



Enhancing Educational Resilience: A Disaster Preparedness Assessment Tool for Educators Aligned with the Pakistan School Safety Framework and Sustainable Development Goals

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Abstract

In this particular exploration study, the primary goal was to make a tool for successfully evaluating the degree of calamity readiness among teachers. To achieve this, the researcher depended on the Pakistan School Safety Framework (PSSF) and Sustainable Development Goals (SDGs) as the establishment for their evaluation instrument. The review included managing a 27-variables to a sum of 320 teachers, including 158 male and 162 female instructors. The research instrument was verified by three subject matter experts before the collection of data for factor analysis. The KMO test was carried out for the appropriate of data for factor analysis. The KMO value was 0.7, which indicated sample appropriateness for data analysis. Through the use of factor analysis, the researchers were able to identify seven key factors that are crucial in evaluating the disaster preparedness of school teachers. These factors encompassed a wide range of aspects, including virtual education and disaster management, knowledge of local risk, safe and secure school building infrastructure, school disaster management spectrum, virtual education and teacher's readiness, disaster management training and learning, general information, and quick response. The resulting tool, known as the "Comprehensive Disaster Preparedness Assessment (CDPA)," was found to be both valid and reliable for assessing disaster preparedness among school teachers. The researchers implemented rigorous factor analysis methods to validate the effectiveness of the tool. This comprehensive approach ensures that the CDPA effectively measures the disaster preparedness of school teachers.

Keywords

Pakistan School Safety Framework, Sustainable Development Goal, Secondary School Teachers, Disaster Preparedness, Disaster Management.

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Introduction

Disasters are described as significant interruptions or unsettling influences to the activity of a local area or society, emerging from the collaboration of a risk with openness, weakness, and limit, prompting significant misfortunes and destroying influences (Keller et al., 2016). Normal risks, including land, hydrological, or meteorological occasions, can possibly inflict damage or misfortune. These perils change into catastrophic events when they influence networks, causing harm, misfortune, interruption, and fatalities that impede standard working. Misfortunes caused because of fiascos are named immediate, backhanded, or immaterial (Peijun Shi, 2019). The investigation of Bavel et al., (2020) underscores the critical worldwide test presented by catastrophes. Over late years, cataclysmic events have brought about significant death toll and extensive harm to foundation in various nations.

The effect of catastrophes can be sorted into immediate, circuitous, and elusive misfortunes. Direct misfortunes incorporate the actual impacts like wounds, fatalities, and harm to foundation and property. Roundabout misfortunes include the disturbance of neighbourhood organizations and utility administrations. Elusive misfortunes allude to the mental effect experienced during a catastrophe. Regular dangers like dry spells, floods, and quakes bring about various setbacks and significant monetary misfortunes every year. The expansion in worldwide cataclysmic events is connected to the uplifted weakness of families and networks, especially in creating locales. Weakness, a vital idea in misfortune influences, implies limitations in getting to assets and recuperating from catastrophes. This weakness can show actually, mentally, socially, strategically, and monetarily, representing the wide-arriving at impacts of fiascos on networks and social orders.

Between 2000 and 2020, an average of 240 million people were affected by global catastrophes that resulted in around 80,000 fatalities and an estimated \$80 billion in damages. Numerous factors, such as population growth, wealth accumulation, harsh weather patterns, and gardening techniques, are held accountable for these unfortunate events. Naturally occurring disasters are more likely to occur in poorer nations like Pakistan. Pakistan is placed 18th in the world in terms of long-term climate risk according to the Global Climate Risk Index (2021) because of severe past and present extreme weather occurrences (Khan et al., 2022). Pakistan is especially susceptible to earthquakes, tropical cyclones, and intense monsoon rains because of its location on the Indian tectonic plate and closeness to the Arabian Sea (Khan et al., 2020). According to the Fiscal Disaster Risk Assessment, floods alone each year may cause damages of up to US\$1.8 billion, or 0.5 percent of the GDP (Butt et al., 2020).

The implementation of the National Disaster Risk Reduction Policy by the Pakistani government in 2013 marked a significant breakthrough in tackling the issues resulting from natural disasters. Prioritizing community-based disaster risk management (CBDRM) and vulnerability assessment with an emphasis on preparedness, prevention, and mitigation. The strategy sought to increase the nation's ability to withstand natural catastrophes by giving priority to these factors. In order to successfully respond to and recover from catastrophes, it also emphasized the significance of collaboration between local communities, non-governmental organizations, and government institutions (Rehman et al., 2019). To guarantee the protection of schools and communities during disasters, a Pakistan School protection Framework (PSSF) must be created in accordance with the National Disaster Risk Reduction Policy (Jafree, 2023). In accordance with the National Disaster Management Plan, the PSSF will incorporate mitigation, readiness, response, and recovery methods for safety. This framework supports disaster preparedness in sustainable cities and communities, which is in line with the objectives of sustainable development. It also corresponds with the Comprehensive School Safety Framework (CSS), which offers a comprehensive plan for protecting teachers and children against a variety of calamities.

