DISABILITY- INCLUSIVE EMERGENCY EVACUATION PLANNING FOR DHAKA METRO STATIONS

Madeha Sattar Khan*[1], Maria Mehrin[2], Mushirah Tasnim[3] and A.F.M. Saiful Amin[4]

[1] Madeha Sattar Khan, BUET-Japan Institute of Disaster Prevention and Urban Safety, Bangladesh, e-mail: madeha@jidpus.buet.ac.bd
[2] Maria Mehrin, BUET-Japan Institute of Disaster Prevention and Urban Safety, Bangladesh, e-mail: maria@jidpus.buet.ac.bd
[3] Mushirah Tasnim, BUET-Japan Institute of Disaster Prevention and Urban Safety, Bangladesh, e-mail: mushirah@jidpus.buet.ac.bd
[4] A.F.M. Saiful Amin, BUET-Japan Institute of Disaster Prevention and Urban Safety, Bangladesh, e-mail: aminsaiful71@gmail.com

***Corresponding Author**

ABSTRACT

Emergency evacuation planning is a crucial step in safeguarding public safety, especially for vulnerable groups such as individuals with disabilities, who often face significant challenges during disaster situations. According to the "National Survey on Persons with Disabilities (NSPD) 2021", approximately 2.53% of the population of Dhaka experiences some form of disability, and among them, around 26.43% are employed. In numerical terms, this constitutes a substantial number exceeding 150,000 individuals who require inclusive and disaster-safe provisions in transportation for their day-to-day activities. Though the recently launched Metro rail service in Dhaka incorporates features like braille lines and dedicated elevators for enhanced mobility within the Metro stations, there has been limited consideration regarding the evacuation procedures for disabled persons during potential emergencies within these stations. In given context, the study aims to determine the appropriate strategies that can be implemented in metro stations of Dhaka for ensuring the safe evacuation of differently-abled individuals. An extensive review of existing literature will be conducted to identify globally recommended and practiced evacuation methods tailored to various types of disabilities. Later, key informant interviews have been done with stakeholders ranging from disabled individuals and metro rail authorities to non-governmental organizations dedicated to the well-being of disable persons. This interview-based approach has provided significant insights of the perspectives, challenges, and concerns of these stakeholders in terms of ensuring secure evacuation processes, bridging the current gap between available strategies and the specific needs of this vulnerable group. The findings of the study will offer proactive measures to metro authorities and emergency responders for making the existing and future metro stations in Dhaka inclusive and safe for every individual, regardless of their abilities.

Keywords: *Evacuation, metro, disability, key informant interviews, strategies*

1. INTRODUCTION

The need for effective crowd evacuation strategies is paramount in the face of disasters such as fires or earthquakes. It becomes especially critical in transportation hubs, particularly those reliant on electricity, where rapid and orderly evacuations are essential. This urgency is especially pronounced in urban metro systems, exemplified by Dhaka's metro, with a daily ridership of 677,300 and only four exits for evacuation according to the Dhaka Mass Transit Company Limited (DMTCL). This underscores the pressing need for rigorous risk assessment and preparedness in the Dhaka metro rail system. A noteworthy comparison can be made with the Delhi Metro station, which accommodates a daily ridership of approximately 50 lakhs (Planning Department of Delhi Government, 2022) and boasts 46 exits at Rajiv Chowk station (The Hindu, 2017).

Emergency evacuation becomes more crucial in the prospect of disabled people. As per the National Survey on Persons with Disabilities (NSPD) in 2021, 2.80% of the overall population in Bangladesh has at least one disability, with 2.45% residing in urban areas. In terms of employment, within the age group of 15 to 65 years, 27.21% of individuals with disabilities are employed. This translates into a considerable number, exceeding 150,000 individuals, who require transportation measures that are both inclusive and resilient to disasters to support their daily commute. Still there exists a societal problem of overlooking and marginalizing individuals with disabilities. On June 4, 2023, Bangladesh experienced an unprecedented event where people with disabilities, weary of neglect and marginalization, united to assert their rights and demonstrated the significance of their lives (The Business Standard, 2023).

