure, lack of essential facilities, and green space, extreme weather events like heatwaves, Urban Heat Island (UHI), and others are experienced with increased severity and more significant impact by the slum dwellers. Mothers of young children are one of the most vulnerable groups to be affected due to their gender, socio-economic, and marginalized status. It was not surprising that the women with young children did not have a proper understanding of the terms “heatwaves” and “climate change”. However, they were most involved in taking protective and adaptive measures such as drinking water, having freshly cooked food, limiting sun exposure, or staying outside while the rooms were extremely hot. Though mothers did not receive any awareness-raising intervention on heatwaves and their impact, they had shown essential health-seeking practices for the general diseases that occurred during the heatwaves. However, more intervention in knowledge and resilience building and knowing the multifaceted impact of heatwaves would make them more resilient to minimize the effect. In addition, their agency over the living space and other minimum essential services should be properly focused so they can properly engage with the adaptive measures. Heat-resilience community centers, affordable mobile clinics, or trained emergency service health workers should be considered to reduce heat stress and heat-related illnesses. Finally, policy shifts are required tailored for the slum residents, emphasizing

their roles and responsibilities, specifically, upgrading slums with climate resilience urban planning.

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Annex

01. Data collection tools

Qualitative data collection Guideline:

Section	Questions asked	Probing Question
Ice breaking	• How are you? • How long have you been living in this area/Slum? Particularly in this household? • How many family members do you have? • How many child/ren? Their age? Do they go to school?	Can you describe your living conditions and how they impact your daily life?
Demographic	• Name: • Age: • Marital Status (widowed or not): • Level of education: • Employment status: • Number of family members: • Child/children number and age: • Gross monthly household income:	Income-related probing: House rent, food expenses, school, health, and others. How many members earn?

Knowledge	Temperature rise: ● In your opinion, are the summer days hotter than previous years? If yes can you explain why you think so? Excessive heat and climate change: ● Are you familiar with the term heatwave/excessive heat? ● Why do you think the pattern in temperature is changing (rising)? ● Do you know the term climate change, weather or environment? Can you give me examples? ● In your opinion, why is the temperature rising? Can you relate with your surroundings (housing, tree)? ● There is a relation between CC and rising temperature? How do you think it is applicable for your life?	● How long have you been living in an urban area? ● Where were you before? ● How were your childhood summer days? ● What difference do you think you see these days? Probing for CC: Childhood memories, village ambiances, difference between urban and rural setting, slum and other area differences ● Where did you learn about heat waves or climate change (e.g., TV, community meetings)?
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Experience and perception	What do you think of the ways heat waves or extreme thermal days impact your life? Physical Impact ● How does the extreme heat affect your daily activities, such as work or household chores? ● Have you experienced any health issues, such as dehydration, fatigue, or heat rash, during heatwaves? ● Do you or your family members face difficulties in sleeping or resting due to the heat? Mental Impact ● How does the heat make you feel emotionally? Do you feel stressed, irritated, or anxious during extreme heat? ● Does prolonged heat affect your concentration or decision-making abilities? ● Have you noticed any behavioral changes in your children or family members during heatwaves? Financial Impact ● Does the heat affect your ability to earn a living (e.g., difficulty working outdoors or reduced productivity)? ● Do you need to spend extra money on items like cooling devices, medical treatments, or water during heatwaves? ● Have you faced any financial losses, such as reduced income or	● How did you feel during the summer time this year? ● What specific challenges do you face during extreme heat days? Please give example ● Can you share any incidents where extreme heat caused problems for your family? ● Have your children faced any health issues during heatwaves (e.g., fever, dehydration)? ● Do you notice any differences in your child's health during the hotter months compared to other seasons? ● Are there specific groups in your community who you think are more affected by heatwaves? ● In your opinion, what are pollutants and how do they affect your life? ● Does heat increase vector borne diseases?
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increased expenses, because of extreme heat?

Social Impact

- Are there conflicts in your family or community due to limited resources like water or electricity during heatwaves?
- Have you observed any changes in social gatherings or events during extreme heat periods?

HH/ community Facilities:

- Do you have access to electricity during heatwaves? Is it reliable?
- Is there enough clean water available for drinking, cooking, and bathing during summer?
- Are your living and sanitation conditions (e.g., ventilation, toilets) comfortable during extreme heat?
- Is there any green area, shared space for community people to take shelter during hotter days?

Heat and pollution:

- Do you think heat increases the pollution level in your community? Why don't you think so?

