

Research Article

MENTAL HEALTH ISSUES FOLLOWING A DEVASTATING EARTHQUAKE 2023: SOCIO-ECONOMIC AND STRUCTURAL DETERMINANTS

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Abstract

There is little study in Turkey on how a large earthquake affects mental health. Among people who had been impacted by the 7.6-magnitude “Kahramanmaraş” earthquake that struck Turkey on February 6, 2023, we sought to examine the factors that were linked to depressive and anxious symptoms. A preliminary cross-sectional examination of the general population was conducted from February 9th to 1st March, 2023. An online questionnaire was used as data collection tool that included the (DASS 21). By leveraging logistics regression, researchers tested the relationship between health behavior change aggregate score and depression, stress, and anxiety. Physical earthquake injuries, a little food shortage, and exhaustion were all linked to anxious feelings. Many individual and socioeconomic factors contributed to the emergence of depression, stress and anxiety indicators after the Turkey earthquake of 2023. *ASEAN Journal of Psychiatry, Vol. 24 (10) December, 2024; 1-10.*

Keywords: Depression; Anxiety and Stress; Insomnia; Dietary Habits; Physical Injury

Introduction

The two most prevalent mental disorders in the general population globally are depression and anxiety. Stresses from the individual (such as anxiety, insomnia), the community (such as discrimination, isolation), and the environment (such as natural disasters) can all have an impact on the development of a disorder [1]. Natural catastrophes may possess a negative influence on psychological health, hastening the short- and long-term development of psychiatric diseases [2]. It has been observed that 10% to 40% of earthquake survivors suffer from depression [3]. Turkey is a seismically active country located in the complicated subduction zone of the Eurasian, African, and Arabian plates [4]. A 7.8 magnitude earthquake jolted Southern Turkey early on February 6th. The most recent numbers show that 38,044 people died and 108,068 were

injured. 56,080 buildings in ten provinces have either fallen or suffered major damage, according to damage surveys [5]. According to the World Health Organization, 1.4 million children and refugees are among the over 23 million people who reside in Turkey’s affected regions. Research undertaken after catastrophes imply that exposure to earthquakes increases the probability of acquiring a number of psychopathologies [6], sadness is a common psychological reaction to natural calamities, notably earthquakes [7,8]. Earthquakes have been associated with a rise in psychopathology, namely Post-Traumatic Stress Disorder (PTSD) and depression [9]. Depression is a psychiatric illness characterized by prolonged weeping and disinterest in common mental disorders such as severe depression, bipolar disorder, and schizophrenia. It really can induce depressive problems, as well as a reduction in interest in sympathetic nervous system activities

like sleep, appetite, or sexual dysfunction, as well as cognitive difficulties and physical symptoms like fatigue and discomfort [10].

Few studies of post-seismic psychiatric illnesses have been undertaken using randomly selected samples of earthquake survivors. Earthquakes are commonly linked to stress symptoms. According to research conducted in Turkey after the 1999 earthquake, survivors suffered long-term illness and stress [11, 12]. The most significant but small predictors of traumatic stress symptoms were gender, prior mental disorder, house destruction, engagement in rescue organizations, prior trauma, and loss of loved ones. First most important determinant of traumatic stress symptoms was dread during the earthquake [9, 13]. Earthquake fear, difficulties expressing thoughts and feelings, and emotional recovery accounted for 81% of the variance in HTQ in a study of psychological responses among survivors [14]. According to psycho trauma research, PTSD is linked to a variety of factors, including trauma exposure, the severity of the loss, the intensity of the dread, a history of mental illness, and others [15]. The outcomes of all these research are challenging to evaluate due to differences in earthquake severity, devastation, time following the earthquake, sampling methods, and measures used. The current investigation is based on an epidemiological analysis of Turkish earthquake survivors from 2023. The purpose of this study was to investigate the occurrence of stress, anxiety, and depression in the first few weeks after the earthquake. The present research aims to examine the following questions:

- Psychological impact as a result of a change towards anxiety, stress, and depression
- Change in living patterns like food sleep and worship