> *"Enough though there was only one person with disability (Visual impairment) in the launch among 1500-1600 passengers, the life of that one person is equally important like the other passengers"* (Participant 13A)

This perspective underscores the need for inclusive emergency response measures that prioritize the safety and well-being of every person, irrespective of their physical condition. In the field of safety research, the aspects of safe evacuation ensuring an inclusive approach have been investigated for several purposes. For instance, Steinfeld (2006) has explained how evacuation and recovery efforts are important along with building design for emergency response. In the context of evacuating metro stations, numerous research studies have been conducted, as evidenced by Mandal et al. (2023), Shi et al. (2012), and Zhang et al. (2016). Mandal et al. (2023) conducted a comprehensive review spanning from 1983 to 2022, revealing that the majority of studies focused on simulation, with a notable gap in detailed examinations of assisted evacuation for evacuees, especially those with disabilities. This highlights a critical aspect that needs attention in the evacuation planning for metro stations. Building on this, Mandal et al. (2022) specifically delved into factors affecting evacuation, emphasizing assisted evacuation in their simulations. Kaiser et al. (2012) focused on optimal bus-stop locations for the evacuation of disabled individuals, evaluating various evacuation procedures for those with special needs. Several evacuation strategies for people of different types of disability have been explained in another study (Proulx, 2002) where the author has critically reviewed and emphasized how evacuation strategies should be particularly curtailed for different types of disabilities. Despite these efforts, a gap in research tailored to the demographic context of Bangladesh and the unique challenges of evacuating metro stations for disabled individuals still exists.

Therefore, the primary objective of this paper is to fill the research gap by addressing the challenges confronted by disabled individuals and suggesting effective strategies for their secure evacuation within the metro stations of Dhaka. This study aims to enrich the existing knowledge on metro station evacuation by incorporating the perspectives of disabled individuals into the understanding of evacuee behaviour. The unique challenges posed by the demographic context of Bangladesh was considered, acknowledging the specific needs and vulnerabilities of disabled individuals during evacuation scenarios. The results of this study will provide guidance to the professionals and decision makers to further improve evacuation strategies and the experience for every individual, regardless of their abilities.

2. METHODOLOGY

The study depends on both primary and secondary data. The collected data was analysed using thematic analysis and descriptive analysis. Lastly, the study identified the underlying issues related to emergency evacuation of metro stations and the most suitable strategies that can be applied for a safe evacuation scenario. Figure 1 provides a brief of the research methodology of the study.

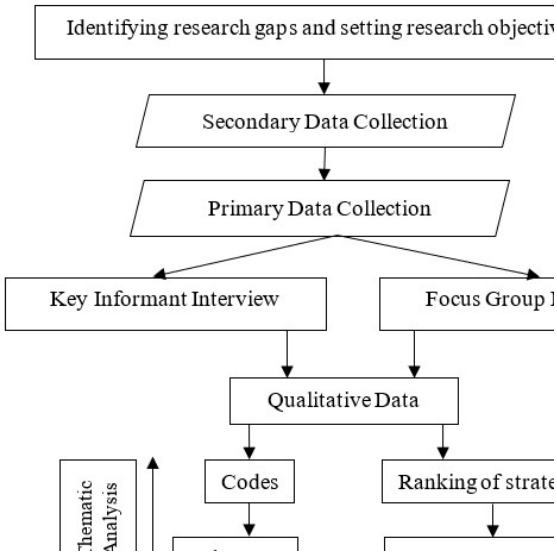

Figure 1: Flowchart of study methodology

2.1 Data Collection

The study was conducted based on both primary and secondary data. It commenced with a thorough and comprehensive review of the current body of literature that aims to uncover internationally recognized and widely employed evacuation approaches. Following this literature review, a focus group discussion and a series of key informant interviews was conducted.

2.1.1 Secondary Sources

To identify existing strategies for the evacuation of disabled individuals in metro stations, the keywords “Accessible Evacuation Methods”, “Safe Egress for Disabled Passengers”, “Barrier-Free Evacuation Strategies”, “Universal Design in Metro Station Evacuation” etc. were employed for searches on both Google Scholar and Google. While the search did not yield a substantial number of studies, strategies given in Table 1 were nonetheless obtained. Notably, a few additional strategies were identified; however, these are omitted from the list as they either lack suitability within the context of Bangladesh or are impractical to implement given the space limitation in existing metro station scenario.