Practice on heat management	Individual level: - Do you remember what steps you took to keep yourself cool in the excessive hot summer days? (machines, food and drinks) HH level: - What was done by you for your children and other family members? What did you do differently? Please share examples. Community level: - Have you heard of people suffering from the heat in terms of their health and well being? Who do you think are the most vulnerable people/ affected by heatwaves? Health facility: - Do you or your family seek help from pharmacies, health workers or any hospital? Have you noticed others doing so? Please give an example.	- What steps do you take to protect your children from extreme heat? - Do you have access to cooling devices or shaded areas? - How do you manage hydration for your family during heat waves? - Where do you usually take your children when they are sick due to heat-related issues? - Are healthcare facilities easily accessible for you? - Do you face any challenges in seeking medical help for heat-related complications? - What type of treatments do you typically seek for your children's heat-related illnesses?
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Recommendations	• What changes would help you better deal with heat waves as a mother? • What resources or facilities would be most helpful for you and your children? How can the community work together for these? • How do the government or NGOs support families during extreme heat?	Please think about the practices of the community and others
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Observation checklist

Theme	Sub-theme	Observation
Living space	• Type of housing material (e.g., tin, bamboo, concrete, plastic sheeting). • Roof material (e.g., tin, concrete, thatch). • Ventilation availability (windows, airflow, cross-ventilation). • Insulation presence (e.g., shaded roofs, heat-resistant materials)	

Surrounding Environment	● Proximity to heat sources (e.g., household/ community cooking space, other). ● Presence of vegetation or green cover (trees, plants). ● Open space availability (for airflow or cooling). ● Density of housing (crowded structures, narrow alleyways)	
Heat Management Practices	● Use of cooling devices (electric fans, traditional hand fans, water sprinklers). ● Presence of water storage (water tanks, buckets). ● Electricity access (reliable for operating cooling devices) Thank you for reaching out. ● Shade structures (canopies, tarpaulins, or umbrellas outside homes).	
WASH situation	● Condition of toilets (cleanliness, ventilation). ● Presence of clean water sources (taps, wells, or other visible water points). ● Drainage system condition (clogging or stagnant water)	

Community and Public Infrastructure	● Community heatwave shelters (visible public shelters or cooling centers). ● Noticeable posters or signs (heatwave warnings or awareness). ● Community-level water distribution points (if available)	
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Guideline for KII

Section	Questions
Demographic	● Name: ● Age: ● Marital Status (widowed or not): ● Level of education: ● Employment status: ● Number of family members:

Roles and responsibility for the community	Questions for Health Workers: • Can you tell me about your role in this healthcare facility? • How long have you been working here? • What are the most common health issues you handle during summer? Questions for Pharmacists: • How long have you been operating in this community? • What types of medications are in high demand during extreme heat? • Have you noticed any changes in healthcare-seeking patterns during summer? Questions for House Owners/community leader: • How long have you lived in this area? • How would you describe the housing conditions here? • Do you notice any specific challenges your tenants face during heatwaves?
Knowledge of Heatwaves	1. Have you noticed any changes in summer temperatures in recent years? 2. How would you describe a heatwave? 3. Do you think heatwaves are connected to climate change? Why or why not? 4. Are you aware of any guidelines or protocols to address heatwave impacts?

Experience and Perception	Health Workers: 1. What heat-related illnesses do you commonly treat during heatwaves? 2. How do you perceive the facility's capacity to handle such cases? Pharmacists: 1. Are there particular health concerns people report during heatwaves? 2. Have you experienced any shortages of medicines or supplies during extreme heat periods? House Owner/community leader: 1. How does extreme heat affect the living conditions of your tenants? 2. Have you taken any measures to improve housing comfort during summer?
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Practices and Coping Mechanisms	Health Workers: 1. What steps does your facility take to protect patients during extreme heat? 2. Have you received any training on handling heat-related health emergencies? Pharmacists: 1. How do you manage increased demand for medications during heatwaves? 2. Are there specific measures you take to store temperature-sensitive drugs during heat? House Owner/Community leader: 1. Do you provide cooling solutions (like fans or shaded areas) for your tenants? 2. Are there community-level measures to address heatwaves in your area?
Recommendation	1. Who do you think are the most vulnerable to heatwaves in this community? 2. Have you noticed any economic or social impacts of heatwaves in the area? 3. What specific steps can be taken to improve preparedness for heatwaves? 4. What role do you think the government, NGOs, or private organizations should play in addressing heat wave impacts?

02. Information and consent form

Information Sheet

Introduction: Greetings, my name is Sohana Reza Urmi, and We are conducting A study on Knowledge, and Perceptions on climate-induced heatwaves and related health impact among slum dwellers in Dhaka,

Bangladesh for my summative learning project from **James P. Grant School of Public Health, BRAC University**.

Serial no.: [Protocol number]

Aim: To assess the slum residents' understanding and perspectives on the impact of climate change on heatwaves and related health impacts

Justification of participation: Your insights are crucial for identifying the knowledge, and perceptions among slum dwellers on climate-related challenges on increasingly hot summer and heatwaves and heat induced diseases. This information will support the development of effective, targeted interventions to strengthen the resilience of communities in low resource settings.

