

RESEARCH ARTICLE

Media-Induced Secondary Traumatic Stress: The Case of the Kahramanmaraş Earthquake in Turkey

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Introduction: Trauma manifests in a variety of ways and disrupts the lives of individuals. This is particularly the case in an age when communication technologies are permeating everyday practices, and media is an essential means of communication. A review of the international literature on disasters reveals that the measurement tools used in the research on the association between Secondary Traumatic Stress (STS) and the media are limited. **Aims:** The main aim of this study is to measure the STS levels in the audience of the media content regarding the Kahramanmaraş-centered earthquake and to examine the factors associated with it.

Methods: First, a measurement tool on the subject was developed, and then its psychometric properties were investigated. Exploratory factor analysis, confirmatory factor analysis, validity, and reliability analyses were conducted throughout the studies ($N = 30$ for Study I; $N = 265$ for Study II; $N = 283$ for Study III).

Results: A 17-item, four-factor (intrusion, anxiety, media distrust, and avoidance), valid and reliable scale was created. Moreover, depression was found to have a partial mediating effect on the significant relationship between media exposure related STS and psychological well-being ($\beta = -.22$, $SE = .027$, 95% CI $[-.25, -.19]$).

Conclusions: The results revealed the multi-dimensional impact of STS on people indirectly exposed to trauma as well as the uniqueness of the scale.

Keywords: secondary traumatic stress, media, earthquake, interdisciplinarity, media psychology.

Introduction

The American Psychological Association (n.d., para 1.) defines the concept of trauma as “an emotional response to a terrible event like an accident, crime, natural disaster, physical or emotional abuse, neglect, experiencing or witnessing violence, death of a loved one, war, and more.” Herman (1997), on the other hand, defines trauma as a response to an event that leads to a deterioration of life harmony and inadequate coping skills. In addition, Van der Kolk (2015) defines the concept of trauma as the psychological result of destructive and stressful events that disrupt an individual’s coping strategies toward a problem. A potentially serious injury or threat to life can be defined as trauma. In addition, several other events that cause the person to develop various negative symptoms can be considered trauma.

Experienced or witnessed traumatic events cause people to develop a range of symptoms and disorders. In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), trauma-related disorders are assessed under the diagnosis of Post-Traumatic Stress Disorder

(PTSD). The common denominator of the disorders under this heading is the potential for a traumatic or stressful event in the person's past to influence the onset of symptoms (Morrison, 2014). This implies that the person was unable to maintain their homeostatic order after the traumatic event to which they were somehow exposed, and they exhibited pathological reactions because their psychological balance was disturbed. To go deeper, according to the DSM-5, the diagnosis of PTSD involves a *stressor* (either directly experiencing or witnessing a trauma in person, or an indirect exposure through the experiences of a relative or close friend, or through professional duties) (criterion A), the *involuntarily re-experience* of the traumatic event (criterion B), *avoidance of or efforts to avoid* trauma-related thoughts, feelings or the reminders of the traumatic event(s) (criterion C), to focus on *negative beliefs, expectations* or *cognitions* or to *dissociate* (criterion D), and to have *physiological* and *emotional reactions* (e.g. anxious feelings, difficulty concentrating or sleeping) related to this (criterion E) (American Psychiatric Association, 2013).

Although PTSD symptoms are usually related to a direct experience of the traumatic event, this may not be the case in all instances of trauma. Figley (1998) defines "Secondary Traumatic Stress (STS)" as an individual's behavioral and emotional reactions, resulting from witnessing stressful events experienced by significant others. Stress in this sense results from caring for, helping, or wanting to help the traumatized person (Dirkzwager et al., 2005). As Figley (1995) argues, in the case of primary exposure, the perceived threat is in a personal position. In the case of secondary exposure, however, it may be related to the lives of people he knows or encounters through his work, rather than to the person himself. It has been suggested that the negative effects of secondary traumatic stress can have similar outcomes to PTSD and that individuals can have almost the same reactions (Bride et al., 2007). A person who has been exposed to a traumatic event at a secondary level may feel uncomfortable, or depressed, have problems concentrating, or exhibit some avoidant behaviors through remembering the experience of the person at the center of the traumatic event (Figley, 1995; 1998). There may also be a reduced sense of hope for the future, excessive reactions to stimuli, outbursts of anger, or irritability. As a result, secondary exposure can be as distressing as primary exposure (Figley, 1998).

Some studies evaluating the prevalence and characteristics of secondary traumatic stress can be mentioned in the literature. For example, the survey by Bride et al. (2009) assessed the levels of PTSD symptoms and STS levels in 225 substance abuse counselors. As a result of the research, counselors frequently exhibited STS symptoms while working with traumatized populations; with almost half of them experiencing intrusive thoughts. A study (Hatcher et al., 2011) included 118 juvenile justice teachers who provide education to incarcerated children. When asked to assess the students they worked with for the effects of the traumatic events they had experienced, the experts reported that 47% of the students had moderate traumatic symptoms, 27% were severely and 7% were severely traumatized. In terms of the teachers' STS symptoms, it was observed that 81% of the participants met at least one of the PTSD criteria, 55% met at least two, and 39% met all of them. Another study conducted in Australia, surveyed 412 professionals supporting clients with alcohol or other drug addiction and found STS in 20% of the participants (Ewer et al., 2015). To give examples from Turkish literature, Kahil and Palabıyıkoglu's (2018) research aimed to examine the STS levels of 228 professional and volunteer aid workers; as a result of the study, it was found that the STS levels of the professionals were higher than those of the volunteers and that the STS symptoms increased as the duration of their occupation increased. In the review study by Yanboluoglu (2019), it was determined that the level of STS varies according to sociodemographic background and may be related to individual factors such as coping skills or burnout. In addition, it was determined that the level of STS increased with experience and was higher in specialists with an individual trauma history.

The disruption of the life cycle and routines of individuals following a traumatic event carries the risk of negative attitudes and behaviors. Depressive disorders that may occur in this context are symptoms that persist for a certain period and may harm people's functionality (Curry & Reinecke, 2003). Depression may include a single negative emotion, accompanying symptoms, or a psychiatric disorder. People may be prone to these negative symptoms when they are indirectly exposed to a traumatic situation. However, a review of the literature reveals that the studies on these relationships are limited. For example, a study by Ariapooran et al. (2022) revealed that STS was associated with depression, anxiety and suicidal ideation in nurses. Another study (Perstling & Rothmann, 2012) found a significant and negative correlation between secondary traumatic stress and psychological well-being.

