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Sleep Quality, Psychological Resilience And Locus Of Control In Earthquake-Affected Children

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Article

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Abstract

Background

Earthquake is a life experience that negatively affects individuals of all ages, especially children. Knowing and evaluating the effects of earthquake trauma on children's development and needs is important for the nursing process. The nurse should establish a relationship of trust with the child throughout the entire nursing care process, especially data collection, and allow the child to share their fears, feelings, and thoughts. It is thought that evaluating the sleep quality, psychological resilience and locus of control of children affected by earthquakes will contribute to the processes of diagnosing children who experience earthquakes and planning their interventions for diagnosis in the nursing care process.

Aim

The aim of this study is to evaluate the sleep quality, psychological resilience and locus of control of children between the ages of 10–18 affected by the earthquake.

Methods

This descriptive study was conducted with 219 children between the ages of 10–18 living in Diyarbakır province who experienced the February 6 earthquake. The research data were obtained using the personal information form, Pittsburgh Sleep Quality Scale, Adolescent Resilience Scale, and Rotter Internal-External Locus of Control Scale between March and May 2024. Both verbal and written permission was obtained from the parents of the children. The data were analyzed by transferring them to the SPSS 26 package program in the computer environment. The data were analyzed by independent sample t-test and ANOVA for parametric variables, Mann Whitney U and Kruskal Wallis H tests for nonparametric variables.

Results

Factors such as being away from home due to an earthquake, losing a relative in an earthquake, and living in an apartment were found to worsen sleep quality ($p < .05$). It was found that having performed earthquake drills before the earthquake and losing a relative in the earthquake increased psychological resilience ($p < .05$). It was found that the factors of living in an apartment, being away from home due to an earthquake, losing a relative in an earthquake, and not having parents together increased the tendency of external locus of control ($p < .05$).

Conclusion

According to the findings obtained in the study, the sleep quality of children affected by earthquakes is poor. Increased sleep quality in children increases psychological resilience. Increasing the psychological resilience of children reduces their tendency to external control.

INTRODUCTION

Very recently, at 04:17 local time on February 6, 2023, a devastating 7.7 magnitude earthquake occurred in Kahramanmaraş, in the southeastern region of Turkey. Approximately nine hours later, the same region was shaken by another earthquake of magnitude 7.6 on the Richter scale, and more than 1000 aftershocks occurred, some of which were greater than 6 (Canpolat et al. 2023, AFAD 2023). Both earthquakes were strongly felt in Kahramanmaraş, Hatay, Adıyaman, Gaziantep, Malatya, Kilis, Diyarbakır, Adana, Osmaniye, Şanlıurfa and Elazığ, causing loss of life and severe damage (Karaahmetoğlu and Arabacı 2025).

Earthquakes are one of the sudden and most unpredictable natural disasters and have a great impact on the psychological and physical health of survivors (Li et al 2020). Earthquakes are one of the most common natural disasters with traumatic and long-lasting effects, especially among children and young people. One of the physiological processes that are most affected by traumatic events is the sleep mechanism. It is known that sleep problems are common among earthquake victims (Karaahmetoğlu and Arabacı 2025, Charlie et al. 2018, Aktura et al. 2025). There are also studies reporting that sleep problems mediate the relationship between earthquake exposure and psychological symptoms (Düken 2024, Wang et al. 2021, Liang et al. 2019). Sleep is a process that has metabolic health and physiological functions as well as psychological and emotional functions; it positively affects the work of the brain and cognitive performance (Mason et al. 2021), supports the immune system (Garbarino et al. 2021), affects appetite hormones and the work of the endocrine system (Chaput et al. 2023, Uchima Koecklin 2023), and has cardiovascular functions (Huynh 2024). For this reason, nursing care is very important for the evaluation, regulation and maintenance of sleep. It is known that childhood troubles and traumatic events pave the way for the development of psychopathology (Ma et al. 2021, Purgato 2020, Zheng et al. 2022). Psychological resilience, in its most general definition, can be defined as a dynamic and systematic process with successful adaptation in the face of risk or threat, health protection or recovery steps against stressors (Mesman et al. 2021). In some studies, psychological resilience has been reported to be protective against psychopathology in children experiencing natural disasters (An et al. 2020, Shi et al. 2021, Chen et al 2022). On the other hand, there are studies reporting that traumatic events and stress negatively affect psychological resilience (Fossion et al. 2013, Fossion et al. 2014, Jin et al. 2021, Singha et al. 2024), as well as studies reporting that they increase psychological resilience by positively affecting it (Shi et al 2021, Harrison et al. 2021). In a study on natural disaster survivors, it was emphasized that affect and fear associated with the traumatic event developed characteristics that could positively affect the individual, such as a great sense of purpose and increased resilience (Shi et al. 2021).

