Improving Disaster Preparedness Services for People with Disabilities

Istiarsyah[1*], Kamarullah[1], Robiansyah Setiawan[1], Amir Hasan Dawi[2]

[1] Universitas Muhammadiyah Mahakarya Aceh, Indonesia
[2] Universiti Pendidikan Sultan Idris, Malaysia
E-mail: istiarsyah@ummah.ac.id

Abstract: Lack of disaster preparedness has contributed to many disaster victims, especially people with disabilities, who are often neglected in making disaster risk reduction plans. In light of the recent World Conference on Disaster Risk Reduction (WCDRR) in Sendai, Japan, and the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030, which establishes new priorities for disaster risk reduction over the next 15 years, this issue has become a hot topic since then. This paper aims to contribute ideas to the Indonesian government in reforming and improving disaster preparedness services for people with disabilities based on successful theories, research, and practices developed in several countries. Through reviewing literature studies related to the issue and interviewing relevant informants in Indonesia, both data sources coped with six strategies that may contribute to improving disaster preparedness for disabled individuals. The strategies as the results of this study are intended to be used as reference material, particularly by the Indonesian National Disaster Management Agency (BNPB), in order to aid in the creation of a framework to better comprehend the communication, mobilization, transportation, and medical requirements of people with disabilities in the context of preparing disaster preparedness program scenarios.
Keywords: Aceh; disaster; disability, inclusive, preparedness.

INTRODUCTION

Natural disasters always bring hardship and adversity to people whom they impact. Damage to infrastructure, delays in aid distribution (Battle, 2015), economic dysfunction (Staupe-Delgado, 2019), insufficient emergency shelters, and unfortunate phenomena like people with physical, motor, sensory, mental, intellectual, and psychosocial disabilities being raped and subjected to sexual violence (Hunt et al., 2015; Kettaneh & Slevin, 2014) are all direct results of natural disasters. This significantly impacted the impoverished country, which has limited resources, undeveloped and adequate infrastructure, and the imbalance between program supply and reality in the field, causing conflict, injustice, and issues in disaster response (Hunt et al., 2015).

Disasters are often considered extreme natural events beyond human control, and many are victims (Spurway & Griffiths, 2016). However, many studies have conceptualized disaster as a structural societal problem that causes a disproportionate vulnerability to specific groups, such as people with disabilities. The interaction between structural issues often determines how individuals, communities, and countries experience vulnerability or resilience (Spurway & Griffiths, 2016). Sometimes, people with disabilities are ignored (Hunt et al., 2015). They are the last group that gets attention from disaster preparedness programs (Battle, 2015) and long-term recovery assistance (Boon et al., 2014). The lack of consideration for disaster management for people with disabilities can cause another problem. Considering their disability, they need assistance and additional support for rehabilitation than people without disabilities.

People with disabilities could get more risk and severe injuries, even deaths, two to four times than people without disabilities (Boon et al., 2014). A marginalized group, such as people with a disability, faces more challenges before and after a disaster, which requires

full attention (Sheikhbardsiri et al., 2017). Besides that, they are socially stigmatized, and isolation and discrimination can have long-term effects (Stough et al., 2016). Natural disaster deteriorates the condition of people with disabilities. They might lose interpersonal support and mobilization assistance (Landry et al., 2016). In addition, people with disabilities are marginalized in society, and many researchers ignore people with disabilities' experiences with disaster (Stough & Kelman, 2018). Based on these issues, the government and other communities, such as humanitarian aid organizations, are responsible for optimally minimizing societal problems, including people with disabilities. Their disaster experiences are essential in planning disaster preparedness and mitigations system to minimize discrimination in assisting needed. Their experiences are needed to provide advice and input for risk management programs and mitigation to obtain responsive and inclusive macro-level responses.