The PSSF primary goal is to enhance multi-risk early warning frameworks while reducing fatality rates, setbacks, financial losses, and property damage. Additionally, it highlights key areas of strength for a catastrophe risk reduction that is kid-focused (Shah et al., 2018). Globally, several countries are harmonising regulations regarding school safety in light of effective frameworks like the Exhaustive School Wellbeing System and the Hyogo System for Activity, which aim to protect children's lives and save framework expenses (Khan et al., 2020).

The CSSF aims to protect students and teachers, ensure uninterrupted access to education, safeguard investments in the education sector, and enhance disaster risk reduction and resilience, structured around three pillars: safe learning facilities, school disaster management, and risk reduction and resilience education, which align with the Sendai Framework and Sustainable Development Goals (Rahman et al., 2018).

It is crucial to establish a Pakistan School Safety Framework (PSSF) that aligns with the National Disaster Management Plan and National Disaster Risk Reduction Policy. This framework will cover prevention, mitigation, preparedness, response, and recovery in the face of any kind of disaster (Jafree, 2023). The PSSF will be consistent with the CSS framework, providing a comprehensive approach for teachers and students to protect against natural and man-made disasters. It also contributes to sustainable development goals by promoting disaster preparedness in sustainable cities and communities. The primary goal of the framework is to reduce mortality rates, casualties, economic losses, and property damages while improving multi-hazard early warning systems. Furthermore, the focus is on child-centered disaster risk reduction (Ahmed et al., 2022). Many countries are adopting school safety guidelines based on global declarations and frameworks such as the Hyogo Framework for Action and the Comprehensive School Safety Framework to save children's lives and minimize infrastructure costs (Khan et al., 2020). The CSSF aims to safeguard students and teachers, ensure uninterrupted access to education, protect investments in the education sector, and enhance disaster risk reduction and resilience. It is organized around three pillars: safe learning facilities, school disaster management, and risk reduction and resilience education, in line with the Sendai Framework and Sustainable Development Goals (Sheehy et al., 2022).

Objective of the Study

The prime goal of this research study is to develop a comprehensive disaster readiness assessment tool for educators based on a Pakistan School Safety Framework (PSSF) and Sustainable Development Goal (SDGs).

Research Question

How can a disaster readiness assessment tool be developed for educators based on a PSSF framework and SDGs?

Research Methodology

The research methodology for achieving the prime objective was qualitative following factor analysis. The KMO test was carried out for appropriateness of data suitability for factor analysis.

Results and Discussion

Factor -1 Virtual Education and Disaster Management

In order to continue learning for long-term disasters, this component raises an inclusive understanding of virtual education and disaster management systems. Schools with high scores in this area demonstrated their readiness for online learning in the event of a long-term calamity.

- An online learning management system is available at my school for any extended natural or man-made disaster (.699).
- I am aware of how to contact disaster management authorities in an emergency (.678).

- In an emergency, I am able to provide first aid at my school (.649).
- Students can access educational resources on risk reduction and catastrophe preparedness (.610).
- The school regularly hosts an awareness-raising program for DRR (Disaster Risk Reduction) student activities (0.491).

Approximately 31% of the variation and 12.8% of the rotational variance are explained by this. This is the most substantial element that probably constitutes a crucial facet of the online learning system, and be ready for any disaster. This most substantial element probably constitutes a crucial facet of the online learning system and being ready for disasters. The goal of this component's further investigation and comprehension should be to improve the efficacy of online learning platforms as well as catastrophe preparedness strategies. This element could provide insightful information that significantly enhances the results in certain areas.

Factor -2 Knowledge of local risk

This component provides detailed information on local risk assessment related to potential hazards and their impact. Educators need to have a comprehensive understanding of natural and man-made threats in order to effectively implement disaster management strategies and be ready to take action in the event of a disaster.

- Regular updates are made to the online learning management system for long-term natural or man-made calamities (.762).
- In the vicinity of my school, flash floods might happen at any time (.701).
- Students receive training for long-term natural or man-made catastrophe online learning (.628).
- I'm ready for a man-made emergency, such as a car crash, fire, or terrorist strike (.501).
- The region of my school is surrounded by industrial facilities (.592).

18.6% of the variation and 12.7% of the rotational variance are explained by it. This part concentrated on raising awareness of local risks that might result in both man-made and natural catastrophes, which is crucial for comprehensive disaster management. It also emphasizes how important community planning and response plans are to lessening the effects of these kinds of incidents. At the local level, a thorough understanding of risk variables may significantly improve the efficacy of disaster management programs.

Factor -3 Safe and Secure School Building Infrastructure

The following components assess the physical safety of the school from both natural and man-made threats. The data suggests that the school is located in a secure area with minimal vulnerability to these types of disasters. Furthermore, the data indicates that no nearby industrial buildings are at risk during a crisis.

- The school's site is secure and protected from both environmental and physical risks, regardless of gender (.801).
- Environmental dangers such as intense rain, intense heat, and extreme cold are mitigated in my academic domain (.715).
- The region of my school is bordered by multistory structures (-.607).
- The location of my school is safe from extreme weather events and calamities caused by climate change (.567).