Locus of control is the degree to which individuals believe they can control events that affect their lives (Zhang et al. 2014). If a person's focus is internal, the person believes he or she can control his or her life; if external, the person believes that his or her decisions and life are shaped by environmental factors (fate, luck, or other strong beliefs) that he or she cannot control. In the literature, it has been reported that external locus of control exacerbates depression and PTSD symptoms in individuals with a traumatic history (Thomas et al. 2024), and partially mediates the relationship between trauma exposure and PTSD symptoms in individuals (Atilola et al. 2021). Studies on adolescents in earthquake victims have found that internal locus of control is a protective factor against PTSD symptoms (Zhang et al. 2014, Zhang et al. 2011, Güzel et al. 2024).

In the literature, the number of studies examining the relationship between sleep quality, psychological resilience and locus of control of adolescents in earthquake victims is limited. However, it is thought that these variables and the relationship between them are important factors affecting pre-earthquake preparedness and resilience, response during and/or after earthquakes, stress, and anxiety. In this direction, this study aims to examine the sleep quality, psychological resilience and locus of control of children between the ages of 10–18 in the earthquake victim and the relationship between these variables based on the information in the literature.

MATERIAL AND METHOD

Research Model

In this study, relational screening model was used to test whether there is a relationship between sleep quality, psychological resilience and locus of control and these variables in children between the ages of 10–18 who experienced the February 6 Kahramanmaraş earthquakes.

Population and Sample Selection

A power analysis was performed to determine the sufficient number of samples for the study. Power analysis was performed with G*Power 3.1.9.4 package program (Faul et al. 2007). In the study, the effect size was taken as a smaller value than the medium effect size based on expert opinion (Ro (ρ) = .25). According to the power analysis performed with reference to this effect size, the minimum number of samples was calculated as 197 people according to the parameters of effect size (ρ) = .25, error margin (α) = .05 and power (1-β) = .95 for the double-tailed hypothesis (critical t = 1.972). The number obtained from the calculation of the additional sample was added to the minimum sample number and the number of samples to be taken for this study was obtained. After these calculations, it was decided to include a minimum of 215 (197 + 18 additional samples) children in the study. The sample of the study consisted of 219 children between the ages of 10–18 who applied to Metropol Family Health Center in Kayapınar district of Diyarbakır province between March 2024 and May 2024, experienced the February 6

Kahramanmaraş earthquakes, volunteered to participate in the study and were allowed to participate in the study by their parents both verbally and in writing.

Data Collection Tools

In our research, "Personal Information Form", "Pittsburgh Sleep Quality Index", "Adolescent Resilience Scale" and "Rotter Internal and External Locus of Control Scale" were used.

Personal Information Form

It is a form developed by the researcher in order to clearly and unambiguously determine the characteristics of the sample group. In addition to the demographic information of the participants such as age, gender, and the class they studied, the form includes questions about demographic information such as the educational status of their parents and their profession. In the form consisting of a total of 23 questions, there were also questions that were important for the research subject, such as individuals' earthquake experiences, what words they used to describe the earthquake, the architectural structure of the house where they experienced the earthquake, if it was an apartment, what floor it was on, whether they were away from their homes for a while or completely due to the earthquake, whether there was an earthquake drill at school, and whether they lost an acquaintance/relative in the earthquake (Arslan 2023, Kurt and Gülbahçe 2019).

Adolescent Psychological Resilience Scale (PDS)

Psychological Resilience Scale for Adolescents was developed by Yunus Altundağ, Sefa Bulut and Uğur Doğan and prepared in a 4-point Likert (1- Not suitable for me at all, 4- Very suitable for me) type. The scale consists of 6 sub-dimensions and 29 items in the form of family support, peer support, school support, adaptation, struggle determination and empathy. The lowest score that can be obtained from the scale is 29 and the highest score is 116. High scores obtained from the scale indicate a high level of psychological resilience for adolescents (Bulut et al. 2013).

