Original Article

The Effects of Nurses' Post-Earthquake Trauma Levels on their Ruminative thought Styles and Caring Behaviors: A Descriptive Correlational Study

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Abstract

Background: Natural disasters like earthquakes significantly impact healthcare professionals' psychological well-being. Nurses who are on the front lines during and after such events often experience high levels of trauma and stress. Thousands of people lost their lives in the Kahramanmaras earthquakes, which were called the disaster of the century, and nurses were deeply affected by this event.

Aims: This study's primary aim was to examine the relationship between post-earthquake trauma levels and nurses' ruminative thoughts and caring behaviors.

Methodology: This research was designed as a descriptive correlational study. The study was conducted with 317 nurses working in public, private, and educational hospitals in Gaziantep, Turkey, who experienced the February 6, 2023, Kahramanmaras earthquakes. They included the Scale for Determining the Level of Post-Earthquake Trauma, the Ruminative Thought Style Questionnaire, and the Caring Behaviors Inventory-24.

Results: The study found that nurses post-earthquake trauma levels, ruminative thought styles, and perceptions of caring behaviors were all above average. A statistically significant positive correlation was observed between post-earthquake trauma levels and ruminative thought styles ($p<0.05$). Nurses who experienced higher levels of trauma also reported more ruminative thoughts. Additionally, trauma negatively affected their ability to provide high-quality care. Sociodemographic factors such as income level, education, and loss of loved ones in the earthquake were significantly associated with both trauma levels and caring behaviors.

Conclusions: The findings suggest that post-earthquake trauma leads to increased ruminative thoughts among nurses, affecting their caring behaviors. Psychological and social support interventions are essential to help nurses cope with the aftermath of natural disasters and maintain the quality of care they provide.

Keywords: ruminative thinking, caring behaviors, post-earthquake trauma, descriptive correlation study.

Introduction

The "disaster of the century," one of the most devastating earthquakes in Turkey's history, occurred on February 6, 2023. This earthquake caused great destruction and loss of life in 11 provinces (Gozukizil & Tezcan, 2023). As a result of damage to some institutions, nurses also lost their lives. In addition to the structural destruction and loss of life they cause, earthquakes also lead to mental and emotional problems such as intense fear, anxiety, guilt, and anger in surviving individuals (Gerstner et al., 2020). Additionally, post-traumatic stress disorder (PTSD) may occur in 3% of those who

encounter natural disasters (Rosellini et al., 2018).

Reactions to earthquakes are influenced by the earthquake's severity, location, past experiences, personal losses, and personality traits (Nakajima, 2012). As sudden and destructive events, earthquakes cause immediate damage and can lead to chronic effects, including anxiety, sleep problems, and emotional blunting (Tanhan & Kayri, 2013). After an earthquake, common issues include anxiety, recurring memories, sleep disturbances, and emotional numbness (Nakajima, 2012). Repeated recollection often leads to rumination, a cognitive process increasingly linked to psychopathologies. Rumination, a repetitive thought pattern associated with anxiety and mood disorders, involves a constant preoccupation with a single subject or thought (Watkins & Roberts, 2020). Ruminative thoughts, a type of intrusive and uncontrollable thinking, are considered a critical cognitive feature of depressive mood (Nolen-Hoeksema et al., 2008). Rumination after an earthquake can disrupt individuals' social and professional lives, causing them to avoid or incompletely fulfill their responsibilities. This can affect nurses' ability to perform their caregiving roles. Some nurses, caught in the disaster while on duty or at home, left their loved ones to continue their caregiving duties.

Accordingly, it is necessary to determine how nurses' post-earthquake trauma levels affect their ruminative thoughts and caring behaviors. This research is significant, as no published study exists in the literature exploring these phenomenon.

Aims: The primary aim of this study was to examine the relationship amongst post-earthquake trauma, nurses' ruminative thoughts, and caring behaviors. The secondary aim was to identify sociodemographic factors, like income, education, and loss of loved ones, linked to variations in trauma and caring behaviors to guide interventions for improving nurses' well-being and performance after disasters.

Hypothesis: It was hypothesized that higher trauma levels would be associated with increased ruminative thoughts and negatively impact caring behaviors.

Materials and Methods

Design: This research was designed as a descriptive, correlational, and cross-sectional study.

Settings and Sample: The study included nurses from public, private, and training hospitals in Gaziantep affected by the February 6 Kahramanmaras earthquakes. Using the G-Power program, the minimum sample size was calculated as 257 nurses, based on a population of 5007 nurses (Ministry of Health, 2022). The confidence interval was α = 0.05, power 0.90, and effect size d = 0.3. Ultimately, 317 nurses who met the inclusion criteria participated in the study.

Inclusion Criteria:
- Working as a nurse in public, private and education research hospitals in Gaziantep during the February 6 earthquakes.
- Speaking Turkish.
- Having an e-mail or social network (WhatsApp, Twitter, Instagram) connection.
- Using a smartphone.
- Volunteering to participate in the study.

Data Collection: Google Forms, a reliable online platform that allows participants to easily submit their responses, was used as the data collection tool. Prior to data collection, the questionnaire procedure was explained to the participants in detail and the importance of completing all sections was emphasized. The online questionnaire was sent to the nurses via social media applications (WhatsApp, Twitter, Instagram) and e-mail. The first page of the questionnaire provided detailed information about the purpose of the study and their participation. The first question of the questionnaire included informed consent that they agreed to participate in the study. Data was collected between April 10 and May 30, 2023.

Data Collection Tools:

Personal Information Form: The researchers prepared this form, which contains 15 questions to determine the sociodemographic characteristics of nurses.