Around 6.6% of the variation and 11.2% of the rotational variance are explained. This part was centered. Although not as crucial as the previous two, the infrastructure of schools has to be safe and secure against both man-made and natural disasters. In general, this element emphasizes how important it is to guarantee that staff and students are in a safe and resilient workplace. It emphasizes how crucial mitigation techniques and readiness are to protecting school communities from any dangers.

Factor -4 School Disaster Management Spectrum

The factors represent the school's disaster management plan and contingency plan. The information shows that all roles have been assigned, the disaster management system has been thoroughly updated, and the data indicates that the disaster management system has been comprehensively updated and all responsibilities have been established. SOPs have been established with more rigor to handle any disaster.

- Emergency Response Teams have been created and trained and are currently active in my school (-.797).
- Specific responsibilities have been allocated for disaster management within my school (.623).
- The school consistently conducts disaster preparedness drills and training sessions in cooperation with Rescue 1122, NDMA (National Disaster Management Authority), NGOs, and CSOs (Civil Society Organizations) (.568).
- The SOPs and contingency plans are regularly reviewed and updated in my school (.537).

11.1% of the rotational variance and 5.7% of the variance are captured. It deals with the school disaster management spectrum. The school contingency plan includes strategies for responding to various emergencies, such as natural disasters, accidents, and threats. It aims to ensure the safety and well-being of students, staff, and faculty in times of crisis.

Factor-5 Disaster Management Training and Learning

These factors show that the NDMA (National Disaster Management Authority) and Rescue 1122 are two external organizations with whom the team has collaborated and received disaster management training. The findings show that extracurricular activities and training are frequently combined. Disaster management organizations are also in charge of overseeing these training sessions.

- Extracurricular activities and events are organized for students to facilitate hands-on learning about disaster preparedness and risk reduction (.839).
- The school performs periodic disaster risk reduction (DRR) assessments (.639).
- I have received training from NDMA, Rescue 1122, and various NGOs (.504).

This data emphasizes thorough training and teamwork, accounting for 10.7% of the variation and 10.7% of the rotational variance. 3.9% of the variance and 8.5% of the rotational variance are explained by it. The evaluation of catastrophe risk and self-preparation are the main topics of this component. This part emphasizes the value of taking preventative action to reduce the likelihood of disasters by conducting in-depth assessments and preparing each individual. Through the prioritization of thorough training and cooperation, it seeks to mitigate possible weaknesses and improve overall readiness for unanticipated circumstances

Factor- 6 Virtual Education and Teacher Readiness

Online learning and instructors' preparedness for major community components in the event of a disaster resilience as well as personal security. The data demonstrates that educators are skilled and ready for any catastrophe.

- I am qualified to instruct online in the event of a natural or man-made calamity (.794).
- In the event of a natural or man-made calamity, I'm ready to instruct online (.639).
- There is defense against material dangers such as acts of terrorism, auto accidents, and violence, and the crime rate around my school (.590).

This factor explained 3.9% of the variance and 8.5% of the rotational variance. This factor highlights the importance of teachers' readiness for the online teaching and learning process during any long-term natural and man-made disaster.

Factor -7 General information and quick response

General awareness and quick response are the critical components for handling any emergency due to environmental hazards or man-made disasters. As stated by the information, educators are aware of first aid and the emergency phone number.

- I am aware of the numbers for emergencies (.794).
- I am equipped to put out fires at my school (-.501).

3.7% of the variance and 7.6% of the rotational variance are explained by it. This part is concentrated on general awareness and quick response. In statistics and data analysis, the phrase "total variance explained" is commonly used, notably with relation to methods like factor analysis or principal component analysis (PCA). It indicates the proportion of a dataset's total variability that may be explained by a certain assortment of elements or factors. For instance, the total variance in the original data is split into separate variances associated with each main component in PCA. The overall variance explained is the sum of these discrete variances. It is often expressed as a percentage of the total variance.

Conclusions and Suggestions

The research has outlined seven critical factors to assess the level of disaster preparedness among school teachers, using the CSS framework and SDGSs targets. It emphasizes that schools with a high readiness for online learning are better equipped to handle prolonged disasters as they prioritize current systems and continuous teacher training. Conversely, schools with low factor loadings could benefit from increased investments in online learning infrastructure and training programs to elevate their preparedness for potential disasters. This study's findings could serve as a foundation for further exploration of disaster preparedness among college and university educators. By evaluating the readiness of higher education instructors, institutions can identify areas for enhancement and formulate strategies to bolster disaster preparedness. Furthermore, this research has the potential to inform the development of comprehensive guidelines and policies for educational institutions to effectively tackle future challenges.

Recommendation for Future Researchers

It is recommended for future researchers to further develop the tool created in this study for evaluating disaster preparedness based on the Pakistan School Safety Framework and the Sustainable Development Goals target. Although the current questionnaire comprises 27 items, it can be expanded to provide a more comprehensive assessment of high school teachers and professors. Additional items should cover a broader range of natural and man-made disasters, focusing on the safety and security of both students and educators. Furthermore, this tool has the potential to be customized for evaluating the disaster preparedness of religious scholars, teachers, and students in Madaris (Islamic seminaries) in Pakistan and globally.

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