Methodology

Participants who reported having been affected by the earthquake and who lived in Adana, a city of 1.8 million people in southern Turkey that suffered a state of emergency as a result of the seismic event, fulfilled the inclusion criteria. By random sampling, 1491 respondents made up the final sample. An anonymous online survey was sent through institutional channels including email and media relations as well as social networks using the survey platform qualtrics. The reliability of tool was determined through pre testing and Cronbach alpha. After pretesting some questions

are rephrased that helped to increase the reliability of data similarity, the value of Cronbach alpha is above 60% that depicts tool is reliable. By random sampling, 1491 respondents made up the final sample. The researchers focused at demographics, physical and health activities including prayer, sleep, antidepressant usage histories, and dietary patterns, as well as health conditions like stress, depression, and anxiety. In the current paper, only survey metrics relevant to the study's goal are included. Individual data included age, sex, social background, educational level, average earnings, and health history. The widely used Depression, Anxiety, and Stress Scale (DASS 21) was utilized to measure emotional pain [16]. Each component's seven aspects were assessed on a Likert scale ranging from 0 to 5, with 5 representing the most important feature to the participant. The valid values for each component, which ranged from 0 to 21, were added to determine the scores for the depression, anxiety, and stress items. Using defined cut-points, the intensity of the symptoms was rated.

The survey has a single question with a Likert scale from 1 to 3. The domain mostly focuses on inadequate food consumption or uncertainty over the household's food supply. The range of possible responses is "I'm not sure about my next meal" to "I'm eating what my body requires." Participants were asked to indicate how their prayer activity has changed since the earthquake in response to a single question with a single response option ranging from 1 to 6. From 1 (I no longer pray) to 6 (I am much busier than usual).

To evaluate sleep, two things were employed. Participants were initially questioned about how long they regularly slept each night before the earthquake (sleep quantity). Participants revealed how the earthquake has impacted their normal level of sleep by answering the inquiry "When the earthquake happened, I..." Five more choices were available, ranging from "am sleeping much better than normal" to "am sleeping considerably worse than usual" [16].

Statistical Analysis

Researchers produced descriptive statistics such as percentages and frequencies from categorical data. For the dependent variable, Standard Deviations (SD) and means were calculated. The non-parametric Kruskal-Wallis test, Wilcoxon rank-sum, and Spearman's correlation analyses were performed to assess depression, anxiety, and stress

levels depending on participants' socioeconomic and demographic characteristics, as well as their health condition. In order to identify fluctuations in alcohol, smoking, sleep, and physical activity use individually, responses for each behavior were reclassified into either negative change (-1), no change (0), or positive evolution (+1). To measure the impact of well-being on lifestyle behavior, a multiple lifestyle behavior index was developed, to sum up, scores from four health-related behaviors. This composite health change score had an output range between -4 and +4. To illustrate the effects of depression, stress, and anxiety levels on this score, average composite health behavior change scores were computed alongside their respective SD. Logistic regression analysis was performed to check the negative alteration the behavior of an individual had any link with the depression, anxiety and stress. By considering age, marital status, household income, gender, years of education, and injury/ disease status in our analysis with a 95% Confidence Interval (CI), researchers were able to provide crude estimates as well as adjusted estimates for these findings. We utilized logistic regression to determine whether any modifications in individual behavioral qualities were linked with stress, depression, and anxiety. A p-value of less than $P < 0.05$ was considered statistically significant for all analyses. It is applied on the adjusted model because logistic regression provide accurate answer either the relationship is prevailed or not and what is the exact difference there is no middle ground in the application of the logistic model.

Results

Table 1 outlines health and the socio-demographic characteristics of our study sample, which was comprised of 1491 respondents with a mean age 50.5 ± 14.9 years, 1005 females overall. Of those surveyed, 937 (62.8%) were married or in relationship while 693 (46.5%), reported having at severe injury. The average score of depression was 1.9 with a standard deviation of 1.3; for anxiety, the mean rating was 1.5 ± 1.0 ; and stress had an average score of 1.6 ± 1.1 respectively. Participants were active on average at 309 minutes/ week before earthquake. On average, prior to the earthquake, participants reported getting 6.7 ± 1.0 hours of sleep each night with half (756 people or 50.7%) claiming their sleep quality had not changed since then. In the account of earthquake 729 (48.9%) participants were having negative

changes in their food routines while 454 (30.5%) were reported no change. A large number of respondents 1319 (88.5%) claimed that they were not in anti-depression while 172 (11.5%) were in anti-depression. Whereas, 1338 (89.7%) got no change and the 103(6.9%) were recorded negative change in their anti-depression condition.

