ORIGINAL RESEARCH

Investigating the Prevalence of Post-Traumatic Stress Disorder (PTSD) in Survivors of Natural Disasters

Dr. Mundada Sagar Dilip

Assistant Professor, Department of Psychiatry, S V S Medical College, Mahabubnagar, Telangana, India

Corresponding Author
Dr. Mundada Sagar Dilip
Assistant Professor, Department of Psychiatry, S V S Medical College, Mahabubnagar, Telangana, India

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ABSTRACT

Aim: This study aims to investigate the prevalence of Post-Traumatic Stress Disorder (PTSD) among survivors of natural disasters, focusing on the occurrence and severity of symptoms using standardized diagnostic tools. **Materials and Methods:** A cross-sectional design was utilized to assess PTSD prevalence in a sample of 100 participants who survived recent natural disasters, including earthquakes, floods, hurricanes, and wildfires. Data were collected using the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) and the PTSD Checklist for DSM-5 (PCL-5). Participants were recruited through community outreach, healthcare facilities, and disaster relief centers, with ethical approval obtained from the Institutional Review Board. Data analysis involved descriptive statistics, chi-square tests, and logistic regression using SPSS version 26.0. **Results:** The study found that 40% of participants exhibited no PTSD symptoms, while 60% showed varying degrees of severity. Mild PTSD symptoms were reported by 25% of the participants, moderate symptoms by 20%, and severe to extreme symptoms by 15%. The logistic regression analysis indicated that age (30-44 years) and multiple disaster experiences were significant predictors of PTSD, with p-values of 0.03 and 0.001, respectively. **Conclusion:** The findings suggest that age and the severity of exposure significantly influence the development of PTSD in natural disaster survivors. Targeted mental health interventions should be prioritized for high-risk groups to mitigate the long-term psychological impact of these events.

Keywords: PTSD, Natural Disasters, CAPS-5, PCL-5, Mental Health

INTRODUCTION

Post-Traumatic Stress Disorder (PTSD) is a mental health condition that arises as a response to experiencing or witnessing traumatic events. It manifests through a wide range of emotional, psychological, and physical symptoms, significantly affecting the individual's ability to function in everyday life. The study of PTSD has gained substantial attention due to its prevalence among survivors of traumatic events, including natural disasters. Natural disasters, such as earthquakes, floods, hurricanes, wildfires, and tsunamis, are among the most destructive phenomena affecting communities worldwide. These events not only cause physical devastation but also lead to significant psychological consequences, particularly in individuals who directly experience their aftermath. This introduction will explore the importance of investigating the prevalence of PTSD in survivors of natural disasters, the unique factors contributing to the onset of PTSD in these circumstances, and the implications of these findings for public health and clinical intervention strategies.[1]Natural disasters are unpredictable and often occur with little or no warning, which can increase their psychological impact on affected individuals. These events result in immediate threats to life, widespread destruction of property, loss of loved ones, and disruptions in social and economic systems. The chaos and trauma resulting from such disasters can overwhelm individuals, triggering a range of emotional and psychological responses. Survivors may experience anxiety, fear, grief, and helplessness as they attempt to cope with the devastation and loss. When these emotional responses persist for an extended period and interfere with daily functioning, they may develop into PTSD.[2]Natural disasters affect communities differently depending on their scale, duration, and severity. While some individuals demonstrate remarkable resilience and are able to recover quickly from the traumatic experience, others may struggle to regain a sense of normalcy, developing long-term

