ACCESSIBILITY OF EMERGENCY EVACUATION FOR DIFFERENTLY-ABLED PEOPLE IN PUBLIC HOSPITAL BUILDINGS IN SRI LANKA: THE NATIONAL POLICY ENHANCEMENTS

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ABSTRACT

It is very difficult task in nature and a prevailing issue in the world today to provide a reasonable access for differently abled people within any building. Specially, giving fair and impartial accessibility has become very complex and an ongoing global issue. However, various policies and guidelines have been developed in countries enabling buildings to be used by the differently abled people by building them in terms of ease of access for emergency evacuation. Among the other buildings, healthcare facility has obtained the first concern when considering its' heavy use by differently abled people. Thus, this research was conducted with the purpose of studying on the accessibility procedures of emergency evacuation for the differently abled people in public buildings with special emphasis to public hospitals since the current evacuation means in healthcare sector are not adequately developed based on the needs of differently abled people. The research was conducted using case study method under qualitative phenomenon. Semi-structured interviews were conducted among building professionals who had more than five years of experience in the field of accessibility to collect the data. Hence, three public hospital buildings in Sri Lanka were selected. Accessibility procedures of emergency evacuation and issues in existing practice were investigated related to safety and security, access to built environment and access to communication in line with the National Policy on Disability for Sri Lanka. Case study data revealed that not having predetermined procedure for evacuating differently abled people and less awareness on existing safety and security procedures thus need special attention. Accordingly, a framework was developed to propose the probable enhancements for the national policy. The enhanced policy can be used as a national strategy to assure the ease of accessibility of emergency evacuation for differently abled people in public hospital buildings in Sri Lanka.

Keywords: Accessibility; Differently-abled People; Emergency Evacuation; Public Hospital Buildings; Sri Lanka.

1. INTRODUCTION

Over the recent years more importance has been given to improve the ease access of buildings for differently abled people. Further, more technologies have also evolved over the recent years whereas disability is increasingly understood as a human rights issue (Ministry of Social Services and Social Welfare, 1996). It shows that a great deal of work has been done for the improvement of accessibility of buildings for differently abled people (Castell, 2014). Further to author, giving fair and impartial accessibility to buildings for the differently abled people has become very complex and it is an ongoing global issue. The reason for this is the scope of controlling the legislation and standardising buildings varies according to each country. On many occasions the needs of differently abled people are viewed separately from other groups of people and often after the design of a building has been completed (Department for Communities and Local Government, 2006). The Government in many parts of the world have realised the need to identify people with a disability to help by developing the policies and programs for them (Widdowson, 1997). For an example, any new building which is going to be used as a public facility should have an arrangement to provide a better accessibility to differently abled people (Americans with Disabilities Act Title II Regulations, 2010). Further, as another approach developed by most of the countries, all the public places and public buildings which are enabled to

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use by the differently able people have been regulated to build them in terms of ease of access for emergency evacuation.

However, the current evacuation means in healthcare sector fails to consider the needs of differently abled people in an emergency situation. Similarly, in Sri Lanka, a little attention has been paid on facilitating ease of access to differently abled people in public sector hospital buildings especially in case of emergencies. Thus, there is a vital necessity of studying on current setting of the accessibility of emergency evacuation for the differently abled people in public buildings with special emphasis to hospital buildings in Sri Lanka. Hence, this research was aimed to answer the research question developed "How to enhance the accessibility procedure of emergency evacuation for the differently abled people in public hospital buildings?" The investigation was led to propose probable enhancements for the 'National Policy on Disability for Sri Lanka'. However, the research was limited to conduct a generic investigation on the public hospital buildings in Sri Lanka which facilitate a longer-term care for patients.

2. LITERATURE REVIEW

Disability is an important development issue with an increasing body of evidence showing that persons with disabilities experience worse socio-economic outcomes and poverty than persons without disabilities (Ministry of Social Services and Social Welfare, 1996). According to a study by Prideaux and Roulstone (2009), disability is a kind of bodily deficiency which prevents the person from doing day-to-day activity for the common people. As Prideaux and Roulstone (2009) and Snook and Oliver (2015) further stated, there is an egret need to create living environments suited for differently abled people persons with disabilities live in all parts of the word and at all levels in every society, and their number is on the increase due to various reasons. Today, it is estimated that over 600 million people or more than 10% of the total global population are suffering or affected by some form of disability. Out of them, nearly 400 million people are living in developing countries (Kanter, 2003). Currently it is roughly 650 million people (Rico, 2015). In Sri Lanka, the total of disabled persons is suffering from any form of disability is at 10%, as estimated in a survey conducted in 2013. The prediction of increase in number of disable persons is up to 24.2% at the year of 2040 in Sri Lanka (Ministry of Health, 2014).

