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RESEARCH ARTICLE

Post-traumatic Stress Disorder (PTSD) and Complex PTSD (C-PTSD) According to ICD-11: A Study Conducted in Turkiye Following the Kahramanmaraş Earthquake

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ABSTRACT

Background: Post-traumatic stress disorder (PTSD) and Complex PTSD (C-PTSD) are significant mental health conditions that arise following exposure to traumatic events. While PTSD is often associated with single traumatic experiences, C-PTSD develops due to prolonged and repeated trauma, particularly in early life. Despite the increasing recognition of C-PTSD as a distinct diagnosis in the ICD-11, research on its prevalence remains limited, particularly in populations affected by natural disasters. This study aims to determine the prevalence of PTSD and C-PTSD among individuals affected by the 2023 Kahramanmaraş earthquake in Türkiye and examine potential age-related differences in symptomatology.

Methods: A cross-sectional study was conducted with 231 participants who directly experienced the earthquake. Participants completed the International Trauma Questionnaire (ITQ), which assesses PTSD and C-PTSD symptoms in accordance with ICD-11 criteria. Sociodemographic variables were also collected and analyzed. Statistical comparisons were performed between two age groups (18-31 years and 32-65 years) using chi-square and t-tests.

Results: The findings revealed that 11.3% of participants met the criteria for PTSD, while 7.3% were diagnosed with C-PTSD. No significant differences were observed between age groups in terms of PTSD and C-PTSD prevalence. However, younger participants (18-31 years) exhibited significantly higher scores for avoidance ($p = 0.001$) and disturbed relationships ($p = 0.011$).

Conclusion: This study contributes to the limited research on C-PTSD prevalence following natural disasters, highlighting the need for further investigations into age-related differences in trauma responses. The findings emphasize the importance of age-sensitive interventions and long-term mental health support for disaster-affected populations. Future research should adopt longitudinal designs and include diverse cultural and linguistic groups to enhance generalizability.

Keywords: Complex posttraumatic stress disorder, earthquake, International Trauma Questionnaire, posttraumatic stress disorder

Introduction

Post-traumatic stress disorder (PTSD) is a mental health condition that can develop following exposure to traumatic events, such as a real threat of death, serious injury, or sexual trauma. In addition to a history of trauma, the condition is characterized by intrusive symptoms, avoidance of trauma-related stimuli, negative mood or cognitions related to the trauma, and changes in arousal levels.[1] Regardless of gender, it is widely recognized that the majority of individuals will experience at least one traumatic event during their lifetime.[2] The literature suggests that around 60% of the general population is exposed to an event that could be classified as traumatic, whereas the likelihood of developing PTSD is significantly lower.[2-4] Various factors, including gender, genetic predispositions, childhood experiences, personality traits, pre-existing psychopathologies, and social support, have been identified as contributing to this variation in the rate of PTSD development.[5-7] A large-scale study conducted in 2014 found that the 12-month prevalence of PTSD was an average of 1.1% (ranging from 0.2% to 3.8%). [8] However, it is also known that lifetime prevalence rates vary

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across countries. In the United States, the rate is reported to be 3.4% [9], while in South Africa, it is 2.3% [10], and in Canada, it is 9.2% [11]. The heterogeneous nature of PTSD complicates the estimation of its prevalence. Various traumatic events have been identified as potential causes of PTSD, and the type of trauma experienced plays a significant role in influencing the clinical course of the disorder.[6,12] It has been found that individuals exposed to interpersonal trauma tend to exhibit more severe PTSD symptoms.[13]

