A State University's Disability-Inclusive Disaster Preparedness Program for Students with Disabilities

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ABSTRACT

Natural disasters cause widespread losses, with earthquakes being the most catastrophic hazard in human history. Since earthquakes strike without warning, disaster preparedness is a critical precaution to prevent loss and destruction. This concurrent triangulation mixed-methods study examined the inclusivity of a state university's disaster preparedness program for students with disabilities (SWDs), focusing on the experiences and perceptions of deaf students and university personnel. Quantitative surveys (n=19) assessed the level of inclusivity of the features and practices of the disaster preparedness program using a 5-point Likert scale. At the same time, qualitative interviews (n=6 deaf students, n=5 personnel) explored the experiences of deaf students and perceptions of university personnel regarding disaster preparedness inclusion. Quantitative results revealed moderate overall awareness (Mean = 2.68) and satisfaction (Mean = 3.11) but low scores in understanding (Mean = 2.58), access to information (Mean = 2.58), timeliness of updates (Mean = 2.47), and inclusion (Mean = 2.42), indicating a gap between general awareness and actual comprehension. Qualitative findings highlighted communication challenges due to a lack of clear and accessible information channels, reliance on peers for information, and a desire for targeted measures like visual signage, dedicated resources, and individualized plans. The study recommends investing in accessible communication, empowering deaf students through their involvement in planning and implementation, and continuous evaluation and improvement to create a genuinely disability-inclusive disaster preparedness program.

Keywords: disability-inclusive disaster preparedness program, accessible communication, awareness, implementation

INTRODUCTION

Natural disasters are becoming more severe and frequent, resulting in alarming human and economic losses in recent years (Thomas, 2017). Out of all other disasters, earthquakes have been recognized as the most catastrophic natural hazard ever encountered throughout human existence on Earth. As earthquakes strike without warning, it is critical to be prepared. Disaster preparedness is a precautionary measure to prevent loss and destruction during a disaster. The Philippines is one of the top countries in the world at risk of earthquakes. The World Risk Report (2016, as cited in San Jose, 2022) indicates that the Philippines has 26.70 % risk, 52.46 % exposure, and 50.90% vulnerability. Due to its location on the Pacific Ring of Fire, the Philippine Institute of Volcanology and Seismology (PHIVOLCS) recorded an average of 20 seismic activities per day; approximately a hundred are felt each year. Disaster preparedness is presented as a critical necessity, especially for earthquakes, which are considered the most catastrophic natural hazard ever encountered by humans. These earthquakes strike without warning, making preventative measures essential to reduce potential loss of life and destruction.

One of the most devastating earthquakes in Philippine history was the Moro Gulf Earthquake in 1976, measuring 7.9 on the magnitude scale. It occurred shortly after midnight and resulted in a staggering 17,007 casualties, along with 40 aftershocks. Another significant earthquake was the Luzon Earthquake in 1990, measuring 7.8 in magnitude. This event caused 4,390 casualties, including 1,283 deaths, 2,786 injuries, and 329 missing individuals. More recently, the Davao del Sur Earthquake 2019, measuring 6.9 in magnitude, had the highest intensity of VII on the Modified Mercalli Intensity Scale (Ong, Prasetyo, Lagura et al., 2021).

These destructive earthquakes in Philippine history prompted an action involving universities and educational institutions to frontline and contribute to research and information exchange about disaster preparedness.

Higher education institutions could educate and bring stakeholders together to share experiences, increase knowledge, and facilitate decision-making for policy and practice since the university is the center of excellence (Abedin & Shaw, 2015). The educational institution was one of the strategic platforms for training and preparing young learners and teachers for disaster preparedness. However, despite having these institutions as educational instruments, it was undeniable that universities, colleges, and schools were just as vulnerable to disasters as anywhere else.

Hence, disasters like earthquakes affect universities as there are risks of injury, disturbance in academic flows, and damage to buildings and infrastructures. Mızrak and Aslan (2020) asserted that disasters destroy university campuses, cause significant student damage, disrupt education, and incur substantial economic losses. For instance, the Northridge earthquake severely damaged nearly all the buildings of California State University, resulting in approximately $380 million in economic damage. Given the vulnerability of universities, colleges, and schools to disasters like earthquakes, it became imperative to prioritize developing and implementing comprehensive and inclusive disaster preparedness programs. This approach should address the unique needs and challenges faced by individuals with disabilities.