Table 2 describes that the difference in psychological distress based on socio-demographic and health characteristics in relation to the depression, anxiety and stress. High stress score was noted in the females as compared to the males however, there was no significant difference in the anxiety and depression score of the both males and females. Younger people aged between 18-45 were having high depression, anxiety and stress level as compared to the other aged groups. Respondents who were married or divorced were having lower depression, anxiety and stress scores as compared to the people who were not married. After analyzing the data, we discovered a notable inverse relationship between years of education and depression scores; however, there was no link observed between anxiety or stress levels. Those in the lowest income demographic experienced higher depression scores than those with greater incomes; however, no distinction was determined between various weekly household earnings and anxiety or stress levels. Respondents identified as having an injury were reported significantly more pronounced depression, anxiety, and stress scores compared to those without such health issue. With respect to depression, anxiety, and stress, Table 2 shows the differences in psychological distress depending on socio-demographic and health variables. Females were shown to have higher stress scores than males, but there was no discernible difference in the scores for anxiety or depression between the sexes. Younger people between the ages of 18 and 45 reported greater levels of stress, anxiety, and depression than elderly adults. When compared to those who were not married those who were married or divorced scored less depressed, anxious, and stressed. After doing a thorough analysis of the data, we found no connection between anxiety or stress levels and the number of years of schooling and depression ratings. The lowest income group had higher depression levels than the highest income group. When respondents with injuries were detected, their levels of melancholy, worry, and stress were much greater than those of respondents who did not have such health difficulties.

According to the degree of sadness, anxiety, and stress, Table 3 shows the mean changes in composite health behavior scores. Except for exceptionally severe cases of despair and anxiety, fewer people had each symptom as symptoms increased. Taking into account sadness, anxiety, and stress, it was shown that, with the exception of cases of really severe anxiety or stress, the average composite health behavior change score fell as symptoms got worse

Table 4 shows a link between DAS marriage status, gender, age, level of education, income, and injury status and detrimental changes in behavior. Only accustomed ORs are accessible to see after taking into consideration age, years of education, gender, marital status, family income, and diagnosed injury status (which had no impact on the associations). Looking at the results, participants who experienced a decrease in food routines were more expected to suffer from higher symptoms

of depression 1.01 (95% CI: 1.06-1.11), anxiety 1.02 (95% CI: 1.05-1.13), and stress 1.01 (95% CI: 1.05-1.11). Individuals who experienced a negative change in their sleep patterns were more possible to agonize from heightened symptoms of depression OR= 1.15 (95% CI: 1.15-1.23), anxiety OR=1.19, (95% CI: 1.19, 1.31), and stress (adjusted OR=1.29 (95% CI: 1.26, 1.35). For those who reported a decrease in anti-depression, they were more likely to experience higher levels of depression OR=1.05 (95% CI: 1.04-1.13), anxiety OR=1.01 (95% CI: 1.06 -1.18), and stress symptoms (OR=1). Additionally, those who reported a negative change in their prayer/ worship habits were more prospective to have greater levels of depression (adjusted OR= 1.02 (95% CI: 1.04-1.10), anxiety OR= 1.01 (95% CI: 1.04-1.12), and stress symptoms OR= 1.01 (95% CI: 1.07-1.13). The results remain consistent for combined variation scores.