psychological issues. The unpredictability of these events leaves survivors vulnerable to heightened stress, fear, and uncertainty, which are critical factors in the development of PTSD. Understanding how these factors contribute to the disorder is essential for implementing effective mental health interventions and support systems for affected populations.[3]PTSD is characterized by a set of core symptoms, including intrusive memories of the traumatic event, avoidance of reminders associated with the trauma, negative alterations in mood and cognition, and heightened arousal or reactivity. In the context of natural disasters, these symptoms can become debilitating, affecting a survivor's quality of life and ability to engage in regular activities. The trauma associated with natural disasters is unique compared to other traumatic events, as it often involves widespread disruption, collective suffering, and repeated exposure to distressing stimuli, such as aftershocks, ongoing weather threats, or media coverage of the event.The severity of PTSD symptoms can vary widely among survivors, influenced by factors such as the nature of the disaster, individual resilience, support systems, prior mental health history, and coping strategies. Some individuals may experience acute stress reactions that resolve within a few weeks, while others may develop chronic PTSD that persists for years. The timing and intensity of PTSD symptoms can also fluctuate, sometimes triggered by reminders of the disaster or related stressful experiences. This complexity in symptom manifestation makes it crucial to investigate PTSD specifically in the context of natural disasters to identify the most vulnerable populations and the mechanisms that influence their psychological outcomes.[4]Multiple risk factors can increase the likelihood of developing PTSD among survivors of natural disasters. These factors can be broadly categorized into pre-disaster, peri-disaster, and post-disaster elements. Pre-disaster factors include the individual's mental health status, personality traits, past trauma experiences, and socio-economic background. Individuals with a history of mental health issues or previous traumatic exposures may have a heightened vulnerability to developing PTSD when faced with new traumatic experiences.Peri-disaster factors relate to the specific characteristics of the disaster itself, such as its magnitude, duration, proximity to the event, perceived threat to life, and the level of physical or emotional distress experienced during the disaster. Survivors who faced direct threats to their lives or witnessed the loss of loved ones tend to have a higher risk of PTSD. The chaotic and life-threatening nature of these events often leaves little time for rational thought or emotional processing, which can amplify feelings of fear, helplessness, and horror.[5]Post-disaster factors involve the survivor's environment and the support received after the event. Social support plays a crucial role in mitigating PTSD symptoms and promoting psychological recovery. Lack of community and familial support, prolonged displacement, ongoing stressors such as financial hardship or loss of employment, and limited access to healthcare services can significantly hinder the recovery process. These factors can exacerbate the psychological impact of the trauma and increase the likelihood of PTSD becoming a chronic condition.Investigating the prevalence of PTSD in natural disaster survivors is essential for several reasons. First, understanding the scope and scale of PTSD in these populations can help in the allocation of resources for mental health support and in designing targeted intervention programs. Knowing which demographics are most affected and what factors contribute to their vulnerability allows for the development of more personalized and effective treatment approaches. Such information can also aid policymakers in crafting disaster preparedness and recovery plans that prioritize mental health as a key component of disaster response.Second, studying PTSD prevalence provides insight into the broader impact of natural disasters on community well-being. The psychological aftermath of these events often extends beyond individual suffering to affect families, communities, and entire regions. High levels of PTSD within a community can impede recovery efforts, strain healthcare systems, and contribute to long-term economic and social challenges. Understanding the prevalence of PTSD can guide the implementation of community-based mental health initiatives and resilience-building strategies that not only address immediate psychological needs but also foster long-term recovery and adaptation.[6]The identification and treatment of PTSD in natural disaster survivors pose significant challenges for healthcare providers. The unpredictable nature of natural disasters means that mental health resources must be adaptable and responsive to the needs of affected populations. Traditional therapeutic approaches, such as cognitive-behavioral therapy (CBT) and exposure therapy, have proven effective in treating PTSD, but there is a growing need to explore alternative and complementary treatments that can be scaled up quickly in disaster settings.

MATERIALS AND METHODS

This study utilized a cross-sectional design to investigate the prevalence of Post-Traumatic Stress Disorder (PTSD) among survivors of natural disasters. The aim was to gather data on the occurrence and severity of PTSD symptoms within this population using structured diagnostic tools and validated questionnaires.The study population comprised individuals who survived recent natural disasters, including earthquakes, floods, hurricanes, and wildfires. Participants were recruited from affected areas through community outreach programs, local healthcare facilities, relief centers, and support groups. Ethical approval was obtained from the Institutional Review Board (IRB) before the study began. All procedures were conducted in accordance

with the ethical principles outlined in the Declaration of Helsinki. Participants were assured of the confidentiality of their responses and their right to withdraw from the study at any time without any repercussions. Anonymity was maintained by assigning unique identification codes to each participant.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Adults aged 18 years and older.
- Individuals who survived a natural disaster that occurred within the last 12 months.
- Ability to provide informed consent and willingness to complete the questionnaire.

Exclusion Criteria

- Severe cognitive impairments that could hinder their ability to understand and respond to the study questions.
- Presence of any diagnosed psychotic disorders that could interfere with participation.
- Any other medical conditions that would prevent the individual from taking part in the study.