Most of the previously mentioned studies used the Secondary Traumatic Stress Scale (STSS), developed by Bride et al. (2004) to measure STS with three subscales: intrusion, arousal and avoidance symptoms. The Secondary Trauma Questionnaire (STQ), developed by Motta et al. (2001), is also a tool used to measure symptoms of secondary trauma. These scales mostly examine the stress that professionals working with traumatized groups develop; on the other hand, secondary traumatic stress may not only be seen in these people. There is also the possibility that any person may develop secondary traumatic stress as a result of media exposure. To ad-

dress this phenomenon, Mancini (2019) developed the Secondary Traumatic Stress Scale for Social Media Users (STSS-SM) and with this scale, secondary traumatic stress was examined through social media posts. Balcı Çelik and Altınışik (2021) conducted the Turkish validity and reliability study of this scale. However, the scarcity of studies, including measurement tools developed for STS, warrants attention.

Although several studies indicate that professionals exposed to the traumas of others experience a significant increase in STS levels (Bride et al., 2007; Bride et al., 2009; Ewer et al., 2015; Hatcher et al., 2011; Kahil & Palabıyıkoglu, 2018; Yanbolluoğlu, 2019), media-induced STS has been investigated in much fewer studies (Comstock & Platania, 2017). In fact, the DSM-5 diagnosis of PTSD (American Psychiatric Association, 2013) requires a close or work-related relationship with the victim in case of indirect exposure; and the definition of STS by Figley (1998) also implies a personal contact between the trauma victim and the person experiencing STS symptoms. These studies, however, focus on STS symptoms of individuals exposed to media content that reflects traumatic situations resulting from disasters, disease, and war, primarily supported by visuals, i.e. in this case there is no personal contact with the victim. For example, the study by Comstock and Platania (2017) measured the levels of STS that occurred after the public watched traumatic events in the world and the individuals affected by these events on social media and television. Their results suggest that indirect exposure to trauma through the media increases anxiety levels in non-specialists. Secker and Braithwaite (2021) conducted a study investigating the relationship between the frequency of watching news about knife crime on social media and STS. They also investigated the potential moderating effects of gender, age, and location. Accordingly, a higher frequency of knife crime viewed via social media was significantly associated with higher STS symptoms. Additionally, the study found that younger female participants generally scored highest on the STS.

A study on the relationship between media and trauma in Turkey (Atalay, 2017) focuses on the risks journalists face when reporting on violence. This study, which summarizes research showing that journalists experience PTSD due to the traumatic events they have witnessed, highlights the need to raise awareness and support them both through the news organizations they work with and independent organizations. For example, some photos and videos may contain disturbing violence, which increases the risk of secondary trauma. Media professionals act as a filter that protects the reader/viewer when deciding which photo or video to use. However, individuals who perform this task are also likely to be affected by the filtered content. Keats and Buchanan (2013) explored the effects of witnessing trauma on Canadian journalists and photojournalists working on national and international assignments. The study's main purpose was to reveal the participants' understanding of the effects of trauma, disaster, or conflict news within the journalistic culture. As a result of the research, the frequency of exposure to violent images was more stressful for journalists than the duration of exposure.

Especially with the advent of digitization, new media, and social media channels have a more fluid structure that allows for speed, simultaneity, feedback, and fewer control mechanisms than traditional mass media and prosumer environments. These features also allow users to be aware of events worldwide, to comment on them, and to distribute and archive content. While all this has transformed the media content and its relationship to the masses in the digitalized world, it also, unfortunately, forms the basis for access to violence and traumatic events in a short time. Therefore, media content can potentially affect everyday life through "exposure" and subsequent affective interaction.

At this point, it is necessary to explain the main differences between traditional media and new media. In general, while traditional media or mainstream mass media tools are classified as television, radio, and newspaper, new media tools can be classified as social media, internet televisions, YouTube, smartphones, and tablets, etc. In exploring the distinctions and complementarities between the new media and mainstream mass media, one must understand the technical distinctions between these various media forms. Mainstream mass media are typically highly centralized, require significant investment and resources, and can be heavily influenced by governments through various mechanisms and forms of control. The new or alternative media on the other hand have radically different characteristics. The new media such as the Internet can be used for both points to mass communications as well as point-to-point and mass-to-point message distribution. They are also extremely decentralized, require very low investment, provide greater interactivity and public participation, and are much more difficult to control (Salman et al., 2011). Therefore, especially with new media content, since there is no "selection" process of written and visual news material by a gatekeeper (news editor), the STS risk of journalists is now a situation that users may also face.

In contrast to the potentially stress-inducing nature of the media, the frequency with which traumatic events are viewed/represented in the media by the masses is also included in the affective desensitization theory. "The theory asserts that viewers may lose their sense of empathy or sympathy for victims of actual violence, especially when violent media content is constantly consumed" (Abanoz, 2018, pp. 217). If we adopt the normalization

process of something extraordinary to sensitive news based on the studies of Ashforth and Kreiner (2002), the following steps emerge: The diffusion strategy is used to avoid the intense emotions that arise when someone encounters sensitive content for the first time (e.g., an image of a wounded or dead body). The next time we encounter another sensitive content, we go into the reframing stage; in other words, the person tries to put the emotions they have experienced again into a more acceptable form. Therefore, the original sadness, pain, or anger can no longer remain in its original intensity. Another visual, encountered later, starts the adaptation process. Thus, the exposed visuals begin to evoke a much lower emotional feeling. The next stage is normalization. Now, for the sensitive content that the person sees, the intense/painful/helpless/disturbing feeling at the beginning is replaced by an ordinary/everyday feeling. The need to react to and act on things that become ordinary also diminishes.

Overall, trauma-related media content can induce STS, with reactions such as emotional intensity, depression, anxiety, and anger in individuals, while at other times it can lead to depersonalization or not acting by becoming unresponsive. In any case, research into the STS-inducing nature of media exposure is still in its infancy. Therefore, this study has two main objectives: (1) to develop a measurement tool for secondary traumatic stress triggered by post-earthquake media content and (2) to investigate the mediator role of depression between media-induced secondary traumatic stress and psychological well-being. We hypothesized that (1) an exclusive tool is needed to investigate media-induced STS levels in people after an earthquake; (2) a significant relationship exists between media-induced STS and psychological well-being; (3) depression mediates the relationship between media-induced STS and psychological well-being.