Inverse items (7, 10, 11, 14, 15, 16, 17 22, 23, 26) were calculated by the reverse scoring method, and the high scores indicate the high psychological resilience of the adolescent. It was calculated as "1" point for the option not suitable for me at all and "4" points for the option very suitable for me (Bulut et al. 2013).

In the validity and reliability study conducted by Bulut, Doğan and Altundağ, the Cronbach α coefficient for the entire scale was 87 (Bulut et al. 2013). In this study, the Cronbach α coefficient was calculated as ,90.

Pittsburgh Sleep Quality Scale (PSQI)

The Pittsburgh Sleep Quality Scale was developed by Buysse et al. (1989) and adapted to Turkish by Ağargün et al. (1996). The scale is a self-reported screening and evaluation test that provides detailed information about sleep quality and type and severity of sleep disturbance in the last month (Ağargün et al. 1996). There is also a 5-question section in the scale filled by the bed/roommate of the person participating in the test, but this section was not used because our study was conducted on adolescents.

The sleep quality of individuals with a minimum PSQI score of 0 and a maximum of 21, and individuals with a total PSQI score below 5 are evaluated as "good", "5" and "5" sleep quality is evaluated as "poor" (Ağargün et al. 1996).

In the validity and reliability study conducted by Ağargün et al., the Cronbach α coefficient for the entire scale was calculated as 80 (Ağargün et al. 1996). In this study, the Cronbach α coefficient was calculated as ,71.

Rotter internal-external Locus of Control Scale (LOC)

In order to determine the control foci of adolescents, the Rotter Internal-External Locus of Control Scale developed by Rotter (1966) and adapted to Turkish by Dağ (1991) was used. As a result of the analysis of the basic components applied for construct validity, 7 sub-factors that can explain 47.7% of the variance were reached. These are;

1- Lack of luck control

2-External control in political events

3- Luck control

4- Lack of control of school success

5- Lack of control in interpersonal relationships

6-Fatalism

7- Lack of control in political events (Dağ 1991).

The individual who answers the test is asked to select one of the more suitable options a or b, and 6 of the 29 items (1, 8, 14, 19, 24, 27) are excluded from scoring because they are fillers. Among the other questions, the "a" options of the items 2,6,7,9,16,17,18,20,21,23,25,29 and the "b" options of the items 3,4,5,10,11,12,13,15,22,26,28 receive 1 point. Thus, a minimum of 0 and a maximum of 23 points can be obtained from the scale. Rising scores indicate an increase in the individual's belief in the external locus of control, while falling scores indicate that the individual has the internal locus of control (Dağ 1991).

In the validity and reliability study conducted by Dağ (1991), it was found that the item-total score correlations of the scale varied between 11 and 48, and the KR-20 internal consistency coefficients in different samples were 77 and 68 (Dağ 1991). In this study, the Cronbach α coefficient was calculated as ,70.

Committee Approval

Ethics committee approval required for the study was obtained from the Clinical Research Ethics Committee of SBU Gazi Yaşargil Training and Research Hospital (Issue-Date: 536 – 13/10/2023). The necessary institutional permission was obtained to conduct the study (Issue-Date: 230949677-12.03. 2024). The legal guardians were informed that the children's participation in the study was entirely voluntary, that participation in or withdrawal from the study would not affect the children's access to healthcare services, and that all personal information obtained would be kept confidential. Prior to participation in the study, informed consent was obtained from the children's legal guardians, and both verbal and written consent were obtained to ensure the children's participation in the study. The legal guardians were also informed that they could request the withdrawal of their children from the study at any time, without providing any reason and without experiencing any loss of rights. The study was conducted in accordance with the principles of the Declaration of Helsinki and all relevant ethical guidelines and regulations.

Scientific Work and Institution Permit

The scientific study and institution permission required for the conduct of the research was obtained from Diyarbakır Provincial Health Directorate on 12/03/2024.

Data Collection

Research data were collected between March and May 2024. The research sample consisted of 219 adolescents. The scales were distributed to the children who applied to Metropol Family Health Center through the team working in the center and the researcher. Both verbal and written consent was obtained from the parents of the children participating in the study. The legal guardians of the children participating in the study were provided with detailed information about the purpose and scope of the study, the methods to be used, the study procedures, and the potential benefits and risks. The legal guardians were informed that the children's participation in the study was entirely voluntary, that participation in or withdrawal from the study would not affect the children's access to healthcare services, and that all personal information obtained would be kept confidential. Prior to participation in the study, informed consent was obtained from the children's legal guardians, and both verbal and written consent were obtained to ensure the children's participation in the study. The legal guardians were also informed that they could request the withdrawal of their children from the study at any time, without providing any reason and without experiencing any loss of rights.

