**Research**

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# Relationships Between Place Identity, Post-Traumatic Stress Symptoms, and Psychological Well-Being After the Earthquake in Hatay

## Hatay'da Deprem Sonrasında Yer Kimliği, Travma Sonrası Stres Belirtileri ve Psikolojik İyi Oluş Arasındaki İlişkiler

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## ABSTRACT

Objective: This study aimed to examine whether place identity, post-traumatic stress symptoms, and psychological well-being differ according to age and gender among adults exposed to the earthquakes that occurred on February 6 and February 20, 2023, and subsequent aftershocks.

Method: The study included 408 adults (200 women, 208 men) exposed to the earthquakes. Data were collected face-to-face using a sociodemographic information form, the Place Identity Scale, the PERMA Scale, and the PTSD Checklist for DSM-5.

Results: Post-traumatic stress symptoms differed by age, with higher scores in the 26–43 group than in the 52+ group. Place identity also differed by age. Post-traumatic stress symptoms were negatively correlated with psychological well-being. The direct effect on psychological well-being was significant and negative, but the indirect effect through place identity was not significant.

Conclusion: The findings indicate that post-traumatic stress symptoms are associated with lower psychological well-being, whereas place identity did not significantly mediate this relationship.

**Keywords:** Place identity, well-being, earthquake, trauma

## ÖZ

Amaç: Bu çalışmada, 6 Şubat ve 20 Şubat 2023 tarihlerinde meydana gelen depremler ve sonrasında gerçekleşen artçı sarsıntılara maruz kalan yetişkinlerde, yere bağlılık/yer kimliği, travma sonrası stres belirtileri ve psikolojik iyi oluş düzeylerinin yaş ve cinsiyete göre farklılaşıp farklılaşmadığının incelenmesi amaçlanmıştır.

Yöntem: Araştırmaya depremlere maruz kalan 408 yetişkin (200 kadın, 208 erkek) katılmıştır. Veriler, sosyodemografik bilgi formu, Yer Kimliği Ölçeği, PERMA Ölçeği ve DSM-5 için Travma Sonrası Stres Bozukluğu Kontrol Listesi kullanılarak yüz yüze toplanmıştır.

Bulgular: Travma sonrası stres belirtileri yaşa göre anlamlı farklılık göstermiştir. 26–43 yaş grubunun puanları 52 yaş ve üzeri gruba göre daha yüksektir. Yer kimliği de yaşa göre anlamlı farklılık göstermiştir. Travma sonrası stres belirtileri ile psikolojik iyi oluş arasında negatif yönde anlamlı bir ilişki bulunmuştur. Travma sonrası stres belirtilerinin psikolojik iyi oluş üzerindeki doğrudan etkisi anlamlı ve negatif bulunurken, yer kimliği üzerinden dolaylı etkisi anlamlı değildir.

Sonuç: Bulgular, travma sonrası stres belirtilerinin daha düşük psikolojik iyi oluş ile ilişkili olduğunu, ancak yer kimliğinin bu ilişkide anlamlı bir aracılık rolü üstlenmediğini göstermektedir.

**Anahtar sözcükler:** Yer kimliği, psikolojik iyi oluş, deprem, travma

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# Introduction

The earthquakes centered in Kahramanmaraş, with magnitudes of 7.7 and 7.6, which occurred in Türkiye on February 6, 2023, and the 6.4 magnitude earthquake centered in Hatay that occurred on February 20, 2023, affected 11 provinces and approximately 14 million people living in these provinces, causing extensive destruction in several cities. As a result of the earthquakes, 507,000 residences and workplaces were either destroyed or damaged beyond repair, and more than 50,000 people lost their lives. In addition, this disaster caused a large number of people to become homeless and exposed them to severe winter conditions (UNDP 2023). The "First Month Report on the February 6, 2023 Kahramanmaraş and February 20, 2023 Hatay Earthquakes" prepared by the Turkish Medical Association (TTB 2023) revealed that Hatay was one of the provinces most severely affected by the earthquake. Approximately 85% of the housing stock in the city center was destroyed, and a substantial portion of the structures of cultural heritage significance were either completely demolished or severely damaged (TMMOB Mimarlar Odası 2023). The destruction caused by the earthquake and the subsequent reserve area decisions resulted in earthquake-affected individuals living in container cities for extended periods and relocating to areas different from their former settlements.

Among individuals affected by the earthquake, in addition to multidimensional stress responses associated with trauma and losses, significant increases may also be observed in the prevalence of post-traumatic stress disorder, major depression, sleep disturbances, and anxiety symptoms (Stroebe et al. 2007, Sönmez and Hocaoğlu 2023, Stukova et al. 2023). It has been observed that even years later, survivors experience a decline in subjective well-being and that the loss of well-being cannot be prevented through divorce and family disintegration (Wang and Wang 2023). All these findings indicate that the adversities experienced through different psychological dynamics after the earthquake negatively affect individuals' lives and that these effects may persist for a prolonged period.