Many people in disaster management view people with disabilities as a homogeneous group without unique and complex needs requiring the value of an emphasis on interdependence, preparedness, and action within the entire community (Kettaneh & Slevin, 2014; Pyke & Wilton, 2020). People with disabilities are marginalized from disaster management planning due to the deprivation or lack of capabilities to cope with disasters themselves (Ton et al., 2019). This could happen because they thought people with disabilities could not operate particular tools to protect themselves and their surroundings. After all, they have a disability in their physical, motor, sensory, and cognitive. Therefore, the best evacuation scene from disaster preparedness planning will not help them; instead, developing disaster management education and training programs for disabled children as early as possible is fundamental (Nagata & Kimura, 2020).

Minority groups, including people with disabilities, have struggled to be victims during natural disasters. They have to struggle to save their life with their ability. Therefore, they would be better placed to provide advice on disaster mitigation planning (McDermott et al., 2016). The obstacles faced by people with disabilities during a disaster differ significantly depending on their type of disability, such as intellectual, sensory, motor, and psychosocial disability. It will determine the types of support needed by people with disabilities (Stough & Kang, 2015).

Consequently, no one-size-fits-all strategy can be used to support every disabled person's needs. The wrong types of assistance and support are mostly given to people with disabilities during a disaster because the authorities are not accurate in identifying the types of disabilities of people with disabilities may have (Alexander, 2015). The difficulties can be exacerbated by the loss or disconnection of support networks for persons with intellectual disabilities, including families, friends, and care providers (Kettaneh & Slevin, 2014).

This article is based on many statements and experiences of disabled individuals regarding unequal aid distribution for them. This is a factual matter that happened in the field of disaster. Regarding the previous research, as explained before, minimizing disaster risk and optimizing the government's attempt at disaster preparedness for people with disabilities. For this reason, this article seeks to learn from disabled people's perspectives from many nations about their engagement in disaster preparedness concerns. Additionally, it aims to offer a contribution idea relevant to improving preparedness services for people with disabilities based on experiences that have occurred and make replications as a consideration to be included in disaster preparedness program planning, particularly for people with disabilities.

LITERATURE REVIEW
Disaster Preparedness and Its Management

Literature about disasters defines these phenomena in different ways. Some definitions focus on the factors causing disasters, others focus on managing crises arising from disasters, and others focus on the trauma caused by disasters. The last-mentioned focus may relate to disasters, which are considered sudden events causing damages, losses, and distresses. Those are also viewed as a consequence of natural danger phenomena that seriously need countermeasures for mega-disasters to build a future disaster-resilient society (Okazumi & Nakasu, 2015). Besides, integrated health education in schools and community-based disaster risk reduction (DRR) plans to create resilient communities are also essential (Pascapurnama et al., 2018). To create do, educating disaster preparedness may act as both life-saving and life-sustaining when considering its impact beyond teaching and learning (Halman et al., 2018). In outline, it can be concluded that disaster is a phenomenon or incident that appears suddenly and unexpectedly and is triggered by a lack of preparedness that causes damages; and the inability of the system to cope with the number of victims and death on a big scale. The difficulty access to reach the disaster areas is an obstacle in distributing food, water, clothes, shelter, and medical aid that seems to exacerbate suffering and cause long-term psychological trauma.

Disaster preparedness generally includes developing plans of what to do, where to go, or whom to call for help. In contrast, disaster happened to increase the chance of success in coping with disasters (Pavkovic et al., 2014). Disaster preparedness is a government, organization, social community, and individuals resolutions to minimize disaster risk levels because of limited resources (Hamann et al., 2016). This is an operation both in the formal context (schools and universities) and non-formal context (public awareness campaigns, workshops, and training of community learning) to promote disaster risk reduction levels (Ronoh et al., 2015). In other words, disaster preparedness is an education strategy and critical awareness to convey information about dangers to the public and society (Spurway & Griffiths, 2016). Therefore, disaster preparedness is an initiative to increase people's preparedness and knowledge about disasters. Its management attempts to increase mindful preparedness for disasters in a particular area. It also aims to increase people's capacity to solve problems alone or without supervisors.