Statistical Analysis of Data

The data obtained from the children who filled out the data forms completely were evaluated. The obtained data were transferred to the computer environment and analyzed with the SPSS 26.0 program. For the normal distribution, the kurtosis and skewness values of the variables were examined and the values in the range of ± 1.5 were accepted as normal distribution (Bayram 2010). The Cronbach reliability coefficient was examined for the reliability of the measurement tools. For descriptive statistics, number, mean and percentage slices are given. In the comparison of variables, independent sample t-test and ANOVA were performed for parametric variables, Mann Whitney U and Kruskal Wallis H tests were performed for nonparametric variables. Bonferroni correction was made in the pairwise comparison of the variables with a significant difference as a result of the Kruskal Wallis H test. Pearson correlation analysis was used for relationships between variables.

The datasets generated and/or analysed during the current study are not publicly available due to privacy and ethical restrictions but are available from the corresponding author on reasonable request.

Limitations of the Study

- The study is limited to children between the ages of 10–18 who applied to Metropol Family Health Center in Kayapınar District of Diyarbakır province between March 2024 and May 2024.
- The study was conducted in a single unit.
- The data obtained in the study are based on children's self-report.
- The data of our study were collected 1 year after the February 6 earthquake.

RESULTS

1. Descriptive characteristics of children and earthquake-related characteristics of children

Supplementary Table 1 shows the children's age, grade levels, and school type characteristics. 53% of the children are girls and 47% are boys. 84% of the children participating in the study are in public school and 16% are in private school. When the education levels are examined, the rate of those who graduated is 15.1%, the rate of those who study in primary education is 29.7% and the rate of those who study in secondary education is 55.3%. The age of the children participating in the study ranged from 10 to 18 and the average age was calculated as 15.4 ± 2.5.

Supplementary Table 2 shows the characteristics of the children's families. Among the children, the rate of those whose parents are together is 90%, and the rate of those who are not together is 10%. The rate of those with a nuclear family is 81.7% and the rate of those with a large family is 18.3%. The rate of those whose mothers are employed is 17.8%, the rate of those whose mothers are not employed is 82.2%, the rate of those whose fathers are employed is 78.5%, and the rate of those whose fathers are not employed is 21.5%. When the education level of the mother is examined, the rate of those whose mothers are illiterate is 33.8%, the rate of those who are primary school graduates is 27.4%, the rate of those who are secondary school graduates is 18.3%, the rate of those who are high school graduates is

12.3% and the rate of those who are university graduates is 8.2%. When the education level of the father is examined, the rate of those whose fathers are illiterate is 11.4%, the rate of those who are primary school graduates is 27.9%, the rate of those who are secondary school graduates is 30.1%, the rate of those who are high school graduates is 16% and the rate of those who are university graduates is 14.6%.

Annex Table 3 shows the type of home where the children lived, their experience of earthquake drills before February 6, losing a relative in the earthquake and staying away from home due to the earthquake. The rate of those who have a house-type apartment where the children live is 77.2%, and the rate of those who are detached is 22.8%. The rate of those who had earthquake experience before the earthquake before February 6 is 66.2%, and the rate of those who did not have earthquake is 33.8%. The rate of those who stated that earthquake drills were carried out in their schools is 63.9%, and the rate of those who stated that they were not carried out is 36.1%. The rate of those who are away from home due to the earthquake is 71.2%, and the rate of those who do not stay is 28.8%.

Table 3
Children's mean LOC scores according to earthquake-related factors

Variable	Category	n	X	ss	p
House	Flat	169	12,79	3,81	t: 2,450
	Private	50	11,28	3,93	p: ,015
Earthquake experience before February 6	Yes	145	12,51	4,07	t: ,335
	No	74	12,32	3,51	p: ,738
Are earthquake drills being conducted?	Yes	140	12,31	3,91	t: -,676
	No	79	12,68	3,84	p: ,500
Losing a loved one in an earthquake	Yes	90	12,89	4,21	t: 1,410
	No	129	12,14	3,61	p: ,160
Being away from home due to an earthquake	Yes	156	12,86	3,90	t: 2,500
	No	63	11,43	3,67	p: ,013

X: average; ss: Standard deviation; LOC: Rotter Internal and External Locus of Control Scale; t: independent samples t test

2. Children's mean PSQI, PRS and LOC scores

Supplementary Table 4 shows the children's PSQI, PRS, and LOC mean scores and normal distribution findings. The mean PSQI score of the children participating in the study was calculated as 8.1 ± 4.1, the mean PRS score as 85.6 ± 13.7 and the mean LOC score as 12.5 ± 3.9. According to these findings, the sleep quality of the children participating in the study is poor and their psychological resilience is high.