The term access can be explained as suitability of a building or other structure for use by people who have disabilities (Widdowson, 1997). In a broader sense, access also includes making forms and information accessible to people with visual or cognitive disabilities; making alarms and signals to people who have hearing impairment and making services such as education and transport accessible to people who have disabilities" (Ministry of Health, 2014). However, it is very difficult task in nature and current problem of the world to provide reasonable access for disabled people within the building which varies country to country and level of their acceptance with aim of the monitoring the legislation and building standards (Castell, 2008). Over the recent years more importance has been given to improve the ease access of buildings for differently abled people, more technologies have also evolved over the recent years. It shows that a great deal of work has been done for the improvement of accessibility of buildings for differently abled people (Castell, 2014). The reason for this is the scope of controlling the legislation and mechanisms used in buildings varies according to each country. According to Americans with Disabilities Act, it requires that government, possessor of the space, service provider, worker or school should provide "reasonable accommodation" to use egress for disabled people (Americans with Disabilities Act Title II Regulations, 2010). The access requirements of differently abled people have been taken into account in recent years. On many occasions, the needs of differently abled people are viewed separately from other groups of people, especially more often after the design of a building has been completed. As the examples, the separation of facilities, such as platform lifts or ramps for wheelchair users located on one side of a stepped entrance can be highlighted (Department for Communities and Local Government, 2006). Further, making such special featured public spaces and the facilities provide an easy access to the building for differently abled people as a built in feature of the environment is good for everyone (Rabinowitz, n.d.).

However, a United Nations survey of 114 countries in 2005 found that many countries had policies on accessibility, but they were unable to found much progress. Of those countries,

- 54% reported no accessibility standards for outdoor environments and streets,
- 43% had none for public buildings,
- 44% had blank for schools, health facilities, and other public service buildings.

- 65% had not initiated any educational programmes,
- 58% had not allocated any financial resources to accessibility,
- 44% of the countries had a government body responsible for monitoring and controlling accessibility for people with disabilities (World Health Organization, 2011).