Disability-inclusive Disaster Preparedness

According to Kruger et al. (2018), paying attention to the needs of persons with disabilities is extremely important since these individuals have extra demands before, during, and after a catastrophe that is particular to the debilitating condition they are living with. The condition, which relatively covers physical and mental disorders, substantially limits one or more of their life activities. Disability is a part of the human incapacity condition, either permanently or temporarily, visible or invisible, and it occurs at birth, during childhood, adulthood, or old age (Jubeh, 2017). Persons with disabilities include those with long-term physical, mental, intellectual, and sensory impairments; their interaction with many barriers will hinder their full and effective participation in society equally with others (Lang et al., 2011). They lose and have limited chances in society at an equal level with others because of social and environmental barriers (Hamann et al., 2016). Hence, disability is a condition or function with a significant impairment such as physical, sensory, cognitive, mental, and other chronic diseases compared to standard people.

METHOD

This qualitative study collected data from two sources. The first source was gathered by reviewing journals on disaster preparedness for people with disabilities that were

successfully applied in some countries, both practical and theoretical. The literature was retrieved from only reputable international journals and publishers.

In addition, to strengthen the data, the second source was retrieved through interviews with disabled people and observation of several special and inclusive schools. The informants, who consisted of three males and two females (See Table 1), were given consent to their approval as part of this study as the interviews were performed in Indonesian and recorded with their acknowledgment. They were selected purposively in the around eastern part of Aceh Province, Indonesia, as this area is beyond the full support for inclusiveness as reported by Muchsin et al. (2022) and considering the province as the most destroyed zone hit by the 2004 Indian Ocean earthquake and tsunami. The natural disaster in the area even turns into a marketing part of educational tourism mitigation (Manan, Wirianto, et al., 2023), having a series of cultural disaster precautions and beliefs (Manan et al., 2021; Manan, Kamarullah, et al., 2023).

The authors believe combining the literature studies and the views of disabled informants from this appropriate area may offer new insights into this study's topic.

Table 1. The Demographic of the Informants

No.	Initials	Age	Sex	Occupation	Disability
1	RP	32	M	Entrepreneur	Physical disability
2	MR	33	M	Restaurant waiter	Physical disability
3	DP	30	M	Unemployed	Vision impairment
4	SW	28	F	University student	Deaf
5	BS	38	F	Teacher	Physical disability

Furthermore, the data analysis for the first source was examined through descriptive analysis. It was carried out to underpin the highlighted issues for disaster preparedness among disabled individuals. Then, for the second source, the data analysis by Miles et al. (2018) was implemented to elucidate the findings through data reduction, data display, and conclusion drawing.

RESULTS AND DISCUSSION
Results
Results from the First Source
The authors have collected the literature considering topics on disaster preparedness for disabled individuals proposed by various relevant studies (Hamann et al., 2016; Kruger et al., 2018; Ronoh et al., 2015; Spurway & Griffiths, 2016), as displayed in Table 2.

Table 2. Relevant Studies of Disaster Preparedness for People with Disabilities

No.	Topics	Types of Document	Years	Authors	Titles	Countries of research
1	Disaster preparedness training program for disabled people	Journal article	2007	Rowland et al.	Emergency response training practices for people with disabilities: Analysis of some current practices and recommendations for future training programs	The United States
		Journal article	2013	Baker and Cormier	Disaster preparedness and families of children with special needs: A geographic comparison	The United States