2.1.2 Primary Data Collection

Since the study aims to grasp the perceptions of disable persons and their insights into evacuee behaviour, online, in-depth interviews were conducted with disabled individuals residing across diverse areas of Dhaka. Qualitative data were gathered through focus group discussions (FGDs) involving disabled persons and key informant interviews (KII) with administrative personnel from non-governmental organizations (NGOs).

Identification of potential NGOs was done through a systematic chain of referrals. Subsequently, a curated list of potential participants, comprising disabled individuals engaged in either employment or academic pursuits, was compiled. Researchers reached out to each potential participant and NGO administrative personnel through email or phone, explaining the study's purpose and objectives, and inviting them to participate. Those who expressed interest were then scheduled for online interviews.

Table 1: Strategies Extracted from Literature

Strategy	Definition	Source
Refuge Area	A relative safety place where an individual requiring help with evacuation can wait along with a companion such as a colleague, buddy, or fire warden until the arrival of the fire service.	(McConnell & Boyce, 2015; Proulx, & Pineau, 1996)
Evacuation Chair	A chair designed with additional wheels that smoothly traverse stair edges to ensure a seamless descent. This chair is equipped with safety features like brakes, belts, kickstands, and footrests to ensure the rider's stability and safety during use. It's important to note that this chair is manual and requires assistance for movement.	(Proulx, 2002)
Stair Lift Chair	A mechanical device installed on a staircase to assist individuals with disabilities in moving. It consists of a seat attached to a track or rail that is affixed along the length of a staircase.	(Proulx, 2002)
Evacuation Elevator	An elevator subject to specific guidelines and regulations that are designed to facilitate self-evacuation in the event of emergency	(Peacock & Bukowski, (2009).
Buddy System	Involves pairing individuals with limitations with one or more people without limitations for assistance during emergencies.	(Proulx, 2002)
Fire Warden	A person who receives training and is responsible for ensuring everyone is aware of and follows the evacuation procedure during emergencies, acts as a leader in guiding others to safety.	(Proulx, 2002)

A total of 10 persons with various disabilities joined the FGD where 8 participants had disabilities by born and 2 of them got injuries through road accidents. Out of 6 NGOs contacted, 5 administrative personals agreed to join the individual interview. All of them have 10-25 years of experience in promoting rights, mainstreaming disability issues and building large scale positive academic, social and employment programs for welfare, safety, and enhanced social inclusion of disabled persons. Participant characteristics of the persons who joined the primary data collection methods are shown in Table 2.

Table 2: Demographic characteristics of subjects

Types of survey participated	Participant Identification No.	Gender	Age (Years)	Occupation	Types of disabilities
FGD	1A	Female	21	Undergraduate student	Wheelchair User
	2A	Male	25	Masters Student	Speech Disability
	3A	Male	26	Masters Student	Low Visibility
	4A	Male	31	Employed	Wheel chair user (amputation from road accident)
	5A	Female	27	Employed	Visual impairment
	6A	Male	34	Employed	Wheelchair user
	7A	Female	32	Employed	Visual impairment
	8A	Female	28	Employed	Visual impairment
	9A	Male	30	Employed	Low visibility
	10A	Male	24	Postgraduate student	Wheelchair user (spinal cord injury through a road accident)
KII	11A	Male	34	Youth connection Team Lead	Visual impairment
	12A	Male	52	Executive Director	Wheelchair User
	13A	Male	33	Deputy Team Lead	--------
	14A	Female	38	Program officer	Low visibility
	15A	Male	48	Head of finance and admin	----------

The interview format used was semi-structured, involving brief background questions followed by open-ended inquiries. This method offered flexibility to delve into the individual perspectives and insights of participants. The pattern of the interview questionnaire aimed to stimulate reflections on specific topics rather than simple yes-or-no answers. The topics being examined, along with the corresponding questions used to prompt discussion, are outlined in Table 3. Near the end of each interview, a presentation was shown to the participants explaining possible evacuation strategies and assistive technologies that can be incorporated in current metro station scenario (listed in Table 1). After the presentation, participants were asked for their opinions and ranking for preferred strategies.