Indeed, facilitating required access for differently abled people in case of an emergency is another requirement which needs to be considered in designing or modifying buildings (Americans with Disabilities Act Title II Regulations, 2010). According to a study by Kisko and Francis (1985), "emergency evacuation is the process of removing the occupants of a building from a potentially dangerous location to a place of safety (Kisko & Francis, 1985). The emergency plan is very much important in safeguarding life of occupiers. It protects not only the differently abled people but also all other stakeholders within the building (National Fire Protection Association, 2016). For many years, the Disability Movement in Sri Lanka has been requesting from the Government for a National Policy on Disability (Ministry of Social Services and Social Welfare, 2003). A national policy for differently abled people was introduced and was accepted by the cabinet in August 2003. Lack of a clear policy that enables them to exercise their rights and responsibilities, guarantees for them an equitable share of available resources and includes them in the socio-economic mainstream has, up to now, led to programmes with poor sustainability. These in turn have had nil or negligible impact on their situation (Ministry of Social Services and Social Welfare, 2003). The classification of types of disability used by the Ministry of Social Welfare for programme development encompasses people who have visual, speech, hearing, mobility, intellectual, and psychiatric disability and disability arising as a result of epilepsy and other causes. It also encompasses multiple disabilities, which is a combination of two or more of these various disabilities in a single individual. According to that, their socio-economic needs have considered such as, employment, education, housing, use of public services, social security, access to the build environment, access to communication and information (Ministry of Social Services and Social Welfare, 2003). Further, since 2006, the government took a revolutionary decision through which all the public places and public buildings are enabled to use by the disabled people under the Disabled Person's Accessibility Regulation 1 of 2006. All the constructed public buildings and public places are enabled to use by them within a three years' period according to Section 2 of above regulation. Although it was started to implement since 2006, the suitable facilities for the disabled people are not integrated within the most of the public buildings until now (Jayawardena, 2015). Hence, determining probable enhancements of existing regulations pertaining to accessibility for differently abled people in public buildings was identified as an urgent and important requirement to be fulfilled. By reviewing key literature, three major categories of accessibility procedures such as, (i) Safety and security, (ii) Access to built environment and (iii) Access to communication were encountered and used in subsequent analysis. Figure 1 presents the conceptual framework developed.
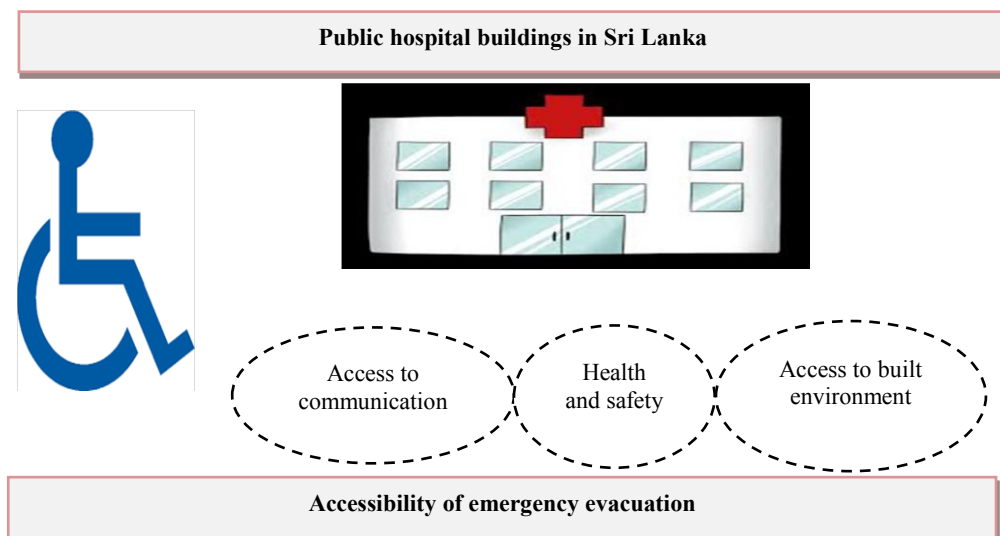

Figure 1: The Conceptual Framework

Section 3 describes the research methodology adopted to identify existing procedures and issues in accessibility of emergency evacuation in public hospital buildings in Sri Lanka.

3. RESEARCH METHODOLOGY

The research was initiated with a literature synthesis for describing the need of the accessibility of the emergency evacuation for differently abled people in public buildings. Since in this research, the current accessibility procedures and related issues were to be investigated, case study method under qualitative approach was found more suitable. Case study is a type of qualitative research approach used when an in-depth investigation of an issue is required (Yin, 2009). Further to authors, by considering the high degree of certainty and validity exist in multiple case study designs, the multiple case study design was used. Three public hospitals in Sri Lanka which provide longer-term care for patients were selected as the cases. The organisation was considered as unit of analysis in each case when studying on the accessibility procedures. Further, a generic investigation was done by considering the accessibility guidelines of the overall hospital building wherein a little attention was paid on separate procedures of individual care units of the hospital.

Direct observations and semi-structured interviews techniques were used to collect the data. According to Yin (2009), interview is one of most important sources of case study information where which appears to be guided conversations rather than structured queries. Thus, nine (09) semi-structured interviews were conducted by selecting three (03) building professionals who had knowledge and more than five (05) years of experience in each case. Table 1 shows the profile of case study interviews.

Table 1: Profile of Interviewees

Case	Designation	Years of Experience
Case A	Fire and safety officer	18
	Engineer	13
	Quality assurance executive	07
Case B	Engineer	16
	Facility manager	05
	Quality assurance executive	03
Case C	Facility manager	08
	Fire and safety officer	07
	Engineer	06

The interview guideline consists of four sections namely Sections A, B, C and D as follows;

- Section A: General information and personal profile
- Section B: Existing accessibility procedures for emergency evacuation
- Section C: Issues in the current practice
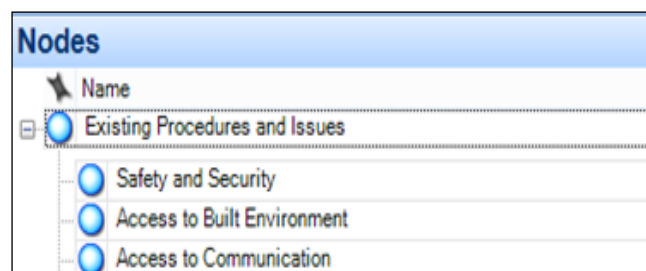- Section D: Strategies to overcome the identified issues