Methods

Participants

A series of studies were conducted using convenience samples. Individuals who regularly followed the news through the media covering the 7.8 and 7.4 magnitude earthquakes centered in Turkey/ Kahramanmaraş on February 6, 2023 were recruited as participants. First, a small pilot study (Study I) was conducted with 30 participants. After that, Study II was conducted with 265 participants. For Study III, 283 people tested the CFA and mediation model. The minimum number of participants required for Study III was found to be 219 by using the G Power 3.1.9.2, with a reliability ratio of .95, an alpha error of .05, and an effect size of .08 for the relevant analyses (Faul et al., 2007; Soper, n.d.). Therefore, the goal was to recruit at least 250 participants for Study III.

Participants aged between 18 and 65 were included in all three studies. As a potential confounding variable for PTSD, none of the participants lost a loved one (e.g., parent, sibling, or child) following the series of earthquakes. Moreover, all the participants resided in provinces outside the earthquake zone. Most participants in Study I, II, and III also had no previous experience working with trauma survivors. All participants were contacted via Turkey's discussion forums and social networking sites. Data collection for Study I and II took place in March and April 2023 and for Study III in June 2023. Table 1 shows the demographic and background information of the samples in each study.

Table 1. Participants' Demographic and Background Information

		Study I (N = 30)	Study II (N = 265)	Study III (N = 283)
Age	Mean (SD)	31.5 (14.4)	34.7 (12.6)	29 (7.4)
		n (%)	n (%)	n (%)
Gender	Female	22 (73.3)	164 (55.6)	178 (62.9)
	Male	8 (26.7)	130 (44.1)	102 (36.0)
	Other	-	1 (0.3)	11 (1.1)
Education	Elementary	0 (0.0)	2 (0.7)	1 (0.4)
	Middle School	1 (3.3)	2 (0.7)	1 (0.4)
	High School	3 (10.0)	29 (9.8)	15 (5.3)
	Undergraduate	8 (26.7)	148 (50.2)	133 (47.0)
	Master	8 (26.7)	55 (18.6)	100 (35.3)
	PhD	9 (30.0)	45 (15.3)	32 (11.3)
	Other	1 (3.3)	12 (4.7)	1 (0.4)

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Table 1. continued

		Study I (N = 30)	Study II (N = 265)	Study III (N = 283)
		n (%)	n (%)	n (%)
Average hours spent on earthquake-related media	0 – 2 per day	7 (23.3)	118 (40.0)	154 (54.4)
	2 – 4 per day	13 (43.3)	107 (36.3)	92 (32.5)
	4 – 6 per day	5 (16.7)	47 (15.9)	26 (9.2)
	6 – 8 per day	1 (3.3)	13 (4.4)	6 (2.1)
	More than 8 per day	4 (13.3)	10 (3.4)	5 (1.8)
Working with trauma abusers	No	24 (80.0)	242 (82.0)	189 (66.8)
	Yes	6 (20.0)	18 (18.0)	94 (33.2)
Primary media platform to track earthquake-related news	Traditional	18 (60.0)	90 (30.5)	54 (19.0)
	Social Media	6 (20.0)	111 (37.6)	181 (64.0)
	Verbal	6 (20.0)	94 (31.9)	48 (17.0)
Number of media platforms followed to track earthquake-related news	One	20 (66.0)	221 (74.9)	189 (66.8)
	Two	6 (20.0)	53 (18.0)	70 (24.7)
	Three	4 (13.3)	21 (7.1)	24 (8.5)

Procedure

This research received ethical approval from the Dogus University Ethics Committee under the reference number E-42435178-050.06.04-44264. All participants were fully informed about the purpose of the study per the Declaration of Helsinki (World Medical Association, 2022) and voluntarily consented to participate in the online survey. The survey was conducted using Google Forms, which is compatible with computers and mobile devices.

In Study I, a preliminary pilot study was conducted with Turkish university students and experts to ensure the construct validity of EMC-STS. During this process, participants could provide feedback on the survey. After getting feedback, some of the questions were eliminated and Study II was conducted to test the psychometric characteristics of EMC-STS. However, to avoid counterbalancing during Study II, respondents were divided into two groups and presented with a different order of questions. Study III aimed to confirm the factor structure of EMC-STS, and to test the mediating role of depression on the relationship between secondary traumatic stress and psychological well-being. Participants spent approximately 10 minutes on each study. For the initial part, participants' demographic and background information is gathered. Following this section, participants completed questionnaires on secondary traumatic stress, depression, and psychological well-being.

Measures

Demographic and Background Information

All three studies began with collecting background information about the participants; including gender, age, educational status, average hours spent on earthquake-related media, working with trauma abusers, primary media platforms to track earthquake-related news, number of media platforms followed to track earthquake-related news, proximity to earthquake zones and experiences of personal loss due to the events. In addition, the studies included the self-reported questionnaires presented below. All measures were administered in Turkish.

Earthquake Related Media Content and Secondary Traumatic Stress

Firstly, 36 items were created for this study. The content of these items was partially derived from items of the STS (Bride et al., 2004) and STSS-SM (Mancini, 2019), and all the symptoms were related to the DSM-5 criterion for PTSD. In addition to intrusion, arousal and avoidance symptoms, which have been measured by previous instruments (Bride et al., 2004; Mancini, 2019), the measurement of media distrust was targeted, including how media contents about the earthquake affected individuals' emotions and cognitions. Many items created were modifications of the aforementioned previous measures, while additional items were developed based on the information from the literature review. Discussions were held and items were modified to reach a consensus and increase the face validity of the measures.

The scale items were reviewed with two academic experts, a professor in clinical psychology, and a professor in media studies specialized in traumatic experiences such as natural disasters. They provided various suggestions

concerning the scale items, such as flow, grammar, and context. The items were also evaluated by the pilot study participants in Study I. Based on the expert opinions and the pilot study, 2 items were eliminated due to contextual problems. Then 17 items were eliminated due to statistical problems during Study II.

