

## Background and Aim

Fire escape and emergency evacuation procedures are essential considerations in the design and maintenance of buildings. However, for individuals living with disabilities, particularly mobility impairment, it is important that extra fire safety considerations are made to enable them easily exit buildings in the event of a fire outbreak.

The Regulatory Reform Fire Safety Order [1] places the responsibility of providing comprehensive fire risk assessments, including safe escape plans for all users, on the person in charge of commercial buildings. Sustainable Development Goal (SDG) 11, aims to create inclusive, safe, and sustainable human settlements. The United Nations (UN) Disability and Development Report [2] highlights the need for accessible housing (SDG target 11.1) and equal housing access for individuals with disabilities (Article 9).

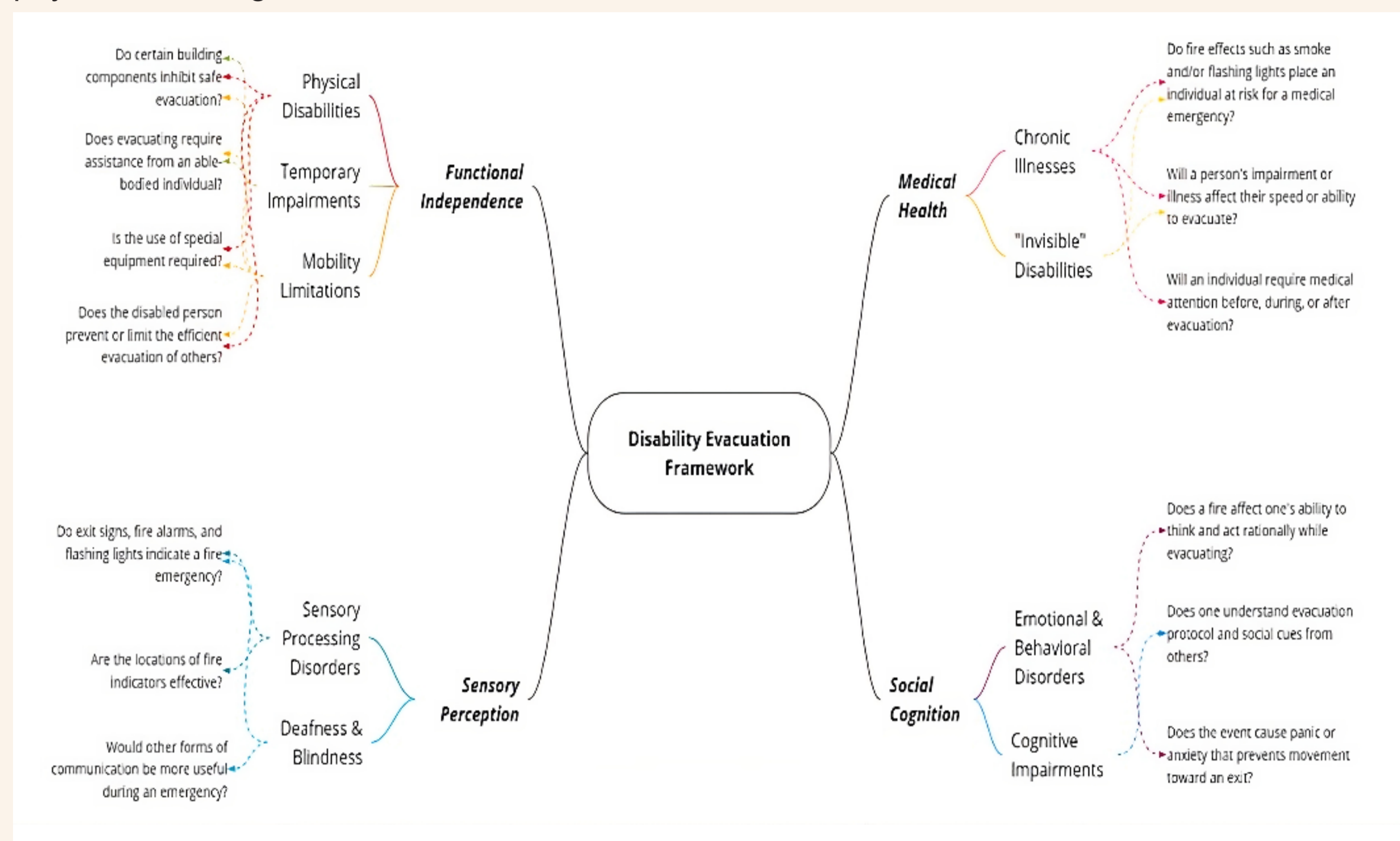
However, the SDG 11 lacks explicit mention of fire safety and escape protocols. Martin [3] advocates for integrating fire perspectives in the implementation of the Sustainable Development Goals (SDGs) through interdisciplinary collaboration to address complex fire-related issues. This study is crucial towards achieving SDG 11, promoting equality, and improvement of housing conditions for differently-abled individuals [3].