Table 3: Guiding questions for the focus group discussion and individual interview*

Core Question	Probe
Do you *(they)* feel safe making regular trips	What is the purpose of regular travel?
	How long do you *(they)* need to travel for regular activities?
	Tell us about the last time you travelled through public transport?
	Does any companion commute with you for regular trip?
What do you think are the challenges you *(they)* face while using the service	What is the proportion of individuals with disabilities currently employed in Dhaka?
	Is proximity to workplace an important factor while looking for jobs?
	How many disabled people you noticed using metro?
	What challenges do you *(they)* face accessing the station?
How aware are disabled individuals about emergency evacuation procedures in metro stations?	Have you ever evacuated from a building during an emergency (earthquake, fire) situation? If yes, what challenges did you face during the evacuation? If no, what were the reasons?
	Do you *(they)* feel adequately informed about accessible evacuation routes and strategies?
	In metro stations, do you think enough measures were taken for heterogeneous population?
	How can metro station staff be better prepared to handle diverse disabilities and mobility challenges?
What accessibility features do you believe should be incorporated into metro station designs to facilitate safe evacuation for disabled individuals?	Are there specific assistive technologies or devices you believe would enhance safety during emergencies?
	Give your perspective on the advantages and possible challenges some evacuation strategies.
	Rank the presented evacuation strategies according to your preferances.

*The questions for the FGD and KII are nearly identical. Italics within parentheses are employed specifically for the KII.

2.2 Ethical Consideration

All participants were informed of the purpose of the study and the time required for the interview. A consent letter, along with an application seeking written permission for video recording the Zoom interview to facilitate accurate data transcription, was sent to participants via email. Concurrently, a semi-structured questionnaire was provided to ensure participants' preparedness ahead of the interview. Furthermore, participants were assured that their personal information and interview responses would remain confidential, and they could withdraw from the study at any time without giving any explanation.

3. DATA ANALYSIS

3.1 Thematic Analysis

The collected qualitative data were analysed using reflexive thematic analysis, a widely accepted method for studying qualitative information (Braun, V., & Clarke, V. 2012). This approach involves

reviewing the dataset to identify themes in the dataset. Initially, key informant interviews and focus group discussions were transcribed into text format, and a thorough reading of the texts was conducted to gain familiarity with the data. The authors then coded the transcripts using the technique of descriptive or semantic coding (Braun, V., & Clarke, V. 2012). Once the transcripts had been coded, these codes were analysed and organized into code families to identify overarching themes. These themes were then defined and named. The final themes comprising of the issues of safe evacuation of metro stations were presented in a comprehensive report.

3.2 Descriptive Analysis

Ranking data were received from participants where they ranked total 6 evacuation strategies (listed in Table 1) on a scale of 1 to 6 where Rank 1 means most preferred strategy and Rank 6 means least preferred strategy. A descriptive analysis was done to identify the most preferred strategies of all the participants. To accomplish this, a specific score was assigned to each rank in accordance with their priority; for instance, Rank 1 was assigned the highest score of 6, while Rank 6 received the lowest score of 1, and so forth. After that, marginal frequencies of each strategy were derived which gives the number of times participants ranked a strategy at particular ranking spot.
The next step involved multiplying the marginal frequency of each rank by the corresponding scale score and summing these values to obtain the total score for each strategy. The determination of the best strategies was then based on these total scores.

4. RESULT

4.1 Underlying Issues Related to Safe Evacuation

According to most of the participants, Metro Rail is the most accessible public transportation mode for them as in metro rail, dedicated elevators, braille lines, disabled-friendly washrooms and equal platform to train level is maintained to ensure accessibility for all. During discussions about emergency evacuation, many participants expressed an inability to recall any real evacuation experiences. When probed with specific questions about evacuation, the common response was often along the lines of "*I don't know how I/others would behave*." This highlights the unfamiliarity of evacuation for most individuals, making it a challenging topic to discuss and relate to personal experiences, particularly in a country like Bangladesh.
At first, it is very crucial to identify obstacles that impede safe evacuation before introducing or implementing evacuation strategies. Addressing underlying issues is essential because without eliminating these challenges, all evacuation strategies are likely to face difficulties in functioning effectively in the long run. The analysis of the interviews resulted in the construction of themes and codes, as shown in Table 4 to identify the inherent problems.