Finally, a 17-item scale was developed involving the dimensions of secondary traumatic stress and media distrust, the Earthquake Related Media Content and Secondary Traumatic Stress Scale - Turkish (EMC-STSS) (see the Appendix for the questionnaire). Four subscales were created after the analysis: intrusion (items 1, 2, 3, 4, 5 and 12), anxiety (items 6, 9, 13 and 15), media distrust (items 7, 8 and 11) and avoidance (items 10, 14, 16 and 17). Participants responded to each item on a 5-point Likert-type scale, ranging from 1 (indicating that it does not describe me at all) to 5 (indicating that it describes me completely). Media distrust items were coded reversely; the total score was calculated after reversing the scores of this subscale. The total score, calculated as the sum of all items, can range from 17 to 85, with higher scores indicating higher STS levels. The scale could be completed in approximately 3 minutes. Detailed information on the psychometric properties is given in the Results section.

Social Media and Secondary Traumatic Stress

The Secondary Traumatic Stress Scale for Social Media Users (STSS-SM), developed by Mancini in 2019, is a 17-item instrument designed to assess symptoms of intrusion, avoidance, and arousal associated with indirect exposure to traumatic experiences through social media platforms. It was developed as a modification of STSS (Bride et al., 2004) via looking at STS through social media content. Items are rated on a Likert-type scale, with 1 indicating never, to 5 indicating very often. Higher total scores equal the higher secondary traumatic stress level. Participants considered their symptoms in the last month. This scale had no revised items and could be completed in approximately 2 minutes. In a validity and reliability study conducted by Mancini (2019), the internal consistency coefficient (Cronbach's α) of the scale and subscales was determined to be .92, .88 for intrusion, .80 for avoidance, and .79 for arousal. Balcı Celik and Altınışık (2021), conducted a validity study of the scale in a Turkish context, and reported a Cronbach's alpha value of .95 for the entire scale, indicating a high level of internal consistency. The total score of this scale was used to test convergent validity; for Study II, the Cronbach's alpha coefficient was .93.

Depression

The Beck Depression Inventory (BDI) was initially developed by Aaron T. Beck et al. in 1961 as a comprehensive measure to assess the severity and level of depressive symptoms and identify the risk of depression. It encompasses emotional, cognitive, somatic, and motivational components. The scale consists of 21 self-report items (Beck et al., 1961; Beck & Beamesderfer, 1974; Beck & Steer, 1984). The Turkish validation and reliability study of the BDI scale was conducted by Hisli (1989a; 1989b). The items in the scale reflect various symptoms associated with depression without implying any specific theoretical explanation for the etiology of depression. These symptoms include depressive mood, pessimism, feelings of failure, dissatisfaction, guilt, self-hatred, self-blame, desire for punishment, crying spells, irritability, social withdrawal, indecision, distorted body image, work impairment, sleep disturbances, fatigue, decreased appetite, weight loss, somatic complaints, and decreased libido. Each response on the Likert-type scale is scored from 0 to 3 and there are no reverse items. A score of "0" indicates the absence of depressive symptoms, while options 1, 2, and 3 reflect the intensity of the symptoms experienced. The Turkish version of the scale has a cut-off point of 17 and a Cronbach's alpha coefficient of .80. The scale is interpreted based on score ranges as follows: scores of 1–9 are considered normal, 10–16 indicate mild depression, 17–29 are moderate depression and 30–65 reflect severe depression (Hisli, 1989a). In the current study Cronbach's alpha coefficients for the BDI scale reached .92, and .94 for Study II and III. Participants were instructed to fill out the questionnaire based on their symptoms in the last month. The scale could be completed in approximately 2 minutes.

Psychological Well-Being

The Psychological Well-Being scale (PWB), created by Diener et al. (2009), consists of eight items that capture crucial aspects of human functioning, including positive interpersonal connections, a sense of competence and effectiveness, and leading a life filled with meaning and purpose. Participants respond to the items of the Psychological Well-Being scale on a Likert-type scale from 1 to 7, where 1 signifies strong disagreement, and 7

represents strong agreement. This scale had no revised items. The total score on this scale can vary between 8 (indicating low levels of well-being) and 56 (indicating high levels of well-being). Telef (2013) conducted a validity and reliability study of the Turkish version of the Psychological Well-Being scale. The questionnaire's internal consistency coefficient (Cronbach's α) was determined to be .80, indicating a good level of reliability. In Study III, Cronbach's alpha coefficient was .91, suggesting acceptable internal consistency. The scale could be completed in approximately 2 minutes.

Statistical Analysis

The primary objective of this study was to develop the Earthquake Related Media Content and Secondary Traumatic Stress Scale in Turkish (EMC-STS). Additionally, a mediation model involving depression as a mediator between earthquake-related secondary traumatic stress and psychological well-being will be tested.

In Study I, participants ($N = 30$) filled out the scale and gave information about the practicality of the questionnaire. 2 items were eliminated at this point. Then construct validity, Principal Component Analysis (PCA), Cronbach's alpha reliability analysis, and convergent validity analysis were employed to accomplish the first goal during Study II ($N = 265$). The normality was tested with the Kolmogorov-Smirnov Normal Distribution Test (K-S), also observing kurtosis and skewness values. To meet the normal distribution assumption, the skewness and kurtosis values were expected to vary between -3 and $+3$. Since the number of participants was over 100, it was accepted that the data was normally distributed if the kurtosis and skewness values were within the expected limits even if $p < .05$ according to the K-S test (Kline, 2016/2019).

The process of item reduction considered convergent validity, item loadings, explained variance, and interitem correlations. Within the scope of the construct validity of EMC-STS, first, the item-total score correlations were examined for item discrimination. It was expected that the item-total score correlation for each item would be at least .20; if any item-total correlation coefficients were below .20, these items would be eliminated (Field, 2018; George & Mallery, 2019). Then PCA was used to decrease the item count and finalize the scale. Selecting the number of components was guided by theoretical considerations, eigenvalues greater than 1, and the scree plot test proposed by Cattell (1966). Subsequently, an Oblimin rotation was conducted with the determined number of components. The suitability of the data for factor analysis was evaluated with the Kaiser-Meyer-Olkin (KMO) coefficient calculated for the adequacy of sample size and the Bartlett sphericity test was used for the suitability of distribution; the KMO value of at least .70 and the Bartlett sphericity test X^2 value being highly significant were accepted as criteria. In addition, we were aiming for the common variance value of each item and its loading on the first factor in the pre-rotation factor matrix to reach at least .30. In the pattern matrix obtained after rotation, it was determined that each item should be loaded on the factor it belongs to with at least .30 and in case of double loading, the difference should be at least .10. It was planned to remove the items that did not meet the conditions from the analysis until the aforementioned conditions were met and to repeat the operations in the relevant step. Cronbach's alpha internal consistency coefficients were calculated as indicators of reliability regarding the scales' final version after PCA. It was expected that these coefficients would be at least .70 and the item-total score correlations would be at least .20 (Field, 2018). The final model consisted of 17 items with four factors. Based on Mancini's (2019) scale development, Bride et al. (2004) and Figley's (1995; 1998) configuration of secondary traumatic stress, subsequent analyses were conducted on the total score of the EMC-STS. Figley (1995; 1998) defined the concept of secondary traumatic stress as a combination of anxiety, arousal and intrusion. In addition to these factors, in this study, media distrust was also considered to be a source that feeds media-induced secondary traumatic stress. To test convergent validity, the Pearson correlation test is performed.