It has been stated that exposure to chronic, repeated, or multiple traumas during childhood not only leads to post-traumatic stress symptoms but also results in a complex symptom cluster that includes difficulties with emotional and interpersonal self-regulation capacities, such as anxious arousal, anger management, dissociative symptoms, and avoidance behaviors.[14] The clinical condition described has been recognized as Complex PTSD (C-PTSD), which was formally introduced and included in the classification systems for the first time in ICD-11.[15] Relatively few studies have focused on Complex PTSD (C-PTSD), which was first conceptualized in the 1990s following the inclusion of PTSD in the DSM-III (Diagnostic and Statistical Manual of Mental Disorders – III). Research on this topic has suggested that C-PTSD arises from chronic and prolonged traumatic experiences that begin in early childhood, distinguishing it from PTSD, which is typically associated with a single traumatic event or a series of discrete traumatic events.[16] Studies conducted on clinical samples have found that the prevalence of C-PTSD can reach as high as 61%, while the prevalence of PTSD can be as high as 25%.[17-19] In a study by Møller et al. (2020), the prevalence of C-PTSD was found to be 36%, while the prevalence of PTSD was 8% among psychiatric outpatients.[19]

It is well established that the findings from studies investigating the prevalence of PTSD concerning age are inconsistent. For example, in a population-based sample of the 1998 flood victims in China, Liu et al. reported that elderly individuals were more than twice as likely to develop PTSD symptoms.[20] In contrast, a study conducted by Goenjian et al. following the 1988 earthquake in Armenia revealed no significant differences in the overall severity of PTSD symptoms between older and younger adults.[21] Furthermore, in a longitudinal study by Kongshøj and Berntsen, conducted 1.5 months and 7 months after Hurricane Florence, younger age was associated with increased vulnerability to PTSD and a tendency to perceive trauma severity more intensely over time.[22]

A review of the existing literature indicates that while studies examining the prevalence of PTSD [23-27] in Türkiye are relatively frequent, there remains a significant gap in research regarding the prevalence of Complex PTSD. This gap is particularly notable in the context of post-traumatic populations affected by major natural disasters. The aim of this study is to address this gap by determining the prevalence of PTSD and C-PTSD among individuals affected by the February 6th earthquake in Kahramanmaraş. Additionally, the study seeks to explore these clinical manifestations while taking age as a variable into consideration, thereby providing a more nuanced understanding of how different age groups may experience and exhibit these conditions in the aftermath of such a traumatic event.

Methods

Participants

The sample for the present cross-sectional study comprised participants (n = 231) who experienced the 2023 Kahramanmaraş

earthquake. The study was conducted between January-June 2024. The established inclusion criteria were as follows: individuals must be over 18 years of age, have directly experienced the earthquake, and voluntarily consent to participate in the study. Potential participants were invited to take part in the research through social media and email channels via an online survey. In total, 253 volunteers who reported a history of exposure to the earthquake completed the self-report forms for the study. However, twenty-two participants failed to provide complete responses to the survey. Ethical approval was obtained from the local ethics committee (IRB: Date: 21.12.2023, Number: 159). All stages of the study were conducted in accordance with the principles of the Helsinki Declaration. No incentives were provided to the participants.

Procedures

After the invited participants completed the online forms, the study sample was determined based on the inclusion criteria. Participants were asked to complete the International Trauma Questionnaire (ITQ). Based on this scale, the numbers of PTSD (Post-Traumatic Stress Disorder) and C-PTSD (Complex Post-Traumatic Stress Disorder) cases were identified. Additionally, the sample was dichotomized by age, and sociodemographic and clinical variables were compared between the two groups.

Measures

Sociodemographic Data Collection

A sociodemographic information form was developed by the researchers to collect essential background information about the participants. This form included items related to age, gender, marital status, educational level, employment status, and income level. The form was designed to ensure a comprehensive understanding of the participants' sociodemographic characteristics. The data collected through this form were used to describe the sample and to examine subgroup differences in the context of the research objectives.