Table 1. Demographic attributes of the population

	N	Percentage or Mean (SD)
Age (years)	1491	50.5 (14.9)
Sex		
Men	486	32.6
Women	1005	67.4
Marital status		
Unmarried	306	20.5
Div./Sep/Widow	248	16.6
Married	937	62.8
Level of education	1491	16.3 (5.1)
Household income		
<\$1000/ Month	389	26.1
\$1000-<\$2000/Month	443	29.7
≥\$2000/Month	659	44.2
Injury status		
No	798	53.5
Yes	693	46.5
DAS (Depression, Anxiety, Stress) score		
Depression	1491	1.9 (1.3))
Anxiety	1491	1.5 (1.0)
Stress	1491	1.6 (1.1)
Physical activity (mints/week)	1491	309.1 (359.5)
Sleep (Hours/night)	609	6.7 (1.0)
Use of anti-depressant		
Yes	172	11.5
No	1319	88.5
Prayer/worship		
Often	301	20.2
Weekly or less	322	21.6

1-2 per day	250	16.8
2-3 per day	286	19.2
4 or 5 per day	332	22.3
Change in food routine		
Negative change	729	48.9
No change	454	30.5
Positive change	308	20.7
Change in sleep quality		
Negative change	607	40.7
No change	756	50.7
Positive change	128	8.6
Change in use of anti-depression		
Negative change	103	6.9
No change	1338	89.7
Positive change	50	3.4
Change in offer prayer		
Negative change	396	26.6
No change	825	55.3
Positive change	270	18.1

Table 2. Depression, anxiety and stress varies according to socioeconomic and health circumstances

Characteristic	Depression Mean (SD)	p-Value	Anxiety Mean (SD)	p-Value	Stress Mean (SD)	p-Value
Sex						
Women	4.2 (4.7)		2.0 (3.1)		4.9 (4.0)	
Men	4.1 (5.0)	0.171	2.0 (3.5)	0.102	4.2 (4.8)	0.005*
Age (years)						
18-45	5.2 (5.1)		2.7 (3.2)		6.4 (4.6)	
46 to 65	3.3 (4.0)	<0.001***	1.3 (2.9)	<0.001 ***	3.9 (3.9)	<0.001 ***
>65	2.7 (3.4)		1.0 (2.0)		1.1 (2.9)	
Marital status						
Unmarried	6.2 (4.3)		2.9 (3.8)		5.7 (4.2)	
Div./Sep/Widow	5.0 (5.2)	<0.001 ***	2.0 (3.1)	<0.001***	4.0 (3.1)	<0.001 ***
Married	3.2 (3.9)		1.2 (2.4)		4.1 (3.2)	
Level of education (Continuous variable)	-0.081	0.002 *	-0.059	0.297	-0.011	0.541
Household income						
<\$1000/Month	4.7 (5.0)		2.1 (2.9)		3.5 (4.2)	
\$1000-<\$2000/Month	3.2 (4.6)	0.039 *	1.7 (3.0)	0.101	4.0 (3.1)	0.112
≥\$2000/Month	3.9 (3.8)		1.3 (3.0)		4.3 (3.6)	
Diagnosed with physical injury						
No	3.8 (4.1)		1.8 (3.0)		4.2(3.5)	
Yes	4.7 (5.0)	0.001 ***	2.7 (3.7)	<0.0001 ***	4.9 (4.3)	0.003
Note: * denotes the significant difference between p-value of correlation for the variables, level of education, household income sex of the respondents and depression, anxiety stress mean *** depicts the highly significant association between p-value for the age and marital status of the respondents and depression.						

Table 3. The degree of sadness, anxiety, and stress is used to stratify the composite health conduct variance

Psychosomatic distress factors	n (%)	Composite health con
Severity (Range of scores)		Change Score Mean (SD)
Depression		
Very low (0–4)	920 (61.7)	–0.42 (1.25)
Below average (5–6)	175 (11.7)	–1.03 (1.25)
Average (7–10)	206 (13.8)	–1.22 (1.34)
Above average (11–13)	79 (5.3)	–1.28 (1.42)
Very high (>13)	111 (7.4)	–1.45 (1.44)
Anxiety		
Very low (0–3)	1175 (78.8)	–0.58 (1.28)
Below average (4–5)	115 (7.7)	–1.20 (1.40)
Average (6–7)	83 (5.6)	–1.24 (1.35)
Above average (8–9)	40 (2.7)	–1.50 (1.52)
Very high (>9)	78 (5.2)	–1.23 (1.61)
Stress		
Very low (–7)	1077(72.2)	-0.49 (1.25)
Below average(8-9)	143 (9.6)	-1.34 (1.23)
Average (10–12)	121 (8.1)	-1.25 (1.46)
Above average (13–16)	105 (7.0)	-1.43 (1.43)
Very high (>16)	45 (3.0)	-1.33 (1.69)

