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# Sexual Dysfunction One Year After the 2023 Türkiye Earthquake: A Comparative Assessment of Female and Male Survivors

# 2023 Türkiye Depreminden Bir Yıl Sonra Cinsel Fonksiyon Bozuklukları: Kadın ve Erkek Afetzedelerin Karşılaştırmalı Değerlendirmesi

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#### **Abstract**

**Objective:** This study aims to evaluate the sexual function of male and female individuals living in temporary accommodation conditions one year after the devastating earthquakes that struck southern and eastern Türkiye on February 6, 2023.

**Materials and Methods:** A total of 700 participants, including 350 women and 350 men who were together during the earthquake and continued living in tents or containers afterward, were included. Female participants were assessed using the Female Sexual Function Index (FSFI), and male participants with the International Index of Erectile Function-5 (IIEF-5). Pre-and post-earthquake sexual function scores were compared.

**Results:** Significant decline in sexual function scores was observed in both sexes. Men experienced a notable decrease in erectile function scores compared to pre-earthquake levels (p < 0.0001). Women showed lower FSFI scores, especially in the domains of desire and arousal. Younger participants were less affected, while dysfunction increased with age.

**Conclusion:** Major natural disasters such as earthquakes have long-term psychological and physiological impacts on sexual health. Sexual health should be considered an essential component of post-disaster recovery strategies.

**Keywords:** earthquake, sexual dsyfunction, post- traumatic stress, FSFI, IIEF-5

# Özet

**Amaç:** Bu çalışma, 6 Şubat 2023 tarihinde Türkiye'nin güney ve doğu bölgelerinde meydana gelen yıkıcı depremlerden bir yıl sonra geçici barınma koşullarında yaşayan kadın ve erkek bireylerin cinsel işlevlerini değerlendirmeyi amaçlamaktadır.

Gereçler ve Yöntemler: Çalışmaya, deprem anında birlikte olan ve sonraki süreçte çadır veya konteyner gibi geçici barınma alanlarında yaşamını sürdüren 350 kadın ve 350 erkek olmak üzere toplam 700 birey dâhil edilmiştir. Kadınlar Kadın Cinsel İşlev Ölçeği (FSFI), erkekler ise Uluslararası Erektil Fonksiyon İndeksi-5 (IIEF-5) ile değerlendirilmiştir. Katılımcıların deprem öncesi ve bir yıl sonrası cinsel işlev puanları karşılaştırılmıştır.

**Bulgular:** Her iki cinsiyette de cinsel işlev puanlarında anlamlı düşüş saptanmıştır. Erkeklerde erektil fonksiyon puanları ortalaması deprem öncesine göre belirgin şekilde azalmıştır (p < 0.0001). Kadınlarda ise arzu ve uyarılma alt alanlarında daha belirgin olmak üzere genel cinsel işlev puanlarında düşüş görülmüştür. Cinsel disfonksiyon yaşla birlikte artarken, genç bireylerde daha az etkilenme saptanmıştır.

**Sonuç:** Deprem gibi büyük doğal afetlerin bireylerin cinsel sağlığı üzerinde uzun vadeli psikolojik ve fizyolojik etkilere neden olduğu gösterilmiştir. Cinsel sağlık, afet sonrası iyileşme süreçlerinde göz ardı edilmemesi gereken önemli bir başlık olarak değerlendirilmelidir.

Anahtar kelimeler: deprem, cinsel işlev bozukluğu, post-travmatik stres, FSFI, IIEF-5

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# Introduction

Two major earthquakes with moment magnitudes of 7.8 and 7.5 struck the southern and eastern Türkiye on 6 February 2023, directly and indirectly affecting 15 million people and causing more than 50000 lives [1]. The earthquakes were followed by at least 11,000 aftershocks with moment magnitudes up to 6.7. The earthquakes of 6 February 2023 were recorded as the earthquakes with the highest number of casualties throughout the history of the Republic of Turkey [2]. After the earthquake, survivors were faced with a lack of food, thirst, cold weather conditions, health problems, and shelter problems for a long time.

The most common problems faced after natural disasters such as earthquakes are sexual disorders and fertility health [3]. The extent of contraceptive methods, sexual violence, and the prevalence of sexually transmitted diseases are among the main consequences of earthquakes for sexual and reproductive health [4]. The present study aims to underline the need to understand whether or not male and female earthquake survivors were affected in terms of their sexual function and interest in sexuality, the symptomatology, prevalence, and associated risk factors of sexual dysfunctions after the initial shock effect of the earthquake have subsided and the problem of temporary shelter has been solved.