The emergence of post-disaster traumatic stress and related psychological problems is associated not only with variables such as the degree of exposure to the traumatic event, social support, age, gender, economic resources, and ethnicity, but also with risk factors including coping level, emotion regulation skills, and prior exposure to trauma (Sönmez and Hocaoğlu 2023, Stukova et al. 2023). Furthermore, a study conducted 20 months after the Central Italy earthquakes of August 24, 2016, with survivors of the earthquake demonstrated that the prevalent content of participants' intrusive memories was associated not only with human loss and death, but also with the loss of the physical environment and objects (Massazza et al. 2022). Research has shown that individuals exposed to mass traumatic events such as earthquakes may recover from these traumatic stressors within six months to one year by utilizing their own resilience capacities, provided that they possess adequate interpersonal, social, and cultural support (Abbasi and Nasir 2023). Within this framework, it is considered that these support processes may be related to the bond individuals establish with place; therefore, attention is drawn to the person–place bond relationship (Ruiz and Hernández 2014). Additionally, it has been reported that a strong attachment to a place is associated with older age, lower educational level, and the individual's ancestral connection to that place (Jansen 2020).

Physical places serve multifaceted functions in human life, including security, belongingness, family life, work, and aesthetic experience (Gesler 1992). Over time, individuals develop attachments to the places in which they live by attributing psychological, social, cultural, and historical meanings to them (Knez 2005, Knez et al. 2018). This person–place bond enables individuals to construct place identity through cognitive and emotional processes; thus, places support both personal and collective identity through memories, traditions, and community membership (Knez et al. 2018, Basu et al. 2020).

Place identity is also regarded as a factor that supports resilience in terms of coping with stress, benefiting from protective resources, and adapting to adverse conditions (Matheson et al. 2020, Mukhopadhyay and Goswami 2021, de Jesús et al. 2022). For this reason, place identity has been reported to be associated with quality of life, life satisfaction, and well-being (Knez and Eliasson 2017, Scannell and Gifford 2017, Knez et al. 2018, Basu et al. 2020).

Natural disasters, on the other hand, may damage residential environments, disrupt individuals' relationships with the places to which they are attached, undermine their sense of security, and increase experiences of loss (Ruiz and Hernández 2014, Zheng et al. 2019). Disruption of place attachment has been associated with loss, grief, depression, PTSD, anxiety, and physical health problems (Wickrama and Kaspar 2007, Ruiz and Hernández 2014, Scannell and Gifford 2017, Knez et al. 2018). Nevertheless, within the context of PTSD, the role of the individual's relationship with the disaster area has still been examined to a limited extent (Puechlong et al. 2021).

Although the importance of various situational risk factors associated with post-traumatic stress disorder and other psychological problems following an earthquake has been extensively demonstrated, the role of the relationship between the individual and the environment has not been sufficiently investigated (Ruiz and Hernández 2014, Puechlong et al. 2021). However, the person–place bond lies at the center of many aspects of life (Scannell and Gifford 2017) and also plays an important role in disaster experiences (Cutter et al. 2008). It has been reported that the environment altered after a disaster may affect individuals' place identity and that this may be associated with psychological symptoms (Ruiz and Hernández 2014, Stukova et al. 2023).

The literature emphasizes the need for further studies examining in greater detail the contribution of place identity to resilience and well-being processes (Scannell and Gifford 2017, Matheson et al. 2020, de Jesús et al. 2022). In addition, it has been suggested that the relationship between place identity and age and gender should be investigated further (Scannell and Gifford 2017). In this regard, a study focusing on place identity is considered likely to contribute both to understanding the role of place identity in psychological adjustment and to the body of knowledge regarding how earthquake survivors can be supported.

Hence, this study aimed to investigate whether place identity, post-traumatic stress symptoms, and psychological well-being vary as a function of age and gender in people who have experienced the earthquakes on February 6th and 20th, 2023 and aftershocks, and whether place identity mediates the relation between post-traumatic stress symptoms and psychological well-being. By examining these constructs simultaneously in people exposed to a major earthquake, this study aims to contribute to the literature, offering a more extensive picture of factors associated with psychological well-being after a disaster. Specifically, investigating place identity as one possible mechanism that connects posttraumatic stress symptoms with psychological wellbeing may further help clarify psychosocial processes relevant for post-disaster adjustment. Given the theoretical and empirical findings from the literature, the researchers proposed that post-traumatic stress symptoms are negatively related with psychological well-being and that place identity is positively related with psychological well-being. Also, this study looked at whether place identity plays a mediating role in the relationship between post-traumatic stress symptoms and psychological well-being. In addition, the study tried to find out whether the variables of post-traumatic stress, place identity, and psychological well-being differ as a function of age and gender.

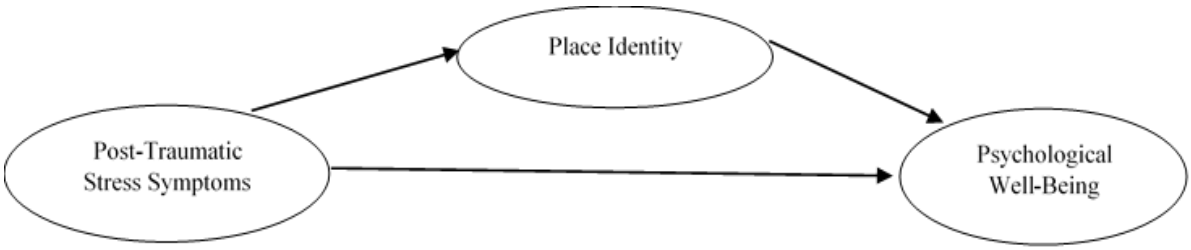



**Figure 1. Hypothetical model of the study**

## Method

The present study was conducted using a correlational research model, which is one of the quantitative research approaches. According to Karasar (2000), the correlational research model aims to determine the degree and direction of the relationships among two or more variables. Since the relationships among post-traumatic stress symptoms, place identity, and psychological well-being were examined in the

present study, the correlational research model was considered appropriate. The study employed a cross-sectional design, as all data were collected from the participants at a single point in time. In addition, a mediation model was tested to examine whether place identity mediates the relationship between post-traumatic stress symptoms and psychological well-being. The hypothetical model tested in the study is presented in Figure 1.