No.	Topics	Types of Document	Years	Authors	Titles	Countries of research
		Journal article	2014	Eisenman et al.	Peer-mentored preparedness (PM-Prep): A new disaster preparedness program for adults living independently in the community	The United States
		Journal article	2014	Wolf-Fordham et al.	Educating first responders to provide emergency services to individuals with disabilities	The United States
		Journal article	2016	Stough et al.	Barriers to the long-term recovery of individuals with disabilities following a disaster	The United States
		Journal article	2022	Villeneuve	Disability-inclusive emergency planning: Person-centered emergency preparedness	The United States
2	Disaster preparedness program for disabled students	Journal article	2011	Boon et al.	School disaster planning for children with disabilities: A critical review of the literature	Literature study
		Journal article	2014	Boon et al.	Emergency planning for students with disabilities: A survey of Australian Schools	Australia
		Book chapter	2018	Stough and Kelman	People with disabilities and disasters	Literature study
		Journal article	2020	Shah et al.	Disaster risk management insight on school emergency preparedness – A case study of Khyber Pakhtunkhwa, Pakistan	Pakistan
3	Big data of inclusivity needs	Journal article	2014	Kettaneh and Slevin	National module for helping individuals with physical disabilities in disaster events	Literature study
		Journal article	2015	Stough and Kang	The Sendai framework for disaster risk reduction and persons with disabilities	Japan
		Book chapter	2015	Alexander	Disability and disaster: An overview	Literature study
		Journal article	2019	Iswari	The challenge of improving special education quality in digital era	Literature study
		Journal article	2020	Pyke and Wilton	Planning for inclusion? An assessment of Ontario's emergency preparedness guide for people with disabilities	Literature study
4	Facilities and services for disabled people	Review paper	2011	Twigg et al.	Disability and public shelter in emergencies	The United States
		Journal article	2012	Daugherty et al.	Disaster preparedness in home health and personal-care agencies: are they ready?	The United States
		Journal article	2018	Gibson et al.	Disaster mental health services review of care for older persons after disasters	The United States
		Journal article	2018	Faruk et al.	An analysis of inclusiveness and accessibility of Cyclone Shelters, Bangladesh	Bangladesh
5	Information warning	Journal article	2011	Chandrappa et al.	Predicting disaster: Asian scenario	Literature study

No.	Topics	Types of Document	Years	Authors	Titles	Countries of research
	system for disabled people	Journal article	2016	Charme et al.	Disaster planning and response with and for people with disabilities	The United States
		Journal article	2017	Kim and Zakour	Disaster preparedness among older adults: Social support, community participation, and demographic characteristics	The United States
		Journal article	2021	Chisty et al.	Disability inclusiveness of early warning system: A study on flood-prone areas of Bangladesh	Bangladesh
6	Community support and social networks	Journal article	2013	Tanaka	Issues in the support and disaster preparedness of severely disabled children in affected areas	Japan
		Journal article	2015	Zakour	Effect of support on evacuation preparedness of persons with disabilities	The United States
		Journal article	2020	Stough et al.	Disasters, schools, and children: Disability at the intersection	Literature study
		Journal article	2020	Pyke and Wilton	Planning for inclusion? An assessment of Ontario's emergency preparedness guide for people with disabilities	The United States
		Journal article	2021	Wei and Yao	Constructing and analyzing spatial-social networks from location-based social media data	Literature study

Results from the Second Source

This part displays the relevant points delivered by the informants. Each point is represented in excerpts matching the topics in Table 2. The informants believed that the disaster preparedness training dedicated to disabled people was a must, ranging from old to young ages, as conveyed by RP in E1 and DP in E2 below.

Excerpt (E1): *Can you imagine we do not know what to do if the tsunami comes again? Even ordinary people will confuse. My big consideration is disabled children, who need full consideration and attention during disasters.* (RP)

E2 : *I can see nothing, so when a disaster occurs, it will be hard for me to save myself, not to mention saving my family. I reckon that training for such conditions will be necessary.* (DP)

However, in E3, MR was pessimistic that the training for that situation had been considered to be realized by the government in his region so far.

E3 : *During my life here, I still do not find that improving awareness for disasters has been conducted in this region. Is it hard to realize, or is it unimportant for ordinary people? At least, make it for the disabled ones.* (MR)

The absence of services and facilities for persons with special needs, as indicated by SW in E4 and BS in E5, has led some informants to believe that governments maintain such a database.

E4 : *The information regarding inclusivity or people with special needs is not comprehensive or has no data.* (SW)

E5 : *As a disabled person, I lack much support. The lack of accessibility whenever I travel from home to workplace or go to public spaces. It reflects that the information about disabled people is available, resulting in few accessibilities for inclusivity.* (BS)

Regarding the information warning system, all the informants agreed that no physical infrastructures were available to provide early warning. Only social media through trending topics or information door-to-door were frequently reliable for them to use during disasters. This reason was represented by RP in E6 and BS in E7 as follows.