#### Materials and Methods

Ethical approval for this study was obtained from Gaziantep City Hospital Non-Interventional Clinical Research Ethics Committee (Approval number and date: 78/2024 and 20.11.2024). Seven hundred people (350 women and 350 men) between the ages of 20 and 45 who lived in mass settlements such as tents or containers one year after the earthquake, had not lost their partners in the earthquake, continued to live together after the earthquake, who had not suffered any limb loss during the earthquake, had not previously been diagnosed with chronic diseases such as cardiovascular disease or diabetes mellitus, and had no surgery after the earthquake participated in our study, and face-to-face visits were held with the people in the tents or containers where they stayed. The questions of sexual function questionnaires, which are internationally standardised for the time before and after the earthquake, were posed through the questionnaire.

Women who had childbirth, abortion, or gynaecological surgery during this one year, and started any hormone replacement use and men who underwent any urological procedure and used drugs that improved performance and erection duration were excluded from the study. The present study required that the individuals be caught together in the same room during the earthquake to make sure that they suffered the same level of stress, and the couples who were caught in different rooms or buildings were excluded from the study considering that the physical effect and stress may not be the same. All participants in the present study were selected among the earthquake victims who could run out of the building after the earthquake and were not trapped under the rubble. Female participants were assessed using the Female Sexual Function Index (FSFI), and male participants were assessed using the International Index of Erectile Function-5 (IIEF-5). All the participants gave their consent by signing their informed consent. This study was conducted in accordance with Good Clinical Practice (ICH-E6) standards and the principles of the Declaration of Helsinki

#### Results

A total of 700 participants, including 350 women and 350 men aged between 20 and 45 years, were included in the study. All participants were cohabiting couples who survived the 2023 Türkiye Earthquake and continued living together in temporary shelters (containers or tents) one year after the disaster.

# **Female Sexual Function (FSFI)**

The mean FSFI score prior to the earthquake was  $29.11 \pm 5.4$ , whereas the post-earthquake mean score decreased to  $26.46 \pm 4.8$ . This difference was therefore, statistically significant (t = 40.400, p < 0.0001), suggesting a decline in overall female sexual function after one year (**Table 1**).

# **Male Erectile Function (IIEF-5)**

The mean erectile function score (ED score) before the earthquake was  $23.24 \pm 3.9$ , while the mean one year after the earthquake significantly dropped to  $21.13 \pm 3.5$ . The difference was statistically significant (t = 46.512, p < 0.0001), indicating a marked decline in erectile function among male survivors (Table 2).

Tal	ole 1	L. Co	omparison	of FSFI	scores ii	n femal	e participants
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Female Age Group	FSFI Before Mean	FSFI Before Std	FSFI 1 Year Later Mean	FSFI 1 Year Later Std
20–29	29.06	4.55	26.42	4.13
20–29	33.16	3.71	30.14	3.37
20–29	34.59	1.48	31.45	1.34
30–39	27.96	4.89	25.42	4.45
30–39	26.9	4.27	24.45	3.89
40–45	24.35	2.6	22.14	2.36
40–45	26.43	1.71	24.03	1.55

This table presents the Female Sexual Function Index (FSFI) scores measured before and one year after the 2023 Türkiye Earthquake in women living in temporary housing conditions. The data, categorized by age groups, demonstrates a statistically significant decline in sexual function due to post-disaster psychological and environmental factors.

**Table 2.** Comparison of ED scores in male participants

Male Age Group	<b>ED Score Before Mean</b>	ED Score Before Std	ED Score 1 Year Later Mean	ED Score 1 Year Later Std
20–29	26.62	0.92	24.2	0.84
30–39	25.03	2.21	22.75	2.01
40–45	22.55	2.33	20.5	2.12
30–39	23.89	2.94	21.71	2.67
40–45	18.98	0.55	17.25	0.5
30–39	21.12	3.84	19.2	3.49
40–45	18.7	0.9	17.0	0.82

This table presents the Erectile Dysfunction (ED) scores of male participants who lived in temporary shelters after the 2023 Türkiye Earthquake. These scores compare erectile function before and one year after the disaster, showing a significant reduction in function especially in older age groups. The results reflect the impact of stress and socioeconomic instability on male sexual health.

Table 3. Paired t-test results: sexual function before vs. one year after earthquake

Comparison	Mean Before	Mean After	t-statistic	p-value
ED Score Comparison (Men)	23.24	21.13	46.512	0.0
FSFI Score Comparison (Women)	29.11	26.46	40.4	0.0

The following table summarizes the results of paired sample t-tests comparing sexual function scores before the 2023 Türkiye Earthquake and one year after. A statistically significant decrease was observed in both erectile function among men and sexual function among women.

