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Predictors of secondary traumatic stress: traumatic experience, psychiatric symptoms and gender vs. mindfulness and mortality awareness

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ABSTRACT

Objective: The present study mainly aimed to examine the relationship between mindfulness, mortality awareness, and the emergence of secondary traumatic stress (STS) symptoms in young adults who had been indirectly exposed to social media content related to the 6 February 2023 Kahramanmaraş earthquakes.

Materials and Methods: Data were collected online between June 2023 and May 2024 from 96 participants aged 18–26 (83% female). Exclusion criteria included direct exposure to the earthquake, residing in the affected provinces, bereavement of close relatives, or engagement in rescue operations. Measures included the Brief Symptom Scale-25, Multidimensional Mortality Awareness Measure, Secondary Traumatic Stress Scale for Social Media Users, and the Five Facet Mindfulness Questionnaire-Short Form. Hierarchical Regression Analysis was used to investigate predictive roles of mindfulness and mortality awareness for secondary traumatic stress symptoms, controlling the effects of gender, past traumatic experience, and the effect of general psychiatric symptomatology.

Results: Gender, psychiatric symptoms, and past trauma history significantly predicted STS, accounting for 30% of the variance. Being female, having more psychiatric symptoms, and a history of trauma were associated with higher STS levels. Adding mindfulness and mortality awareness increased the explained variance to 46%. Specifically, mortality fearfulness and mortality legacy positively predicted STS symptoms, suggesting that fear of death and the need to leave a legacy may heighten vulnerability. Conversely, the mindfulness sub-dimension of nonjudging inner experience negatively predicted STS, indicating a protective role. Independent-samples t tests indicated that STS scores were higher among participants with a past trauma history than those without (M=52.00 vs 43.30), t(94)=2.58, p=.011, and among females versus males (M=47.24 vs 36.20), t(93)=2.80, p=.006.

Conclusion: Controlling for established predictors (female gender, psychiatric symptomatology, and past trauma), mortality fearfulness and mortality legacy remained positive predictors of STS, whereas nonjudging of inner experience remained a negative predictor. This pattern suggests that mortality awareness and mindfulness facets contribute unique variance to STS beyond core risk factors.

Keywords: secondary traumatic stress, mindfulness, mortality awareness

INTRODUCTION

According to the American Psychiatric Association (APA), the term "trauma" is defined as an actual or threatening encounter with death, serious injury or sexual assault [1]. In accordance with this, the emphasis is placed on exposure rather than exclusively on firsthand victimization. These events, may have been either directly or indirectly experienced by the individual. Post-traumatic stress disorder (PTSD) is characterised by the involuntary resurgence of traumatic memories, distress when reminded of the event, and avoidance of related triggers. It can also involve negative alterations in cognition and mood related to the event. The condition may also manifest as symptoms of arousal and reactivity [1]. In this clinical context, trauma-related symptom constellations are predominantly discussed within the framework of PTSD.