The aim of this study was to examine fire escape procedures dispatched in buildings to ascertain their suitability for the physically challenged in the event of a fire outbreak, with a view to identify areas for enhancement.



## Methodology

The study is a literature review paper that retrieved data from relevant published works by textual analysis. The data were gathered through Internet search with the aid of Google Scholar search engine and content analysed. The findings were descriptively presented in themes. The study utilized the Disability Evacuation Framework [4] as the guideline for establishing fundamental components for safe egress. The primary focus was on 'Functional Independence,' encompassing physical disabilities, temporary impairments, and mobility limitations. The findings were grouped into three categories: Building Architecture, Complimentary Personnel and Procedures, and Additional Devices, which highlighted the accessible fire escape protocols for individuals with disabilities or mobility issues. The study is useful for guiding policy makers, scholars, and professionals when making decisions concerning fire safety protocols for individuals with physical challenges.



The Disability Evacuation Framework [4]



Fire Safety Symbols [13].

## Findings

The key findings of the study were categorized under three sub-headings as follows:

### A. Building Architecture Features:

Building architecture encompasses all characteristics of the building relating to fire escape and safety procedures. Areas of refuge were identified as designated spaces where individuals with mobility impairments can temporarily await assistance during emergencies [5]. Safe Elevators, also known as Occupant Emergency Elevators (OEEs), enable individuals with disabilities to self-evacuate more efficiently and independently [4]. Clear and effective communication systems were also highlighted, considering the diverse communication needs of individuals with disabilities during fire emergencies [4].

### B. Complimentary Personnel and Procedures:

Complementary systems involving personnel and procedures were identified to aid building users with disabilities during fire emergencies. Fire wardens play a crucial role in fire safety and evacuation, including assisting in the safe evacuation of occupants with disabilities [6], [7]. The "buddy system" assigns a responsible person to aid individuals with disabilities during evacuation [8], [9], [10]. Building fire lists were suggested to maintain updated records of occupants with disabilities that require aid from evacuation personnel during a fire emergency [10].

### C. Additional Devices:

Additional devices for enhancing fire escape for occupants with physical disabilities were identified. Evacuation chairs are designed to aid mobility-impaired users in safely exiting buildings via stairways [11], [12]. For buildings lacking safe elevators, transfers and lifts offer horizontal evacuation options to safer areas [4]. However, consideration for user autonomy is essential [8], [9], [10].

## Conclusion and Recommendations

This study emphasizes the importance of accessible fire escape protocols for building users, especially those with physical disabilities and mobility impairments. Existing procedures may not be suitable for physically challenged individuals during emergencies, calling for improvements.

Recommendations include implementing Personal Emergency Evacuation Plans (PEEPs) for personalized evacuation strategies. Policymakers and architects should prioritize provisions for fire escape measures to benefit individuals who are physically challenged. The study holds significant implications for policy formulation and serves as a valuable resource for architects, students, instructors, and scholars seeking guidance on accessible fire escape protocols in buildings.

Moreover, researchers can utilize and build upon its findings for further advancements in the field. The following areas are suggested for future studies: case studies of commercial buildings to assess their level of fire safety preparedness for occupants that are physically challenged; users' perception studies to examine the satisfaction level of physically challenged persons with existing fire escape protocols and measures in different building types; and studies on the exploration of the use of technology to improve existing fire safety protocols for physically challenged individuals in the built environment.

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