Figure 2: Coding Structure

The data collected through semi-structured interviews in each case were analysed by using cross case analysis techniques as this research contains three cases. According to Yin (2009), cross case analysis is a preferable to apply for the analysis of multiple cases. In analysing the collected data, content analysis technique was used to gather data by codifying qualitative information collected in each case into predetermined categories based on key literature reviewed. QSR.Nvivo 10 software was used in content analysis due to its popularity in similar research setting. Figure 2 illustrates the coding structure developed for case analysis. Next section presents the key research findings of the study.

4.   DATA ANALYSIS AND FINDINGS

This section presents key findings of the study broadly on three major headings such as, existing procedures, issues and suggestions on policy enhancements with regards to three areas of safety and security, access to built environment and access to communication as determined in Figure 1.

4.1.   SAFETY AND SECURITY

▪   **Existing procedures**

It is important to consider the safety and security arrangements in the hospital particularly for the differently abled people and patients. According to fire and safety manager in Case A, *"once a patient got operated he is temporarily unable to do his activities so he is considered as a differently abled person and has a need to safe and secure himself."* Thus, various procedures have been implemented within the general system to evacuate the differently abled people in case of an emergency. Locating signboards and floor plans, implementing emergency preparedness programme and locating care unit at each floor can be identified as existing means. As quality assurance executive in Case B stated, *"each wing of the floor has a care unit. It is especially beneficial for the differently abled people and patients as they can easily access without any problems. Staffs in those care units will take the responsibility to handle the patients as well as visitors in emergency situations."* However, as there is no specific procedure adopted for differently abled people, several issues prevail within existing practice can be identified.

▪   **Issues**

The empirical data of case studies indicated several issues relating to safety and security in public hospital buildings in terms of accessibility for differently abled people. Not having fire lift to use in emergency situations and not facilitating emergency call points for patients were identified as major issues existed in three cases selected. This has become a critical issue specially when evacuating differently abled people in case of any emergency. Statement of quality assurance executive in Case B that "*if fire catches on the top floor and unfortunately differently abled people got into the side and will be a problem for them to exit, so in case of such problems always difficult to evacuate those differently abled people and according to the standard operational procedures there are only ways to carry them outside by means of manually but no other facilities*" shows importance of such. Further, in most of the emergencies, differently abled people have been evacuated manually as there is no fire lift, no predetermined procedure or an accessibility guideline for differently abled people in selected organizations. Another issue highlighted was the less awareness on existing safety and security procedures by both patients and officials. As stated by engineer in Case A that "*generally most of the people do not follow the signs and it will create many turmoil for them as well as the officials too.*" Accordingly, several procedural issues can be identified such as not having fire lift to use in emergency situations, not facilitating emergency call points for patients, no predetermined procedure or an accessibility guideline for differently abled people and less awareness on existing safety and security procedures by both patients and officials, which should be conversed with national policy enhancements.

▪   **Suggestions for policy enhancements**

In order to mitigate the issues existed in safety and security procedures, several attributes can be suggested for enhancing the policy. Each hospital should adopt a new procedure which contains special needs of differently abled people and should prioritize them in times of emergency. Further, as case respondents proposed, proper arrangements and placement of fire lift and provision for a band system to easily identify the conditions of each differently abled people can also be implemented in public hospital buildings for easy of accessibility in case of an emergency. Facility manager in Case C stated that *"We have faced lots of issues when evacuating differently abled people during emergencies without having a proper accessibility plan. So, proper arrangements and placement of fire lift will be important to evacuate them easily and without any harm"* shows the importance of proposing such. Further, installing emergency call point beside every patient's bed will be helpful for ease of evacuation, as stated by most of case respondents.

Hence, the existing accessibility procedures available for safety and security in national policy can be enhanced by adopting a new procedure which contains special needs of differently abled people, prioritizing the needs of differently abled people in times of emergency, proper arrangements and placement of fire lift, installing

emergency call point beside every patient's bed and adding provisions for a band system to easily identify the conditions of each differently abled people.