Table 4: Themes and code examples constructed from the perspectives of participants

Themes	Code Examples
Awareness and social orientation to disability	People often do not know how to help
	People do not understand the situation as they never experenced it or made aware of it
Lack of evacuation experience	I never participated in a mock drill
	I can not anticipate whether other people would help me
Lack of Inclusivity	We are not considered as stakeholders
	Our safety and convenience are in no one's mind

The following sections describe each theme highlighting the participants' perspectives.

4.1.1 Awareness and Social Orientation to Disability

Understanding the challenges faced by individuals with different abilities can be challenging, particularly for those without personal experiences in such situations. Therefore, relying on assistance

from the general public, who may not be trained for emergency situations, could pose challenges, as explained by a participant with visual difficulties:

> *"The group that faces the most risk is the people evacuating together. They try to be considerate but end up running away because of the danger around them. Expecting empathy from general people who also don't know what to do is a luxury in such scenarios".* (Participant 1A)

Beyond the immediate challenges faced by individuals with disabilities, the deficit in awareness regarding inadequate assistance is vital as it fragments community responses during emergencies, diminishing overall resilience and social cohesion. At the same time, according to most participants, a lack of orientation to disability contributes to the perpetuation of stereotypes and biases, fostering an environment where individuals with disabilities may face stigmatization and discrimination during evacuations.

> *"While there are braille tiles in the metro rail stations, the general public is unaware of their purpose, leading to problems. The main problem is a lack of awareness, and that's not something we can fix overnight. It requires collective effort."* (Participant 6A)

> *"We have a separate section of seats in the metro rail coach. It's not about segregation but rather making it easier to identify individuals with special needs, particularly during emergency situations but how properly is that maintained? Orientation of mass people towards a cohesive society is a dire need now."* (Participant 10A)

4.1.2 Lack of Evacuation Experience

In Bangladesh, where natural disasters are not uncommon, the less participation of disabled individuals in evacuation planning raises serious concerns. Given that evacuation is not a routine occurrence for the general population, a majority of respondents indicated a lack of firsthand experience in real evacuation scenarios. This absence of practical exposure contributes to a heightened sense of uncertainty surrounding evacuation procedures. The uncertainty in one's own behaviour is a noteworthy aspect of this uncertainty as explained by a participant:

> *"I do not think I can confidently say how I would behave in such scenario as I am never made prepared for this. Being a person in need of mobility aid, I would only hope I get help"* (Participant 2A)

> *"Fire drills are a foreign concept here; it seems the needs of disabled individuals aren't considered in rescue plans. We haven't had the opportunity to participate in any drills."* (Participant 4A)

Thus, the lack of confidence and reliance on external help underscore the urgency of addressing these concerns within the broader context of emergency response planning to ensure the safety and well-being of individuals with mobility impairments.

4.1.3 Lack of Inclusivity

In the context of Bangladesh, a country having many accessibility challenges, the exclusion of disabled individuals in the planning and decision-making stages creates an environment that doesn't adequately cater to their specific needs. While mentioning that there has been limited consideration regarding the evacuation procedures for disabled persons as no ramp exists within the station, a key-informant interviewee gave importance to the fact that this wouldn't have been the case if they were included in decision-making phase:

> *"At the beginning, the Metrorail authority reached out to us for our opinions during the construction phase. Unfortunately, due to COVID, the procedure stopped and our voices were*

not heard. In fact, since the Metrorail started operating, we are no longer considered stakeholders." (Participant 4A)

Also, the lack of preparedness in emergency scenarios further underscores the gravity of the issue. Another participant emphasizes the need for a paradigm shift in training approaches to ensure that responders, both in public and private sectors, possess the knowledge and skills to assist disabled individuals effectively during emergencies:

"We need some serious disability-oriented training here. It's not just about ticking boxes; it's about genuinely comprehending and responding to the needs of individuals with disabilities, especially in emergency situations." (Participant 7A)