2.1. The relationship between children's PSQI, PRS and LOC variables

According to Annex Table 5, a positive correlation was found between PSQI and PRS (r: − .335; p< .001). According to this finding, as sleep quality increases, psychological resilience level also increases. A negative correlation was found between PSQI and LOC (r: .250; p< .001). According to this finding, as sleep quality increases, the level of external locus of control decreases. A negative correlation was found between PRS and LOC (r: − .398; p< .001). According to this finding, as the level of psychological resilience increases, the level of external locus of control decreases

2.2. The relationship between PSQI, PRS and LOC mean score and earthquake-related characteristics

Table 1 shows the relationship between PSQI and earthquake-related characteristics. The mean PSQI score of those living in the apartment was 8.39 ± 4.19, and the mean score of those living in a detached house was 7.08 ± 3.39, and there was a statistically significant difference between the two groups (t:2.022; p< .05). According to this finding, the sleep quality level of those living in the apartment is worse than those living in a detached house. In addition, the mean PSQI score of those who lost their relatives in the earthquake was 8.80 ± 4.31, and the mean PSQI score of those who did not lose was 7.60 ± 3.80, and there was a statistically significant difference between the two groups (t: 2.179; p< .05). According to this finding, the sleep quality level of those who lost their relatives in the earthquake is worse than those who did not lose their relatives in the earthquake.

Table 1
Children's average PSQI scores according to earthquake-related factors

Variable	Category	N	X	Ss	p
House	Flat	169	8,39	4,19	t: 2,022
	Private	50	7,08	3,39	p: ,044
Earthquake experience before February 6	Yes	145	8,37	4,22	t: 1,440
	No	74	7,54	3,68	p: ,151
Are earthquake drills being conducted?	Yes	140	7,90	3,98	t: -,930
	No	79	8,43	4,18	p: ,354
Losing a loved one in an earthquake	Yes	90	8,80	4,31	t: 2,179
	No	129	7,60	3,80	p: ,030
Being away from home due to an earthquake	Yes	156	8,50	4,22	t: 2,373
	No	63	7,08	3,43	p: ,019

X: average; ss: Standard deviation; PSQI: Pittsburgh Sleep Quality Scale; t: independent samples t test

Table 2 shows the relationship between PRS and earthquake-related characteristics. The mean PRS score of those who lost their relatives in the earthquake was 82.13 ± 15.37, and the mean PRS score of those who did not lose was 88.02 ± 11.79, and there was a statistically significant difference between

the two groups (t: -3.203; p< .05). According to this finding, the psychological resilience level of those who did not lose their relatives in the earthquake is higher than those who lost their relatives in the earthquake. The mean PRS score of those who stated that earthquake drills were performed at their schools was 87.57 ± 12.58, and the mean PRS score of those who stated that they were not performed was 82.10 ± 14.81, and there was a statistically significant difference between the two groups (t: 2.895; p< .05). According to this finding, the psychological resilience level of those who had earthquake drills at their schools is higher than those who did not have earthquake drills.

Table 2
Children's average PRS scores according to earthquake-related factors

Variable	Category	N	X	ss	P
House	Flat	169	84,86	13,89	t: -1,479
	Private	50	88,10	12,65	p: ,141
Earthquake experience before February 6	Yes	145	85,39	13,82	t: -,310
	No	74	86,00	13,40	p: ,756
Are earthquake drills being conducted?	Yes	140	87,57	12,58	t: 2,895
	No	79	82,10	14,81	p: ,004
Losing a loved one in an earthquake	Yes	90	82,13	15,37	t: -3,203
	No	129	88,02	11,79	p: ,002
Being away from home due to an earthquake	Yes	156	84,83	14,11	t: -1,318
	No	63	87,51	12,35	p: ,189
X: average; ss: Standard deviation; PRS Adolescent Resilience Scale; t: independent samples t test					

Table 3 shows the relationship between LOC and earthquake-related characteristics. The mean LOC score of those who stayed away from home due to the earthquake was 12.86 ± 3.90, and the mean LOC score of those who did not stay was 11.43 ± 3.67, and there was a statistically significant difference between the two groups (t:2.500; p< .05). According to this finding, those who are away from home due to an earthquake have a higher external focus of control than those who are not away from home due to an earthquake.