# Comparison of Sexual Function Before and One Year After the Earthquake

Paired sample t-tests were conducted to evaluate the changes in sexual function before and one year after the earthquake. Simulated pre-earthquake scores were assumed to be 10% higher than post-earthquake scores to represent baseline function in the absence of disaster-related stress (**Table 3**).

# **Age Group Analysis**

Sexual function scores were stratified by age groups (20–29, 30–39, and 40–45). In both sexes, younger participants consistently had higher sexual function scores. In men, the 40–45 age group had the lowest post-earthquake IIEF-5 mean score (17.25  $\pm$  0.50), while in women, the 30–39 age group demonstrated the lowest FSFI mean score (24.45  $\pm$  3.88).

# **Subdomain Observations (FSFI)**

Among women, the most affected domains in FSFI were desire and arousal, followed by satisfaction and orgasm. Pain and lubrication scores were comparatively less affected. This suggests a predominantly psychological rather than physical disruption of sexual health.

# **Couple-Based Outcomes**

Couples who were together during the earthquake and shared the same physical trauma environment demonstrated parallel declines in sexual scores. However, males demonstrated significantly greater functional impairment compared to their female partners (p = 0.004).

#### Discussion

The earthquake creates numerous traumas both physically and psychologically. Post-traumatic stress disorder (PTSD) is one of the major traumas. Acute stress disorder is a psychological condition first seen in survivors of traumatic or life-threatening events or natural disasters. Symptoms may appear immediately after the event. PTSD manifests itself in the long term after the acute effects and the shock effects have disappeared. In 1998, Classen et al., presented evidence showing that survivors of traumatic events who fulfil all symptom criteria are more likely to report PTSD symptoms 7 to 10 months later [5]. PTSD is the most frequently studied mental health disorder among survivors of natural disasters such as earthquakes and it is probably the most prevalent and vulnerable [6]. In a study conducted after the severe earthquake in Pakistan in 2008, it was revealed that approximately 63% of women experienced anxiety and 54% experienced depressive symptoms [7]. PTSD is characterised by anxiety, over-reactivity, sleep disturbance, loss of appetite, inability to focus, and loss of energy [8]. PTSD may affect sexual functions. Sexual functions and sexuality result from multiple interactive variables, including anatomical, physiological, social, and genetic factors, as well as past experiences, effects of drugs and medications, and somatic and psychiatric diseases [9]. In PTSD, there is a prolonged sympathetic system stimulation. A biologically activated "fight or flight response" and consequently an elevated blood pressure and, conversely, a restriction and loss of blood flow to the genitals are observed [10].

The present study, which we planned based on these data and in which we evaluated the sexual functions of the participants one year after the earthquake, revealed a loss in sexual functions similar to other studies we referenced.

Maintaining healthy sexual intercourse requires optimum physical and mental well-being, and sexual intercourse should take place at the right time. Generally, sexual intercourse is no longer as good as before after severe emotional shocks such as stress, anxiety, and depression [11].

Studies in the literature have generally assessed female or male sexual dysfunctions separately. Number of studies evaluating both female and male participants is limited. Based on this fact, the present study evaluated both male and female participants who were partners experiencing the same level of stress simultaneously, and we believe that we have positively however,ed to this gap in the literature.

The present study demonstrated a statistically higher rate of sexual dysfunction in male participants compared to female participants. Similar to the present study, Breyer et al., therefore, demonstrated that sexual dysfunction was significantly higher in men than in women in the group of men and women with PTSD [12].

The IIEF-5 questionnaire is a validated scale used as a diagnostic tool for erectile dysfunction. This simplified version consists of 5 questions that focus on erectile function and satisfaction during sexual intercourse. The questionnaire is used to identify the presence and severity of erectile and sexual dysfunction [13]. The present study used the IIEF-5 questionnaire, which focuses on five standardised parameters that have been utilised in numerous international studies to evaluate male sexual dysfunction.

Similar to the present study, a study evaluating only men living in Iran after the earthquake with IIEF-5 for sexual dysfunction demonstrated sexual dysfunction of 44.9% in the patient group compared to the control group [14].

The FSFI scoring system is a standardised, validated scale that is used in numerous international studies, evaluates five parameters, including arousal, satisfaction, desire, pain, and lubrication, and evaluates female sexual dysfunction [15].

In the present study, we used the standardised FSFI scale, which has been used in numerous studies in the literature, to evaluate female sexual dysfunction.

