

Disaster Preparedness Amongst Schools Teachers: A Holistic Approach Towards Development of a Research Tool

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Abstract

The Comprehensive School Safety Framework (CSSF) is a complete strategy for creating safe learning environments for administrators, teachers, students, and school staff. The CSSF framework has three pillars: safe learning facilities, school disaster management, and risk reduction and resilience education. This study was conducted to develop a research tool to assess disaster preparedness among school teachers using the Comprehensive School Safety Framework (CSSF). A questionnaire was developed by the researcher, which had 27 items. There were 320 school teachers selected from 64 schools. Based on factor analysis, there were seven factors found for the disaster preparedness of school teachers: online learning and emergency preparedness, local risk awareness, physical safety and infrastructure, organization disaster management, online teaching readiness, active learning and disaster training, general awareness, and immediate response. The tool developed by the research was named disaster preparedness and risk reduction (DPRR). This tool is validated and reliable based on factor analysis for the assessment of disaster preparedness among school teachers

Keywords: Comprehensive school safety framework (CSSF); School teachers; Disaster preparedness; online learning

Abstrak

Kerangka Kerja Keamanan Sekolah Komprehensif (CSSF) adalah strategi lengkap untuk menciptakan lingkungan belajar yang aman bagi administrator, guru, siswa, dan staf sekolah. Kerangka kerja CSS memiliki tiga pilar: fasilitas pembelajaran yang aman, manajemen bencana di sekolah, dan pendidikan pengurangan risiko dan ketahanan. Penelitian ini dilakukan untuk mengembangkan alat penelitian untuk menilai kesiapsiagaan bencana di kalangan guru sekolah dengan menggunakan Kerangka Kerja Keselamatan Sekolah Komprehensif (CSSF). Sebuah kuesioner dikembangkan oleh peneliti, yang memiliki 27 item. Ada 320 guru sekolah yang dipilih dari 64 sekolah. Berdasarkan analisis faktor, terdapat tujuh faktor yang ditemukan untuk kesiapsiagaan bencana guru sekolah: pembelajaran online dan kesiapsiagaan darurat, kesadaran risiko lokal, keselamatan fisik dan infrastruktur, manajemen bencana organisasi, kesiapan mengajar online, pembelajaran aktif dan pelatihan bencana, umum kesadaran, dan respons segera. Alat yang dikembangkan dalam penelitian ini diberi nama kesiapsiagaan bencana dan pengurangan risiko (DPRR). Alat ini telah divalidasi dan dapat diandalkan berdasarkan analisis faktor untuk penilaian kesiapsiagaan bencana di kalangan guru sekolah.

Kata kunci: Kerangka keselamatan sekolah yang komprehensif (CSSF)Guru sekolah; Kesiapsiagaan bencana; pembelajaran online

INTRODUCTION

According to Mulugeta (2016), disasters are a major worldwide concern and problem. In recent years, numerous nations have experienced natural disasters, resulting in the loss of numerous lives and the destruction of human-made structures (Jha, 2010). Disasters are defined as major disruptions or disturbances of a community's or society's functioning at any level or scale caused by the presence of a hazard that interacts with exposure, vulnerability, and capacity, resulting in significant losses and devastating impacts (P. Scarlett et al., 2022). A natural hazard can be classified as a geologic, hydrologic, or meteorological phenomenon that has the potential to inflict harm or loss. A natural hazard becomes a natural disaster if its occurrence makes an impact on communities, causing damage, loss, disruption, and fatalities that disable the affected person from functioning in a normal state. Losses caused by disasters are classified into three categories: direct, indirect, and intangible (Caldera & Wirasinghe, 2021). Direct losses are the physical effects that include the death and injury of people and damages or destruction to infrastructure and other properties. Indirect losses include disruption and adverse effects on local businesses and utility services. Intangible losses, on the other hand, are psychological effects suffered during the occurrence of the disaster. Natural hazards such as drought, floods, and earthquakes cause thousands of casualties and billions of dollars in losses annually (Chhibber & Laajaj, 2013). The global increase in natural disasters is largely due to the increasing vulnerability of families and communities, particularly in developing nations (Wu & Guo, 2021). Vulnerability, a crucial concept in disaster impacts, indicates limitations in resource access and recovery potential. It can be physical, psychological, social, political, and economic, illustrating the impact of disasters on communities and societies (Bolin & Kurtz, 2017) Global disaster losses are increasing, with an average of 240 million people affected annually between 2000 and 2020, resulting in 80,000 deaths and an estimated \$80 billion in damage costs. Factors include resource depletion, population growth, extreme weather, and agricultural activities (Sakai & Yao, 2023).