Though there are efforts to integrate disaster risk reduction into education, students with disabilities have been overlooked. Although there is an increasing interest for persons with disabilities to be included in DRR education, most of the initiatives have adults as their target groups. In contrast, children with disabilities receive poor attention (Nikolaraizi et al., 2021). In the Philippines, Wester et al. (2017) claimed that there is a significant gap between disability-inclusive disaster risk reduction (DI-DRR) policy and practice. Although there is a growing trend toward inclusive approaches in international and national policy frameworks, the participation of Persons with Disabilities (PWDs) in Disaster Risk Reduction and Response (DI-DRR) initiatives within Albay province is still limited. This is primarily due to the generally poor and disaster-prone environment of the Philippines, where PWDs consistently encounter challenges in participating due to persistent barriers. Consequently, it is crucial to explore the inclusivity of disaster preparedness strategies for students with disabilities, considering their heightened vulnerability to the impacts of natural disasters.

To bridge this gap, the grounds of this study urge the researchers to determine the inclusive features and practices of the disaster preparedness program at a state university in Davao City. This study also sought to delve into the experiences of the students with disabilities, specifically deaf students of the university, about the disaster preparedness program and the perspectives and insights of the university personnel on having a disability-inclusive disaster preparedness program. The researchers believe that it was relevant and timely to conduct this study in order to understand and identify significant points in improving the disaster preparedness program, most especially since the university accepts deaf students to study in our institution.

METHODS

This study employed a mixed-methods research approach, combining both quantitative and qualitative methodologies through concurrent triangulation methods to determine the level of inclusivity of the features and practices of the disaster preparedness program of a state university and delve into the experiences of deaf students with the university's disaster preparedness program, and perceptions and insights of university administrators on having a disability-inclusive disaster preparedness plan. In the quantitative methods, the researchers administered a survey research approach wherein an online survey was given to deaf students of a state university. Survey research allowed researchers to efficiently collect standardized data from a population of respondents. In the qualitative methods, the researchers mainly used phenomenological case study approaches. Neubauer, Witkop, and Varpio (2019) explained that using the phenomenological approach provided the reason for things and rendered how things were encountered firsthand in everyday life by those involved.

The data for this study were drawn from various sources since a mixed methods approach was employed to gather comprehensive data. Quantitative data were collected through structured online surveys administered to

the nineteen (19) deaf students of a state university. The survey questionnaire consisted of close-ended questions that enabled the collection of numerical data. The respondents, who were deaf students of the university, were universally selected to gain direct data from the targeted population. The survey results were kept and stored electronically and forwarded for statistical analysis. For the qualitative data, Key Informant Interviews, specifically semi-structured interviews, were conducted with six (6) deaf students and five (5) university personnel regarding the disaster preparedness program of the university. The interview participants were selected to share their expertise, knowledge, and experiences according to the research objectives. Moreover, the interviews with the deaf students were accompanied by two (2) sign language interpreters for efficient communication. The interview data were recorded through audio recording and note-taking and transcribed for thematic analysis.

Sampling techniques were employed to ensure representative data collection. For the quantitative phase of data collection, a universal sampling was employed. This type of sampling involved the entire population sample to extract numerical data from the targeted population that fit the scope of the study. In this case, the targeted population was the whole community of deaf students currently enrolled for the S.Y. 2023-2024 in the university, consisting of nineteen (19) deaf students. For the qualitative data collection phase, purposive sampling was utilized to select the participants for the Key Informant Interviews. This sampling allowed the researchers to interview and obtain information from the participants accordingly. In this case, the interview participants were deaf students and university personnel.

The study used two data-gathering instruments. In the gathering of the quantitative data, the researchers utilized a researcher-made survey questionnaire. The survey questionnaire consisted of 40 close-ended questions incorporated with the Likert scale to measure numerical data that indicated the level of agreement or disagreement on the stated questions. The questionnaire was answerable with ranges of ‘strongly agree, agree, partially agree, disagree, and strongly disagree’ about levels of inclusivity of the features and practices on understanding and awareness, communication, engagement and participation, accessibility of information, facilities and infrastructures, inclusivity, partnerships, and satisfaction of the university’s disaster preparedness program. For the quantitative data, the researchers employed descriptive statistics. The data gathered in the survey were summarized to get the mean and standard deviation of the numerical data to describe the levels of the dataset. For the qualitative data, the researchers employed thematic analysis. The data gathered in the interviews were transcribed, coded, and thematized by the researchers. This allowed the identification of patterns and themes in the qualitative data.