4.2. ACCESS TO BUILT ENVIRONMENT

- **Existing procedures**

There are several accesses to the building. Are they effectively being used in emergency situations? This is a serious problem in many buildings. Findings also revealed that most of the public hospital buildings in Sri Lanka are having general circulation path including lot of emergency access other than any special evacuation ways specially arranged for differently abled people. As stated by engineer in Case B, "*we don't have any special evacuation ways specially arranged for differently abled people. They have to use the normal evacuation routes as all others.*" Facility manager in Case C also verified that "*there are lot of ways have been identified for emergency evacuation in this building such as, lifts, elevators, ramps, fire exit, fire doors, staircase footpaths and corridors.*"

However, not having proper guideline for accessibility for differently abled people has led to several issues as described subsequently.

- **Issues**

The absence of a fire lift in the building and not using directional tactile tiles were identified as major issues existed in current procedures. Directional tactile tiles help the blind people to identify the pathways. Facility manager in Case C said that "there *is no any fire lift in the hospital and further there are no any tactile tiles placed in the building.*" Further, there is no any announcing system which announces the floor number inside the lift during operation. This was also identified as another major drawback by most of respondents.

Accordingly, not using directional tactile tiles, absence of a fire lift and not having proper announcing system were recognised as major issues related to built environment which need to be considered in national policy enhancements.

- **Suggestions for policy enhancements**

While lot of emergency accesses are available within public hospital buildings in Sri Lanka, the effective use of those was proposed to encourage within the national policy. Hence, providing sufficient awareness and training for internal employees on how to evacuate differently abled people, adopting special needs of differently abled people into the emergency preparedness programme or having a specific programme for differently abled people were highlighted by most of the case respondents. As proposed by quality assurance executive in Case A, *even though we have lots of emergency access to built environment, no one knows what the correct and right way to use them is. Therefore, providing proper training for staff and for specially appointed evacuation team would be beneficial.*" Furthermore, installing directional tactile tiles is also mentioned as an important provision to include in the national policy to guide visually impaired people along a route with ease of access to built environment.

Hence, new provisions for an effective use of emergency accesses, providing sufficient awareness and training on how to evacuate differently abled people, introducing a specific programme for differently abled people and installing directional tactile tiles can be conversed in national policy enhancements.

4.3. ACCESS TO COMMUNICATION

- **Existing procedures**

Case study findings divulged that, most of the public hospital buildings are suffering from fewer procedures adopted for access to communication. As the existing strategies available, having public address system and locating signboards can be highlighted. Further, some of hospitals have appointed a specialist from the blind school to support blind people in case of an emergency. As proved by Facility manager in Case B *"whenever there is a problem due to the language barrier especially for the blind people they appointed a specialist from the blind school for their betterment."* Even though the buildings are equipped with public address systems and signboards as the existing strategies, the lack of procedures specifically for differently abled people has generated several issues as described accordingly.

▪ **Issues**

As common to many buildings, absence of a proper audible system and scarcity of strobe lights are the major drawbacks. *"If any visual notifications like strobe lights are available in the hospital, deaf people can alert them from the danger. But unfortunately, hospital does not have such facilities"* said the fire and safety officer in Case C. In Case A, fire and safety manager of the hospital also stated that there is no any special audible system particularly for the deaf people. Further, quality assurance executive in Case B said that *"even though a lot of strategy measures during emergency situations to evacuate the people, there is no any special strategy available for the differently abled people and in case of such danger those differently abled people are protected by manually with the help of existing care unit."* Further, no scrolling reader for supporting deaf people and communication barrier existed between local staff and foreign patients and visitors are the other issues that need to be considered for policy enhancements. Hence, the issues of not having scrolling reader for supporting deaf people, absence of proper audible system and strobe lights and communication barriers existed between local staff and foreign patients and visitors can be considered in national policy enhancements.

▪ **Suggestions for policy enhancements**

As a key area that needs to be considered in national policy enhancements, introducing provisions for ensuring 'access to communication' can be suggested. As depending on the traditional alarm system alone could generate several issues, hospital accessibility procedures can be introduced with special strategies for differently abled people such as, VADs (Visual Alarm Devices - flashing beacons) etc. Another enhancement that can be proposed through policy is providing provisions for installing strobe lights, emergency scrolling readers and other tactile devices such as pagers or vibrating pillows or beds etc. As stated by facility manager in Case C *"Scarcity of visual notification systems is a major issue in our building. Thus, making provisions for providing such facilities would be important".* As case respondents proposed installing VADs (visual alarm devices - flashing beacons) and other tactile devices such as pagers or vibrating pillows or beds can be facilitated in hospital buildings for ease of use by differently abled people in emergency situations.