4.2 Identification of Most Suitable Evacuation Strategies

Given the diverse range of disabilities among participants, they underscored the importance of implementing each evacuation strategy to cater to various disability types. While participants ideally proposed having all strategies available for optimal preparedness, practical constraints, such as financial limitations and spatial restrictions, make it impractical to install all strategies simultaneously in metro stations. The study's analysis involved assigning scores to each strategy based on the frequency of specific rankings (as detailed in Table 5) to determine the most preferable strategies overall. Among these, the Evacuation Elevator emerged as the top choice, obtaining a total score of 73 (as depicted in Figure 2), while the Evacuation Chair received the least preference with a total score of 45. This underscores a general preference for Evacuation Elevators as the most effective evacuation method according to participants. Additionally, the scores for the stair lift chair and buddy system closely followed the evacuation lift. Although participants highlighted the importance of ramps for enabling self-evacuation for wheelchair users, the study excluded this strategy due to the impracticality of constructing ramps in already-built metro stations of Dhaka city, constrained by space limitations.

Table 5: Marginal frequencies of strategies derived from participants' ranking

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7
Stair Lift Chair	2	5	3	2	0	3	0
Buddy System	4	1	3	3	1	0	3
Evacuation Chair	0	2	3	0	1	6	3
Refuge Area	0	1	2	4	5	3	0
Fire Warden	1	1	2	3	2	2	4
Evacuation Elevator	5	4	1	2	1	0	2

Figure 2 illustrates the prioritization of strategies, as determined by the total score obtained from the rankings assigned by survey participants.

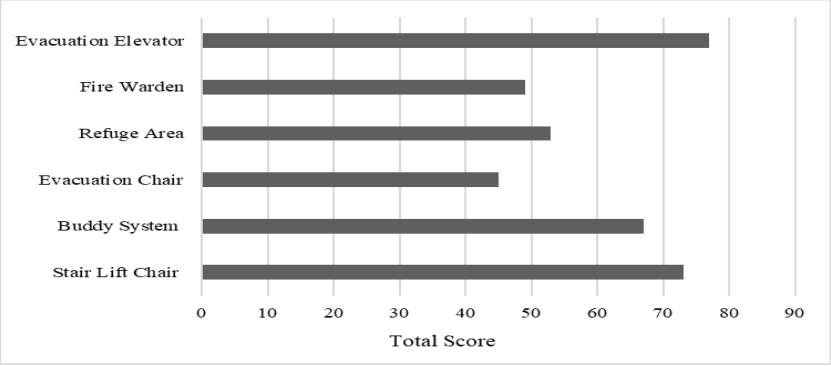

Figure 2: Preference of strategies according to survey participants

5. DISCUSSION

5.1 Insights Regarding the Evacuation Strategies

This section of the paper discusses the top three strategies (shown in Figure 2) from the perspective of the study participants to further improve them according to the needs of the direct user group.

5.1.1 Evacuation Elevator

Consistent with the findings of the study, there is a growing interest in using elevators as a practical option for emergency evacuation worldwide. The concept of an evacuation elevator represents a universal strategy for evacuation, indicating its ability to evacuate a diverse range of human abilities and thus fostering inclusivity (Steinfeld, 2006). According to the participants, the main reason for its popularity is that it is the only way that people with disabilities can avail themselves without assistance. They can maintain their independence throughout the evacuation. While stating the benefits of evacuation elevator, participant 1D quoted,

"With these heavy-wheeled mobility devices, carrying me down using stairs is a real challenge for my mother. That's why having access to an elevator is crucial for my safety and well-being."

Besides, this strategy offers psychological benefits, as individuals with any kind of disabilities don't have to wait in an area of refuge uncertain about whether someone will come to evacuate them.
However, participants voiced concerns regarding the potential utilization of the evacuation elevator by individuals without disabilities, citing their experiences with the existing dedicated lift for them in the metro stations.

"In the age of social media, I think you are all well aware of the viral image from the metro station, depicting a person in a wheelchair waiting for the lift while it was fully occupied by so-called normal people."

Their concerns revolved around the possibility of overcrowding during evacuation, suggesting that such a situation could undermine the functionality of the elevator for individuals with authentic mobility requirements.