Scale that Determines the Level of Trauma after the Earthquake (SDLTE): This scale was developed by Tanhan and Kayri in 2013. It is a scale that measures the stress levels experienced by individuals after an earthquake. The scale consists of 20 items. Likert-style items are "I strongly disagree-1",

"I slightly agree-2", "I moderately agree-3", "I strongly agree-4", and "I completely agree-5". The lowest score obtained from the scale is 20, and the highest is 100. The score range of 52.385 on the scale indicates a threshold at which individuals are traumatized. Higher or lower scores than this threshold value indicate low and high levels of traumatization. Increasing scores from the scale indicate that individuals' exposure to earthquake trauma also increases. As a result of the reliability analysis conducted on the scale, the internal consistency coefficient (Cronbach's alpha) of the scale was determined to be 0.87 (Tanhan & Kayri, 2013). In this study, the Cronbach alpha value of the scale was found to be 0.940.

Ruminative Thought Style Questionnaire (RTSQ): This questionnaire was developed by Brinker and Dozois in 2009. It was adapted into Turkish by Karatepe (2010). The questionnaire, consisting of 20 items, has a Likert-type 7-point scoring system. In the questionnaire that tries to evaluate ruminative thought styles, participants rate the extent to which the expressions in the items express themselves with a rating between 7 (expresses me very well) and 1 (does not express me at all). It can be said that as the score obtained from the questionnaire, which does not have a cut-off score determining ruminative thought style, increases, the ruminative thought tendencies of the participants also increase. The questionnaire has one factor. The reliability of the study's internal consistency was high (Cronbach Alpha = 0.907) (Karatepe, 2010). In this study, the Cronbach's alpha value of the questionnaire was 0.959.

Caring Behaviors Inventory-24 (CBI-24): The adaptation study of the "Caring Behaviors Inventory," developed by Wolf, Giardino, and Osborne (1994), into Turkish, was carried out by Kursun and Kanan (2012). This inventory is in the form of a 6-point Likert-type consisting of 24 items and four subscales: assurance (8 items), knowledge and skill (5 items), respect (6 items), and connectedness (5 items). Each item of the inventory is graded from "always" to "never" (6=always, 5=most of the time, 4=usually, 3=sometimes, 2=almost never, 1=never). The total score obtained from CBI-24 is between 24-144. A high score indicates that the perception of nursing care quality is positive.

In the study of Kursun and Kanan (2012), the Cronbach alpha value of the scale was determined to be 0.97 in patients and 0.96 in nurses (Kursun & Kanan, 2012). In this study conducted with nurses, the Cronbach's alpha value of the inventory was found to be 0.968.

Data Analysis: Data were analyzed using SPSS 27.0. Descriptive statistics (number, percentage, mean, and standard deviation) were calculated for nurses' sociodemographic characteristics.

Skewness and Kurtosis values between -1.0 and +1.0 confirmed normal data distribution (Hair et al., 2010). A t-test compared two groups, ANOVA tested 3 or more groups, and Tukey's Post Hoc identified significant differences. Pearson Correlation Analysis examined relationships between scales, with $p < 0.05$ indicating significance. Data completeness and accuracy were checked, and missing data were handled using listwise deletion.

Ethical Consideration: Ethics committee approval dated 05.04.2023 and numbered 2023/87 was obtained from Gaziantep University Clinical Research Ethics Committee for this study. At every stage of the study, the principles of the Declaration of Helsinki were followed, and confidentiality was emphasized. The research data have not been and will not be used for any purpose other than scientific purposes.

Results

Participant Characteristics

When the sociodemographic characteristics of the nurses in the study are examined, the mean age is 34.23±7.26, 79.8% of the participants are women, 71.9% of them are married, 46.4% of them have an income level that is "the income is less than the expenses," 72.9% of them have a bachelor's degree, the mean professional experience as a nurse is 11.82±7.77 years, and the mean weekly working hours are 43.18±7.06 (Table 1). When nurses' opinions about the February 6 earthquakes were examined, it was seen that 84.6% of them caught the earthquake at home, 50.8% of them lost their relatives in the earthquake, 52.1% of them did not lose their colleagues in the earthquake, 48.3% of them

lost their homes after the earthquake, and 47.6% of them stated that the institutions they worked for were determined to be slightly damaged (Table 1).

Findings Related to Measurement Tools

The mean score of the Scale that Determines the Level of Trauma after the Earthquake subscale of Behavior Problems was found to be 11.37±3.73, the mean score of the Scale that Determines the Level of Trauma after the Earthquake subscale of Emotive Limitedness was found to be 12.04±4.29, the mean score of the Scale that Determines the Level of Trauma after the Earthquake subscale of Affective was found to be 12.73±3.37, the mean score of the Scale that Determines the Level of Trauma after the Earthquake subscale of Cognitive Structure was found to be 15.01±3.70, the mean score of the Scale that Determines the Level of Trauma after the Earthquake subscale of Sleep Problems was found to be 9.26±3.70, and the Scale that Determines the Level of Trauma after the Earthquake mean score was found to be 60.44±15.92.

The mean score of the Ruminative Thought Style Questionnaire was found to be 88.62±26.74. The mean score of the Caring Behaviors Inventory-24 subscale of Respectful was found to be 30.17±4.52, the mean score of the Caring Behaviors Inventory-subscale of Connectedness was found to be 24.67±4.10, the mean score of the Caring Behaviors Inventory-subscale of Knowledge and Skill was found to be 26.94±3.45, the mean score of the Caring Behaviors Inventory-subscale of Assurance was found to be 40.54±5.98, and the Caring Behaviors Inventory-mean score was found to be 122.33±16.72. The findings determined that the nurses' ruminative thought styles, post-earthquake trauma levels, and perceptions of caring behaviors were above average (Table 2).