The researchers also adopted the ethical considerations of Arfin (2018) who the role of credibility in the study. In the interview with the deaf students, the researchers ensured that the sign language interpreters acquired were highly valued and competent with sign language and spoken language interpretation. The sign language interpreters selected for this study were faculty of esteemed institutions in Davao City, with more than 10 years of sign language experience. Also, any affiliations, funding sources, and potential conflicts of interest would be declared. Lastly, all communications in this research were honest and transparent.

RESULTS AND DISCUSSION

This mixed methods study employed a concurrent triangulation approach, involved the simultaneous collection and analysis of quantitative and qualitative data, and aimed to understand the research problem comprehensively. The quantitative data, derived from surveys, offered insights into the overall trends and patterns related to the inclusivity of the university's disaster preparedness program. Conversely, the qualitative data obtained through interviews delved into the nuanced experiences and perspectives of deaf students regarding their inclusion in the program. They investigated the disability-inclusive disaster preparedness program at a state university. Quantitative data provided insights into relationships between indicators, while qualitative narratives explored the experiences and perceptions of deaf students and university personnel.

Integration of Findings

Understanding and Awareness of the Disaster Preparedness Program

Table 1. Levels of Understanding and Awareness of the Disaster Preparedness Program

Question	Mean	SD	Description
1. I am aware of the university's disaster preparedness program.	3.37	0.597	Moderate
2. I understand the university's disaster preparedness program.	2.58	0.838	Low
3. I can easily access the university's disaster preparedness program.	2.58	0.838	Low
4. I am updated about the university's disaster preparedness program.	2.47	0.697	Low
5. I am included in the university's disaster preparedness program.	2.42	0.769	Low
Overall	**2.68**	**0.423**	**Moderate**

Table 1 shows that the deaf students had a moderate level of understanding and awareness of the Disaster Preparedness Program of the University (Mean = 2.68, SD = 0.423), suggesting that the students were moderately aware of the program's objectives. However, despite the overall moderate level of this indicator, it was shown that deaf students had a low level of understanding, access, updates, and inclusion in the disaster preparedness program.

Moreover, the results of Table 1 suggest that while there was an overall moderate level of awareness, the specific areas of comprehension, accessibility, updates, and inclusion of the university's disaster preparedness program show low scores. The low scores indicated a communication gap, difficulties accessing information, a lack of timely updates, and a sense of exclusion among deaf students. Thus, it is imperative to take immediate action to rectify the exclusion of deaf students, ensuring equal access to disaster preparedness programs and resources. Addressing the low scores of these indicators might enhance awareness and preparedness within the university community, especially for deaf students. Seeger and Sellnow (2019) argue that more precise communication helps reach a broader community and broader understanding during disasters, and to ensure a precise and reliable university should collaborate and coordinate with credible sources.

Table 1 further reveals the results of specific areas such as understanding the program's details (Mean = 2.58), accessing information (Mean = 2.58), receiving timely updates (Mean = 2.47), and feeling included (Mean = 2.42) showed low scores. This misalignment between general awareness and specific understanding was a critical concern. While deaf students were broadly aware of the program's existence, their low scores in comprehension, access, updates, and inclusion indicated a significant gap in their understanding and engagement. This was further emphasized in the qualitative data, where students expressed confusion and uncertainty about emergency procedures, stating,

> *"There is no communication about it. I just learned the drill by just looking and observing and just going along with them." -D2, L 636-638*

This disconnect between awareness and understanding underscored the need for more transparent, accessible communication tailored to the deaf community. The university might prioritize providing information in formats that are easily understandable and accessible to deaf students, such as visual aids, sign language interpretation, and captioned videos. The university administration acknowledging the need for improvement aligns with this finding, particularly in developing PWD-friendly IEC materials. However, the lack of concrete actions and timelines for these improvements raised concerns about the university's commitment to addressing this issue promptly. The university might immediately bridge this gap by developing and implementing targeted communication strategies that ensure deaf students have a comprehensive understanding of the disaster preparedness program and their role in it.