Table 4. The association between mental distress and detrimental behavioral changes related to health

Adjusted Model (n = 1261) #			
	Depression	Anxiety	Stress
Logistic regression	Odds ratio (95% CI)		
Food routine	1.01 ** (1.06, 1.11)	1.02 * (1.05, 1.13)	1.01 ** (1.05, 1.11)
Sleep	1.15 * (1.15, 1.23)	1.19 * (1.19, 1.31)	1.29 * (1.26, 1.35)
use of anti-depression	1.05 * (1.04, 1.13)	1.01 ** (1.06, 1.18)	1.01 ** (1.05, 1.15)
Prayer/Worship	1.02 * (1.04, 1.10)	1.01 ** (1.04, 1.12)	1.01 ** (1.07, 1.13)
	Linear Regression–score estimate (95% CI)		
Composite change score	–0.09 * (–0.10, –0.07)	–0.10 * (–0.12, –0.07)	–0.10 * (–0.12, –0.08)
<p>Note: In Logistic Regression there is “no change/positive change”. *** P<0.001; # Which is adjusted for age, years of education, gender, marital status, household income and chronic disease status.</p> <p>The first variable food routine, use of anti-depression, prayers and worship, had highly significant ** p.value for the odds ratio of depression while it had * significant p-value for the Anxiety and depression. Similarly sleep had * significant p-value for depression, anxiety and stress.</p>			

Discussion

The current study looked at how eating habits, sleeping patterns, medicine use, and prayer activity changed as environmental factors after the earthquake, individual health attitudes as well as a cumulative value for the health behavior change index. Key findings of the study indicated that the three aspects of psychological distress: depression, anxiety, and stress were demonstrated to be substantially correlated with changes in health behavior, both individually and as a composite score. Several research have been carried out to study the relationship between various natural changes and components associated with psychological discomfort. For example, Substantial research has been done on the harmful impact that natural catastrophes have on mental health [17,18]. Much attention has been placed on post-disaster mental health issues such as depression and PTSD, with earthquakes functioning as a basis [19]. Much emphasis has been paid to negative mental health impacts [20-22]. According to the current study, the aggregate healthcare behavior modification score fell as depression intensity increased. In the preceding example, participants with intermediate symptoms of depression reported a somewhat negative change (0.42 points) in the aggregate health related behaviors modification score, whereas those with really severe symptoms reported a significantly positive shift (1.45 points). Higher levels results of DAAS were associated with unfavorable improvements in the composite health behavior change scores. According to the results of logistic regression, a negative change in any behavior was strongly linked to a greater vulnerability of experiencing depression, anxiety, and stress. Natural disasters have a detrimental effect on the lives, connections, and mental and physical wellness of victims in the short, medium, and long term. One of the most common mental health problems among these sufferers is PSTD [23]. A review conducted previously indicated that earthquakes predisposed sufferers to a variety of mental health issues, including anxiety, depression, suicide, and PTSD [24]. Psychological impacts, such as suicidal ideation, become more prevalent. Suicide ideation can be exacerbated by major depression, a history of previous mental health troubles, property damage, economic concerns, injuries or loss of relatives, and life-threatening disorders [24]. Disaster-related nutritional changes may have an impact on one's mental and physical health [25]. According to the current study, food

