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POST-EARTHQUAKE MUSCULOSKELETAL PAIN IN MEDICAL FACULTY STUDENTS: STRESS-RELATED PAIN PROCESS

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Abstract

Aim: In the last decade, humans have been faced with natural disasters such as earthquakes, floods, and forest fires worldwide. In the long term, the effects of the trauma experienced after these disasters continue. We aimed to detect musculoskeletal pain and earthquake-related conditions in term 5 faculty of medicine, students after the high-intensity earthquake.

Material and Methods: The study was planned as a cross-sectional, descriptive study. All term 5 students (n=110) were included in the study. Data was obtained through the online survey Google Forms and participants were enabled to complete it as soon as possible.

Results: In the study, n=82 students (48 girls, 34 boys) participated in our survey voluntarily. 34.1% of the participants were 23 years old, 29.3% were 24 years old, 19.5% were 22 years old, and 14.6% were 25 years old. Forty-eight point eight percent of the participants stated that they moved away from the city after the earthquake. 24.4% indicated that they lost a relative in the earthquake. 48.8% of the participants said that there was an increase in musculoskeletal pain after the earthquake. The most common area of pain was in the low back with a rate of 37%. This rate was followed by the neck with 18.5% and the back and shoulder areas with 14.8%. 36.8% of the participants stated that post-earthquake pain negatively affected academic performance. 36.6% of the participants had sleep problems after the earthquake, 29.3% had post-earthquake dizziness, 24.4% had gait instability, 19.5% had anxiety/depression, and 12.2% started to use medications for these problems.

Conclusion: In the post-earthquake period, musculoskeletal complaints were observed in the term 5 students of the faculty of medicine, most frequently in the low back, neck, and back/shoulder regions. In addition, problems that will negatively affect their academic success, such as insomnia, depression/anxiety, dizziness, and imbalance, are also observed.

Keywords: Earthquake, musculoskeletal pain, dizziness, chronic pain, medical student

INTRODUCTION

Earthquakes are an ideal natural trigger factor for acute/chronic stress. Earthquake disasters are associated with numerous complaints, especially pain in the musculoskeletal system.

These complaints arise from the physical damage that may occur during the earthquake, great stress experienced, housing and sleeping problems in the subsequent period, and the stressors caused by tens of thousands of aftershocks. Physiological effects

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of sympathetic nervous system activation can be seen in the human body in the acute and chronic periods (1). On February 6, 2023, two consecutive major earthquake disasters occurred in Kahramanmaraş, Türkiye, with magnitudes of 7.4 and 7.6 on the Richter scale. Tens of thousands of people died after this disaster, and millions of people were affected.

Central sensitization causes differences in the processing of the pain response through multiple mechanisms, such as abnormal processing of pain signals by the central nervous system, an increase in neurotransmitter levels, changes in the transmission and perception of pain signals, nerve cells becoming sensitive to pain through structural or functional changes (neuronal plasticity), and a decrease in the pain threshold (2). Acute and chronic stress response may play a role in the development of chronic pain through central sensitization.

Chronic stress can increase the sensitivity of the nervous system and thus contribute to central sensitization. Stress can change the body's perception of pain and cause it to feel more intense and widespread. Additionally, the effects of stress on the immune system (neuroinflammation) may also contribute to central sensitization. Stress status must be taken into consideration in the evaluation of pain response (3).

Individuals who experience an earthquake may suffer an increase in their existing pain or new pain complaints due to the central sensitization mechanism. In addition, depression, anxiety, and sleep problems can negatively influence pain complaints in the musculoskeletal system (4). Here, we aimed to evaluate the prevalence and severity of musculoskeletal pain, along with accompanying complaints such as sleep disturbance, dizziness, depression, anxiety, and imbalance, in term v medical faculty students who experienced the 2023 Kahramanmaraş earthquake.

MATERIAL AND METHODS

The study was planned as a cross-sectional, descriptive study. All term 5 students (n=110) receiving a 2-week physical medicine and rehabilitation internship training were included in the study. Data were obtained through the online survey, Google Forms and participants were encouraged to complete it as soon as possible. Participants were asked yes/no questions about the following: age; gender; whether muscle pain increases after the earthquake; whether muscle pain affects academic success; the region the pain is in; its severity on the visual analog scale (VAS); whether they were left in the rubble and, if so, for how long; whether they lost a relative in the earthquake; sleep problems after the earthquake; and whether they had any accompanying problems such as dizziness, imbalance, and medication use.