## Sample

The study sample was selected using a convenience sampling method from among adults living in container settlements and rural neighbourhoods in the Antakya, Defne and Samandağ districts of Hatay, which were affected by the earthquakes in February 2023. During field visits, researchers explained the purpose and procedure of the study to potential participants and invited them to take part voluntarily.

The inclusion criteria for the study were as follows: (a) being aged 18 or over, (b) having resided in one of the selected districts during the February 2023 earthquakes, and (c) having experienced the earthquakes directly. Participants were informed of the purpose of the study before completing the questionnaire, and both verbal and written informed consent was obtained. Each participant completed the questionnaire independently after receiving instructions from the researchers. For participants who experienced literacy difficulties, the researchers read the items aloud verbatim without interpreting them or influencing the participants' responses.

According to the Address Based Population Registration System (ABPRS) data of the Turkish Statistical Institute, the total population of Hatay province is 1,686,043. Within this population, the number of individuals aged 18 and above is approximately 1,115,000. Since the target population of the study consisted of individuals aged 18 and above, this number represents the population of the study. In determining the sample size to be included in the study, the unknown population sample formula was used. According to this method, the determination of the sample size is expressed by the following formula:

"n=" "z" ^"2" "(p×q)" /"d" ^"2"

According to this method, the sample size is as follows:

"n=" 〖"(1,96)" 〗^"2" "(0,50×0,50)" / 〖"(0,05)" 〗^"2" "=384"

In the study, the sample size was calculated as 384 at a 95% confidence level with a 5% margin of error.

## Procedure

This study was initiated after obtaining ethics committee approval from the Çukurova University Scientific Research and Publication Ethics Committee in the Field of Social and Human Sciences (Decision date and no: 02.02.2024/8). Permissions regarding the scales used in the study were obtained via e-mail from the researchers who developed the scales or conducted their Turkish adaptation before the data collection process began.

The scales used in the study were administered face-to-face by the researcher through individual interviews with individuals who experienced and were exposed to the earthquakes that occurred on February 6, 2023, in the central districts of Hatay province. Before the administration of the scales, verbal and written consent was obtained from the participants, and they were informed that the study was based on voluntary participation. In addition, the data collected within the scope of the study will be stored in a locked cabinet, the key to which will be accessible only to the researcher, in accordance with the principle of confidentiality.

## Measures

The research data were obtained using the sociodemographic information form, the Place Identity Scale, the PERMA Scale, and the PTSD Checklist for DSM-5.

### Sociodemographic Information Form

Personal information regarding the participants was obtained through the sociodemographic form used in the study. The sociodemographic form consisted of questions regarding the participants' gender, age, educational status, marital status, and similar characteristics.

### Place Identity Scale

The scale developed by Knez and Eliasson (2017) was used to measure the psychological and cognitive bond individuals establish with place. The adaptation and psychometric evaluation studies regarding the Turkish version of the scale were completed by Usluoğlu et al. (in press) in 2024. The scale consists of a total of 10 items and has two subdimensions: Emotional (Items 1–5) and Cognitive (Items 6–10). The scale employs a 7-point Likert-type rating system (1 = Strongly disagree, 7 = Strongly agree), and there are no reverse-coded items. In the adaptation study, the Cronbach's alpha coefficient for the total score was reported as .96 and the McDonald's omega coefficient as .95. In the present study, the Cronbach's alpha internal consistency coefficient for the total score of the scale was calculated as .72. The data of the present study were collected from a sample independent of this process after the validity and reliability evidence of the scale had been established.

### PERMA Scale

The PERMA Scale was used to evaluate individuals' levels of psychological well-being. Developed by Butler and Kern (2016), the scale consists of five core dimensions-positive emotions, engagement, positive relationships, meaning, and accomplishment-and 23 items. The scale uses an 11-point Likert-type rating system, and items are scored between 0 and 10. Items 7, 12, 14, and 20 are reverse scored. The scale was adapted into Turkish by Demirci et al. (2017), and the Cronbach's alpha internal consistency coefficient of the Turkish version was reported as .91 for the total score. In the present study, the Cronbach's alpha coefficient for the total score of the scale was calculated as .85.

### PTSD Checklist for DSM-5

In the study, the PTSD Checklist (PCL-5), developed by Weathers et al. (2013) and adapted into Turkish by Boysan et al. (2017), was used to measure the severity of post-traumatic stress symptoms. Based on the DSM-5 diagnostic criteria, the 20-item scale has a Likert-type rating ranging from 0 to 4, and the total score ranges between 0 and 80. The scale consists of four subdimensions: re-experiencing (1–5), avoidance (6–7), negative cognitions and mood (8–14), and hyperarousal (15–20). Boysan et al. (2017) reported the Cronbach's alpha internal consistency coefficient for the total score of the scale as .94. In the present study, the Cronbach's alpha coefficient for the total score of the scale was calculated as .90.