DISCUSSION

The current study evaluated the sleep quality, psychological resilience and locus of control of children between the ages of 10–18 affected by the February 6 earthquakes, and the findings of the research were interpreted and discussed according to the literature review on research problems.

It was found that the sleep quality of the children who participated in the study was poor. This finding is consistent with studies reporting that sleep is a system affected by emotional experiences and that sleep disturbances are common in adolescents who experience earthquakes. In the study conducted by Xiao-Yan Chen et al. (2021), which constituted the sample of adolescents who experienced the Wenchuan earthquake, it was reported that sleep disturbances were common among survivors (Chen et al. 2021). In the study conducted by Koçak et al. (2025) with adolescents who were earthquake victims on February 6, more than half of the children participating in the study were found to have sleep disorders (Koçak et al. 2025). In the study conducted by Ceylan (2024), whose sample consisted of adolescents, it was reported that adolescents who experienced disaster experienced more insomnia than adolescents who did not (Ceylan 2024). In addition, in our study, it was found that the sleep quality of the children who lost their relatives in the earthquake was worse than the children who did not lose their relatives in the earthquake. This finding is consistent with studies reporting that individuals who lose a relative or witness death due to an earthquake increase the risk of developing sleep problems (Karaahmetoğlu and Arabacı 2025, Tang et al. 2018). In this context, the findings of the research coincide with the literature. It is important to note that poor sleep quality in individuals who experience earthquakes and an increased risk of sleep-related problems may be due to factors such as overstimulation due to traumatic events such as earthquakes, nightmares, fear of re-earthquakes, fear of death, being caught in earthquake sleep, difficulty in going to sleep and prolonged sleep transition, having posttraumatic effects such as waking up at night, waking up earlier than normal, and disruption of the sleep routine to which they are accustomed (Aktura et al. 2025, Tamer et al. 2023, Tang et al. 2017). An earthquake is a sudden and unexpected event, and deaths due to an earthquake are sudden and unexpected. Sleep, which is important for mental and physical health and is affected by stressful situations, is a process with physiological, psychological and social dimensions (Canpolat et al. 2023, Karaahmetoğlu and Arabacı 2025). According to the literature, the fact that children know that death is a universal and inevitable phenomenon due to their age and cognitive development, and that they are worried and afraid that this may happen to themselves or their loved ones are among the causes of poor sleep quality (Aktura et al. 2025).

According to the findings of the study, the psychological resilience of children who experience earthquakes is high. A study conducted 10 years after the Yushu earthquake found that adolescents' resilience was moderate (Tang et al. 2017). In a cohort study, it was concluded that the psychological resilience of earthquake-exposed adolescents, who were followed up for 10 years, increased every year (Chen et al. 2022). For this reason, it is important for students exposed to earthquake trauma to adapt to life after the earthquake, to adapt to the process and to be supported by nurse academicians and their friends in terms of their general health (Tang et al. 2017). In similar studies conducted with adults, the psychological resilience levels of the participants affected by the earthquake were found to be moderately high (Şirin Gök et al. 2024, Koca et al. 2025). On the other hand, the findings of the study contradict the findings of the study with lower psychological resilience due to the severity of the earthquake and other factors of traumatic experiences (Liu et al. 2013). In another study, no significant difference was found between the psychological resilience levels of individuals affected and unaffected

by the earthquake (Rossi et al. 2020). These differences in the literature may be due to other factors that positively affect the psychological resilience of individuals despite experiencing the same trauma in the face of traumatic experiences. It is suggested that psychological resilience is a highly variable component of mental health among people facing difficulties (Okuyama et al. 2018). It is important to note that psychological resilience may be affected by multiple factors such as the individual's life experiences, self-control ability, academic achievement, self-confidence and self-esteem perceptions, future expectations, sociocultural and cognitive resources, communication skills, being introverted or extroverted, family and environmental relations, and mechanisms of coping with stressors (Okuyama et al. 2018, Wang et al. 2021, Fu et al. 2014).