5. DISCUSSION

According to the case study data, the existing procedures and issues in accessibility procedures of emergency evacuation for differently abled people in public hospital buildings in terms of health and safety, access to built environment and access to communication should have special attention in national policy enhancements. Empirical findings revealed that absence of fire lift to use in emergency situations, not facilitating emergency call points for patients, not having predetermined procedure or an accessibility guideline for differently abled people and less awareness on existing safety and security procedures by both patients and officials could increase the threat on differently abled people in case of an emergency. Thus, a special attention can be paid in national policy enhancement. Experts also expressed that, absence of a fire lift, no use of directional tactile tiles and absence of proper announcing system for lifts located can be highlighted as other accessibility related issues existed in current practice. Nevertheless, access to communication also needs special attention in the process of policy enhancement, as the current practice prevails several issues such as, absence of a proper audible system, scarcity of strobe lights, no scrolling reader for supporting deaf people and communication barriers existed between local staff and foreign patients and visitors specially in case of an emergency. The summary of key issues identified in case analysis are presented in Table 2.

As empirical data revealed, not having a predetermined procedure or an accessibility guideline for differently abled people and less awareness and training on evacuation of differently abled people in case of an emergency were the critical issues existed in public hospital buildings. Hence, the specialised modern technologies can be introduced within public hospital buildings to overcome the accessibility issues. Accordingly, as the key findings derived through case analysis, probable enhancements were proposed to overcome the identified issues in existing procedures.

Table 2: Summary of Key Issues in Accessibility Procedures

Major category	Issues in existing procedures
Safety and security	▪ Not having fire lift to use in emergency situations ▪ Not facilitating emergency call points for patients ▪ No predetermined procedure or an accessibility guideline for differently abled people ▪ Less awareness on existing safety and security procedures by both patients and officials
Access to built environment	▪ Not using directional tactile tiles ▪ Not having proper announcing system
Access to communication	▪ Absence of a proper audible system ▪ Scarcity of strobe lights ▪ No scrolling reader for supporting deaf people ▪ Communication barrier existed between local staff and foreign patients and visitors

The opinions of experts in the field and the secondary data divulge key attributes for enhancing the National Policy on Disability for Sri Lanka as indicated below,

▪ A major section can be introduced for accessibility of emergency evacuation for differently abled people in public buildings

▪ The major section can be added with accessibility rules and regulations which are mainly related to safety and security, access to built environment and access to communication.

▪ The provisions of safety and security may include; adopting new procedure which contains special needs of differently abled people, prioritize differently abled people in times of emergency, making proper arrangements and placement of fire lift, introducing provision for a band system to easily identify the conditions of each differently abled people and installing emergency call point beside every patient's bed.

▪ Access to built environment can be added with new provisions including, providing sufficient awareness and training on how to evacuate differently abled people, adopting the special needs of differently abled people into the preparedness programme or having a specific programme and installing directional tactile tiles for guiding differently abled people with clear directions specially in case of an emergency.

▪ Further, installing Visual Alarm Devices (VADs), installing emergency scrolling readers and other tactile devices such as pagers or vibrating pillows or beds can be noted under 'access to communication' in the process of national policy enhancements.

The summary of strategies deemed in the developed framework (Figure 3) can be used to enhance the National Policy for Disability in Sri Lanka.