## Statistical Analysis

SPSS 28.0 package software was used in the analysis of the research data. Data were tested for normality based on skewness and kurtosis. George and Mallery (2010) suggest that if skewness and kurtosis are within the range of 2 to + 2, then the data are normally distributed and parametric analysis can be applied. All the research variables had skewness and kurtosis statistics in this range and as such, parametric data analyses were conducted. A t test (independent-samples) was used to test whether the means of post-traumatic stress symptoms, place identity and psychological well-being of the subjects were statistically significantly different between the genders.

One-way analysis of variance (ANOVA) was performed to test the statistically significant differences in post-traumatic stress symptoms, place identity, psychological well-being between the age groups. If significant differences were found in the ANOVA, the Scheffé post hoc test was used to identify what age groups differed from each other. Correlation between post-traumatic stress symptoms, place identity, and psychological well-being were investigated by using Pearson's correlation analysis. A mediation analysis was used to investigate a model of post-traumatic stress symptoms (predictor) on psychological well-being (outcome) with place identity as a mediator. The analysis was run with Hayes' PROCESS macro (Model 4) with 5,000 bootstrap samples and a 95% confidence interval. The indirect effect was regarded

statistically significant if the 95% bootstrap confidence interval did not contain zero. Furthermore, a mean score on the Place Identity Scale (M = 63.29, SD = 7.00), which appears to be relatively high, was analyzed to check whether this was a restriction of range problem that might lead to problems with the statistical analyses. While the mean score on this scale was relatively high, the standard deviation was also fairly large which demonstrates variability between scores. Accordingly, the high mean on this scale was interpreted as a feature of the study sample, not as a difficulty with the scoring method or the measurement of the construct.

# Results

The sociodemographic characteristics of the participants included in the study are presented in Table 1.

**Table 1. Sociodemographic characteristics of the participants**

| Variable | Groups | n | % |
|---|---|---|---|
| Age | 18–25 | 97 | 23.8 |
| | 26–43 | 249 | 61 |
| | 44–51 | 32 | 7.8 |
| | 52 years and above | 30 | 7.4 |
| Gender | Female | 200 | 49 |
| | Male | 208 | 51 |
| Marital Status | Single | 213 | 52.2 |
| | Married | 195 | 47.8 |
| Educational Level | High school and below | 166 | 40.7 |
| | Associate degree | 51 | 12.5 |
| | Bachelor's degree and above | 191 | 46.8 |

A total of 408 individuals participated in the study. Examination of the age distribution of the participants revealed that 97 individuals (23.8%) were between the ages of 18–25, 249 individuals (61.0%) were between the ages of 26–43, 32 individuals (7.8%) were between the ages of 44–51, and 30 individuals (7.4%) were aged 52 years and above. Regarding gender distribution, it was determined that 200 participants were female (49.0%) and 208 were male (51.0%). In terms of marital status, 213 participants were single (52.2%), whereas 195 were married (47.8%). Examination of educational level indicated that 166 participants had a high school education or below (40.7%), 51 participants had an associate degree (12.5%), and 191 participants had a bachelor's degree or higher (46.8%).

Before conducting the data analysis, the presence of outliers and extreme values was examined, and no outliers or extreme values that would disrupt the normality of the distribution were detected. Subsequently, skewness and kurtosis values were checked to determine whether the research dataset exhibited a normal distribution (Table 2).

**Table 2. Descriptive statistical values and normality distribution table**

| Variable | Mean | SD | Minimum | Max. | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| **Post-Traumatic Stress Symptoms** | 47.82 | 15.96 | 4.00 | 80.00 | -0.352 | -0.028 |
| **General Psychological Well-Being** | 6.47 | 1.30 | 1.69 | 9.88 | -0.406 | 0.660 |
| **Place Identity** | 63.29 | 7.00 | 36.00 | 70.00 | -1.035 | 0.687 |

SD: Standard deviation

Table 3 presents the results of the independent samples t-test conducted to examine whether post-traumatic stress symptoms, general psychological well-being, and place identity levels differed according to gender among individuals who experienced the earthquakes that occurred on February 6, 2023, and who were residing in the central districts of Hatay province and exposed to the disaster. It was concluded that none of the variables examined in the study, namely post-traumatic stress symptoms, general psychological well-being, and place identity, demonstrated a statistically significant difference according to gender ($p > .05$).

| Table 3. Relationship between research variables and gender | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Group** | **n** | **Mean** | **SD** | **t** | **p** | **Cohen's d** |
| Post-Traumatic Stress Symptoms | Female | 200 | 49.02 | 14.86 | 1.481 | 0.139 | 0.147 |
| | Male | 208 | 46.68 | 16.91 | | | |
| General Psychological Well-Being | Female | 200 | 6.40 | 1.30 | -1.081 | 0.281 | 0.108 |
| | Male | 208 | 6.54 | 1.30 | | | |
| Place Identity | Female | 200 | 63.43 | 7.21 | 0.398 | 0.691 | 0.040 |
| | Male | 208 | 63.15 | 6.82 | | | |

In the present study, a one-way analysis of variance (ANOVA) was conducted to examine whether post-traumatic stress symptoms, general psychological well-being, and place identity levels significantly differed according to the age groups of individuals who resided in the central districts of Hatay province and were exposed to the earthquakes that occurred on February 6, 2023 (Table 4) . According to the analysis results, post-traumatic stress symptom scores differed significantly across age groups ($F = 3.258$; $p = .022$; $\eta^2 = .024$). The results of the Scheffe post hoc test indicated that the post-traumatic stress symptom scores of individuals in the 26–43 age group ($M = 48.89$; $SD = 15.59$) were significantly higher than those of individuals aged 52 years and above ($M = 40.07$; $SD = 19.11$) ($p = .041$).