E6 : *The only disaster warning device, especially for tsunamis, is available in Banda Aceh. We do not have such a system in the eastern part, making us only rely on social media or locals reporting disasters.* (RP)

E7 : *We only knew about disasters through traditional ways, either mouth-to-mouth or television.* (BS)

Though the pessimistic opinions of the informants were found, some believed that disaster preparedness programs should be improved through training, socialization, information systems, and supporting communities.

Discussion

Ideas and Solutions of Disaster Preparedness Services for People with Disabilities

In this part, some ideas on strategies for disaster preparedness services for people with disabilities are pointed out based on the literature studies related to the topic. The strategies are reflections from some countries which successfully increase the disaster preparedness system for people with disabilities. There are six strategies of disaster preparedness proposed by the works of literature for people with disabilities: (1) a disaster preparedness training program for people with disabilities; (2) developing a disaster preparedness system for a special school; (3) an extensive data system for types of disabilities and identification of needs; (4) providing shelters or disaster emergency care homes for people with disabilities; (5) friendly information warning system for people with disabilities; (6) community support and social networks. The strategy for improving disaster preparedness for people with disabilities can be seen in Figure 1 below.
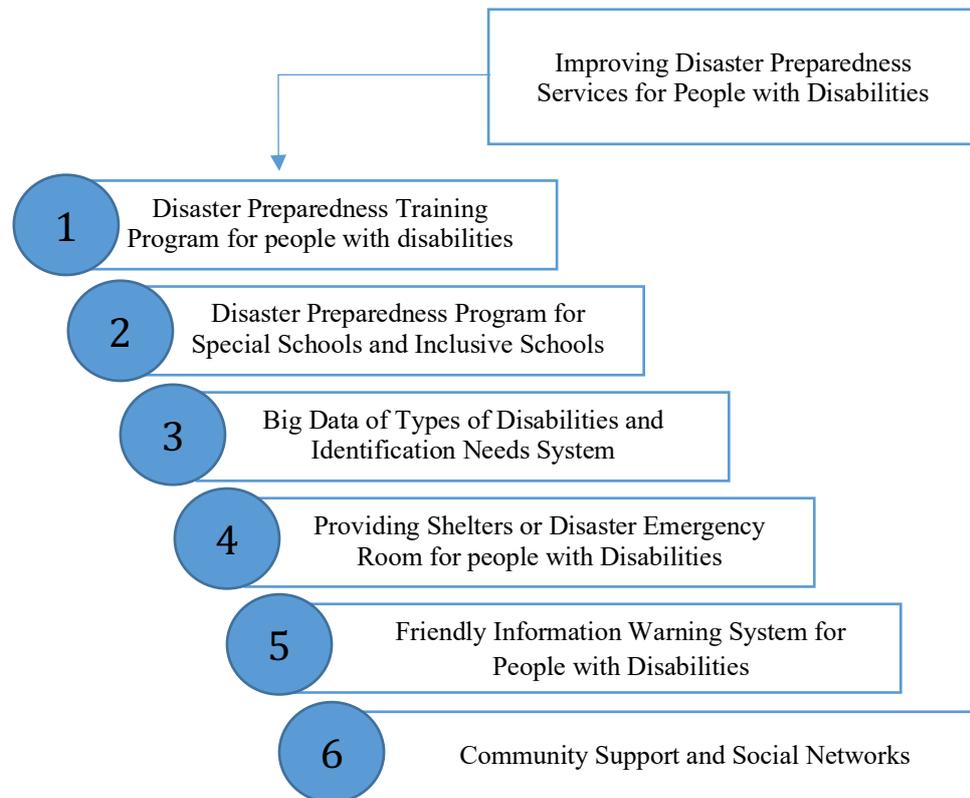
Figure 1. Strategy for Improving Disaster Preparedness for People with Disabilities

Figure 1. Strategy of Improving Disaster Preparedness for People with Disabilities

1) Disaster preparedness training program for people with disabilities

The confusion experienced later on by disabled people, as portrayed in E1 and E2, needs to be overcome. Some studies have suggested solutions. A study conducted by Baker and Cormier (2013) with survey research design, before and after the survey, showed the result that there was a significant improvement in disaster preparedness statistically as a result of a training program for 30-35 days after intervention and when people with disabilities move into the different geographic area. Another study conducted by Eisenman et al. (2014) was experimental. Four classes were taught by health educators and peer mentors, focusing on earthquake safety knowledge and disaster preparedness for two hours. The result showed an improvement in preparedness after a month of intervention.