The study was completed when the entire target population was reached. VAS, a VAS, is a scale (0-10 cm), that shows the subjective evaluation of pain. Since face-to-face medical education was provided at our university, in the earthquake zone, in the second year following the earthquake, the research was carried out during this period.

Inclusion Criteria

- To be a term 5 medical student,
- Having experienced the 2023 February Kahramanmaraş earthquake,
- To volunteer.

Exclusion Criteria

- Having a serious orthopedic disability before the earthquake,
- Not volunteering,
- Not having experienced an earthquake.

Statistical Analysis

Since the entire population (n=110) will be included, the sample size was not calculated by power analysis. Variables are presented as numbers (n) and percentages (%). Figures were obtained from Google Forms. The study was planned in accordance with the principles of the international Helsinki Declaration and approved by Kahramanmaraş Sütçü İmam University, Faculty of Medicine Non-invasive Clinical Research Ethics Committee (approval number: 08, dated: 24.06.2024). A written online informed consent form was obtained from the participants.

RESULTS

In the study, n=82 students (48 girls, 34 boys) participated in our survey voluntarily. 34.1% of the participants were 23 years old, 29.3% were 24 years old, 19.5% were 22 years old, and 14.6% were 25 years old (Figure 1). No participant was trapped under debris. 48.8% of the participants stated that they moved away from the city after the earthquake. 24.4% indicated that they lost a relative in the earthquake. Descriptive characteristics were listed in Table 1.

Forty-eight point eight percent of the participants stated that there was an increase in musculoskeletal pain after the earthquake. The most common area of pain was in the low back region, with a rate of 37% (Figure 2). This rate was followed by the neck with 18.5%, and the back and shoulder areas with 14.8%. Post-earthquake pain intensity was evaluated via VAS (Figure 3). VAS=1 scored the highest with 33.3%.

Thirty-six point eight percent of the participants stated that post-earthquake pain negatively affected their school performance.

Thirty-six point six percent of the participants were have sleep problems after the earthquake, 29.3% have post-earthquake dizziness (dizziness, feeling of an earthquake, and imbalance attacks), 24.4% have gait instability, 19.5% have anxiety/depression, and 12.2% started to use medication for these problems. Sixty-three point four percent stated that they woke up in the morning without having had enough sleep.

Table 1. Descriptive characteristics of the participants

	n=82
Gender (F/M)	48/34
Median age, year	23
Participants trapped under the debris	0
Participants, lost at least one relative because of earthquake	20 (24.4%)
Post-earthquake increased musculoskeletal pain	40 (48.8%)

F: Female, M: Male

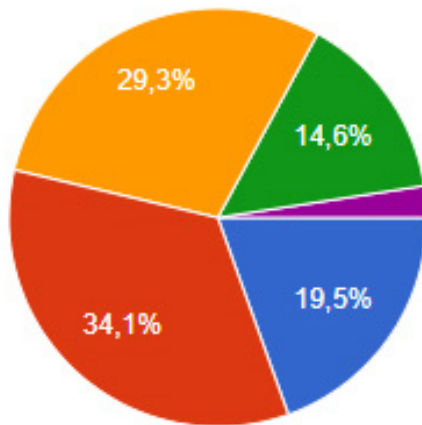


Figure 1. Age distribution of the participants

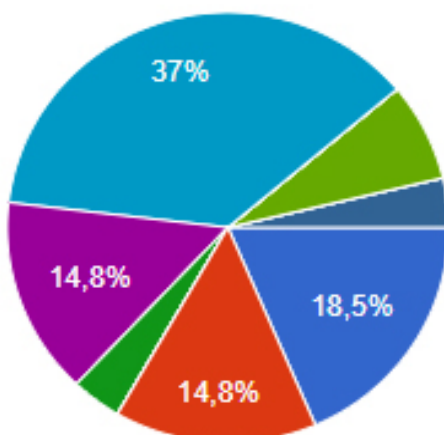


Figure 2. Distribution of the pain area

DISCUSSION

Türkiye is located in a region with widespread seismic fault lines, and has witnessed many devastating earthquakes from the past to the present. Two major earthquakes occurred in Kahramanmaraş province in February 2023. Tens of thousands of people were trapped under the rubble. Most post-earthquake injuries occur due to objects falling on people, crushing injuries caused by being directly under the debris, and disruptions during rescue and transfer from the debris.