Female nurses' mean scores in the Scale that Determines the Level of Trauma after the Earthquake subscales of Behavior Problems, Affective, Cognitive Structure, Sleep, and Scale that Determines the Level of Trauma after the Earthquake total are significantly higher than those of men.

Among the nurses participating in the study, the mean scores of the Scale that Determines the Level of Trauma after the Earthquake and its subscales are statistically significantly higher than those whose income is less than their expenses compared to those whose income is equal to or higher than their expenses. Additionally, the Ruminative Thought Style Questionnaire mean score of nurses whose income is less than their expenses are statistically significantly higher than those whose income equals their expenses.

The mean scores of the Caring Behaviors Inventory-24 and its subscales of Respectful, Connectedness of nurses with a graduate degree are statistically significantly higher than those with a Vocational High School of Health degree. At the same time, the mean score of the Caring Behaviors Inventory-24 subscale of Assurance of nurses with a graduate degree is significantly higher than that of nurses with an associate degree (p<0.05) (Table 3).

The mean scores of the Scale that Determines the Level of Trauma after the Earthquake and its subscales of the nurses who lost their mother/father/sibling/spouse/close relative/ close friend/neighbor in the February 6 earthquake are statistically significantly higher than those who did not. In addition, the Ruminative Thought Style Questionnaire mean score of those who lost a close relative, close friend/neighbor in the earthquake is significantly higher than those who did not.

The mean scores of the Scale that Determines the Level of Trauma after the Earthquake subscales of Behavior Problems, Emotive Limitedness, Affective, Cognitive Structure, and the Ruminative Thought Style Questionnaire of nurses who lost their friends/colleagues in the earthquake are significantly higher. The mean score of the Scale that Determines the Level of Trauma after the Earthquake and its subscales of Behavior Problems, Emotive Limitedness, and Affective and Cognitive Structure of nurses whose houses were moderately damaged/highly damaged/collapsed after the earthquake are significantly higher than those that were not undamaged or slightly damaged.

In addition, the mean scores of the Ruminative Thought Style Questionnaire, Caring Behaviors Inventory-24, and Caring Behaviors Inventory-24 subscales of Connectedness and assurance of nurses whose houses were damaged after the earthquake are statistically significantly higher. The mean scores of the Scale that Determines the Level of Trauma after the Earthquake and its subscales of Emotive Limitedness and Affective of those whose institutions were moderately damaged after the earthquake are significantly higher than those whose institutions were undamaged (p<0.05) (Table 4).

Findings Related to Correlation Analysis

It was determined that there is a statistically significant, positive, and moderate correlation between nurses' age and years of employment as a nurse. It was determined that there are positive weak correlations between the years of employment as a nurse and the mean scores of the Scale that Determines the Level of Trauma after the Earthquake subscales of Emotive Limitedness, Affective, Sleep Problems, and the Ruminative Thought Style Questionnaire total. It was determined that there is a statistically significant, positive, and moderate correlation between the mean scores of the Ruminative Thought Style Questionnaire, Scale that Determines the Level of Trauma after the Earthquake, and its subscales. Additionally, a statistically significant, positive, and moderate correlation was found between the mean scores of the Scale that Determines the Level of Trauma after the Earthquake subscale of Cognitive Structure, Caring Behaviors Inventory-24, and the Caring Behaviors Inventory-24 subscales of Respect, Knowledge and-Skill (p<0.05) (Table 5).

Table 1: Sociodemographic Characteristics of the Nurses and their Opinions on the February 6 Earthquakes (n=317)

		n (%)			n (%)
Gender	**Female**	253 (79.8)	**The status of losing a relative in an earthquake**	**Absent**	156 (49.2)
	Male	64 (20.2)		**Mother-father-sibling-spouse**	13 (4.1)
Marital Status	**Married**	228 (71.9)		**Close relative**	57 (18.0)
	Single	89 (28.1)		**Close friend/neighbor**	91 (28.7)
Income	**The income is less than the expenses**	147 (46.4)	**The status of losing a colleague the earthquake**	**Present**	152 (47.9)
	The income is equal to expenses	133 (42.0)		**Absent**	165 (52.1)
	The income is higher than the expenses	37 (11.6)	**Damage statuses of the participants' houses after the earthquake**	**Undamaged**	98 (30.9)
Educational Level	**Vocational high school of health**	18 (5.7)		**Slightly damaged**	153 (48.3)
	Associate's degree	23 (7.3)		**Moderately damaged**	26 (8.2)
	Bachelor's degree	231(72.9)		**Heavily damaged**	29 (9.1)
	Postgraduate	45 (14.1)		**Collapsed**	11 (3.5)

The place where the participants were during the earthquake	At home	268 (84.6)	Damage statuses of the institutions where the participants were employed after the earthquake	Undamaged	115 (36.3)
	On duty	34 (10.7)		Slightly damaged	151 (47.6)
	In the car	15 (4.7)		Moderately damaged	23 (7.3)
Age: 34.23±7.26				Heavily damaged	24 (7.6)
Years of employment as a nurse: 11.82±7.77				Collapsed	4 (1.3)
Working hours per week: 43.18±7.06					