This intervention aligns with the newest approach to reducing disaster risk and preparedness programs, emphasizing the importance of including people with high risks, such as people with disabilities, in the preparedness program. The second theme discusses how an organization considers people with disabilities in joining their event for disaster preparedness. Stough et al. (2016) analyze the practice of emergency personal disaster preparedness training to help people with disabilities with limited mobility in three rural locations and three cities in Northeast Kansas, America. The result showed the development of self-protection skills and self-rescue evacuation routes.

Wolf-Fordham et al. (2014) studied the result of an online training program developed for people with disabilities to encourage knowledge of friendly disaster preparedness. The result showed that the post-test scores of people with disabilities increased after training.

The disaster preparedness training program provides knowledge and skills for people with disabilities to be more innovative in tackling disaster and preparing it (Villeneuve, 2022; Wolf-Fordham et al., 2014).

2) Disaster preparedness program for special schools and inclusive schools

Until now, schools involved in disaster preparedness planning programs organized by the government and local or international NGOs are generally regular schools such as elementary, junior, and high schools, both regular, vocational, traditional, and Islamic. However, the realization of disaster preparedness in a special school is still limited, as reflected in E3, so there is a significant gap in attempting to achieve preparedness standards for accommodating the needs of children with disabilities. The gaps include the difficulty of mobility and communication with people with disabilities during evacuation procedures or things related to local health authorities to ensure health needs can be accommodated during the disaster response phase (Boon et al., 2011). Besides that, the lack of involvement of special schools in planning and developing policies of disaster preparedness risks causes failure and discrimination in providing the aid they need (Stough & Kelman, 2018); even a developed country like Australia confronted such issue (Boon et al., 2014). Not only is improving quality of human resources in pedagogical contexts at schools important (Istiarsyah et al., 2019), yet the collaboration to improve their professionalism in emergency response and management and plans for school-based disaster response and recovery, especially for students with special needs, as is the case in Pakistan (Shah et al., 2020).

3) Big data on types of disabilities and identification needs system

Many people in disaster management view people with disabilities as a homogeneous group without unique and complex needs (Kettaneh & Slevin, 2014; Pyke & Wilton, 2020). The barriers faced by people with disabilities during a disaster will differ depending on their types of disability, such as intellectual, sensory, physical, and psychological disability. It influences the types of aid and support they need (Stough & Kang, 2015). As a consequence, there is no one-size-fits-all strategy that meets the needs of all persons with disabilities. The wrong types of assistance are often provided to people with disabilities in disasters because the authorized people are inaccurate in identifying the type of disability (Alexander, 2015).

We know that government has data on the number of people with disabilities throughout Indonesia, although some still are unsure of the data, as revealed in E4 and E5. Nonetheless, accurate data is still needed. Besides those data, the government also needs data about the types of disabilities or barriers that people with disabilities face to distribute the appropriate assistance and needs to the right target.

4) Providing shelters or disaster emergency rooms for people with disabilities

Daugherty et al. (2012) evaluated the supplies and services between emergency rooms for people with disabilities and regular public hospitals. They discover significant differences in the level of supplies, and the services of disaster emergency rooms for people with disabilities are prepared better than general hospitals. It is due to the availability of trained medical resources to serve people with disabilities and tools and goods needed based on the level and types of barriers or disabilities of people with disabilities. Besides that, there is also excellent coordination with local and international NGO institutes concerned with disabilities. This is also supported by Gibson et al. (2018) that emergency response systems must be developed to accommodate people with disabilities during disasters. It includes evacuation facilities and services, trained medical staff, and appropriate communication systems, where most individuals with special needs demand those in E5.