For Study III, the confirmatory factor analysis (CFA) and mediation model were tested ($N = 283$). CFA of EMC-STS with four factors was conducted with another sample, since the best way to verify the factor structure obtained as a result of EFA is to test the factor structure in a different sample with CFA (Kline, 2016/2019). To evaluate the adequacy of the estimated Confirmatory Factor Analysis (CFA) models, commonly used fit indices, including the root mean squared error of approximation (RMSEA) with a 90% confidence interval, standardized root mean squared residual (SRMR), comparative fit index (CFI), Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) were presented. Maximum Likelihood Estimates were used to determine multi-normal distribution, factor loadings, extractions and item-total correlations. For these indices, the cut-off criteria suggested by Hu and Bentler (1999) and Baumgartner and Hombur (1996) are utilized, with values of $\leq .06$ for RMSEA, $\leq .08$ for SRMR, and $\geq .90$ for both GFI, AGFI, and CFI. We also provide the χ^2/df and the corresponding significance test. It is important to note that these measures are difficult to interpret on their own as they

are highly influenced by the sample size (Hu & Bentler, 1999). Moreover, the mediation effect was investigated by PROCESS, a modeling tool that utilizes ordinary least squares (OLS) regression to analyze observed variables (Hayes et al., 2017). The software investigates how one or more mediating or moderating variables impact the relationship between the independent and dependent variables. It calculates the direct, indirect, and total effects of variable X on variable Y, along with unstandardized and standardized regression coefficients, standard errors, and other statistics such as t and p values and R^2 . Unlike the Sobel test, the Process Macro offers a range of coefficients and test statistics that elucidate the indirect, direct, and total effects and total and partial effect sizes. PROCESS has several models regarding the chosen analysis; for this part, Model 4 was selected for the intent to create a mediation model. A bootstrapping method was performed using SPSS Process Macro to examine if depression mediated the relationship between secondary traumatic stress and psychological well-being. The Options “Show total effect model,” “Effect size,” and “Standardized coefficients” were selected to observe the mediation.

While all analyses of Study I and II were calculated with the SPSS v26 package program, PROCESS v4.2 for SPSS and AMOS v26 were used in Study III. The study’s research design is the cross-sectional survey method in the causal/comparative model. The Levene homogeneity test was used to control the variances among the groups of demographics, and since all groups were found to have equal variance ($p > .05$), no participant group was excluded.

Results

Study I: Item Generation and Pilot Study

First, 36 items were created to measure the relationship between earthquake-related media content and secondary traumatic stress. In Study I ($N = 30$), participants’ feedbacks about the scale were gathered and discussed with the experts. Two of the items (“The news and posts about the earthquake do not affect me.”, “I stay away from events, people and places that remind me of the earthquake.”) had grammatical issues, contextual problems or repetitive meanings; therefore, these items were deleted before Study II, which continued with 34 items.

Study II: Item Reduction and Psychometric Properties of EMC-STS

Firstly, item-total score correlations were analyzed in Study II. Nine items were eliminated due to low levels (in between .03 and .17) of correlations. Then, during the first PCA with 25 items, eight items were eliminated due to double loadings [e.g. “Some elements used in earthquake news (sad music, still photos, etc.) increase my anxiety.”, “When I see disasters happening to people through the media, I fear for my own life.”].

Therefore, the most compatible seventeen items were selected and tested through PCA ($KMO = .92$; $Bartlett_{(351)} = 3851.87$, $p < .001$), based on the four-factor model’s theoretical background. The four-factor structure was confirmed by the eigenvalues, accounting for 62% of the total variance. The scree plot obtained from the same analysis also confirmed the four-factor structure with seventeen items. Three items (item num. 7, 8, and 11) were coded reversely. Table 2 presents the items and their formulations derived from Study II. The factor loadings on these components ranged from .44 to .93. The final scale exhibited a Cronbach’s alpha coefficient of .81. At the same time, the subscales for intrusion, arousal, media distrust, and avoidance had Cronbach’s alpha coefficients of .84, .78, .74, and .74, respectively. The skewness and kurtosis values of each scale was in between (–3) and (+3); therefore the scales were normally distributed (see Table 3).

The convergent validity of EMC-STS was measured from the correlation with STSS-SM and BDI. Results revealed a significant positive correlation between EMC-STS and STSS-MS ($r = .50$, $p < .001$), and BDI ($r = .32$, $p = .002$).

Study III: Confirmatory Factor Analysis (CFA) of EMC-STS and Mediation Effect

This study including 283 participants had two objectives: to examine a CFA of the EMC-STS and to test the mediating role of depression in the relationship between secondary traumatic stress and psychological well-being.

Fit statistics of the CFA analysis showed a good fit in the model (a 4-factor model, based on PCA results presented in Table 2), $\chi^2(122) = 357.46$, $\chi^2/df = 2.93$, $p < .001$, RMSEA = .059 (90% CI [.028, .090]), SRMR = .07, GFI = .89, AGFI = .88 and CFI = .90. Table 4 shows descriptive statistics of the scale’s final version, while factor covariances and standardized factor loadings can be seen in Figure 1.