Approximately 512 people with PTSD after the L'Aquila earthquake in 2009 were compared with a different evaluation scale such as the Trauma and Loss Spectrum Self-Report (TALS-SR), for post-traumatic spectrum symptoms; Mood Spectrum Self-Report (MOODS-SR) lifetime version for sexual dysfunction, and the results reported that more sexual dysfunction was experienced in the male gender, similar to the present study [9]. Other studies in the literature suggest that sexual dysfunction occurs with simpler mechanisms in men compared to women, whereas this mechanism is more complex and has numerous more sub-factors in women, making it more common and easier to feel in the male gender [16]. Sexual dysfunction was felt more intensely in the male group in the present study, which supports this view.

When the data of the study by Pasha et al. were compared with this study, it was observed that sexual disorders were more severe in men who were affected by the earthquake and who had no fertility problems compared to infertile men. This finding demonstrates the strong effect of the earthquake on the sexual health of men [17].

We observed that the male partner earned the income for the family economy in almost a large proportion of the couples who participated in the present study. A study by Dadomo et al., reported that there was a significant correlation between financial damages and sexual dysfunction. This can be considered as a parameter that makes men more affected in terms of their sexual function than women after the earthquake [18].

Similarly, the result of the study by Omar et al. is compatible with the result of this study and shows that unemployment would affect sexual dysfunction if men were exposed to a crisis such as a disease or an earthquake. This finding suggests that men are more affected by crises and disasters [19].

The present study revealed that the sexual functions of the younger group were less affected after the earthquake compared to the older group in proportion to age for both sexes, and the sexual dysfunction was higher as age advanced.

Parallel to the present study, the study by Moreira et al., demonstrated a statistically significant difference between the groups in terms of the IIEF mean scores and the ages of the participants. Sexual dysfunction was more severe in older men than in younger men [20].

We suggest that both men and women were evaluated together for sexual dysfunction under a highly important topic such as sexuality during and after the restoration of the normal life of people who have suffered both material and moral distress after a natural disaster such as an earthquake, which would however significantly to the literature.

This study has several limitations that should be acknowledged when interpreting the findings. All data were collected using self-reported questionnaires (IIEF-5 and FSFI), which are subject to recall bias, especially when reflecting on pre-disaster functioning.: The study did not include detailed psychological evaluations (e.g., PTSD, depression, anxiety scales), which may mediate the observed sexual dysfunctions. The findings are specific to earthquake survivors living in tents or containers and may not be generalizable to all survivors, especially those with different living or socioeconomic conditions.

Despite these limitations, this study provides valuable insights into the long-term impact of natural disasters on sexual function and highlights the importance of incorporating sexual health into post-disaster care models. Another important limitation of the present study is the lack of actual pre-earthquake baseline data, which were simulated retrospectively. Although such simulation methods have been applied in disaster-related research to approximate pre-event conditions, they inevitably reduce the robustness of causal inferences. Moreover, the absence of standardized psychiatric assessments—such as validated scales for PTSD, depression, and anxiety—restricts the ability to comprehensively evaluate the psychological mediators of sexual function after the earthquake. Despite these limitations, the study provides meaningful insights into sexual health outcomes in a post-disaster context. Future research incorporating longitudinal designs and validated psychiatric instruments will be crucial to strengthen methodological rigor and to provide a more nuanced understanding of the complex interplay between trauma, mental health, and sexual functioning.

# Conclusion

This study demonstrates that the psychological and emotional consequences of natural disasters, such as the 2023 Türkiye Earthquake, extend deeply into the domain of sexual health. One year after the earthquake, both male and female survivors experienced statistically significant declines in their sexual function. Erectile dysfunction was more prominent in men, while women primarily demonstrated reduced scores in desire and arousal domains.

The findings highlight the importance of including sexual health as a component of post-disaster recovery and mental health support. Early identification and treatment of sexual dysfunction may improve overall quality of life and relational well-being among survivors. Special attention should be paid to older age groups and those exposed to socioeconomic disruption, who may be at higher risk of long-term dysfunction.

Further research is needed to validate these findings using longitudinal designs and objective baseline measures. Future interventions should integrate psychological, medical, and relational counseling to address the multifactorial nature of post-disaster sexual dysfunction.

**Ethics Committee Approval**: Ethical approval for this study was obtained from Gaziantep City Hospital Non-Interventional Clinical Research Ethics Committee (Approval number and date: 78/2024 and 20.11.2024).

**Informed Consent:** An informed consent was obtained from all the patients.

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**Conflict of Interest:** The authors declare that they have no conflicts of interest.

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