Table 2. The SDLTE, RTSQ, CBI-24, and their Subscales' Mean Scores

Scales & Subscales	Item Number	Mean±Standard Deviation	Minimum-Maximum Scores	Minimum-Maximum Scores in the Current Study
Behavior Problems	4	11.37±3.73	4-20	4-20
Emotive Limitedness	5	12.04±4.29	5-25	4-20
Affective	4	12.73±3.37	4-20	4-20
Cognitive Structure	4	15.01±3.70	4-20	7-20
Sleep Problems	3	9.26±3.70	3-15	3-15
SDLTE Total	20	60.44±15.92	20-100	25-95
RTSQ Total	20	88.62±26.74	20-140	20-140
Respectful	6	30.17±4.52	6-36	16-36
Connectedness	5	24.67±4.10	5-30	12-30
Knowledge and Skill	5	26.94±3.45	5-30	14-30
Assurance	8	40.54±5.98	8-48	24-48
CBI-24 Total	24	122.33±16.72	24-144	69-144

Table 3. Correlations between the Nurses' Sociodemographic Characteristics, SDLTE, RTSQ, CBI-24, and Their Subscales' Mean Scores

Sociodemographic Characteristics		SDLTE						RTSQ	CBI-24				
		Behavior Problems	Emotive Limitedness	Affective	Cognitive Structure	Sleep Problems	Total	Total	Respectful	Connectedness	Knowledge and Skill	Assurance	Total
Gender	**Female**	11.66±3.61	12.21±4.26	13.00±3.31	15.30±3.64	9.47±3.73	61.65±15.68	89.61±27.22	30.11±4.55	24.64±4.01	26.90±3.53	40.59±5.96	122.26±16.73
	Male	10.25±4.02	11.37±4.35	11.68±3.39	13.90±3.76	8.42±3.49	55.64±16.09	84.70±24.59	30.42±4.43	24.81±4.44	27.07±3.18	40.32±6.10	122.64±16.82
Test and Significance Values		**t: 2.731 p: 0.007**	t: 1.405 p: 0.161	**t: 2.813 p: 0.005**	**t: 2.717 p: 0.007**	**t: 2.038 p: 0.042**	**t: 2.726 p: 0.007**	t: 1.314 p: 0.190	t: -0.491 p: 0.624	t: -0.293 p: 0.770	t: -0.349 p: 0.727	t: 0.320 p: 0.749	t: -0.162 p: 0.871
Marital Status	**Married**	11.48±3.74	11.89±4.08	12.67±3.23	15.05±3.51	9.21±3.62	60.31±15.37	88.57±26.12	30.07±4.28	24.61±3.88	27.02±3.35	40.39±5.77	122.11±16.08
	Single	11.11±3.73	12.44±4.76	12.87±3.70	14.93±4.16	9.39±3.92	60.76±17.36	88.76±28.42	30.41±5.09	24.84±4.63	26.73±3.73	40.91±6.51	122.89±18.34
Test and Significance Values		t: 0.792 p: 0.429	t: -0.975 p: 0.331	t: -0.466 p: 0.641	t: 0.240 p: 0.810	t: -0.394 p: 0.694	t: -0.213 p: 0.832	t: -0.058 p: 0.954	t: -0.552 p: 0.582	t: -0.412 p: 0.681	t: 0.684 p: 0.494	t: -0.682 p: 0.495	t: -0.373 p: 0.710
Income	The income is less than the expenses	12.34±3.79	13.29±4.38	13.34±3.34	15.78±3.72	10.22±3.73	64.98±16.22	94.44±26.50	30.70±4.62	25.16±4.18	26.97±3.56	40.91±6.08	123.76±17.28
	The income is equal to the expenses	10.57±3.48	11.03±3.74	12.39±3.35	14.45±3.58	8.56±3.36	57.02±14.39	81.90±25.71	29.87±4.34	24.39±3.89	27.11±3.07	40.49±5.64	121.87±15.48
	The income is higher than the expenses	10.45±3.56	10.75±4.50	11.51±3.09	14.00±3.50	7.94±3.89	54.67±15.45	89.64±26.43	29.16±4.60	23.78±4.35	26.18±4.26	39.21±6.72	118.35±18.43
Test and Significance Values		F: 9.573 **p: <0.001 (1>2) (1>3)**	F: 12.445 **p: <0.001 (1>2) (1>3)**	F: 5.679 **p: 0.004 (1>2) (1>3)**	F: 6.243 **p: 0.002 (1>2) (1>3)**	F: 10.200 **p: <0.001 (1>2) (1>3)**	F: 12.290 **p: <0.001 (1>2) (1>3)**	F: 8.056 **p: <0.001 (1>2)**	F: 2.235 p: 0.109	F: 2.250 p: 0.107	F:1.047 p: 0.352	F: 1.204 p: 0.301	F: 1.641 p: 0.195
Educational Level	**Vocational high school of health**	11.55±3.48	11.66±4.36	13.33±3.21	16.11±3.54	9.94±3.84	62.61±16.06	82.33±24.35	32.66±2.76	26.50±3.03	28.50±1.75	43.00±3.86	130.66±10.16
	Associate's degree	11.47±4.02	12.13±4.64	12.82±3.44	15.17±3.85	9.21±4.15	60.82±16.98	84.82±31.69	31.17±4.31	25.95±3.64	28.08±3.31	43.04±6.20	128.26±16.30
	Bachelor's degree	11.52±3.80	12.25±4.32	12.77±3.35	15.06±3.75	9.45±3.70	61.07±16.08	89.99±26.93	30.06±4.60	24.58±4.21	26.77±3.52	40.45±6.06	121.86±17.11
	Postgraduate	10.48±3.32	11.11±3.90	12.22±3.49	14.28±3.40	8.00±3.28	56.11±.14.21	86.06±23.97	29.24±4.44	23.80±3.82	26.62±3.52	38.75±5.58	118.42±15.55
Test and Significance Values		F: 0.992 p: 0.397	F: 0.938 p: 0.423	F: 0.553 p: 0.647	F: 1.129 p:0.338	F: 2.183 p: 0.090	F: 1.352 p: 0.258	F: 0.823 p: 0.482	F:2.930 **p: 0.034 (1<4)**	F: 2.702 **p: 0.046 (1<4)**	F: 2.406 p: 0.067	F: 3.804 **p: 0.011 (2<4)**	F: 3.409 **p: 0.018 (1<4)**