Table 2. Factor Construction of EMC-STs: Exploratory Factor Analysis Results of Study II (N = 265)

Factor names and items	Factor loadings	Extraction	Item-total correlation
<i>Intrusion. 6 items. Eigenvalue = 6.68; Variance = 39.3%</i>			
2. When I put myself in the place of earthquake victims, my heart starts beating fast.	.83	.73	.57
1. I feel helpless when I think of earthquake victims.	.81	.61	.47
3. When I see the experiences of those affected by the earthquake in the media, I feel as if I lived it myself.	.79	.69	.46
4. Because of some images, I lost sleep.	.55	.61	.63
12. I lose my appetite as I watch the news about the earthquake.	.54	.49	.56
5. When I see the people pulled out of the wreckage, I think it is me instead of them, and I am scared.	.50	.56	.59
<i>Anxiety. 4 items. Eigenvalue = 1.69; Variance = 10%</i>			
13. I do not want to stay indoors as I watch earthquake-related footage on the news.	.76	.56	.56
6. The news about the earthquake makes me uneasy.	.74	.56	.59
15. I am worried that there will be earthquakes again as I am exposed to earthquake footage.	.71	.60	.58
9. Media content with constant earthquake warnings raises my concerns.	.67	.60	.65
<i>Media distrust. 3 items. Eigenvalue = 1.15; Variance = 6.7%</i>			
*7. I am more sensitive to earthquakes after the news I see in the media.	.82	.70	.31
*8. After the news I saw in the media, I need to take action to avoid disaster during the earthquake.	.81	.65	.42
*11. Watching earthquake-related programs motivates me to act on issues I am worried about.	.67	.68	.35
<i>Avoidance. 4 items. Eigenvalue = 1.02; Variance = 6%</i>			
16. I want to be alone when I see the earthquake shares in the media.	.93	.80	.30
17. After sharing about earthquake victims, I have a problem focusing.	.63	.68	.58
10. I have nightmares because of the images shared in the media.	.58	.51	.56
14. The news about earthquake victims in the media reduces my faith in living.	.44	.53	.58

EMC-STs: Earthquake Related Media Content and Secondary Traumatic Stress Scale

Note: Factor loadings and explained variances are values observed after rotation. Items with (*) were reverse coded prior to analysis.

Table 3. Descriptive Statistics of the EMC-STs Total Score and Its Subscales in Study II (N = 265)

	EMC-STs Total score	EMC-STs subscales			
		Intrusion	Anxiety	Media distrust	Avoidance
Mean (SD)	49.2 (9.3)	23.1 (5.2)	13.1 (4.2)	6.9 (2.8)	10.3 (3.9)
Skewness	-.41	-.74	-.42	.69	.58
Kurtosis	-.09	.33	-.50	.25	-.11

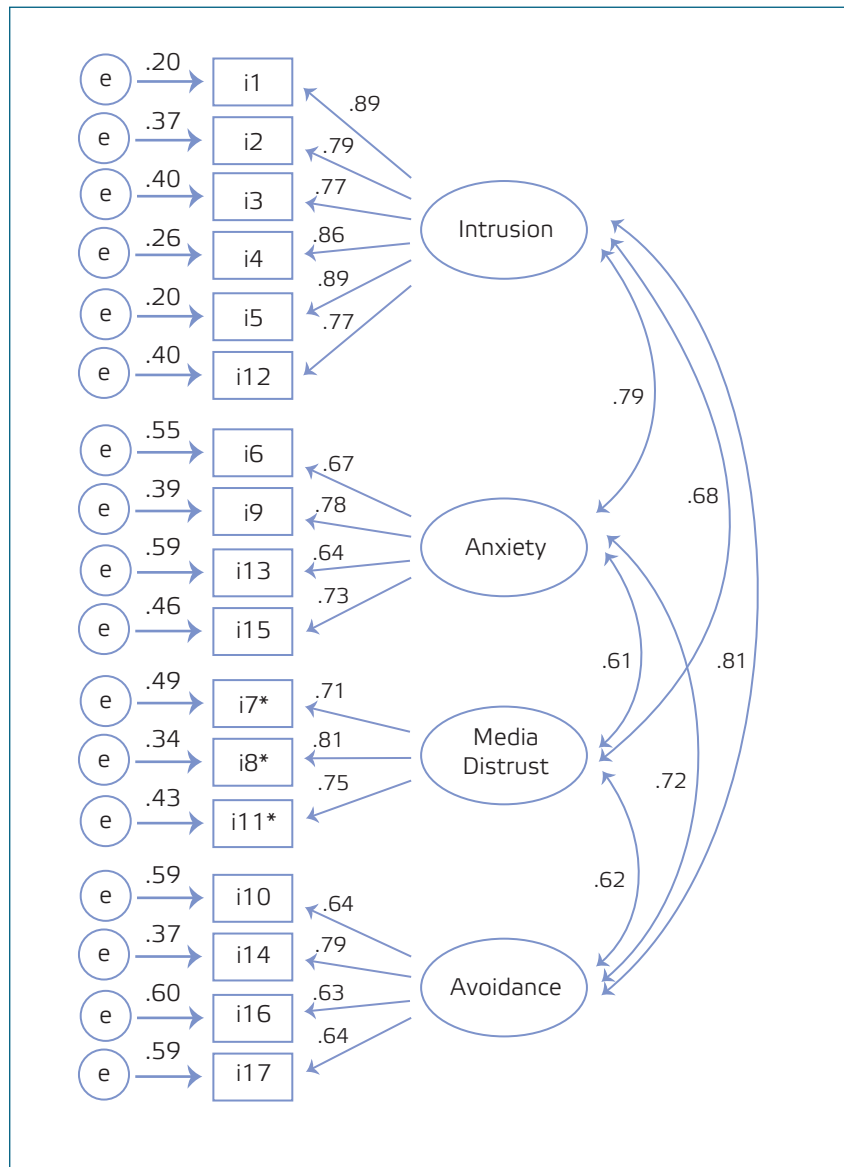
EMC-STs: Earthquake Related Media Content and Secondary Traumatic Stress Scale

Table 4. Descriptive Statistics of the EMC-STs Total Score and Its Subscales in Study III (N = 283)

	EMC-STs Total score	EMC-STs subscales			
		Intrusion	Anxiety	Media distrust	Avoidance
Mean (SD)	53.1 (9.9)	22.9 (5.1)	14.1 (3.9)	6.4 (2.5)	9.8 (3.8)
Skewness	-.33	-.62	-.36	.63	.50
Kurtosis	-.01	.20	-.43	.20	-.03