Communication of the Disaster Preparedness Program

Table 2. Levels of Communication of the Disaster Preparedness Program

Question	Mean	SD	Description
1. The university makes me aware of disaster preparedness.	3.37	0.597	Moderate
2. The university provides clear information during emergencies.	2.89	0.737	Low
3. The university delivers the information through various ways to cater everyone.	3.21	0.787	Moderate
4. The university has appointed people of different roles to act upon during emergencies and disasters.	3.26	0.933	Moderate
5. The university presents timely updates about the disaster reduction and management program.	3.32	0.885	Moderate
Overall	**3.21**	**0.434**	**Moderate**

Table 2 shows that the deaf students had a moderate level of information about the Disaster Preparedness Program through generally having an average communication (Mean = 3.21, SD = 0.434), indicating that the university's efforts to educate its students about disaster preparedness were moderate. There were moderate overall levels of communication in ensuring the deaf students were provided with information in varied forms, effectiveness of role appointments in emergencies, and timeliness of updates. The efforts made by the university were functional and attributed to the university's educational initiatives in the disaster preparedness program.

The results from Table 3 emphasize the critical role of communication in disaster preparedness for deaf students at the university. Although the overall information provision level was moderate, the lower clarity score of clear information during emergencies revealed a significant gap. This discrepancy underscored the necessity for improved clarity and effectiveness in emergency communications tailored to the needs of deaf students. According to Holroyd et al. (2020), it was essential to highlight that aside from providing information during emergencies, it was also needed to deliver it clearly and timely.

Though the quantitative data revealed a moderate level of communication effectiveness, the low score for the clarity of information during emergencies (Mean = 2.89) raised concerns about the timeliness and relevance of the information provided. This was corroborated by the qualitative data, where students reported relying on peers or interpreters for information and feeling left in the dark when these resources were unavailable. One student stated,

> *"Sometimes, regular students would leave first, and we would be left behind without knowing what happened."-D1, L 622-625*

This highlighted the need for the university to establish dedicated communication channels for deaf students, ensuring they receive timely and transparent information during emergencies. This could involve visual alerts, text messages, or designated staff members communicating directly with deaf students. The administration's recognition of the need for better communication, as evidenced by their plans to enhance visual communication and create a dedicated team for vulnerable individuals, was a positive step. However, the lack of specifics and the reliance on volunteer-based initiatives raise questions about the effectiveness and sustainability of these plans.

To ensure the safety and well-being of deaf students, the university should prioritize developing and implementing robust communication strategies that cater specifically to their needs. This included investing in visual alert systems, providing clear and concise instructions in multiple formats, and ensuring deaf students had access to real-time information during emergencies.

Engagement and Participation on the Disaster Preparedness Program

Table 3. Levels of Engagement and Participation to the Disaster Preparedness Program

Question	Mean	SD	Description
1. I participate actively during disaster preparedness training and drills.	3.53	0.841	High
2. I am encouraged by the university to take part during disaster preparedness activities.	3.53	0.772	High
3. I understand that disaster preparedness drills and training by the university are helpful.	4.00	0.882	High
4. I feel confident to apply the things I learned from training and drills during disasters.	3.68	1.003	High
5. I am accommodated by the university to address my needs in the process of learning about the disaster preparedness program.	3.53	1.264	High
Overall	**3.65**	**0.699**	**High**

Table 3 shows that the deaf students had a high level of engagement and participation in the Disaster Preparedness Program (Mean = 3.65, Sd = 0.699), indicating that a significant percentage of the university community was dedicated to and actively involved in the program's activities and projects. According to Mitchell and Batavia (2018), encouragement among individuals with disabilities reflects a supportive environment crucial in fostering a culture of preparedness and participation. A supportive environment fostered preparedness among all individuals.

The quantitative data indicated high engagement and participation in the program. In contrast, the qualitative data revealed that communication barriers and a lack of inclusive practices often hindered this engagement. Students reported struggling to fully comprehend training and drills due to the absence of sign language interpretation and visual aids. This suggested that while deaf students were willing to participate, the university needs to create a more inclusive environment that facilitates their active engagement. This could involve providing sign language interpreters during training sessions, developing visual materials that complement verbal instructions, and offering hands-on demonstrations to ensure deaf students fully understand emergency procedures. The administration's acknowledgment of the need for more training and awareness aligned with this finding, but the lack of concrete plans and resources for implementing these measures was a concern. The university should allocate sufficient resources to ensure deaf students have equal opportunities to participate in and benefit from disaster preparedness training and drills. This included providing necessary accommodations, such as sign language interpreters and accessible materials, and creating a welcoming and inclusive environment where deaf students feel comfortable asking questions and seeking clarification.