F: One Way Anova Test Value, t: Independent Sample T Test Value, p: Significance Level

Table 4. Correlations between the Nurses' Opinions on the February 6 Earthquake, the SDLTE, RTSQ, CBI-24, and their Subscales' Mean Scores

		SDLTE						RTSQ	CBI-24				
		Behavior Problems	Emotive Limitedness	Affective	Cognitive Structure	Sleep Problems	Total	Total	Respectful	Connectedness	Knowledge and Skill	Assurance	Total
The place where the participants were during the earthquake	At home	11.36±3.77	11.91±4.21	12.62±3.39	15.06±3.66	9.14±3.68	60.11±15.81	87.69±27.29	30.07±4.39	24.55±4.00	26.96±3.32	40.37±5.86	121.97±16.15
	On duty	11.61±3.37	13.11±4.87	13.17±2.76	15.23±4.21	9.94±4.09	63.08±17.05	90.76±25.00	30.32±5.70	24.67±4.82	26.50±4.74	40.91±7.16	122.41±21.49
	In the car	11.00±4.00	12.06±4.16	13.73±4.09	13.73±3.21	9.73±3.10	60.26±.15.84	100.33±17.25	31.60±3.90	26.86±3.75	27.53±2.38	42.66±5.06	128.66±14.30
Test and Significance Values		F: 0.146 p: 0.864	F: 1.196 p: 0.304	F: 1.098 p: 0.335	F: 0.981 p:0.376	F: 0.814 p: 0.444	F: 0.525 p: 0.592	F: 1.714 p: 0.182	F:0.827 p: 0.438	F: 2.271 p: 0.105	F: 0.502 p: 0.606	F: 1.113 p: 0.330	F: 1.138 p: 0.322
Losing a relative in an earthquake	Absent	10.42±3.69	11.28±4.09	11.91±3.36	13.89±3.71	8.42±3.49	55.94±15.69	82.67±26.56	30.07±4.78	24.62±4.34	26.87±3.73	40.53±6.13	122.10±17.58
	Mother-father-sibling-spouse	13.15±3.50	14.69±4.11	15.07±2.78	17.23±3.37	10.84±3.80	71.00±13.47	98.84±22.53	28.30±4.57	22.69±4.95	26.23±3.46	38.30±7.02	115.53±18.50
	Close relative	12.24±3.72	12.63±4.19	13.59±3.26	16.49±3.19	10.43±3.89	65.40±.14.44	93.87±25.48	31.05±4.00	25.50±3.61	27.80±2.44	41.56±5.19	125.92±13.92
	Close friend/neighbor	12.20±3.46	12.61±4.46	13.26±3.17	15.70±3.43	9.73±3.62	63.52±.15.37	94.10±26.48	30.06±4.31	24.53±3.76	26.62±3.46	40.23±6.00	121.46±16.37
Test and Significance Values		F: 7.253 p: 0.000 (2>1, 3>1, 4>1)	F: 4.318 p: 0.005 (2>1)	F: 7.593 p: 0.000 (2>1, 3>1, 4>1	F: 11.367 p:0.000 (2>1, 3>1, 4>1	F: 6.148 p: 0.000 (3>1, 4>1)	F: 9.774 p: 0.000 (2>1, 3>1, 4>1)	F: 5.407 p: 0.001 (3>1, 4>1)	F:1.506 p: 0.213	F: 1.854 p: 0.137	F: 1.656 p: 0.177	F: 1.240 p: 0.295	F: 1.697 p: 0.168
The status of losing a friend/colleague the earthquake	Present	12.13±3.74	12.64±3.98	13.48±3.23	15.73±3.47	9.67±3.67	63.66±15.16	92.62±26.09	29.88±4.33	24.32±4.04	26.83±3.29	40.07±5.85	122.11±16.18
	Absent	10.68±3.60	11.49±4.49	12.04±3.35	14.35±3.79	8.88±3.70	57.47±16.08	84.93±26.88	30.44±4.69	25.00±4.13	27.04±3.60	40.97±6.08	123.46±17.18
Test and Significance Values		t: 3.503 p: <0.001	t:2.397 p: 0.017	t: 3.861 p: <0.001	t: 3.366 p: <0.001	t: 1.894 p: 0.059	t: 3.519 p: <0.001	t: 2.578 p: 0.010	t: -1.103 p: 0.271	t: -1.457 p: 0.146	t: -0.531 p: 0.596	t: -1.344 p: 0.180	t: -1.246 p: 0.214
Damage statuses of the participants' houses after the earthquake	Undamaged	10.57±3.85	11.19±4.44	12.30±3.48	14.61±3.73	9.02±3.79	57.70±16.10	84.91±27.03	30.64±4.89	25.35±4.26	27.39±3.73	41.74±5.97	125.14±17.57
	Slightly damaged	11.20±3.48	11.97±3.80	12.22±3.17	14.78±3.65	8.92±3.65	59.11±14.72	87.69±26.22	29.94±4.10	24.31±3.73	26.77±3.18	40.07±5.55	121.10±15.17
	Moderately damaged	12.19±3.68	12.61±3.87	13.76±2.99	15.42±3.17	10.11±3.29	64.11±.14.93	91.07±24.18	30.19±5.02	24.57±4.63	26.53±3.79	40.38±6.73	121.69±19.10
	Heavily damaged	13.65±3.29	14.65±4.88	15.37±2.66	16.82±3.39	10.62±3.27	71.13±14.86	100.89±25.34	28.86±4.82	23.51±4.64	26.03±3.70	38.13±7.13	116.55±18.59
	Collapsed	13.09±4.65	12.45±6.08	14.27±3.69	16.18±4.81	10.45±4.86	66.45±22.91	96.45±33.79	32.63±3.93	27.00±3.57	28.54±2.50	43.09±4.34	131.27±13.46