Methodology

A sample size of 100 participants was determined to be sufficient to achieve statistical significance with a confidence level of 95% and a margin of error of ±5%. A purposive sampling technique was used to ensure that individuals with varying degrees of exposure to natural disasters were included.Data were collected using the following standardized tools:

Demographic Questionnaire: Participants were asked to provide information on age, gender, marital status, educational background, occupation, type of natural disaster experienced, and the extent of their exposure.

Clinician-Administered PTSD Scale for DSM-5 (CAPS-5): This tool was used to assess the presence and severity of PTSD symptoms according to the criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). The CAPS-5 includes a structured interview format that evaluates the frequency and intensity of symptoms.

PTSD Checklist for DSM-5 (PCL-5): A self-report questionnaire that assesses PTSD symptoms on a scale of 0 to 4, where 0 indicates "Not at all" and 4 indicates "Extremely." The PCL-5 was used to identify the severity of the PTSD symptoms experienced by the participants.

Participants were approached at disaster relief sites, hospitals, and support centers. They were informed about the study's objectives, procedures, risks, and benefits. Written informed consent was obtained before the commencement of data collection to ensure voluntary participation. Data were collected through face-to-face interviews using the CAPS-5 and self-administered questionnaires (PCL-5) for those who preferred a written format. For participants who could not complete the questionnaires in person, telephone interviews were conducted to ensure inclusivity.

Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) software, version 26.0. Descriptive statistics were used to summarize the demographic data and prevalence rates of PTSD symptoms. The severity of PTSD symptoms was assessed using frequency distributions and mean scores derived from the PCL-5. Inferential statistics, including chi-square tests and logistic regression analysis, were conducted to explore associations between demographic factors and PTSD prevalence. A p-value of <0.05 was considered statistically significant for all tests.

RESULTS

Table 1: Demographic Characteristics of Study Participants

The demographic characteristics of the study participants provide a detailed overview of the sample population's gender, age distribution, and marital status. The gender distribution is nearly even, with 52% male and 48% female participants, indicating a balanced representation of both genders. Regarding age groups, the largest segment of participants falls into the 30-44 years category, comprising 40% of the sample. This is followed by the 18-29 years group at 30%, the 45-60 years group at 20%, and the 60+ age group at 10%. In terms of marital status, 60% of the participants are married, 30% are single, and 10% are either divorced or widowed. These demographics suggest a diverse group in terms of age and life stages, which may influence their experiences and reactions to stressors like natural disasters.

Table 2: Types of Natural Disasters Experienced by Participants

Table 2 outlines the types of natural disasters that participants in the study have experienced. Floods were the most commonly reported disaster, experienced by 30% of participants, followed closely by earthquakes at 25%. Hurricanes affected 20% of the participants, while wildfires impacted 15%. Notably, 10% of the participants reported experiencing multiple types of disasters. This distribution highlights that floods and earthquakes are the most frequently encountered natural disasters among the study participants, which might have implications for their psychological responses and resilience.

Table 3: Prevalence of PTSD Symptoms Based on CAPS-5 Assessment

The prevalence of PTSD symptoms among the participants was assessed using the CAPS-5 tool, as detailed in Table 3. The results indicate that 40% of participants showed no signs of PTSD. Among those experiencing symptoms, 25% reported mild PTSD, 20% reported moderate PTSD, and 10% had severe PTSD symptoms. A small percentage, 5%,

experienced extreme PTSD symptoms. These findings suggest that while a significant portion of the sample does not exhibit PTSD, a notable number of individuals still suffer from varying degrees of psychological distress following exposure to natural disasters.

Table 4: PTSD Checklist (PCL-5) Scores Distribution

Table 4 presents the distribution of PTSD Checklist (PCL-5) scores, categorizing the severity of PTSD symptoms. The highest frequency of participants, 35%, falls into the minimal severity category with scores ranging from 0-9. Mild symptoms (scores 10-19) were reported by 30% of participants, while 20% experienced moderate symptoms with scores between 20-29. Severe symptoms, indicated by scores of 30-40, were noted in 10% of the sample, and 5% of participants had extreme symptoms with scores above 40. This distribution mirrors the findings from the CAPS-5 assessment, reinforcing the conclusion that while many participants have minimal or mild symptoms, a subset still suffers from more severe PTSD.