According to Twigg et al. (2011), the provision for disabled people generally fails to meet their needs and describes the main problem areas. However, by incorporating widely accepted inclusive design principles and design standards, shelters and facilities can be made

that are more user-friendly, accessible, and inclusive, leading to a more supportive built environment for all (Faruk et al., 2018).

5) Friendly information warning system for people with disabilities

In a disaster preparedness program, a friendly disaster warning information system for disabilities is essential, which is agreed upon by the informants in E6 and E7. Kim and Zakour (2017) discussed the importance of disaster warning information considering accessibility for people with disabilities. Chandrappa et al. (2011) reported a framework of inclusive warning system mobile-based alert, even though in certain disasters, handicapped people cannot respond to the warning (Chisty et al., 2021). Charme et al. (2016) believed that the government needs to assess whether the emergency warning system suits people with disabilities. It aims to identify needs and provide recommendations to reach people with disabilities in society. The conclusion is that people with disabilities have different disabilities, such as physical, motor, cognitive and sensory, and emotional and behavioral barriers. Because of that, some of them need different disaster warning systems should be based on their disability.

6) Community support and social networks

Communities and social networks are strategies that can improve disaster services for people with disabilities. Wei and Yao (2021) argued that online social media has a role in communicating and finding people with disabilities during a disaster. They can also contribute to analytical models in understanding the role of the distribution truck in mediating the negative impact of disasters or emergencies on people with disabilities, proposing together the main goal for better change. This provides an example that social strength can build the resilience of people with disabilities in dealing with disaster. As shown in E7, it is proved by the existence of a traditional way of delivering information on disaster preparedness through mouth-to-mouth. Zakour (2015) surveyed 710 samples of people with disabilities from seven states of America. It found that informal social support and member of volunteers increase personal assistance in disaster preparedness for people with disabilities. Community-level interconnectedness, readiness, and action in the context of more extensive social and material situations are all considered as they relate to increasing individuals' resilience in the face of adversity (Pyke & Wilton, 2020).

Factors causing children with disabilities can die two times faster than other populations; therefore, involving the community or society and volunteering to provide daily daycare for people with disabilities to actively discuss individual and household preparedness is essential (Tanaka, 2013). It means that raising children as a part local community is a significant factor in saving them from disaster. Community support and social networking strategies should be increased to minimize the number of disaster victims.

CONCLUSIONS

This article aims to improve disaster preparedness strategy services for people with disabilities. Those abovementioned strategies reflect other countries that successfully improve disaster preparedness services for people with disabilities. Any programs that other countries will apply should be learned based on experiences and other countries' success.

Through this article, the authors hoped to contribute ideas, especially for the National Disaster Management of Indonesia, in developing the frameworks to understand the functional needs of people with disabilities in communication, mobility, transportation, and medical need at a disaster scene. This is important to take further steps rather than state a commitment to involve a disabled person in disaster preparedness and ensure that it will give a positive result, effective and efficient for all people with disabilities and society in their environment. The authors expect that in this short time, there will be more intervention and

report to build strong knowledge about the best practice to involve people with disabilities in the policies, plans, and implementation of disaster preparedness.

The authors advise that in disaster preparedness planning for the future, it is necessary to move beyond individual preparedness and focus on structural measures. The lack of people with disabilities involvement in planning disaster preparedness can cause failure. Life experiences of people with disabilities struggling during disasters will be a reflection idea aimed at assisting according to the characteristics of the barriers of people with disabilities. Besides that, the authors also suggest that the skills, knowledge, and experiences of people with disabilities are worthwhile and must be considered in preparing for inclusive disaster management.

Finally, it is vital to improving people with disabilities' involvement in creating policies. Direct participation from disabled people is needed because their self who can represent their needs in a disaster. Continuous efforts must be made and improved to empower people with disabilities to be involved in disaster risk reduction.

Nonetheless, this study has some limitations. A vast scope of literature should be included, covering not only reputable international journals but also other reputable academic sources and non-formal works and platforms, like social media. In addition, more informants from more regions, either national or international, will provide more insightful arguments to enrich the research findings. Hence, further studies must consider those aspects to contribute knowledge to this topic and other relevant issues.

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