Test and Significance Values		F: 5.046 p: <0.001 (4>1) (4>2)	F: 3.940 p: 0.004 (4>1) (4>2)	F: 7.499 p: <0.001 (4>1) (4>2)	F: 2.576 p:0.038 (4>1) (4>2)	F: 2.043 p: 0.088	F: 5.267 p: <0.001 (4>1) (4>2)	F: 2.374 p: 0.052 (4>1)	F:1.807 p: 0.127	F: 2.484 p: 0.044	F: 1.705 p: 0.149	F: 2.971 p: 0.020 (4>1)	F: 2.610 p: 0.036
Damage statuses of the institutions where the participants were employed after the earthquake	Undamaged	10.68±3.79	11.14±4.51	12.00±3.59.	14.33±3.81	8.76±3.87	56.94±16.89	86.08±28.48	30.70±4.64	25.20±4.19	27.20±3.64	41.10±5.48	124.20±16.66
	Slightly damaged	11.74±3.59	12.36±3.92	12.84±3.12	15.31±3.50	9.51±3.63	61.78±14.65	89.35±25.14	29.93±4.32	24.45±3.98	26.73±3.37	40.26±6.12	121.39±16.37
	Moderately damaged	12.73±4.64	14.00±4.31	14.39±3.31	16.30±3.80	10.43±3.69	67.86±.17.04	99.08±26.49	30.56±5.10	24.95±4.54	27.34±3.45	40.95±6.80	123.82±19.28
	Heavily damaged	10.83±2.79	12.45±4.74	13.54±3.24	15.37±3.96	8.91±3.41	61.12±15.46	85.58±27.49	29.12±4.77	23.62±4.12	27.00±3.28	39.50±6.86	119.25±17.35
	Collapsed	13.00±4.24	12.25±3.86	15.00±1.41	13.75±3.30	9.25±2.21	63.25±13.50	92.00±28.15	28.00±2.16	22.75±1.50	24.75±2.21	38.75±4.99	114.25±10.71
Test and Significance Values		F: 2.462 p: 0.045	F: 2.779 p: 0.027 (3>1)	F: 3.682 p: 0.006 (3>1)	F: 2.109 p:0.080	F: 1.327 p: 0.260	F: 3.021 p: 0.018 (3>1)	F: 1.264 p: 0.284	F:1.099 p: 0.357	F: 1.221 p: 0.302	F: 0.775 p: 0.542	F: 0.631 p: 0.641	F: 0.964 p: 0.428

F: One Way Anova Test Value, t: Independent Sample T Test Value, p: Significance Level

Table 5. Correlations between the Nurses' Age, Years of Employment, Working Hours Per Week, SDLTE, RTSQ, CBI-24 and their Subscales' Mean Scores

			Age	Years of employment as a nurse	Working hours per week	SDLTE						RTSQ	(CBI-24)				
						Behavior Problems	Emotive Limitedness	Affective	Cognitive Structure	Sleep Problems	Total	Total	Respectful	Connectedness	Knowledge Assurance		Total
Age		r	1	.929**	-.073	.054	.124*	.105	.084	.107	.042	.113*	.078	.063	.123*	.091	.094
		p		**.000**	.195	.334	**.027**	.062	.134	.057	.455	**.044**	.168	.262	**.028**	.106	.093
Years of employment as a nurse		r	.929**	1	-.078	.072	.123*	.116*	.105	.125*	.027	.128*	.021	.016	.098	.043	.045
		p	**.000**		.173	.207	**.032**	**.043**	.067	**.029**	.640	**.025**	.719	.782	.088	.453	.430
Working hours per week		r	-.073	-.078	1	-.030	.069	-.069	.060	.030	.049	.018	-.009	-.027	.022	.003	-.003
		p	.195	.173		.589	.220	.224	.290	.598	.384	.753	.874	.629	.696	.956	.951
SDLTE	**Behavior Problems**	r	.054	.072	-.030	1	.686**	.576**	.633**	.677**	.436**	.846**	.028	.056	.049	.022	.039
		p	.334	.207	.589		**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	.621	.316	.383	.699	.485
	Emotive Limitedness	r	.124*	.123*	.069	.686**	1	.588**	.677**	.640**	.507**	.861**	.037	.010	.049	.033	.034
		p	**.027**	**.032**	.220	**.000**		**.000**	**.000**	**.000**	**.000**	**.000**	.509	.864	.389	.554	.541