When the analyses regarding the place identity variable were examined, it was observed that place identity scores significantly differed according to age groups ($F = 7.763$; $p < .001$; $\eta^2 = .055$). The results of the Scheffe post hoc test revealed that the place identity scores of individuals in the 18–25 age group ($M = 65.05$; $SD = 6.51$) and those in the 44–51 age group ($M = 65.91$; $SD = 7.11$) were significantly higher than the scores of individuals in the 26–43 age group ($M = 62.00$; $SD = 7.07$) (respectively, $p = .003$; $p = .027$). In contrast, general psychological well-being scores did not differ significantly according to age groups ($p > .05$).

| Table 4. Relationship between research variables and age | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Group** | **n** | **Mean** | **SD** | **F** | **p** | **Post-hoc** | **$\eta^2$** |
| Post-Traumatic Stress Symptoms | 18–25(1) | 97 | 48.53 | 15.54 | 3.258 | **0.022** | 2 > 4 | .024 |
| | 26–43(2) | 249 | 48.89 | 15.59 | | | | |
| | 44–51(3) | 32 | 44.69 | 15.26 | | | | |
| | 52 years and above (4) | 30 | 40.07 | 19.11 | | | | |
| General Psychological Well-Being | 18–25(1) | 97 | 6.39 | 1.44 | 0.666 | 0.573 | - | .005 |
| | 26–43(2) | 249 | 6.46 | 1.28 | | | | |
| | 44–51(3) | 32 | 6.54 | 1.27 | | | | |
| | 52 years and above (4) | 30 | 6.76 | 1.05 | | | | |
| Place Identity | 18–25(1) | 97 | 65.05 | 6.51 | 7.763 | **<.001** | 1, 3 > 2 | .055 |
| | 26–43(2) | 249 | 62.00 | 7.07 | | | | |
| | 44–51(3) | 32 | 65.91 | 7.11 | | | | |
| | 52 years and above (4) | 30 | 65.53 | 5.46 | | | | |

| Table 5. Pearson correlation analysis findings | | | | |
|---|---|---|---|---|
| | | **1** | **2** | **3** |
| 1. Post-Traumatic Stress Symptoms | r | 1 | | |
| 2. General Psychological Well-Being | r | -.133** | 1 | |
| 3. Place Identity | r | -0.042 | 0.096 | 1 |

**p < .001

In the study, Pearson correlation analysis was conducted to examine the relationships between post-traumatic stress symptoms, general psychological well-being, and place identity variables (Table 5). When the analysis results were examined, a negative and statistically significant relationship was found between post-traumatic stress symptoms and general psychological well-being ($r = -.133$; $p < .001$). This finding indicates that as post-traumatic stress symptoms increase, individuals' levels of general psychological

well-being tend to decrease. In contrast, no significant relationship was found between post-traumatic stress symptoms and place identity ($p > .05$). Similarly, no statistically significant relationship was identified between general psychological well-being and place identity ($p > .05$).

The mediating role of place identity in the relationship between post-traumatic stress symptoms and general psychological well-being was tested among individuals who resided in the central districts of Hatay province and were exposed to the earthquakes that occurred on February 6, 2023 (Table 6).

In the research model, the mediating role of place identity in the relationship between post-traumatic stress symptoms and psychological well-being was examined using Hayes' PROCESS Model 4. The results indicated that post-traumatic stress symptoms did not significantly predict place identity ($\beta = -0.0185$, SE = 0.0218, $p = .396$, 95% CI [−0.0613, 0.0243]). Similarly, place identity did not significantly predict psychological well-being ($\beta = 0.0168$, SE = 0.0091, $p = .066$, 95% CI [−0.0011, 0.0348]). In contrast, the direct effect of post-traumatic stress symptoms on psychological well-being was statistically significant and negative ($\beta = -0.0105$, SE = 0.0040, $p = .009$, 95% CI [−0.0184, −0.0027]).

The indirect effect of post-traumatic stress symptoms on psychological well-being through place identity was not statistically significant ($\beta = -0.0003$, BootSE = 0.0004, 95% CI [−0.0013, 0.0004]). Because the 95% bootstrap confidence interval included zero, the indirect effect was considered non-significant. Thus, place identity did not significantly mediate the relationship between post-traumatic stress symptoms and psychological well-being. The total effect of post-traumatic stress symptoms on psychological well-being was statistically significant and negative ($\beta = -0.0108$, SE = 0.0040, $p = .007$, 95% CI [−0.0187, −0.0030]).