International Trauma Questionnaire (ITQ): It is an 18-item self-report instrument aligned with the diagnostic criteria outlined in the International Classification of Diseases, 11th Revision (ICD-11). Designed for both clinical and research purposes, the ITQ employs clear and concise language to ensure its applicability across diverse international contexts. It includes straightforward diagnostic rules and begins with a brief description of the traumatic event experienced by the individual, along with details about the timing of the event. The first nine items of the ITQ assess symptoms associated with Post-Traumatic Stress Disorder (PTSD), specifically focusing on re-experiencing traumatic events in the present and avoidance behaviors reflecting a sense of current threat. These items evaluate the severity of symptoms experienced within the past month and their impact on the individual's functional capacity. The remaining nine items target symptoms related to Disturbances in Self-Organization (DSO), which include affective dysregulation, negative self-concept, and disturbances in relationships. These items measure individuals' emotional states, self-perceptions, interpersonal relationships, and overall functioning. Responses to all items are scored on a Likert scale ranging from 0 (not at all true) to 4 (extremely true). A score of ≥2 on any item indicates the presence of a symptom or its impact on functional impairment. Based on this scoring system, a diagnosis of PTSD is assigned if the individual meets the criteria for PTSD symptoms alone. Complex PTSD is diagnosed when both PTSD and DSO criteria are met. If

Table 1. Sociodemographic characteristics of the study groups

Variable	Total (n=231)		18-31 years (n=115)		32-65 years (n=116)		Statistics	p
	M	SD	M	SD	M	SD		
Age; year	33.86	11.20	25.09	4.29	42.55	8.92	U=0.000	**<0.001****
	N	%	N	%	N	%		
Gender							χ^2=1.059	0.303
Female	156	67.5	74	47.4	82	52.6		
Male	75	32.5	41	54.7	34	45.3		
Marital Status							χ^2=0.89.864	**<0.001****
Single	109	47.2	90	82.6	19	17.4		
Married	108	46.7	24	22.2	84	77.8		
Other	14	6.1	1	7.1	13	92.9		
Educational Level							χ^2=5.508	0.138
Primary School	10	4.3	2	20	8	80		
High School	34	14.7	17	50	17	50		
University	142	61.5	69	48.6	73	51.4		
Master's Degree or Higher	45	19.5	27	60	18	40		
Economic Status							χ^2=1.959	0.376
Low	72	31.2	39	54.2	33	45.8		
Middle	115	49.8	58	50.4	57	49.6		
High	44	19.0	18	40.9	26	59.1		
Employment Status							χ^2=14.392	**<0.001****
Working	135	58.4	53	39.4	82	60.7		
Not-working	96	41.6	62	64.6	34	35.4		
Physical injury in an earthquake, Yes	101	43.7	53	52.5	48	47.5	χ^2=14.392	0.471
The acquaintance died in the earthquake, Yes	165	71.4	88	53.3	77	46.7	χ^2=2.911	0.088

M: mean, N: number, SD: Standard Deviation, %: frequency, U: Mann Whitney U test, χ2: Chi-square test; *: $p<0.05$, **: $p<0.01$

only DSO criteria are satisfied, no formal diagnosis is made.[17] The Turkish validity and reliability study of the scale was conducted by Gündoğmuş et al.[28]

Data Analysis

The statistical analysis for the study was conducted using SPSS 20.0 and Jamovi 2.6.23 statistical software. The data were analyzed in two groups based on the median age of the study population: 18-31 years and 32-65 years. Categorical variables were presented as frequencies and percentages, whereas continuous variables were expressed as mean ± standard deviation. To compare categorical variables, the Chi-square test was employed, while the Student's T-test was used for the comparison of continuous variables. The primary objective was to examine differences between the study groups by analyzing measurements and sociodemographic characteristics. In the statistical analysis, a p-value of ≤0.05 was considered indicative of statistical significance.

Table 2. Clinical characteristics of the study groups

Variable	Total (n=231)		18-31 years (n=115)		32-65 years (n=116)		Statistics	p
	N	%	N	%	N	%		
PTSD diagnosis							$\chi^2 = 1.62$	0.200
Yes	26	11.3	16	13.9	10	8.6		
No	205	89.7	99	86.1	106	91.4		
C-PTSD diagnosis							$\chi^2 = 0.07$	0.790
Yes	17	7.3	8	7.0	9	7.8		
No	214	92.7	107	93.0	107	92.2		
	M	**SD**	**M**	**SD**	**M**	**SD**		
International Trauma Questionnaire								
Reexperiencing	1.61	1.69	1.67	1.57	1.56	1.80	t=0.490	0.624
Avoidance	2.16	1.99	2.58	2.03	1.75	1.86	t=3.239	**0.001****
Sense of threat	2.46	2.24	2.58	2.31	2.34	2.17	t=0.803	0.423
PTSD Symptoms	6.24	5.15	6.83	5.02	5.65	5.24	t=1.745	0.082
Affective dysregulation	3.15	1.75	3.33	1.77	2.97	1.72	t=1.546	0.123
Negative self-concept	2.50	2.17	2.67	2.18	3.32	2.16	t=1.224	0.222
Disturbed Relationships	2.50	2.17	2.87	2.21	2.14	2.08	t=2.554	**0.011***
DSO Symptoms	8.16	5.12	8.87	4.89	7.44	5.25	t=2.138	**0.034***