	Affective	r	.105	.116*	-.069	.576**	.588**	1	.653**	.584**	.519**	.793**	.043	.073	.046	.043	.054
		p	.062	**.043**	.224	**.000**	**.000**		**.000**	**.000**	**.000**	**.000**	.447	.198	.415	.450	.337
	Cognitive Structure	r	.084	.105	.060	.633**	.677**	.653**	1	.724**	.488**	.870**	.122**	.103	.184**	.094	.130**
		p	.134	.067	.290	**.000**	**.000**	**.000**		**.000**	**.000**	**.000**	**.030**	.068	**.001**	.094	**.021**
	Sleep Problems	r	.107	.125*	.030	.677**	.640**	.584**	.724**	1	.479**	.856**	.079	.099	.101	.079	.095
		p	.057	**.029**	.598	**.000**	**.000**	**.000**	**.000**		**.000**	**.000**	.159	.078	.073	.163	.092
	Total	r	.113*	.128*	.018	.846**	.861**	.793**	.870**	.856**	.574**	1	.072	.078	.101	.063	.082
		p	**.044**	**.025**	.753	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**		.198	.165	.073	.261	.144
RTSQ	**Total**	r	.042	.027	.049	.436**	.507**	.519**	.488**	.479**	1	.574**	.078	.078	.091	.039	.073
		p	.455	.640	.384	**.000**	**.000**	**.000**	**.000**	**.000**		**.000**	.164	.165	.107	.490	.195
	Respectful	r	.078	.021	-.009	.028	.037	.043	.122*	.079	.078	.072	1	.928**	.746**	.872**	.964**
		p	.168	.719	.874	.621	.509	.447	**.030**	.159	.164	.198		**.000**	**.000**	**.000**	**.000**
	Connectedness	r	.063	.016	-.027	.056	.010	.073	.103	.099	.078	.078	.928**	1	.683**	.825**	.933**
		p	.262	.782	.629	.316	.864	.198	.068	.078	.165	.165	**.000**		**.000**	**.000**	**.000**
CBI-24	**Knowledge and Skill**	r	.123*	.098	.022	.049	.049	.046	.184*	.101	.091	.101	.746**	.683**	1	.720**	.834**
		p	.028	.088	.696	.383	.389	.415	**.001**	.073	.107	.073	**.000**	**.000**		**.000**	**.000**
	Assurance	r	.091	.043	.003	.022	.033	.043	.094	.079	.039	.063	.872**	.825**	.720**	1	.945**
		p	.106	.453	.956	.699	.554	.450	.094	.163	.490	.261	**.000**	**.000**	**.000**		**.000**
	Total	r	.094	.045	-.003	.039	.034	.054	.130*	.095	.073	.082	.964**	.933**	.834**	.945**	1
		p	.093	.430	.951	.485	.541	.337	**.021**	.092	.195	.144	**.000**	**.000**	**.000**	**.000**	

r: Pearson Correlation Analysis Coefficient, p: Significance Level, *: Weak Correlation, **: Moderate Correlation, ***: High Correlation

Discussion

It is thought that, depending on the PTSD that occurs in individuals after the earthquake, thoughts of recurrence, constantly remembering the moment of the earthquake, and ruminative thoughts as if an earthquake is happening may cause nurses to avoid fulfilling their professional roles and responsibilities or to perform them incompletely. Considering the importance of care in nursing, disruptions in the caregiving role may disrupt the provision of health services. Therefore, determining the effect of the trauma experienced by nurses caught in the February 6 earthquakes after this disaster on their ruminative thoughts and care behaviors is very important for providing health services.

According to the findings of this research, it was determined that nurses' ruminative thought styles, post-earthquake trauma levels, and perceptions of caring behaviors were above average. When the literature was examined, similar results were obtained with our research according to different studies' findings (Aydın & Özcan, 2021; Celik, 2023; Erenoglu et al., 2019). In line with the findings of this research and the findings obtained from the literature, providing the necessary psychological and social support to nurses after the earthquake may contribute to reducing the ruminative thought caused by the earthquake, coping with stress and PTSD, and as a result, providing a higher quality nursing care.

Healthcare professionals, especially nurses, are on the front lines in epidemics, disasters, and war. In the Kahramanmaras-centered earthquakes that occurred in Turkey on February 6, nurses, in addition to taking part in the rescue, protection, treatment, and care services, also suffered from the loss of lives and property in their own families and close circles. Ruminative thought styles also increase with the increase in caring burdens and the problems they experience, such as depression, anxiety, and trauma (Andrades et al., 2021; Aydın & Özcan, 2021). This study's determination that ruminative thought styles increase as post-earthquake trauma levels increase supports this information in the literature.

Problems such as depression and anxiety are frequently seen after natural disasters, and such problems affect women the most (Anwar et al., 2011). As a result of this study, it was determined that women's post-earthquake trauma levels were higher than men's. This situation can be associated with taking on the care burden of the child and family after the earthquake, changing their living place, and having problems fulfilling their motherhood roles. In line with these findings, it is essential to provide the necessary physical and psychological support to all individuals, especially women, after the earthquake for the integrity of the family and for women to fulfill their roles as mothers effectively (Kun et al., 2013).

It was determined that among the nurses participating in the study, those whose income was less than their expenses had higher post-earthquake trauma levels than other groups. Socioeconomic levels are essential concepts that affect individuals' financial situation, living conditions, employment, social relations, health, and other access rights, and, therefore, their stress and trauma levels (Reiss et al., 2019). In short, it can be said that individuals with low socioeconomic status are more affected by traumatic events such as earthquakes (Dorahy et al., 2015). Accordingly, their post-earthquake trauma levels will also be higher. In line with the literature and the findings obtained from this study, efforts to improve society's welfare and socioeconomic level before traumatic events such as earthquakes occur are an important factor in maintaining healthy societies. In addition, necessary financial support should be provided to all employees, especially health workers with low socioeconomic status, to maintain health services and continuity of care after the earthquake.