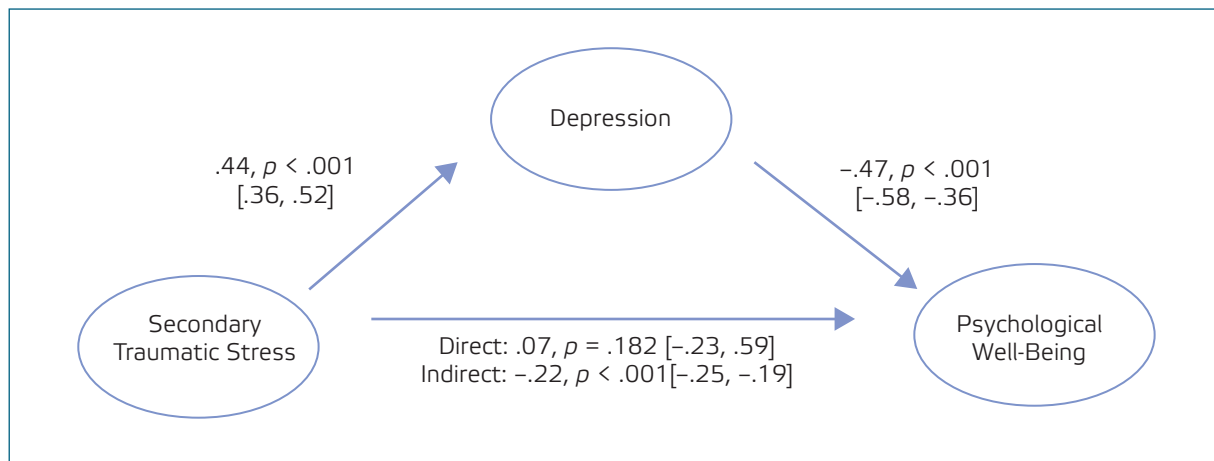
EMC-STs: Earthquake Related Media Content and Secondary Traumatic Stress Scale

Figure 1. Standardized Parameters of CFA for EMC-STS in Study III (N = 283)



For the mediation, media-related secondary traumatic stress was assessed as the independent variable (IV), psychological well-being as the dependent variable (DV), and depression as the mediator (M). Firstly, the results indicated a significant positive relationship between secondary traumatic stress and depression ($\beta = .44, p < .001$). This finding suggests that higher levels of secondary traumatic stress are associated with greater symptoms of depression. Second, a significant negative relationship was observed between depression and psychological well-being ($\beta = -.47, p < .001$). This implies that higher levels of depression are associated with lower levels of psychological well-being.

Furthermore, the relationship was found to be non-significant when examining the direct effect of secondary traumatic stress on psychological well-being ($\beta = .07, p = .183$). This indicates no direct relationship between secondary traumatic stress and psychological well-being. To explore the mediating role of depression, an analysis of the indirect effect was conducted. The results revealed a significant indirect effect of secondary traumatic stress on psychological well-being through depression ($\beta = -.22, SE = .027, 95\% CI [-.25, -.19]$). This suggests that depression partially mediates the relationship between secondary traumatic stress and psychological well-being. The mediation analysis summary is shown in Figure 2.

Figure 2. The Mediation Model with Standardized Coefficients in Study III ($N = 283$)

Discussion

The first of our primary purposes in this research was to develop a measurement tool for secondary traumatic stress symptoms triggered by media contents related to the earthquake, the second was to conduct a mediation effect test, including this measurement tool. Therefore, we firstly hypothesized that STS levels would be affected by media exposure. Moreover, a novel measurement tool is needed to investigate STS induced by earthquake-related media contents. Finally, there is a significant association between media-induced STS and psychological well-being, and depression would mediate this relationship. The results indicated that both objectives have been achieved.

Previous studies had revealed that individuals from various occupational groups (e.g., nurses, lawyers, social workers) may develop secondary traumatic stress due to the traumatic situations they are indirectly exposed to (Bride et al., 2007; Bride et al., 2009; Ewer et al., 2014; Hatcher et al., 2011; Kahil & Palabıyıköğlü, 2018; Yanbolloğlü, 2019). Most of these studies only focused on the relationship between individuals' descriptives (e.g. age, gender) and their STS levels. In this current study, EMC-STS directly measured secondary traumatic stress induced by media contents related to an earthquake, a particular type of trauma. Since the study's focus lay on investigating secondary stress due to earthquake-related media content, this study specifically examined people who did not suffer any losses, as there was a possibility that it could be confused with post-traumatic stress.

In the EMC-STS developed as a product of these studies, intrusion was identified as the highest rated ($M = 22.9$, $SD = 5.1$ for Study III) among the participants' stress reactions. Intrusion includes trauma-related negative emotions, thoughts, images, and sensations that individuals unintentionally experience due to traumatic events or incidents. Hence, users need to develop media literacy awareness. Media literacy is the ability to access, analyze, evaluate, and communicate messages in various forms (Aufderheide, 1993). To control the involuntary exposure level of individuals under control after a disaster, they need to know how, how much, and how to consume media content.

In parallel with the studies in the literature investigating the relationship between media and secondary traumatic stress (Atalay, 2017; Keats & Buchanan, 2013), this study examined the level of STS induced by media content. However, whereas Comstock and Platania (2017) examined secondary traumatic stress using DSM-IV-TR criteria in their study, for the current study, items relating to secondary traumatic stress symptoms were created using the DSM-5.

Also, Comstock and Platania (2017) emphasized the importance of secondary traumatic stress, which may arise from media content, among the factors affecting psychological well-being. Psychological well-being is the management of the existential challenges individuals face in their lives (Keyes et al., 2002). The exacerbation of secondary traumatic stress, which may arise from media exposure, leads to depression, hurting the personal development of individuals and their ability to communicate with others at a quality level. Therefore, the media industry needs to create structural and fundamental changes in areas such as broadcasting. A sensitive approach needs to be taken for broadcasting news about uncontrolled traumatic events such as natural disasters.

It is important to consider ethical values when creating media content. Alongside these ethical values, one of the duties that should be assumed by the media on behalf of the public is to avoid the elements that will trigger an individual or social trauma. Content created for "click-bait", such as the use of visuals designed to attract at-

attention, and striking headlines without any control mechanism, can harm social life. The primary role of the news media is to provide accurate information to the public, but this information should be presented in a way that does not lead to traumatic results.

Disaster journalism is the process of obtaining information about any extraordinary event that risk societies are exposed to, using the right resources and specializing on the subject before, during, and after the disaster. The responsibility for disaster preparedness, response, and mitigation rests with the media (Kutukoglu, 2021). Thus, it is imperative that media professionals receive training in disaster journalism and that the course on disaster journalism be introduced in journalism education institutions.