insecurity has slightly increased, affecting dietary practices and leading to psychological discomfort. In Nepal, a 2015 study indicated that, according to the domestic food security availability index, food insecurity increased from 12.4% (6.9% - 21.2%) to 17.6% (11.7% - 25.6%) [26]. The same study was presented in Port-au-Prince, Haiti, and revealed that more than 50% of the people there experienced moderate to severe food insecurity, it might result in psychological and physical health issues in the future [27]. There was a greater incidence of depressive symptomatology in those who had suffered physiological injury as a consequence of the earthquake. This discovery supports an earlier Peruvian research [28]. According to a study persons who lost loved ones in the 2007 Pisco earthquake had an 11% frequency of depression. Moreover, the latter research and another [29]. According to studies done following the 2008 Wenchuan earthquake, depressed symptoms were prevalent in those who had suffered physical harm, but there were no appreciable differences from healthy people, this is in line with the findings of the present research.. The trauma of a family member's injuries is likely to be greater for the person since it may compound the emotional consequences of the earthquake. Sleeplessness has been linked to a higher incidence of depression symptomatology. Teens who survived an earthquake and later acquired PTSD had a 50% increased chance of developing sleeplessness, according to a retrospective research [30]. Another study revealed that resilience mediates the association between stress and insomnia [31]. In contrast, other studies [32,30] it has been demonstrated that insomnia precedes psychopathology. The intricate relationship between anxiety and sleeplessness may be explained by how sleep affects emotion regulation and memory consolidation [33]. As a result, future research should give more proof in situations like as earthquakes and other natural calamities. Not only the disasters affect living conditions, but also it can drastically alter human thinking towards religions [34]. Our research indicated that disasters had a lower impact on worshiping behaviors. Some of the religious approaches that Muslims regularly apply to cope with difficulties in life are religiosity, belief, trusting God, prayer, forgiveness, supplication, and recitation of the Quran, remembrance of God, patience, and gratitude [35]. These practices help to reduce negative impacts due to disasters and give strength to restore emotional stability.

Recommendation

After the Turkish earthquake in 2023, the aim of this study is to spot any early indications of PTSD. Accurate statistics are still needed for public health policy. These techniques need to be enhanced in light of credible and relevant scientific understanding to enable the early recognition and therapy of depression, anxiety, and stress. For instance, we showed that vulnerable populations in Turkey, such as those suffering with physical violence and food shortages, require special attention [36]. Although these people may be more prone to post-disaster PTSD, treatments may focus on pre-existing mental health conditions, such as insomnia. In this situation, early detection and therapy of PTSD can aid in anticipating and preventing later adverse consequences, such as poor quality of life, hopelessness, and suicide. Natural catastrophes of all types are becoming more common across the world. Thus, psychiatrists must accept responsibility for the effects of trauma, conduct more extensive research on methods of working with trauma survivors, and design therapies based on scientific evidence. A seismically dangerous zone encompasses 92% of Turkey. An awareness and training program for certain skills would help in the development of a sense of mastery and control, minimizing psychological suffering among survivors.

Conclusion

People were more likely to exhibit depressed symptoms if they had a history of mental illness, had relatives who had had earthquake injuries, had political or social support, experienced moderate food insecurity, or had any degree of sleeplessness symptoms. Also, those who had severe food insecurity, physical earthquake injuries, or any degree of sleeplessness were more likely to exhibit signs of anxiety. Our study broadens our understanding of these factors as they pertain to earthquakes.

Limitations

This research has limitations. Most importantly, due of the sampling limitations, the results should be interpreted with care. It is highly suggested not to apply the findings of this study to the broader population because we utilized a non-probability

sampling strategy. However, while interpreting the results, it is important to consider methodological limitations such the cross-sectional pattern, non-probabilistic sampling method, and a small number of samples. Further evidence of these limits is needed to improve local therapies and stop harmful impacts on mental health. Further research with a more representative age range and participants chosen at random may be required to replicate these findings. It is also worth noting that several important elements (for example, loss of family members and/or property damage) that may be related to the participants' mental health were not gathered and examined in this study. This study did not gather or investigate women issues in particular. As a result, it is strongly advised that such aspects be included in future research to better understand the consequences of catastrophes on mental health and strength.

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Data Availability Statement

None

Conflict of Interest

The authors declare no potential conflicts of interest with respect to research, financial relationship, authorship and/or publication of this article.

Ethical Consent

Participants were told of the study's goals and methodology before the interview process began, and their verbal informed consent to participate was then obtained. The Committee of University of Agriculture, University's Department of Sociology accepted ethical consent (Ethics-PK-2023).

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