Quality nursing care involves meeting patient needs with professionalism, empathy, respect, and compassion through therapeutic relationships and teamwork (Peršolja, 2021). Nurses must understand and apply professional values, which require advanced academic preparation (Sibandze & Scafide, 2018). This study found that nurses with postgraduate degrees provided higher quality care than those from vocational high schools. Therefore, improving and prioritizing undergraduate nursing education through collaboration between the state and educational institutions is essential.

There is a link between losing a loved one in an earthquake and increased PTSD levels. A study on adolescents found higher post-traumatic

stress in those who witnessed injury or death during the earthquake (Wahab et al., 2021). Similarly, this study showed that nurses who lost close relatives or friends in the February 6 earthquake had higher trauma levels. These findings highlight the psychological impact of the earthquake, beyond physical damage. Supporting individuals physically, mentally, and psychologically is crucial for the well-being of individuals, families, and communities.

Research shows a significant link between post-earthquake trauma and ruminative thought styles (Andrades et al., 2021). This study found that individuals who lost a relative, friend, or colleague in the earthquake had higher trauma and ruminative thought levels. Therefore, the ruminative thoughts of those affected, especially those who lost loved ones, should be addressed. Further studies should explore these thoughts across all age groups, and psychological support should be offered to help manage negative thoughts and beliefs.

The literature indicates that relocating to temporary shelters after an earthquake can trigger post-traumatic stress (Farooqui et al., 2017). This study found that nurses whose homes were destroyed had higher trauma and ruminative thought levels than those with undamaged or slightly damaged homes. However, their increased exposure to hardship may have enhanced their empathy for those in need, explaining why nurses who lost their homes exhibited higher caring behaviors than others.

Emotionally significant experiences, like earthquakes, are more likely to be remembered due to the reinforcing effects of stress hormones (McIntyre & Roozendaal, 2007). Damaged buildings, including hospitals, remind nurses of the disaster, increasing their stress and anxiety. This study found that nurses working in moderately damaged hospitals had higher PTSD levels. Therefore, hospitals should be assessed, reinforced, and safe to reduce stress and PTSD for healthcare workers.

Limitations and Generalizability

This study has some limitations. First, since the study has a cross-sectional design, it is impossible to identify causal relationships with certainty. The data obtained only reflect the situation based on nurses' feedback at the time of the study and it was not possible to examine changes over time. Secondly, since the data were collected through an online survey, there is a tendency for participants to self-report their responses and a risk of bias. This may affect the accuracy of some responses. Furthermore, the study was limited to nurses working in specific hospitals in Gaziantep and may not reflect nurses' experiences in other regions. Therefore, the generalizability of the results to groups of nurses in regions more affected by the earthquake or with different demographic characteristics is limited.

Despite certain limitations, this study's findings provide essential information to understand nurses' psychological state after the earthquake and develop supportive interventions.

Conclusion: This study examined the relationship between nurses' post-earthquake trauma, ruminative thoughts, and caring behaviors, finding that all were above average. A significant correlation exists between trauma levels and ruminative thought styles. Among the nurses who participated in the study, those whose income was less than their expenses and those who lost their mother/father/brother/sister/wife/close relative/close friend/neighbour in the 6 February earthquake had higher scores on the Scale that Determines the Level of Trauma after the Earthquake and its subscales. Nurses whose houses were moderately damaged/heavily damaged/demolished after the earthquake had higher mean scores on Scale that Determines the Level of Trauma after the Earthquake and its subscales Behavioural Problems, Emotional Limitation and Affective and Cognitive Structure.

Recommendations: In trauma-affected areas, it is crucial to include preventive self-care measures in nursing education. Nursing schools should prioritise teaching strategies for managing stress, recognising early signs of trauma and promoting emotional resilience. Nursing programmes should be strengthened with resilience building modules. Resilience training may include techniques for emotional regulation, self-reflection and seeking support when needed. Nursing education should emphasise the principles of trauma-informed care, helping nurses recognise trauma in both patients and themselves and respond with empathy and professionalism. Curriculum development should include modules on stress coping mechanisms for both nurses and the population they serve. By equipping future

nurses with these skills, they will be better prepared to cope with the psychological challenges they may face in high-stress environments.

Employers should offer mental health support services, including counselling, psychotherapy and access to trauma-informed care. Support groups, both peer-led and facilitated by professionals, can also provide an outlet for nurses to share their experiences and cope with emotional burden. Given the long-lasting nature of the psychological impact of trauma, employers should provide ongoing access to mental health resources. This may include periodic check-ins with health professionals and integrating mental health care into routine health management for staff. Health managers and team leaders should be trained to recognise signs of trauma or burnout in their teams. This allows for early intervention and ensures that struggling staff members get the help they need before their mental health deteriorates further.

Implications: Based on the results of this research, psychological and social support can be provided to reduce nurses' stress and trauma. External nursing support can be offered to maintain quality of care and reduce workload. In hospital work environments, shorter shift hours can be implemented to improve care and reduce sleep-related trauma. Shelters can be provided for nurses who are displaced after the earthquake. Damaged hospitals can be repaired and patients transported to minimize trauma reminders. Alternative leave can be provided for nurses who have experienced personal loss to support psychological recovery. Similar efforts could be undertaken in other affected regions and professions.

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