Procedure: If you agree to participate, we will conduct an interview that will last approximately 30-50 minutes. You will be asked questions about your knowledge and perceptions of heatwaves and related diseases. With your permission, we may record the interview and/or take photos as part of our documentation.

Benefits of participation: There are no direct benefits for participation. However, your contribution will inform future interventions that could improve intervention related to community resilience on heatwaves related health complications and financial loss.

Risk: There are no known physical or mental risks associated with participation in this study. Some questions may be sensitive, but you may skip any question that makes you uncomfortable. Please inform us, and we will respect your decision.

Confidentiality and anonymity: All information provided will be kept confidential and anonymous. Data will be stored securely, with only authorized team members having access. We may publish the findings, but your identity will not be revealed. Results may be shared with healthcare leaders, but no personal identifying details will be included.

Nature of participation: Participation is entirely voluntary, with no obligation to participate. You may withdraw at any time without any consequence. You may also request data withdrawal after participation, which we will honor according to our data management protocol.

Contact information: For questions or concerns regarding the study, please contact Sohaan Reza Urmi through this phone number +8801777148987. For ethical concerns, can contact the Institutional Review Board: + 801993379512. Email: irb-jpgsph@bracu.ac.bd)

Consent Form

Title of the study: A study on Knowledge, and Perceptions on climate-induced heatwaves and related health impact among slum dwellers in Dhaka, Bangladesh

If you agree to participate in this study, please confirm by putting your signature/thumbprint.

Thank you for your cordial cooperation.

(Note to investigator: Please note that the items below can vary from protocol to protocol)

Do you give permission for the interview to be audio recorded? <i>Please note that at any point during the interview, you can ask the interviewer to turn off the recording device.</i>	Yes	No
Do you give permission to share your findings?	Yes	No
Do you give permission to take photos?	Yes	No
Do you give permission to share the photos?	Yes	No
If required, can I contact you again for further clarification or data collection?	Yes	No
Do you have any questions?	Yes	No
State the question		

Interviewer name:

Respondent's name:

Interviewer signature:

Respondent's signature/thumbprint:

Date:

Date:

Tables1: on demographic details of the participant

Participant's details								
SI No	Interview type	Age	Sex	Occupation	Education	Number of children (age)	Monthly Household Income	Years living in Korail Slum
Participant 01	IDI	38	Female	House help	Class 5	3 (19, 15,10 yrs)	24000	15yrs
Participant 02	IDI	28	Female	Housewife	Class 5	2 (8 and 1 yrs)	18000	4yrs
Participant 03	IDI	20	Female	Housewife	Class 7	1 (1 yr)	10,000	2.5yrs
Participant 04	IDI	21	Female	Housewife	Class 8	1(2.5 yrs)	25,000	7yrs
Participant 05	IDI	19	Female	Garment worker	class 5	1 (0.5 yrs)	30,000	15yrs
Participant 06	IDI	18	Female	Housewife	Class 6	1 (1.5 years)	9000	3yrs
Participant 07	IDI	33	Female	House Help	Class 5	3(3, 10 and 13 yrs)	25,000	17yrs
Participant 08	IDI	30	Female	House Help	No schooling	2 (6 and 8 years)	15000	12yrs
Participant 09	IDI	21	Female	House Help	Class 8	2 (2 and 4 years)	17000	10yrs
Participant 10	IDI	28	Female	House Help	No schooling	2 (8 and 1.5 yrs)	15000	8yrs
Participant 11	IDI	29	Female	Office assistant	class 5	1 (10 years)	15000	15yrs
Participant 12	IDI	29	Female	Housewife	Class 5	1 (1.5 years)	25000	27yrs
Participant 13	KII	48	Male	Pharmacy Owner	HSC	NA	NA	NA
Participant 14	KII	56	Female	House manager	Class 5	NA	NA	NA
Participant 15	KII	45	Female	Health Supervisor	Class 5	NA	NA	NA
Participant 16	KII	50	Female	House owner	Master's	NA	NA	NA

Table 2: Variables and coding

Theme	Codes	Sub-codes
Knowledge	Understanding Heatwave and climate change Factors influencing climate change and increasing heat	Recalling school lessons Source of information on climate and weather Difference between rural and urban heat Factors making the slum excessive warm Religious belief
Experience and perception	Experience of most recent summer Impact on physical health Impact on mental health Impact on earnings and financial management Impact on social interaction Impact on HH/community facilities	Water, sanitation, drainage and waste management
Practices for heat management	Personal and household level Community level Health seeking behavior	Food and drinks Other behavioral adjustments Sharing space Supporting with necessary items Non-facility level Facility level
Recommendations	Measures needed for better management Community cope up strategies Support from GO/NGO entities	