**Table 6. Mediation analysis findings**

| Type of Effect | Path | β | SE | p | CI (Lower limit) | CI (Upper limit) |
|---|---|---|---|---|---|---|
| Direct Effect | PTSD → PI | -0.0185 | 0.0218 | .396 | -0.0613 | 0.0243 |
| | PI → PWB | 0.0168 | 0.0091 | .066 | -0.0011 | 0.0348 |
| | PTSD → PWB | -0.0105 | 0.0040 | .009 | -0.0184 | -0.0027 |
| Indirect Effect | PTSD → PI → PWB (Indirect) | -0.0003 | 0.0004 | - | -0.0013 | 0.0004 |
| Total Effect | PTSD → PWB | -0.0108 | 0.0040 | .007 | -0.0187 | -0.0030 |

PI: Place Identity; PTSD: Post-Traumatic Stress Disorder; PWB: Psychological Well-Being; SE: Standard Error; CI: Confidence Interval

## Discussion

In the current study, the levels of post-traumatic stress symptoms, general psychological well-being, and place identity of individuals exposed to the February 6, 2023 earthquakes did not significantly differ according to gender. This finding suggests that the collective experience and remembrance of disasters may not always make the psychological effects distinctly differentiated according to demographic factors (Conway et al. 2008, as cited in Knez et al. 2018). Indeed, some studies examining post-disaster mental health, well-being, and identity processes have also reported that these variables do not significantly differ according to gender (Jones and Walker 2023). Similarly, place identity is a part of the cognitive and emotional bond established by individuals with their physical environment and plays an important role in the formation of self-perception (Proshansky et al. 1983). Large-scale disasters such as earthquakes may directly affect individuals' living spaces and create an environmental trauma encompassing all members of the community (Anguelovski 2013). For this reason, the disruption of place-related bonds may produce similar psychological reactions regardless of gender. Accordingly, studies demonstrating that local identity and spatial attachment levels do not differ between women and men after disasters are also available (de Jesús et al. 2022). This finding may also be explained within the framework of the social identity approach and the perspective of collective resilience. According to the social identity approach, individuals obtain meaning and social support through the groups to which they belong, and this may serve an important protective function in post-traumatic processes (Muldoon et al. 2019). Following major disasters such as earthquakes, shared experiences and collective identities may become more prominent

than individual differences. In this context, the collective resilience that emerges after disasters is shaped more by the shared identity and common experiences of the community than by individuals' gender (Albers et al. 2021). Therefore, the emergence of similar levels of post-traumatic stress symptoms, psychological well-being, and place identity among women and men can be considered an expected finding.

The study also revealed that post-traumatic stress symptoms differed according to age groups, and particularly that individuals in the 26-43 age group exhibited higher levels of post-traumatic stress symptoms compared to individuals aged 52 years and above. This finding may be associated with the protective effect of age and the life experience approach frequently discussed in the literature. Individuals in young and middle adulthood generally carry multiple life roles simultaneously, such as family responsibilities, economic obligations, and concerns regarding the future. This situation may cause the uncertainty and threat perception created by traumatic events to be experienced more intensely. Indeed, the literature indicates that younger individuals may experience greater anxiety and fear regarding the possible consequences of environmental threats compared to older individuals (Knez et al. 2013). Furthermore, some studies suggest that older individuals may have developed certain coping experiences due to previous social, economic, or natural crises they encountered, which may enhance psychological resilience (Muldoon et al. 2019). In this context, the higher post-traumatic stress symptoms observed in the middle-aged group may be explained by the intensity of responsibilities individuals undertake throughout the life cycle.

The findings regarding place identity demonstrated that individuals in the 18-25 and 44-51 age groups had higher levels of place identity compared to individuals in the 26-43 age group. Place identity constitutes a part of the cognitive and emotional bond individuals establish with the places in which they live and is generally closely associated with the duration of time spent in a place and the social relationships formed within that environment (Knez 2005, Albers et al. 2021). In this regard, the fact that individuals in the 44-51 age group may have lived in the same city for a long period of time and established most of their social relationships within that environment may contribute to a stronger attachment to place. On the other hand, the 18-25 age group represents individuals in the process of identity development, and during this period individuals may develop a strong sense of belonging to places where childhood and youth memories are shaped. In contrast, the 26-43 age group generally represents a stage of life characterized by higher spatial mobility due to reasons such as career development, marriage, or child-rearing. In the literature, place identity is sometimes also defined as "settlement identity," and it has been stated that spatial mobility increases when individuals do not establish a strong connection between their identities and their current living environments (Feldman 1990, as cited in Woods 2006). In this context, the relatively lower place identity scores observed in this age group may stem from the fact that the spatial losses and uncertainties regarding the future that emerged after the earthquake weakened the bond individuals established with the places in which they lived.

In the study, it was observed that the level of general psychological well-being did not show a significant difference according to age groups. This situation may stem from the fact that psychological well-being is a more holistic and relatively more stable psychological structure compared to post-traumatic stress symptoms. In the literature, psychological well-being and psychopathology are considered related yet distinct constructs (Albers et al. 2021). Therefore, even if individuals experience a certain level of stress symptoms following a traumatic event, they may maintain their general well-being levels through protective factors such as finding meaning in life, social support, and resilience. In addition, it has been suggested that traumatic experiences may, in some cases, trigger processes such as post-traumatic growth and collective resilience. The findings of Knez et al. (2018), demonstrating that although the emotional bonds individuals establish with places may be damaged after a natural disaster, cognitive processes and memories related to place can still be preserved, thereby providing a form of spatial continuity that supports individuals' well-being, also support this finding. In this context, it may be stated that individuals exposed to the earthquake in Hatay, despite experiencing collective trauma, strive to maintain their connection with life and preserve their psychological well-being regardless of age group.