Developing countries, like Pakistan, are more vulnerable to disaster risks. According to the Global Climate Risk Index (2021), Pakistan ranks 18 globally in long-term climate risk, with past and ongoing extreme weather events (Khan et al., 2022). Pakistan's geographical location on the Indian tectonic plate and proximity to the Arabian Sea makes it highly susceptible to earthquakes, tropical cyclones, and heavy monsoon rains (Khan et al., 2020). The Fiscal Disaster Risk Assessment estimates that flooding alone can cause up to US\$1.8 billion in annual damages, equivalent to 0.5 percent of the GDP (Butt et al., 2020). Pakistan's government implemented the National Disaster Risk Reduction Policy in 2013, focusing on prevention, mitigation, and preparation components of disaster risk reduction. The policy emphasizes vulnerability assessment and community-based disaster risk management (CBRDM) to reduce catastrophe losses. By prioritizing prevention, mitigation, and preparation, the National Disaster Risk Reduction Policy aims to enhance the country's resilience to natural disasters. Additionally, the policy encourages collaboration between government agencies, non-governmental organizations, and local communities to effectively respond to and recover from disasters (Khan & Jan 2014). Nevertheless, it is crucial to also create a Pakistan School Safety Framework (PSSF) that is in line with the National Disaster Management Plan and National

Disaster Risk Reduction Policy for prevention, mitigation, readiness, response, and recovery in the case of any form of catastrophe (Jafree, 2023) The PSSF aligns with the CSS framework, a comprehensive strategy for teachers and students to protect against natural and man-made disasters. It aligns with sustainable development goals, promoting disaster preparedness in sustainable cities and communities. The framework aims to reduce mortality rates, casualties, economic losses, and property damages and improve multi-hazard early warning systems. Child-centered disaster risk reduction is a top priority (Ahmed, 2013). Countries are implementing school safety guidelines following global declarations and frameworks, such as the Hyogo Framework for Action and the Comprehensive School Safety Framework, to save children's lives and reduce infrastructure costs (Khan et al., 2020). CSSF aims to protect students and teachers from harm, ensure consistent access to education, protect education sector investments, and enhance disaster risk reduction and resilience. It consists of three pillars: safe learning facilities, school disaster management, and risk reduction and resilience education, aligning with the Sendai Framework and Sustainable Development Goals (Pal et al., 2021).

GENERAL DESCRIPTION OF THE COMMUNITY, PROBLEMS AND TARGET SOLUTIONS

General description

it is crucial to also create a Pakistan School Safety Framework (PSSF) that is in line with the National Disaster Management Plan and National Disaster Risk Reduction Policy for prevention, mitigation, readiness, response, and recovery in the case of any form of catastrophe (Jafree, 2023) The PSSF aligns with the CSS framework, a comprehensive strategy for teachers and students to protect against natural and man-made disasters. It aligns with sustainable development goals, promoting disaster preparedness in sustainable cities and communities. The framework aims to reduce mortality rates, casualties, economic losses, and property damages and improve multi-hazard early warning systems. Child-centered disaster risk reduction is a top priority (Ahmed, 2013). Countries are implementing school safety guidelines following global declarations and frameworks, such as the Hyogo Framework for Action and the Comprehensive School Safety Framework, to save children's lives and reduce infrastructure costs (Khan et al., 2020).

CSSF aims to protect students and teachers from harm, ensure consistent access to education, protect education sector investments, and enhance disaster risk reduction and resilience. It consists of three pillars: safe learning facilities, school disaster management, and risk reduction and resilience education, aligning with the Sendai Framework and Sustainable Development Goals (Pal et al., 2021).

Problem

Developed research tools for disaster preparedness for school teachers using a comprehensive school safety framework.

Target solution

Increase knowledge and skills for school teachers to Develop research tools for disaster preparedness

METHOD

This framework uses a comprehensive school safety framework through socialization KMO test is a tool designed to assess the data's suitability for factor analysis and Bartlett's Test of Sphericity tests the null hypothesis,

RESULTS AND DISCUSSION

1. Online Learning & Emergency Preparedness

This section contains a lot of information about online learning management systems and their preparedness for long-term catastrophes. Schools with high scores on this component look to be well-prepared for distance learning. As an example,

- 1) My school has an online learning management system during any long-term natural or man-made disaster (.699).
- 2) I know how to get assistance in an emergency from disaster management authorities(.678)
- 3) I can give First Aid during an emergency in my school(.649)
- 4) Learning materials on disaster preparedness and risk reduction are available for students (.610)
- 5) The school has a regular program of DRR (Disaster Risk Reduction) awareness-raising activities for students (0.491)

Explains approximately 31. % of the variance and 12.8% of the rotated variance. This is the most significant component and likely represents a critical aspect of the online learning System and Disaster Preparedness

2. Awareness of Local Risks

These components mainly address school locations, catastrophe risk assessments, and emergency preparedness. The numbers, ranging from 5.5 to 7, represent schools' catastrophe risk assessments and preparedness for handling emergencies.