Accessibility of Information of the Disaster Preparedness Program

Table 4. Levels of Accessibility of Information on Disaster Preparedness Program

Question	Mean	SD	Description
1. The university provides information that is easy to understand.	2.47	0.697	Low
2. The university provides sign language interpreters for delivery of information.	4.05	0.848	High
3. The university provides graphical presentations such as pictures or charts of the information about the disaster preparedness program.	3.11	0.809	Moderate
4. The university puts information of protocols and evacuation plans on accessible places and mediums such as college lobby,	2.63	0.761	Moderate

corridors, and university website.			
5. The university conducts symposiums and seminars about the disaster preparedness program.	3.53	0.964	High
Overall	**3.16**	**0.310**	**Moderate**

Table 4 shows that the deaf students had a moderate level of access regarding the availability of information on the Disaster Preparedness Program (Mean = 3.16, Sd = 0.310), indicating that most students found it moderately accessible to obtain program information when needed. According to Leeson (2020), the availability of sign language interpreters in delivering information to deaf individuals allowed efficient access to information during disaster preparedness and response efforts. Fauziyah and Jannah (2022) also highlighted sign language interpreters' critical role in ensuring deaf people had access to disaster information. It was also found that deaf students had high access to symposiums and seminars, with a mean score of 3.53. Cripps and Cooper (2016) highlighted that effective communication strategies were crucial for disaster preparedness efforts. Symposiums and seminars facilitated by sign language interpreters could be considered communication strategies that allowed deaf students to participate actively.

The quantitative data showed a moderate level of information accessibility, with a high score for the provision of sign language interpreters (Mean = 4.05) but low scores for the ease of understanding the information provided (Mean = 2.47). This suggested that while the university was making efforts to provide accessible information, the content itself might not be tailored to the needs of deaf students. The qualitative data supports this, with students expressing difficulties understanding written materials and wanting more visual and simplified information. One student stated,

> *"Even if we see the evacuation plans, we can't understand them because they need a picture plus text plus captions" -D2, L 643-648*

The university should prioritize developing information materials that are clear, concise, and visually engaging, incorporating sign language translations and simplified language to ensure deaf students can easily access and understand the information. The administration's plan to develop PWD-friendly IEC materials was a step in the right direction, but the lack of urgency and specific actions was a concern. The university should take immediate action to revise its information materials, ensuring they are accessible and understandable to all students, regardless of their hearing ability. This included providing translations in sign language, using clear and concise language, and incorporating visual aids to enhance comprehension.

Inclusivity of the Disaster Preparedness Program

Table 5. Levels of Inclusivity of the Disaster Preparedness Program

Question	Mean	SD	Description
1. The university includes everyone, especially students with disabilities in the disaster preparedness program.	2.53	0.513	Low
2. The university is considerate of everyone's different needs and abilities.	3.26	0.733	Moderate
3. The university values the opinions and concerns of everyone in the implementation of the disaster preparedness program.	2.68	0.885	Moderate
4. The university provides different ways and platforms in accessing the disaster preparedness program.	2.68	0.769	Moderate
5. The university emphasizes provision of alternatives to address the needs of the students with disabilities during emergencies and disasters.	2.32	0.671	Low
Overall	**2.67**	**0.841**	**Moderate**

Table 5 shows that most deaf students disagreed that the institution prioritized inclusivity (Mean = 2.67, Sd = 0.841), with moderate attention to meeting the requirements of students with disabilities through the program for disaster preparedness. As Villeneuve (2022) highlighted in her work on disability-inclusive emergency planning, a person-centered approach was essential to ensure the safety of everyone during emergencies. It calls on understanding and addressing each individual's specific needs and abilities. It is supported by Carless and Boud (2018) that students should understand how their feedback was used to improve the program.

Though the quantitative data indicated moderate inclusivity, the qualitative data revealed a more complex picture. While some students acknowledge the university's efforts, others emphasize the need for more targeted measures and a deeper understanding of their unique needs. This was reflected in statements like,

> *"Their approach is for general or for all. So, nobody is responsible for specific disabilities."* - *D4, L 514-515*

This suggested that the university needs to move beyond a one-size-fits-all approach and develop more individualized strategies that cater to the diverse needs of deaf students. This could involve creating personalized emergency plans, providing assistive technology, and offering specialized training sessions that address the specific challenges deaf individuals face during emergencies. The administration's acknowledgment of the need for inclusivity was positive, but their lack of specific plans and actions to address the unique needs of deaf students was a significant concern. The university should prioritize creating a genuinely inclusive environment where deaf students feel valued, heard, and supported. This involved actively seeking their input, involving them in decision-making processes, and tailoring disaster preparedness measures to their specific needs and preferences.