Table 5: Chi-Square Analysis of PTSD Prevalence by Demographic Factors

Table 5 details the results of the chi-square analysis examining the association between demographic factors and PTSD prevalence. Gender was found to be not significantly associated with PTSD prevalence, with a chi-square value of 3.45 and a p-value of 0.06. However, age group showed a significant association, with a chi-square value of 8.21 and a p-value of 0.04. Marital status was also found to be not significant in its association with PTSD, with a chi-square value of 2.98 and a p-value of 0.09. The type of disaster experienced was significantly associated with PTSD prevalence, having a chi-square value of 10.34 and a p-value of 0.02. These results suggest that while factors like age and type of disaster significantly influence PTSD prevalence, gender and marital status do not have a statistically significant impact.

Table 6: Logistic Regression Analysis of Factors Associated with PTSD

Table 6 presents the results of a logistic regression analysis, identifying factors associated with PTSD among participants. Gender (female) had an odds ratio (OR) of 1.35 with a 95% confidence interval (CI) of 0.85 to 2.15 and a p-value of 0.12, indicating no significant association. However, being in the 30-44 age group significantly increased the odds of PTSD, with an OR of 2.45, a CI of 1.45 to 4.13, and a p-value of 0.03. Participants who experienced multiple disasters had a much higher risk of developing PTSD, with an OR of 3.78, a CI of 2.12 to 6.74, and a highly significant p-value of 0.001. The severity of exposure also played a significant role, with an OR of 2.68, a CI of 1.89 to 5.21, and a p-value of 0.008. These results highlight that both the number of disasters experienced and the severity of exposure are strong predictors of PTSD, while age also plays a notable role in the risk of developing the disorder.

Table 1: Demographic Characteristics of Study Participants

Demographic Factor	Frequency (n)	Percentage (%)
Gender		
Male	52	52%
Female	48	48%
Age Group (Years)		
18-29	30	30%
30-44	40	40%
45-60	20	20%
60+	10	10%
Marital Status		
Married	60	60%
Single	30	30%
Divorced/Widowed	10	10%

Table 2: Types of Natural Disasters Experienced by Participants

Type of Disaster	Frequency (n)	Percentage (%)
Earthquake	25	25%
Flood	30	30%
Hurricane	20	20%
Wildfire	15	15%
Multiple Events	10	10%

Table 3: Prevalence of PTSD Symptoms Based on CAPS-5 Assessment

Severity Level	Frequency (n)	Percentage (%)
No PTSD	40	40%
Mild PTSD Symptoms	25	25%

Moderate PTSD Symptoms	20	20%
Severe PTSD Symptoms	10	10%
Extreme PTSD Symptoms	5	5%

Table 4: PTSD Checklist (PCL-5) Scores Distribution

PCL-5 Score Range	Severity Description	Frequency (n)	Percentage (%)
0-9	Minimal	35	35%
10-19	Mild	30	30%
20-29	Moderate	20	20%
30-40	Severe	10	10%
Above 40	Extreme	5	5%

Table 5: Chi-Square Analysis of PTSD Prevalence by Demographic Factors

Demographic Factor	Chi-Square Value	p-value	Significance
Gender	3.45	0.06	Not Significant
Age Group	8.21	0.04	Significant
Marital Status	2.98	0.09	Not Significant
Type of Disaster	10.34	0.02	Significant

Table 6: Logistic Regression Analysis of Factors Associated with PTSD

Predictor Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Gender (Female)	1.35	0.85 - 2.15	0.12
Age (30-44 years)	2.45	1.45 - 4.13	0.03
Experience of Multiple Disasters	3.78	2.12 - 6.74	0.001
Severity of Exposure	2.68	1.89 - 5.21	0.008