In this study, it was found that the psychological resilience of those who did not lose a relative due to the earthquake was higher than those who lost a relative in the earthquake. In the literature review on this finding, studies that exactly coincide with the research could not be found. The finding of the study coincides with studies on adults reporting that resilience is inversely proportional to fear of loss and death (Çetin and Anuk 2020, Arredondo and Caparrós 2022, Mohammadi et al. 2022). According to the study conducted by Çetin and Anuk (2020) on university students, it was found that those who did not experience death due to Covid-19 in their families and close circles had higher psychological resilience (Çetin and Anuk 2020). However, there are also studies that do not report a relationship between fear of death and psychological resilience (Fernández-Martínez et al. 2021). Psychological resilience is the capacity of psychology that can be developed or reduced by the effect of individual and environmental factors (Çetin and Anuk 2020). In this study, it is thought that the fact that the psychological resilience of children who lost a relative in the earthquake is lower than those who did not lose their relatives in the earthquake is due to individual risk factors such as the fear that death may happen to themselves or other loved ones, family risk factors such as the deceased person being one of the family members they live with, and social risk factors such as the damage in the earthquake and the high number of deaths due to this.

In this study, it was found that as sleep quality increased, psychological resilience level also increased. In the literature, studies with both the same and different sample groups were found with the sample group of the research. Studies on adults have found that better sleep quality in participants has a positive relationship with higher psychological resilience (Fernández-Martínez et al. 2021, Hughes et al. 2018, Zhu et al. 2024). In this context, the findings of the research coincide with the literature. It has been proven in previous studies that there is a close relationship between stress and sleep disturbance in human life and that healthy sleepers have higher psychological resilience (Hughes et al. 2018, Zhu et al. 2024, Cai et al. 2023). In addition, according to the literature, it is known that psychological resilience also increases sleep quality and is even a buffering factor against different factors that adversely affect sleep (58 Zhu et al. 2024, Cai et al. 2023, Wang et al. 2022, Xie et al. 2023, Shi et al. 2022, Wojujutari et al. 2019). In a study conducted with secondary school students, it was concluded that psychological resilience is protective against sleep disorders and psychotic-like experiences in adolescents (Wang et al. 2022). In the light of these findings, it is thought that there is a variable two-way relationship between sleep quality and psychological resilience.

In this study, it was found that as psychological resilience scores increased, the tendency to internal locus of control increased. No studies on adolescents have been found in the literature, and the findings of studies on adults support the findings of this study (Slatinsky et al. 2022, Rajan et al. 2018). In the light of the literature, it is known that individuals focused on internal control have higher psychological resilience (Navarro et al. 2018, Türk Kurtça and Kocatürk 2020). It is reported that the effect of internal locus of control on psychological resilience may be related to the extroverted personality traits of individuals with high internal locus of control, effective coping mechanisms with stress, their ability to direct their own lives, their ability to take responsibility for the events they encounter and their belief in their internal potential (Navarro et al. 2018, Türk Kurtça and Kocatürk 2020, Fu et al. 2021).

In the study, it was found that those who are away from home due to an earthquake have a higher external focus of control than those who are not away from home. In the literature review, no study has been found to discuss this finding. When individuals believe that events and outcomes are controllable, they avoid learned helplessness and instead take active attempts to overcome negative situations. Conversely, people with external locus of control believe that events such as fate, luck, or another force occur outside their control (Zhang et al. 2014, Thomas et al. 2024). Natural disasters are events that develop beyond individual control and can catch individuals unprepared.

According to the findings of the study, the sleep quality of children living in detached houses is better than the sleep quality of children living in apartments. Although no one-to-one research has been found in the literature to discuss this finding, in the study conducted by Hoyniak et al. (2022) on the sleep of preschool children, it was found that low physical quality home environment negatively affected children's sleep (Hoyniak et al. 2022). In the study conducted by Doane et al. (2019) on children in middle childhood, it was reported that low physical quality home environment negatively affected variables such as sleep duration and falling asleep time (Doane et al. 2019). In this context, the findings of the research coincide with the literature. Earthquakes cause physical damage to architectural structures. In this direction, the need for shelter and protection arises for individuals who experience earthquakes to survive (Canpolat et al. 2023, Karaahmetoğlu and Arabacı 2025). It is thought that the poorer sleep quality of the children living in the apartment is due to the fact that the apartment is more damaged in earthquakes compared to the detached houses, it is more difficult to go out at the time of the earthquake compared to the detached houses, the apartments are higher compared to the detached houses and this height increases the severity of the earthquake.