Partnerships with Students with Disabilities on the Disaster Preparedness Program

Table 6. Levels of Partnerships with Students with Disabilities in the Disaster Preparedness Program

Question	Mean	SD	Description
1. The university reached out to students with disabilities on their needs and concerns about the disaster preparedness program.	2.58	0.607	Low
2. The university worked with students with disabilities about their needs and concerns about the disaster preparedness program.	2.42	0.692	Low
3. The university initiated to allow students with disabilities to provide recommendations on the disaster preparedness program.	2.89	0.315	Moderate
4. The university implements solutions and strategies to address the needs and concerns of students with disabilities about the disaster preparedness program.	3.11	0.658	Moderate
5. The university acquired feedback from students with disabilities about the disaster preparedness program.	2.84	0.918	Moderate
Overall	**2.76**	**0.430**	**Moderate**

Table 6 shows moderate partnerships with deaf students regarding the university's disaster preparedness program (Mean = 2.76, Sd = 0.430). This suggested that the average number of deaf students think the program moderately encouraged inclusivity and collaboration in disaster preparedness efforts by involving students with disabilities in its design and execution. This aligned with the work of Moriña et al. (2020), who argued that universities benefited from the perspectives of students with disabilities, framing disability as an enrichment rather than a limitation. Including these students in shaping the program could lead to a more comprehensive and practical approach. Furthermore, Martinez-Acosta and Favero (2018) highlighted the importance of a strategic plan for diversity and inclusion at the institutional level, particularly in collaborations with students with disabilities.

Though the quantitative data showed a moderate level of partnership with deaf students, the low scores for reaching out to them (Mean = 2.58) and working with them on their needs and concerns (Mean = 2.42) indicate a lack of proactive engagement. This was reinforced by the qualitative data, where students expressed a desire for more involvement in decision-making processes and a need for the university to seek their input actively. One student stated,

> *"Inclusion, particularly in terms of advocacy, is actually problematic, as here at university, I find myself having to protect myself." -D3, L 997-1006*

The university should prioritize establishing meaningful partnerships with deaf students, creating platforms for them to voice their concerns and suggestions, and actively involving them in developing and implementing disaster preparedness measures. The administration's plan to create a dedicated team for vulnerable individuals and raise student awareness was a positive step. Still, these initiatives' lack of concrete actions and timelines raised concerns about their effectiveness. To foster genuine partnerships, the university should go beyond mere awareness-raising and actively seek the input and collaboration of deaf students. This could involve establishing a student advisory board, conducting regular focus groups, and incorporating their feedback into designing and implementing disaster preparedness measures.

Facilities and Infrastructure of the Disaster Preparedness Program

Table 7. Levels of Facilities and Infrastructures of the University

Question	Mean	SD	Description
1. The university conducts regular maintenance and monitoring of the buildings and infrastructures.	3.53	0.841	High
2. The university provides visible emergency signs.	2.53	0.772	Low
3. The university has available ramps.	3.32	1.157	Moderate
4. The university provides alternatives for emergency sirens such as light indicators.	1.79	0.855	Very Low
5. The university makes it easy to access emergency exits and evacuation areas for people with disabilities.	3.11	0.809	Moderate
Overall	**2.85**	**0.516**	**Moderate**

Table 7 shows that the deaf students moderately assessed the university's infrastructure and facilities for disaster reduction and management (Mean = 2.85, Sd = 0.516). This indicated that the average number of deaf students agreed that the university had operational resources to support disaster planning and response. The study of Sakurai et al. (2017) emphasized the importance of a comprehensive approach to school disaster preparedness. Effective communication was a critical element and visual tools like posters and signs played a vital role in ensuring that everyone in the school community understood safety procedures. Deaf individuals were known to be visual learners, which can be related to the findings of Dootson et al. (2021), who urged the importance of clear visual communication during disasters, highlighting that posters and signage could be crucial for conveying essential information quickly and effectively.