Millions of people were woken up from their sleep by a massive earthquake and then experienced housing problems for a long time. This major earthquake trauma, along with tens of thousands of aftershocks, can cause anxiety, sleep disturbance, feeling like an earthquake is happening, dizziness, loss of balance, sleep problems, and head, neck, back pain in earthquake victims. Functional disability is frequently encountered after natural disasters. Complaints related to the musculoskeletal system are frequently encountered with or without musculoskeletal injury. Post-disaster housing problems and post-traumatic stress-related sleep disorders are also associated with musculoskeletal complaints (5,6).

It is necessary to identify earthquake-related musculoskeletal system problems. After a disaster, previously existing musculoskeletal complaints may increase and new complaints may also arise. Depression and anxiety from psychological stress after an earthquake are very common, and these two clinical conditions are closely related to pain. Scientific data support that the severity of pain increases and becomes chronic in the presence of depression. The opposite is also true. This situation may negatively affect the person's recreational, community, professional activities, and school success (7-9).

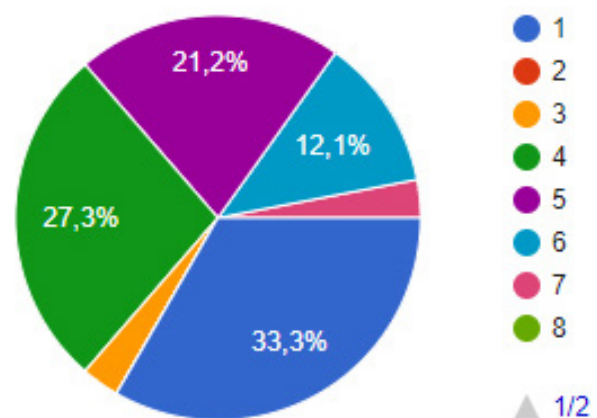


Figure 3. Evaluation of pain with VAS scale (1-10)
VAS: Visual analog scale

Although none of the participants was trapped under the rubble, and nearly half of them moved away from the city after the earthquake, the high rates of problems indicate that they experienced difficulties following the acute period of earthquake trauma.

We know that pain complaints differ between sexes and are more common in females (10). The fact that more than half of our group was female may have affected the study results. Medical school students constitute a group with higher education and intellectual capacity than the general population. Since this group is both educated and healthcare personnel, their awareness and influence regarding events may be higher. We also know that a group of volunteers, including medical students, worked actively in the hospital after the earthquake. Although there is a lot of data in the literature on the prevalence of musculoskeletal pain in the geriatric age group, there is little data on the frequency of pain in the young population. This article will contribute to the literature in this area.

The survey being conducted one year after the earthquake, data being taken from only one region, and a lack of full societal representation due to participants' education levels, prevent the generalizability of the results. Evaluations are based only on the person's statement; no measurements such as sensitization scales (central sensitization scale, S-LANNS) were taken into account.

CONCLUSION

In the 2nd year of the earthquake disaster, musculoskeletal pain was observed with high frequency in term v students of the faculty of medicine, most frequently in the low back, neck, and back and shoulder regions. In addition, problems such as insomnia, depression/anxiety, dizziness, and gait instability, that will negatively affect their academic success, are also observed.

Ethics

Ethics Committee Approval: The study was planned in accordance with the principles of the international Helsinki Declaration and approved by Kahramanmaraş Sütçü İmam University, Faculty of Medicine Non-invasive Clinical Research Ethics Committee (approval number: 08, dated: 24.06.2024).

Informed Consent: A written informed consent form was obtained from the participants.

Footnotes

Authorship Contributions

Concept: T.T.K., Design: T.T.K., Data Collection or Processing: T.T.K., C.Z.Y., Analysis or Interpretation: C.Z.Y., Writing: T.T.K.

Conflict of Interest: The authors have no conflicts of interest to declare.

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