- 1) The online learning management system is regularly updated for long-term natural or man-made disasters (.762)
- 2) Flash floods may occur without warning in my school area (.701)
- 3) Students are trained for online learning in long-term natural or man-made disasters (.628)
- 4) I'm prepared for a man-made disaster like a terrorist attack, fire, or road accident.
- 5) There are industrial facilities adjacent to my school area (.592)

It accounts for 18.6% of the variance and 12.7% of the rotated variance. Given its focus on risk assessment and emergency preparedness, this is also a vital component but less significant than the first.

3. Physical Safety & Infrastructure

These components show how physically safe the school is from both man-made and natural disasters. The data indicates that the school is situated in a safe area that is vulnerable to both natural and man-made disasters. Additionally, the data reveals that there are no industrial buildings that are damaged during a crisis.

- 1) The gender-wise school location is safe and secure from physical and environmental threats (.801)
- 2) There is protection from environmental threats like heavy rain, extreme heat, and cold in my school area (.715)
- 3) There are multi-story buildings adjacent to my school area (-.607)
- 4) My school location is safe against climate-related extreme events and disasters (.567)

explains about 6.6% of the variance and 11.2% of the rotated variance. This component focused on risk assessment for natural and man-made disasters, is also important but less so than the first two.

4. Organizational Disaster Management

These components outline the school's contingency plan and disaster management strategy; the data shows that the disaster management system has been completely updated, and all

responsibilities have been established. More severe SOPs are designed to deal with any calamity.

- 1) Emergency Response Teams are formed, trained, and active in my school (-.797)
- 2) Responsibilities have been assigned regarding disaster management in my school(.623)
- 3) The school regularly conducts disaster preparedness drills and training in collaboration with Rescue 1122, NDMA (National Disaster Management Authority), NGOs, and CSOs (Civil Society Organizations)(-.568)
- 4) The SOPs and contingency plan are revised and updated regularly in my school(.537)
- 5) I'm prepared for natural disasters like earthquakes, heavy rain, storms (.512)

Captures 5.7% of the variance and 11.1% of the rotated variance. It deals with School management Contingency and Disaster Management systems

5. Active Learning and Disaster Training

These variables reflect disaster management training and collaboration with external disaster management organizations such as NDMA, Rescue 1122, and others. The findings reveal that training is routinely combined with extracurricular activities. These training sessions are also overseen by disaster management organizations.

- 1) Extra-curricular activities and events are conducted for students to provide active learning about disaster preparedness and risk reduction (.839)
- 2) The school periodically conducts a DRR (Disaster Risk Reduction) assessment.
- 3) I'm trained by NDMA (National Disaster Management Authority), Rescue 1122, and NGOs (.504)

Explains 10.7% of the variance and 10.7% of the rotated variance, focusing on comprehensive training and collaboration. It accounts for 3.9% of the variance and 8.5% of the rotated variance. This component focuses on disaster risk assessment and self-preparedness

6. Online Teaching Readiness

Disaster risk assessment and self-preparation are essential components of community resilience and individual safety. The data shows that teachers are trained and prepared for any disaster.

- 1) I'm trained to teach online during any natural or man-made disaster (.794)
- 2) I'm prepared to teach online during any natural or man-made disaster (.639)
- 3) There is protection from physical threats like terrorist attacks, traffic accidents, violence, and crime in my school area (590)

It accounts for 3.9% of the variance and 8.5% of the rotated variance. This component focuses on disaster risk assessment and self-preparedness.

7. General Awareness and Immediate Response

Awareness and self-preparation are critical components of disaster management. According to the data, teachers are aware of the emergency phone number and first aid.

- 1) I am aware of emergency telephone numbers (.794)
- 2) I'm prepared for firefighting in my school (-.501)

It accounts for 3.7% of the variance and 7.6% of the rotated variance. This component focuses on Awareness and Self-Preparedness.

The term "total variance explained" is frequently used in statistics and data analysis, particularly in the context of techniques such as principal component analysis (PCA) or factor analysis. It denotes the percentage of overall variability in a dataset that is accounted for by a certain collection of variables or components. The overall variance in the original data, for example, is divided into separate variances associated with each main component in PCA. The sum of these

individual variances is the total variance explained. It is frequently stated as a proportion of the overall variation.

CONCLUSIONS AND SUGGESTIONS

The study reveals that there are seven factors to analyze disaster preparedness amongst school teachers (SST) based on the CSS framework. Schools with high online learning readiness are well-prepared for long-term disasters, maintaining updated systems and prioritizing continuous training for teachers. However, schools with low factor loadings may need to invest more in online learning infrastructure and training program

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