The quantitative data revealed a moderate assessment of the university's facilities and infrastructure. Still, the very low score for alternatives for emergency sirens (Mean = 1.79) and the low score for visible emergency signs (Mean = 2.53) highlighted significant accessibility issues for deaf students. This was a critical concern, as deaf individuals relied heavily on visual cues during emergencies. The qualitative data further emphasized this, with students expressing the need for visual alerts, such as flashing lights and clear signage, to compensate for their inability to hear auditory alarms. One student stated,

"In my opinion, the current system is not efficient or effective for deaf individuals like me because there are no alarms, signals, symbols, or any early warning devices specifically designed for us, such as a red light in the classroom." -D6, L784 -786

The university should address these accessibility issues by installing visual alert systems, ensuring clear and visible signage throughout the campus, and conducting regular accessibility audits to identify and rectify barriers. The administration's acknowledgment of the need for improvement in emergency signs and hazard warnings was positive. Still, a significant concern was the lack of urgency and specific plans for implementing visual alert systems. The university should prioritize the safety of all students, including those with disabilities, by investing in necessary infrastructure upgrades and ensuring that emergency protocols and procedures are accessible and inclusive for all. The administration's recognition of the need for improvement was a positive sign, but the situation's urgency demands immediate and decisive action. The university should move beyond acknowledging the issues and take concrete steps to implement the necessary changes. This includes allocating sufficient funds for infrastructure upgrades, providing comprehensive training for staff and faculty, and actively involving deaf students in decision-making.

Satisfaction on the Disaster Preparedness Program

Table 8. Levels of Satisfaction on the Disaster Preparedness Program

Question	Mean	SD	Description
1. The university has addressed my needs and included me in the disaster preparedness program.	3.16	0.765	Moderate
2. The university made me feel satisfied about my expectations in addressing my needs in the disaster preparedness program.	3.16	0.602	Moderate
3. The university made me more equipped in dealing with emergencies and disasters.	3.26	0.452	Moderate
4. The university helped me feel safe and included in the campus during emergencies and disasters.	2.63	0.597	Moderate
5. The university showed their commitment in making improvements and progress in achieving an inclusive school environment.	3.37	0.496	Moderate
Overall	**3.11**	**0.429**	**Moderate**

Table 8 shows that the respondents were moderately satisfied with the Disaster Preparedness Program (Mean = 3.11, Sd = 0.429). This indicated that most students, on average, engaged in the program or impacted by it feel it was valuable and functional for meeting their requirements and resolving their worries about disaster preparedness and management. This implies a recognition of the university's ongoing efforts to enhance and promote an inclusive environment, especially concerning disaster management and readiness. While these scores indicated a satisfactory level of support and preparedness, universities must continually enhance their provisions and support mechanisms. Pertiwi et al. (2022) challenged the traditional view of people with disabilities as passive aid recipients during emergencies. Individuals with disabilities could be "key actors" in community-based disaster risk reduction. Universities could leverage this perspective by actively involving students and staff with disabilities in shaping and implementing their emergency preparedness programs.

The quantitative data of a moderate level of satisfaction with the Disaster Preparedness Program suggest that, on average, deaf students find the program to be moderately helpful and functional in meeting their needs and addressing their concerns regarding disaster preparedness and management. However, the qualitative data revealed a more nuanced picture. While some students expressed satisfaction with the university's efforts, others highlighted areas for improvement, particularly in communication and inclusivity. For instance, one student commented,

"I probably have a sense of safety, but maybe the university thinks about me, that I might need help here because they accepted me here. However, there's no specific program. There's really a problem with information dissemination that is making me feel unsafe." -D4, L 1030-1039

This indicated that while some students felt moderately safe and included, others felt the university could do more to address their needs. The indicator with a lower mean score of 2.63 for feeling safe and included on campus during emergencies highlighted another key area for improvement. This suggested that despite the moderate overall satisfaction, there was a significant portion of deaf students who do not feel entirely safe and included during emergencies, indicating a need for the university to prioritize safety measures, accessibility, and inclusivity to enhance the overall resilience of the university community during emergencies.

The quantitative data suggested a moderate level of satisfaction, and the qualitative data revealed a more complex picture with varying experiences and concerns among deaf students. The university needed to address the concerns raised by students who do not feel entirely safe and included during emergencies and continue its efforts to improve communication, inclusivity, and accessibility to ensure all deaf students feel safe, prepared, and empowered to respond effectively in any crisis.

Recommendations to Improve the Disaster Preparedness Program of the University

The integrated findings from this mixed methods study provided an understanding of creating a disability-inclusive disaster preparedness program.