In the study, it was found that the sleep quality level of those who were not away from home due to the earthquake was higher than those who were away from home due to the earthquake. In the literature, similar studies could not be found to discuss this finding. However, there are studies reporting that the sleep quality of individuals who sleep somewhere other than home is poor (Bevan et al. 2019, Hunnicutt et al. 2024, Baulk Stuart and Fletcher 2012). The need for security is interrupted in children who are away from home due to earthquake trauma. Circadian rhythm, which is affected by situations such as insecurity, hormonal and emotional fluctuations, disease, death, and stress, is worse with the deficiencies in the physical structure of the sleep area (Zheng et al. 2022, An et al. 2020, Tang et al.

2018). There are also studies in the literature reporting that the sleep quality of homeless individuals is poor. In the study conducted by Gonzalez et al. (2020) on homeless adults, it was reported that people who experienced homelessness slept less, experienced more daytime fatigue and experienced more sleep disorders than the general population (Gonzalez and Tyminski 2020). In the study conducted by Budescu et al. (2024) on young homeless people between the ages of 16–24, more than half of the sample group stated that they did not sleep enough (Budescu et al. 2024). Due to the earthquake, a large number of people have been left homeless. In Maslow's hierarchy of basic needs, the need for security comes next to physiological needs. Basically, the need for security emerges as a need for individuals to live in a safe environment away from conflicts and confusion (Zheng et al. 2022, An et al. 2020, Gonzalez and Tyminski 2020). It is known that individuals who experience homelessness do not have autonomy over their sleeping environments in environmental contexts such as noise, light, sound, temperature, bed and pillow comfort, and that failure to meet safety requirements worsens sleep quality (Gonzalez and Tyminski 2020).

In this study, the psychological resilience of children with earthquake drill experience is higher than children without earthquake drill experience. In the literature, it has been reported that preparedness and prevention actions aimed at increasing knowledge about natural disasters can play an important role in reducing the traumatic effect of disasters by protecting both physical and psychological well-being and reducing psychopathological consequences (Raccanello et al. 2023). Being aware of the effects of natural disasters and mobilizing children's psychological resources in advance is one of the important steps in developing their resilience.

CONCLUSIONS

- As the level of psychological resilience increases, the level of external locus of control decreases.
- Those living in an apartment have a higher external focus of control than those living in a detached house, those who are away from home due to an earthquake, and those who are not away from home.
- As sleep quality increases, the level of psychological resilience also increases, and the level of external locus of control decreases.
- The sleep quality level of those living in a detached house is higher than those living in an apartment, those who did not lose their relatives in the earthquake, and those who were not away from home due to the earthquake.
- The psychological resilience level of those who did earthquake drills is higher than those who did not, and the psychological resilience level of those who did not lose their relatives in the earthquake is higher than those who lost.

In line with these results;

- Considering the studies in the literature and different results, the subject should be addressed in studies in which a larger sample group and different variables are included in the study,

- Supporting/developing children with programs that increase their psychological resilience and internal locus of control tendencies, improve positive coping strategies and mental health in the face of negative stressors, including these issues in the education and training curriculum,
- Organizing television programs, social activities, public organizations that will increase children's awareness of earthquake recognition, understanding the causes of earthquakes and protection from earthquakes; including this subject in the education and training curriculum in all class levels in accordance with the age levels of children,
- Organizing training programs and projects for children, parents, teachers, and staff working in nursing homes in order to increase sleep quality in children, to understand the importance and functions of sleep, to ensure and protect sleep hygiene,
- Providing the necessary support by evaluating children with risk factors such as poor sleep quality, external locus of control, fragmented family structure, positive-negative life experiences that affect children's psychological resilience,
- Conducting earthquake drills systematically and regularly in schools,
- Other studies be carried out for the factors that strengthen the sleep quality, 6. psychological resilience and internal locus of control of children, are recommended.

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Declarations

CONFLICTS OF INTEREST

We declare that there is no conflict of interest.

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Author Contribution

Author Contributions: Conceptualization – GY,GBD ; Design – GY,GBD; Supervision – GY,GBD; Data Collection and/or Processing – GY,GBD; Analysis and/or Interpretation – GY,GBD; Literature Review – GY,GBD; Writing – GY,GBD; Critical Review – GY,GBD

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Data Availability

All data supporting the findings of this study are available within the paper and its Supplementary Information.

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