The finding of a negative relationship between post-traumatic stress (PTS) symptoms and general psychological well-being in the study is a frequently reported and theoretically expected result in the

trauma literature. Traumatic events may create intense psychological stress by disrupting individuals' ways of making sense of the world, their fundamental beliefs, and their life goals. According to the meaning-making model, the disruption of individuals' existing life purposes and goals by trauma may lead to increased levels of depression, anxiety, and stress, while simultaneously decreasing well-being indicators such as life satisfaction and happiness (Park and Gutierrez 2013). In this respect, it is expected that an increase in PTS symptoms would be associated with a decrease in psychological well-being. Indeed, the literature indicates that psychological well-being and psychopathology indicators are related yet distinct dimensions (Albers et al. 2021). Similarly, a study conducted by Jones and Walker (2023) reported that perceived identity threat increased post-traumatic stress symptoms, which in turn was associated with decreases in individuals' levels of well-being.

The absence of a significant relationship involving place identity should be interpreted cautiously. Although previous research suggests that natural disasters may alter individuals' emotional and cognitive relationships with their living environments, the present study did not assess place identity before and after the earthquake. Therefore, it cannot be concluded that the February 6, 2023 earthquakes weakened, disrupted, or transformed participants' place identity. Instead, the findings indicate that, within the post-earthquake context examined in this cross-sectional study, place identity was not significantly associated with post-traumatic stress symptoms or psychological well-being and did not function as a significant mediator. One possible explanation is that the psychological consequences of the disaster may have overshadowed the potential contribution of place identity to well-being. Alternatively, the complex coexistence of attachment, loss, displacement, and identity-related threat following a large-scale disaster may have attenuated the observed associations. These interpretations remain tentative, and longitudinal studies comparing place identity before and after disasters are needed to determine whether and how disaster exposure changes place-related bonds over time.

The absence of a significant relationship involving place identity may also be explained by the level of identity threat created by trauma. The Social Identity Model of Identity Change (SIMIC) suggests that when traumatic events are experienced as threatening to individuals' existing identities (Muldoon et al. 2019). In this context, some studies have shown that following disasters, not only the level of place identity but also the perceived threat directed toward this identity more strongly explains psychological outcomes. Jones and Walker (2023) demonstrated that, in the post-disaster process, the level of place identity alone was limited in explaining well-being, whereas the perception of identity threat was a much stronger determinant. In addition, it has been suggested that severe traumas may weaken, or in some cases even fragment, individuals' perceptions of place and place identity (Ranieri 2021). Under such circumstances, even if individuals continue to feel attached to a place, this attachment may no longer function as a psychological resource. Consequently, the findings suggest that the relationship between post-traumatic stress symptoms and psychological well-being is consistent with the trauma literature; however, the absence of a relationship between place identity and psychological variables may stem from the fact that large-scale disasters such as earthquakes weaken or transform the bonds of meaning and belonging individuals establish with place.

In the present study, the absence of a significant mediating role of place identity in the relationship between post-traumatic stress symptoms and psychological well-being may be related to the complex role that place-related bonds can assume in the post-disaster context. Theoretically, place identity is accepted as an integrated part of the individual's self-perception in relation to the physical environment. However, major and destructive traumas such as earthquakes may disrupt this integration that individuals establish with the physical world. Indeed, Ranieri (2021) states that severe traumas may "pulverize" and atrophy the place identity within the individual's mind. In such a situation of fragmentation, place identity may cease to function as a coherent internal reference that supports individuals' psychological well-being. Given the magnitude of the destruction caused by the earthquake in Hatay, the relationship individuals established with their living environment may have involved complex experiences of attachment, loss, and identity-related threat. Such post-disaster experiences may help explain why place identity did not emerge as a significant mediator of the relationship between post-traumatic stress symptoms and psychological well-

being in the present study. However, since place identity was not assessed before and after the earthquake, these interpretations should be considered tentative.

Similarly, the literature also contains findings demonstrating that the effect of place identity on well-being may weaken after disasters. In a study conducted by Knez et al. (2018), while a strong positive relationship was identified between place identity and psychological well-being before a natural disaster, this relationship was found to decrease significantly after the disaster. The findings indicated that individuals continued to preserve cognitive memories related to place; however, due to the damage inflicted on the emotional bond established with place, place identity ceased to function as a supportive resource for well-being. In this context, the inability of place identity to significantly predict psychological well-being in the present study may be considered a reflection of this emotional disconnection emerging after the disaster.

On the other hand, within the disaster literature, it has also been suggested that rather than the level of attachment individuals establish with place, the perceived threat directed toward identity may be more determinant in explaining psychological outcomes. Jones and Walker (2023) demonstrated that after disasters, the level of place identity alone remained limited in explaining well-being, whereas perceived threat toward identity emerged as a stronger predictor. Within this framework, it is possible that the massive threat and destruction caused by the earthquake in Hatay exerted a strong influence on psychological processes independently of individuals' place identity. In such a situation, regardless of the level of place identity, the perception of threat and the experience of loss created by trauma may overshadow the potential protective effect of place identity. This may explain why place identity did not demonstrate a statistically significant mediating role in the relationship between post-traumatic stress symptoms and psychological well-being.