DISCUSSION

In this study, the gender distribution (52% male, 48% female) was balanced, and gender did not have a significant impact on PTSD prevalence (p = 0.06). These findings align with earlier studies, such as Carmassi et al. (2018), who reported no substantial gender differences in PTSD prevalence following natural disasters, suggesting that gender alone may not be a significant predictor in all contexts.[7] However, some studies have found contrasting results. For example, Tolin & Foa (2016) demonstrated that women were more likely to develop PTSD than men after traumatic events, indicating that the type of trauma and cultural context may influence gender-based outcomes.[8]Age showed a significant association with PTSD prevalence (p = 0.04), with individuals aged 30-44 years having the highest odds of developing PTSD. This result is consistent with research by Norris et al. (2015), which found that middle-aged adults are often more vulnerable to PTSD following disasters due to increased responsibilities and stressors.[9] This age group faces higher financial and familial pressures, which could exacerbate psychological distress. In contrast, younger and older adults may have different coping mechanisms or social support networks that mitigate PTSD risk.Marital status did not show a significant relationship with PTSD prevalence in this study (p = 0.09). However, past research has yielded mixed results. For instance, Bonanno et al. (2017) found that marital support could reduce the likelihood of PTSD, particularly in cases where strong spousal support was present. This discrepancy could be due to variations in the quality of marital relationships or differences in the study populations.[10]Participants in this study reported experiencing various natural disasters, with floods (30%) and earthquakes (25%) being the most common. The type of disaster significantly influenced PTSD prevalence (p = 0.02). Previous studies have also indicated that the type and severity of disaster exposure impact PTSD outcomes. For instance, Lowe et al. (2016) found that individuals exposed to hurricanes were more likely to experience severe PTSD symptoms compared to those who experienced less intense disasters like wildfires. This could be related to the displacement and destruction caused by floods and hurricanes, leading to more chronic stress and trauma.[11]The CAPS-5 and PCL-5 assessments in this study revealed that while 40% of participants showed no signs of PTSD, 25% had mild symptoms, and 5% experienced extreme PTSD. These findings align with the results of a meta-analysis by Goldmann & Galea (2016), which reported that approximately 10-20% of individuals exposed to natural disasters develop moderate to severe PTSD symptoms. The variability in PTSD severity across studies may be attributed to differences in sample populations, exposure levels, and resilience factors.[12]The CAPS-5 and PCL-5 assessments are widely used to measure PTSD, and their consistency across studies has been demonstrated. For example, Weathers et al. (2018) validated the CAPS-5 tool and found it to be highly reliable in diagnosing PTSD in disaster survivors. The PCL-5 tool has also shown a strong correlation with PTSD diagnoses, supporting its use in this study to gauge symptom severity accurately.[13]Logistic

regression analysis revealed that the experience of multiple disasters was a strong predictor of PTSD, with an odds ratio (OR) of 3.78 and a highly significant p-value of 0.001. This finding is consistent with Neria et al. (2019), who reported that cumulative exposure to multiple traumatic events significantly increases the risk of developing PTSD. The compounded stress from repeated exposure may overwhelm coping mechanisms, leading to more severe psychological outcomes.[14]Additionally, the severity of exposure was another significant predictor (OR = 2.68, p = 0.008). This result echoes findings from Pietrzak et al. (2017), who found that individuals exposed to life-threatening situations during disasters were at higher risk for PTSD. The greater the perceived threat to life, the more intense the emotional and psychological response, which can contribute to the development of PTSD.[15]While gender (female) was not a significant predictor in this study (p = 0.12), some literature has suggested that females may have a slightly higher predisposition to PTSD under certain conditions. Kessler et al. (2015) found that women generally have higher PTSD rates following disasters, but the significance varies based on cultural, social, and contextual factors.[16]The overall PTSD prevalence in this study, where participants displayed some level of PTSD symptoms, is comparable to other disaster-related PTSD studies. For instance, Galea et al. (2015) reported a PTSD prevalence of 50-60% among survivors of major natural disasters such as hurricanes and earthquakes.[17] In contrast, a study by Thienkrua et al. (2016) found a lower prevalence of 30-40% following less severe disasters like floods. The differences in these studies may be due to the varying intensity of the disasters and the populations affected.[18]

CONCLUSION

In conclusion, this study found that PTSD prevalence among survivors of natural disasters is influenced by various demographic factors and the nature of the disaster itself. Gender was not a significant predictor of PTSD, while age, particularly the 30-44 years group, and the experience of multiple disasters were identified as key risk factors. The severity of disaster exposure also played a critical role in increasing PTSD risk. These findings highlight the importance of targeted mental health interventions and support strategies for vulnerable populations following natural disasters. Understanding these factors can guide the development of more effective and personalized treatment approaches to mitigate the long-term psychological impact on survivors.

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