Testing the mediation role of depression between STS and psychological well-being is also considered to be a novel approach that will contribute to the literature. As emphasized by Ariapooran et al. (2022), high levels of secondary traumatic stress are associated with increased levels of depression, and this relationship is also included in the current study. In addition, Perstling and Rothmann's (2012) study revealed a significant and negative relationship between secondary traumatic stress and psychological well-being, similar to our present study. In both studies, secondary traumatic stress was limited to some occupational groups and was not based on media content. Therefore, the present study can be considered as pioneering. The results highlight the critical mediating role of depression in explaining the relationship between media-induced secondary traumatic stress and psychological well-being. The results suggest that individuals experiencing higher levels of secondary traumatic stress may be at an increased risk of developing depression, negatively impacting their psychological well-being.

Strengths and Limitations

In this study, we have developed a unique concept while focusing on the relationship between secondary traumatic stress and media. We tested this concept by performing a model test to assess its usability. Our study was at the forefront due to the steps we have taken to create a tool to address the unique problem of media-related STS and testing it with mediator effects. The aim of our study was to develop a tool that measures secondary traumatic stress resulting from earthquake-related media content. Previous studies have either overlooked the existence of secondary traumatic stress or have failed to measure it using earthquake-specific media content.

One of the main limitations of the study is that it was conducted with adults (+18). It is well known that the age limit for the use of new media is especially low (Vogels et al., 2022). The ability of children and adolescents to cope with the traumatic processes they may experience after a natural disaster may remain more primitive than that of adults. Secondary traumatic stress levels may increase if they are exposed to images of earthquake survivors their age. Users under the age of 18 were excluded from the study since a separate evaluation should be made, especially for those exposed to social media. The study's second limitation is that the research is conducted online and with self-report scales. The method of online data collection was preferred because of the advantage of collecting data from different locations; however, since the data is self-reported, its accuracy may be questionable. Furthermore, it was assumed based on the research call that participants followed earthquake-related news regularly, this, however, could not be directly confirmed based on the variable measuring average time spent on earthquake-related media. Also, collecting data online may represent people who use more social media, which will create a problem for generalizability. Finally, the effect that media type, occupation, and closeness to the location bears STS may also need to be tested.

The studies presented explored media induced STS symptoms. While trauma-related media contents can elicit reactive responses like heightened emotions, depression, anxiety, and anger in individuals, it can also lead to outcomes such as depersonalization or a lack of responsiveness. It is crucial, however, not to solely concentrate on the negative impacts of media content on individuals. Media, including news and interviews with opinion leaders, has earned the audience's trust and possesses the potential to positively influence people. The key lies in creating news that incorporates the psychological states of the masses while considering the conditions under which media content is produced and adhering to ethical principles and rules.

Conclusion, Implications, and Future Directions

It's worth noting that secondary traumatic stress is typically associated with trauma-focused occupational groups, with media not explicitly identified as a source. Thus, the study had two primary goals: to devise a measurement tool for identifying secondary traumatic stress stemming from post-earthquake media content, and to formulate a model in which depression acts as a mediator in the relationship between this secondary traumatic stress and

psychological well-being. The first of our hypotheses was realized through Studies I, II and III. In other words, the EMC-STS scale was contributed to the literature, and an essential measurement was created for earthquake-related media contents and media-related STS levels. Also, our hypothesis was verified as a result of the mediation analysis conducted in hypotheses 2 and 3. Hereby, not only a significant relationship was found between media-related STS and psychological well-being but also, depression was confirmed as a significant mediator in between media-induced STS and psychological well-being.

The first suggestion for future studies is to develop separate scales for other traumatic events that are not considered to be natural disasters and to conduct an in-depth analysis. Different traumatic events may result in different psychological consequences. Therefore, separate measurement tools should be developed, at least for artificial or naturally occurring traumatic events. Another critical point is the need to develop special prevention programs that prepare individuals for such social events, not just experts in the field. Further research and interventions focusing on reducing secondary traumatic stress in media and addressing depressive symptoms may be beneficial in promoting psychological well-being for individuals exposed to trauma. Finally, along with the variables selected for the mediation model, other variables that may influence the process, such as social support, should also be included in the model. High levels of social support may be a protective factor against secondary traumatic stress, therefore social support could be examined as a moderating variable in future studies.

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Author contribution

Selin KIRAZ DEMİR conceptualization, design, methodology, investigation, project administration, data management, formal analyses, interpretation, supervision, writing original draft, writing review and editing.

Nur İNCİ NAMLI: conceptualization, design, methodology, investigation, project administration, data management, formal analyses, interpretation, writing original draft, writing review and editing.

Declaration of interest statement

The authors have no conflicts of interest to disclose.

Ethical statement

This manuscript is the authors' original work.

All participants engaged in the research voluntarily and anonymously.

Their data are stored in coded materials and databases without personal data.

Studies were approved by Dogus University Ethical Commission under the reference number E- 42435178-050.06.04-44264.

Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

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Appendix : Earthquake Related Media Content and Secondary Traumatic Stress Scale

Below you will find a list of statements made by people who have had traumatic experiences or interacted with traumatized individuals in the media, expressing the impact of their experiences. Read each statement and choose the appropriate number (1 = does not describe me at all; 5 = describes me completely); next to it, to indicate how often this statement has been correct for you in the past month.

	1	2	3	4	5
1. I feel helpless when I think of earthquake victims.					
2. When I put myself in the place of earthquake victims, my heart starts beating fast.					
3. When I see the experiences of those affected by the earthquake in the media, I feel as if I lived it myself.					
4. Because of some images, I lost sleep.					
5. When I see the people pulled out of the wreckage, I think it is me instead of them, and I am scared.					
6. The news about the earthquake makes me uneasy.					
7. I am more sensitive to earthquakes after the news I see in the media.					
8. After the news I saw in the media, I need to take action to avoid disaster during the earthquake.					
9. Media content with constant earthquake warnings raises my concerns.					
10. I have nightmares because of the images shared in the media.					
11. Watching earthquake-related programs motivates me to act on issues I am worried about.					
12. I lose my appetite as I watch the news about the earthquake.					
13. I do not want to stay indoors as I watch earthquake-related footage on the news.					
14. The news about earthquake victims in the media reduces my faith in living.					
15. I am worried that there will be earthquakes again as I am exposed to earthquake footage.					
16. I want to be alone when I see the earthquake shares in the media.					
17. After sharing about earthquake victims, I have a problem focusing.					