DSO: disturbances in self-organization, M: mean, N: number, PTSD: posttraumatic stress disorder, SD: standard deviation, %: frequency, χ2: Chi-square test, t: Independent samples t-test, U: Mann Whit**n**ey U test, *: p<0.05, **: p<0.01

Results

The mean age of participants (n = 231) was 33.86 years (SD = 11.20), with 67.5% identifying as female. In the comparison of sociodemographic data between the two study groups, statistically significant differences were found in age (p <0.001), marital status (p <0.001), and employment status (p <0.001). However, no statistically significant differences were observed in variables such as gender, educational level, economic status, physical injury during the earthquake, or loss of acquaintances during the earthquake (p >0.05) (Table 1).

Table 2 displays the distribution of clinical variables and their comparisons between the study groups. The analysis revealed that 11.3% (n = 26) of participants were diagnosed with PTSD, while 7.3% (n = 17) met the criteria for C-PTSD. A comparison of ITQ scores between the two groups showed statistically significant differences in avoidance (p = 0.001), disturbed relationships (p = 0.011), and DSO symptom scores (p = 0.034). Conversely, no significant

differences were observed in re-experiencing, sense of threat, PTSD symptoms, affective dysregulation, and negative self-concept scores ($p > 0.05$).

Discussion

This study examined the prevalence of PTSD and C-PTSD subsequent to the 2023 Kahramanmaraş earthquake, as well as the potential influence of age on the manifestation of these disorders. The results indicated that the prevalence rates for PTSD and C-PTSD were 11.3% and 7.3%, respectively. Although there was no significant difference in the prevalence rates of PTSD and C-PTSD among groups, the younger group reported higher scores for avoidance and disturbed relationships.

Earthquakes, like other natural disasters, occur suddenly, uncontrollably, and typically without prior warning. Due to their far-reaching consequences, including widespread impact on populations, as well as the potential for injuries, fatalities, and destruction, they are regarded as a global public health issue.[29] Following natural disasters, individuals may develop persistent psychiatric disorders, depending on certain personal factors.[30] In this context, there are studies in our country that investigate the prevalence of PTSD following natural disasters. In Altındağ and colleagues' one-year follow-up study, the rates of earthquake-related PTSD were found to be 42% within the first month and 23% during the subsequent 13 months.[31] In another study, 586 earthquake survivors who had started living in prefabricated houses after the 1999 Gölcük earthquake were included, and in an assessment conducted approximately 20 months later, the prevalence of PTSD was found to be 39%.[32] When the data obtained in our study were examined, the prevalence of PTSD was found to be 11.3%. This may be related to the different demographic characteristics of the individuals in the sample and their individual coping mechanisms. Additionally, the time frame during the data collection process and the assessment methods employed may have contributed to the lower rates observed compared to other studies.

A review of the literature reveals that there are a limited number of studies on the relationship between C-PTSD and natural disasters. In this context, a study by Li and colleagues conducted on a sample of healthcare workers in China reported the prevalence rates of PTSD and C-PTSD following an earthquake as 0.58% and 0.34%, respectively. This low prevalence was explained by the fact that the study was conducted approximately eleven years after the earthquake, suggesting that trauma survivors may have experienced remission either spontaneously or through treatment.[33] In our study, the prevalence of C-PTSD was found to be 7.3%, contributing to the literature on natural disasters and the development of illness. However, it can be stated that the findings obtained regarding this relationship need to be supported by more comprehensive studies with different samples, and therefore, further research is required.