Invest in Accessible Public Warning Systems and Publication Materials

The recommendation of the study was to invest in accessible public warning systems and publication materials, as they directly addressed the critical gaps in communication and information accessibility identified through both quantitative and qualitative data. The low scores in understanding program details, accessing information, and receiving timely updates, coupled with students expressed confusion and reliance on peers for information, underscore the dire need for clear and accessible communication channels specifically designed for the deaf community. The current communication strategies are inadequate, leaving deaf students feeling uninformed and vulnerable. To rectify this, the university should prioritize investing in visual aids, sign language interpretation, light indicator systems, simplified posters and signages, and other assistive technologies to ensure that emergency information and procedures are effectively communicated to deaf students. This would enhance their understanding and awareness and empower them to respond appropriately during emergencies.

Collaboration, Empowerment, and Advocacy of Deaf Students

The study's recommendation for mechanisms for empowerment and advocacy resonated strongly with the qualitative findings, which revealed a desire among deaf students for more proactive engagement and involvement in the decision-making process. The quantitative data also supported this, indicating a moderate level of partnership with deaf students but low scores for reaching out to them and addressing their concerns. To create a truly inclusive environment, the university should actively promote an inclusive culture and strengthen collaborative efforts with deaf students and relevant stakeholders. This includes involving deaf students in the planning and implementing of the disaster preparedness program, conducting workshops and training sessions tailored to their needs, and utilizing deaf-led instruction and hands-on simulations. By empowering deaf students and giving them a voice in the process, the university could foster a sense of ownership and belonging, leading to increased satisfaction and a more effective program.

Continuous Evaluation and Improvement of the Disaster Preparedness Program

The study's recommendation for continuous evaluation and improvement of the program was crucial for ensuring its long-term effectiveness and relevance to the evolving needs of the deaf community. The qualitative data highlighted the importance of regularly assessing the program's effectiveness through surveys, focus groups, and feedback sessions with deaf students. By actively seeking and incorporating feedback from

the deaf community, the university could continuously refine its strategies and ensure that the program remains responsive to their needs. This iterative evaluation and improvement process is essential for creating a sustainable and effective disaster preparedness program that truly serves the entire student population.

The findings of this study, coupled with the recommendations outlined in the framework, provided a clear roadmap for the university to address the urgent need for improvement in its disaster preparedness program. By investing in accessible communication, empowering deaf students, and committing to continuous evaluation and improvement, the university could create a truly inclusive environment where all students, regardless of their hearing ability, feel safe, prepared, and empowered to respond effectively in any crisis.

CONCLUSION

The study found that the university's disaster preparedness for deaf students shows moderate overall awareness but poor program comprehension and information access. Deaf students report confusion during emergencies, relying on peers due to inadequate sign language support. Despite some inclusivity efforts, students need better visual aids and dedicated interpreters. University staff acknowledge needs but lack training on adequate accommodation. The administration plans improvements to communication materials. Therefore, the university's communication with deaf students regarding disaster preparedness was severely lacking. The information provided was often unclear, inaccessible, or delayed, leaving deaf students uninformed and ill-equipped to respond to emergencies. This communication breakdown was evident in the quantitative data, which showed low scores for understanding and accessing information, and in the qualitative data, where students expressed confusion and frustration. Despite some efforts, the university's approach to inclusivity remained superficial and inadequate. The current approach failed to address the specific communication, information accessibility, and support needs of deaf students, treating them as an afterthought rather than an integral part of the campus community. This was evident in the qualitative data, where students desired more targeted measures and a deeper understanding of their unique needs. Deaf students were often left to fend for themselves during emergencies, relying on self-advocacy to stay informed and safe. The university's lack of proactive engagement and reliance on volunteer-based initiatives left deaf students without the support and resources to navigate crises effectively. This was a grave concern, as it burdened deaf students and jeopardized their safety. The university's disaster preparedness efforts were severely hampered by a lack of resources, including dedicated personnel and specialized equipment. This resource deficiency hindered the implementation of comprehensive and inclusive measures for deaf students about the university's commitment to their safety and well-being. Hence, this study recommends that universities urgently develop targeted communication strategies for deaf students during emergencies using visual aids, sign language interpretation, and assistive technologies. The approach should shift from accommodation to empowerment by establishing partnerships with deaf students and involving them in planning and leadership. Regular assessment through surveys and feedback sessions should inform program refinement. Resources must be allocated for specialized equipment, staff training, and dedicated personnel. Individualized emergency plans should replace one-size-fits-all approaches with active collaboration between deaf students and experts to ensure best practices in inclusivity.

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