In addition, the direct and negative effect of post-traumatic stress symptoms on psychological well-being may also have contributed to the absence of a mediating role for place identity. According to the meaning violation model developed by Park and Gutierrez (2013), traumatic events violate individuals' fundamental life goals and systems of meaning, directly resulting in high stress and low well-being. In events such as earthquakes, which radically alter individuals' living environments, social relationships, and daily life routines, the psychological impact created by trauma may emerge in a highly powerful and direct manner. Therefore, the effect of post-traumatic stress symptoms may make it difficult for more indirect psychological variables, such as place identity, to assume a mediating role in this process.

Finally, in some cases, a strong place identity may become an element that triggers feelings of loss and grief rather than functioning as a healing resource. Studies examining experiences of forced migration or displacement indicate that strong attachment to former living environments may, in some cases, be associated with higher trauma symptoms and lower life satisfaction (Wnuk et al. 2025). This situation may cause place identity to become a complex structure containing both positive and negative emotions. When such a contradiction exists, the relationship between place identity and psychological variables may weaken statistically or become neutralized. Consequently, the findings suggest that large-scale disasters such as earthquakes may weaken the emotional bond individuals establish with the places in which they live, that the direct impact of trauma may overshadow identity-based protective mechanisms, and that place identity may, in some cases, transform from a source of recovery into a reference point associated with loss and grief.

While evaluating the findings of this study, several limitations should be taken into consideration. First, the data in the study were collected through self-report inventories. Since self-report-based measurements rely on participants' own perceptions and evaluations, they may be influenced by factors such as social desirability tendency, recall bias, or emotional state, which may limit the objectivity of the measurements. Therefore, the use of clinical interviews, observational methods, or multiple data sources in future studies may contribute to a more comprehensive evaluation of the findings. Another limitation is the use of purposive sampling, which may have resulted in selection bias and limited the generalizability of the findings to the wider population affected by the February 6, 2023 earthquakes. In addition, the study did not gather detailed information regarding participants' specific earthquake exposure and personal losses, such as loss of a family member or close person, physical injury, displacement, or loss of or severe

damage to housing. These factors may have heavily influenced participants' post-traumatic stress symptoms, psychological well-being, and place identity, and their absence from the analysis limits the ability to control for differences in individual disaster experiences. Future studies should therefore apply more representative sampling strategies and assess the severity and type of earthquake exposure in more detail. In addition, the study was conducted using data obtained from 408 adult individuals. Although this sample size is sufficient for statistical analyses, the fact that the sample was based on a specific disaster context and a particular geographical group may limit the generalizability of the findings to all earthquake survivors or different disaster contexts. Furthermore, the collection of data at a single time point restricts the possibility of examining the temporal changes in the relationships among the variables.

## Conclusion

The aim of this study was to examine the relationships between post-traumatic stress symptoms, psychological well-being, and place identity among individuals exposed to the February 6, 2023 earthquakes. The findings revealed that post-traumatic stress symptoms were negatively associated with psychological well-being; however, place identity did not demonstrate a significant relationship with either post-traumatic stress symptoms or psychological well-being. In addition, post-traumatic stress symptoms were found to differ according to age groups and were observed at higher levels particularly among individuals in middle adulthood. In contrast, psychological well-being levels did not differ according to age groups, whereas place identity levels were found to be higher in certain age groups. When evaluated in terms of gender, no significant differences were identified between women and men regarding post-traumatic stress symptoms, psychological well-being, and place identity levels.

The results of the study indicate that traumatic experiences negatively affect individuals' psychological well-being and that post-traumatic stress symptoms constitute an important risk factor for well-being. Nevertheless, the absence of a significant relationship between place identity and psychological variables suggests that large-scale disasters such as earthquakes may weaken the emotional bonds individuals establish with the places in which they live. In this context, it may be stated that the bond individuals establish with place during the post-disaster period may acquire a different meaning compared to the pre-trauma period, and that the function of place identity as a protective resource for psychological well-being may temporarily weaken. Furthermore, the findings demonstrate that post-traumatic stress symptoms may become more pronounced particularly during middle adulthood, a period characterized by intense life responsibilities.

In line with these findings, several recommendations may be developed for future research and clinical practice. First, the use of longitudinal research designs is recommended in future studies in order to better understand how place identity changes during the pre- and post-disaster processes. In addition, examining the relationship between place identity and psychological well-being not only through the level of attachment but also through variables such as identity threat, perception of spatial loss, and experiences of displacement may provide important contributions to the literature. Furthermore, comparative studies conducted across different disaster types and cultural contexts may contribute to a more comprehensive understanding of post-traumatic psychological processes.

From the perspective of clinical practice, it is important that post-disaster psychosocial interventions should not be limited solely to individually focused approaches aimed at reducing trauma symptoms, but should also include interventions that support individuals in re-establishing bonds with the places in which they live and strengthening community-based resilience processes. Particularly considering that individuals in middle adulthood may constitute a higher-risk group in terms of post-traumatic stress symptoms, the burden of responsibilities and living conditions of this age group should be taken into account in psychosocial support programs. In addition, community-based psychosocial support programs may contribute to strengthening individuals' sense of belonging and rebuilding social bonds during the post-disaster reconstruction process. Such holistic interventions may contribute not only to the reduction of trauma symptoms in the post-disaster period, but also to the enhancement of psychological well-being and social resilience.

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