A review of previous studies suggests that advanced age may be associated with PTSD and could be considered a risk factor for the development of PTSD.[34,35] Natural disasters are known to evoke feelings of fear, helplessness, and vulnerability in individuals of all ages.[36] Pekovic and colleagues have proposed that the impact of an unexpected disaster may be particularly overwhelming for elderly individuals. This is because they are already more likely to feel vulnerable due to the combined effects of chronic health conditions, impaired cognitive functions, and diminished sensory awareness, which can exacerbate their sense of fragility during such events.[37] In

contrast, a study conducted by Xu and Song after the Wenchuan earthquake found that individuals under the age of 30 had a higher likelihood of developing PTSD.[38] Similarly, Kato and colleagues have reported that age is inversely related to the development of PTSD, with a significant reduction in post-traumatic stress symptoms observed in individuals over the age of 60. This finding has been explained by the psychological burden faced by younger age groups, who must cope with the added challenges of rebuilding their lives and finding new employment, both for themselves and their families, after a disaster.[39] In our study, the PTSD diagnosis rate in the 32-65 age group was found to be 8.6%, which, although not statistically significant when compared to the younger age group (18-31 years), was proportionally lower. In light of these findings, it can be suggested that the effects of trauma may be related to age. However, the lack of a significant difference between the age groups in terms of PTSD and C-PTSD development suggests the complex nature of the influence of age on PTSD development. This implies that factors such as the type of trauma, personal resilience, and the level of social support may play a more decisive role. Additionally, considering that younger age groups may face different psychological burdens and stressors, it can be concluded that further research is needed to better understand the role of age in PTSD development.

Additionally, in our study, the scores for avoidance and disrupted relationships were found to be higher in the 18-31 age group. This may be related to the specific psychosocial developmental challenges of this age group and their coping strategies following trauma. These individuals may possess less mature coping skills and may struggle with emotional regulation in the aftermath of trauma. At the same time, societal pressures related to success, independence, and emotional resilience can create additional stress for this age group, potentially increasing tendencies toward post-traumatic avoidance. Moreover, the underdevelopment of social support systems in this age group may contribute to relationship disruptions. In conclusion, the impact of age on PTSD development is complex and multidimensional, and further research in this area is needed.

This study has several notable limitations. First, the research employed a cross-sectional design, which limits the ability to make causal inferences about the development of PTSD and C-PTSD. A longitudinal study design would allow for a more accurate examination of the evolution of these disorders over time. Additionally, data were collected solely through online surveys, which excluded individuals without internet access. This limitation may affect the generalizability of the findings to the broader population. Moreover, the timing of data collection, one year after the earthquake, may have impacted the accuracy of the disease prevalence assessment. The study sample consisted exclusively of participants with Turkish language proficiency, even though the region affected by the Kahramanmaraş earthquake is characterized by a high degree of linguistic and ethnic diversity due to migration. As such, the inclusion of only Turkish-speaking participants limits the representation of various linguistic and ethnic groups, potentially overlooking the experiences of individuals from different cultural backgrounds. Furthermore, the relatively small sample size of 231 participants restricts the generalizability of the findings, making it difficult to extrapolate the results to the wider population. Lastly, the reliance on self-report measures introduces the potential for subjective bias, which may influence the

accuracy of the data and the conclusions drawn from it. Data collection one year after the earthquake may have affected the assessment of disease prevalence.

Conclusion

The present findings indicate that 11.3% of the participants have been diagnosed with PTSD, while 7.4% fulfill the criteria for C-PTSD. Given that this study represents one of the few investigations conducted in Türkiye regarding the prevalence of C-PTSD, it provides valuable insights and makes a substantial contribution to the existing literature. In conclusion, our research emphasizes the potential age-related differences in specific PTSD and C-PTSD symptoms, such as avoidance and disturbed relationships, and highlights the necessity for further investigation into these disorders in greater depth. Future studies should examine the clinical characteristics of individuals across various age groups while taking into consideration the diverse impacts of different types of trauma.

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