The enhanced policy can be used as a basis to evaluate the current practice of public hospital buildings in Sri Lanka. Indeed, the national policy can be introduced with proposed enhancements to facilitate a reasonable access for differently abled people in public hospital buildings in case of an emergency.
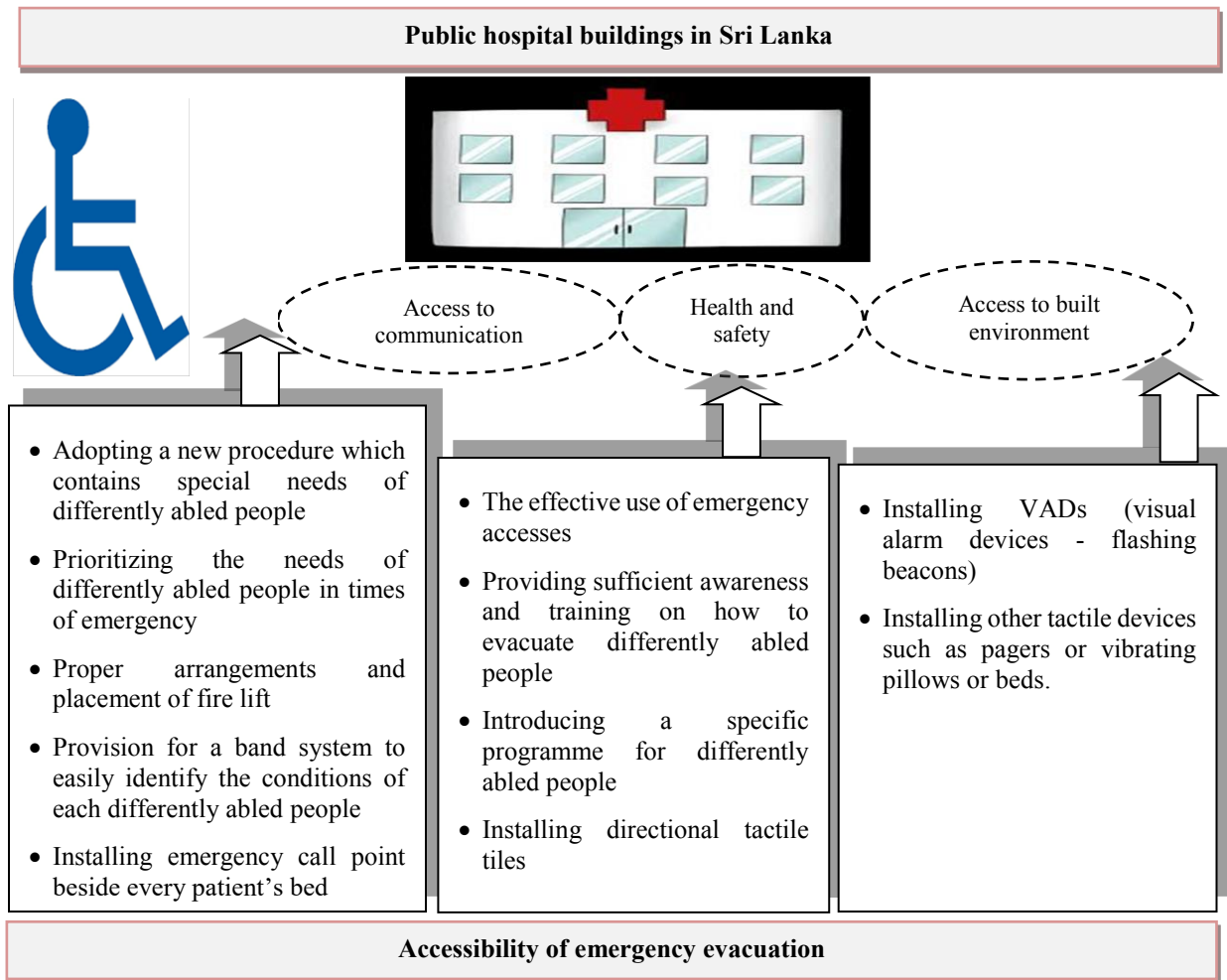
Figure 3: Suggestions for Enhancements

6. SUMMARY

By considering the necessity had on studying accessibility of emergency evacuation for the differently abled people in public buildings in any unfavourable environment, this research was conducted in this respect while a special attention was given to public hospitals. The reason behind the selection of public hospital buildings is justified by the current means of evacuation which were existed in healthcare sector fail to necessitate the need of differently abled people. As findings revealed, several issues were identified in existing practice related to safety and security, access to built environment and access to communication. Thus, developing special plans and strategies to help the differently abled people and adopting their special needs into existing means of evacuation would be fruitful as it may definitely aid their survival in times of emergency. As the main implication of the study, probable enhancements for the National Policy on Disability for Sri Lanka were proposed through a framework to overcome the accessibility issues in public hospital buildings in Sri Lanka. Thus, the enhanced policy can be preceded as a national strategy to assure the proper evacuation of differently abled people during emergencies in public hospital buildings with easy accessibility undeniably.

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