The Americans with Disabilities Act (ADA) specifies the necessity of safety features such as backup power and water-resistant bodies in emergency evacuation elevators (2010 ADA Standards for Accessible Design, 2010). The elevators currently operational within the metro station adhere to these ADA requirements. However, as outlined in the New London Plan 2021, there exists a criterion requiring the evacuation lift to be integrated with a designated refuge point (Evacuation of mobility impaired occupants: Review of international code requirements, 2023)- a specification not accounted for in the current design of the metro station.

5.1.2 Stair Lift Chair

The stair lift chair is a highly efficient mobility tool in evacuations, with the potential to significantly reduce the barrier posed by stairs in emergency egress situations. While assistance is necessary to use this mobility device, participants noted that it would decrease the physical effort needed to carry them upstairs. Participants highlighted another rationale for choosing this strategy, emphasizing that a stair lift can be installed on stairs without requiring alterations to the civil structure. According to the International Organization for Standardization (ISO) 9386-2:2000 (2019), stairlifts are required to operate on inclinations that do not surpass 75 degrees from the horizontal plane. The staircase within the metro station meets this particular requirement. Furthermore, integrating this device with the stairs ensures that the evacuation speed of individuals using the stairs remains unaffected.
However, the strategy is not without criticism by the participants. Numerous study participants expressed concern about the inherent physical risks involved in the process of transferring from the

mobility device to the emergency stair travel device, both for the evacuee and the individuals assisting in the evacuation. Moreover, this emergency stair travel device can accommodate only one person per trip. This process is time-consuming and poses the risk of significant injuries due to its slow nature.

5.1.3 Buddy System

Since it is not uncommon for individuals with disabilities to be left behind due to the lack of awareness and training of other occupants or the belief that evacuating these individuals is the sole responsibility of trained professionals, the buddy system is famous among disabled persons. Designating a buddy guarantees that there is at least one individual willing to assume the responsibility of assisting the disabled person. According to one female participant, "The idea of waiting passively for a rescue that may or may not come is emotionally hard to accept." Implementing the buddy system as a strategy provides a proactive approach, offering support and shared responsibility in emergency situations.
All participants agreed to the main drawing of this strategy is to be dependency. The effectiveness of the buddy system relies heavily on the availability of designated buddies. If a buddy is unavailable or unable to fulfil their role during an emergency, the entire strategy may fail.

5.2 Suggested Modification in Metro Station

- Addressing the concern of misusing evacuation elevators during emergency situations, it is essential to decide if their usage will be limited to disabled occupants exclusively. This determination can be made based on the ridership data for individual metro stations. For instance, if a significant number of disabled individuals frequently use the station, it is advisable to reserve the elevator for them rather than the general public.

- Since the existing stairs of the metro stations of Dhaka are sufficiently wide, a rail can be mounted to the treads of the stairs, with a chair or lifting platform attached to the rail. However, design upgradation is needed to cater to the needs of overpopulated countries like Bangladesh. For instance, introducing a U-shape rail so that more than one chair lift can move simultaneously.

- Given the relatively low number of disabled passengers utilizing metro stations, incorporating empathetic staff volunteers can be a key element of the buddy system in the stations. A critical aspect of the buddy system involves comprehensive training for the staff members, encompassing emergency procedures and fostering disability-related behaviour. The subsequent actions involve identifying the passengers requiring additional support, understanding their needs of, establishing clear communication channels, and conducting regular check-ins to foster a supportive and inclusive environment. This ensures that during emergencies, the staff is well-informed about the passengers' locations.

6. CONCLUSION

While the complete elimination of disaster risk in metro stations may be unattainable, the implementation of certain soft strategies can effectively mitigate these risks. This paper specifically addresses the challenges faced by individuals with disabilities during metro evacuations and proposes appropriate strategies to address these issues. A single strategy cannot fit all types of disabilities. Once a strategy is chosen, a clear and comprehensive procedure must be established, outlining evacuation actions for all occupants. Life safety measures within public places like metro stations, inclusive of both disabled and non-disabled persons, require universal awareness, as anyone may encounter an impairment or be called upon to assist someone with a disability. Therefore, it is crucial that emergency plans are prominently displayed and distributed to all persons, accompanied by regular training and practice sessions, forming an integral part of a safe evacuation.

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