The notion of STS which was first theorised by Ludick and Figley in 2017, can be defined as the risk of secondary traumatisation that occurs because of indirect exposure to the traumatic experiences of others [2]. In both direct and indirect exposure to traumatic experiences, the symptoms that develop in individuals are remarkably similar [3]. Like PTSD, STS includes intrusive thoughts, avoidance, hyperarousal, disturbing emotions, sleep problems, and interpersonal difficulties [4]. Although the existence of secondary trauma in professional groups that assist trauma victims is widely accepted, there is a paucity of research examining whether STS can occur in ordinary people exposing to trauma on the internet, television or social media [5]. While STS shares several common risk factors with PTSD—including female gender, high levels of psychological distress, and insufficient social support—it also differs in symptom severity, phenomenology, and etiology. Unlike PTSD, STS emerges from indirect exposure, such as repeatedly hearing about or witnessing others' trauma. The symptoms are usually less severe, but they can still be clinically important [6,7]. Moreover, the risk of STS is especially high in groups who are regularly exposed to others' suffering with strong empathy (such as healthcare providers, therapists, and humanitarian workers) and in situations of repeated indirect exposure, including media coverage of disasters [8,9]. These distinctions underline the importance of examining both shared and unique pathways to stress responses in the aftermath of collective trauma. On 6 February 2023, two earthquakes occurred in Turkey measuring 7.7 and 7.6 on the Richter scale, respectively, at 4:17 and 13:24. These seismic events affected a total of 11 provinces. Afterwards, it was estimated that approximately 13 million individuals were impacted, with a reported 46,000 fatalities [10,11]. Turkey is a disaster-prone country frequently exposed to large-scale events such as earthquakes, mining accidents, and industrial catastrophes, which increases collective vulnerability to secondary traumatization. Epidemiological studies show that PTSD prevalence rates after earthquakes in Turkey have been considerably high; for example, it is found that elevated PTSD symptoms among adults following the 2011 Van-Erciş earthquake [12]. These findings indicate that large-scale disasters in Turkey have left a lasting psychological impact on adults. In addition, it is reported that 74.4% of participants felt unprepared and anxious [13]. These findings underscore how inadequate preparedness amplifies psychological distress. Moreover, media coverage in Turkey often presents disaster-related events with repetitive, graphic, and emotionally charged content. International evidence suggests that such media exposure can amplify stress and secondary traumatization [14,15]. These structural and sociocultural factors likely contribute to elevated levels of STS within the Turkish society.

It is thought that even individuals who were not directly exposed to the earthquake may have been subjected to recurrent exposure to media portrayals regarding the earthquake in the following days of the disaster. In this context, the present study aims to investigate the secondary traumatic effects in individuals who have experienced the earthquake indirectly through the media.

The extant literature on trauma indicates that mindfulness and acceptance-based practices can improve the psychological adjustment of traumatized individuals and reduce the risk of developing PTSD symptoms [16]. Accordingly, it is important to specify what is meant by mindfulness in this context.

Mindfulness can be defined as the act of attending to the present moment nonjudgementally [17]. The term mindfulness is defined as the non-judgmental and non-reactive observation of the ongoing flow of internal and external stimuli including unwanted emotions and cognitions as they arise [18]. Practices of mindfulness-based stress reduction are thought to have a positive effect on emotional well-being [19]. Alongside the utilisation of mindfulness practices for the general public, there is also literature concerning their use for individuals who are indirectly exposed to trauma. For instance, Setti and Argentero's study in 2014 revealed a negative correlation between mindfulness and vicarious traumatization in a sample of firefighters [20]. Accordingly, it is thought that elevated levels of mindfulness appear to offer a safeguard against the occurrence of vicarious traumatization among firefighters. In a similar vein, a study conducted with lawyers reported that mindfulness was a negative predictor of STS [21]. In light of the accumulated research findings, it is hypothesized that the concept of mindfulness may be an important factor within the context of this study.

In addition to the concept of mindfulness, the concept of mortality awareness was introduced to deepen the issue because rescue activities received prolonged media coverage in the short period after earthquake. Thus, it is thought that people who follow these news through media channels have been exposed to the concept of death for a prolonged time. One of the significant theories associated with the notion of mortality awareness is the Terror Management Theory. In accordance with Terror Management Theory, the awareness of mortality and the inevitability of death can exert a significant influence on thoughts, feelings and behaviours [22,23]. In this context, it is estimated that a considerable number of individuals have been exposed to the destruction especially through the utilization of social media platforms. Within the scope of this study, the concept of mortality awareness consists of sub-dimensions such as mortality fearfulness, mortality legacy, mortality acceptance, mortality disempowerment and mortality disengagement [24]. Mortality legacy, in this context, is defined as the act of creating a legacy to ensure survival beyond death. The concept of mortality fearfulness is understood to reflect the anxiety associated with the impossibility of escaping death. Mortality acceptance, on the other hand, is defined as the acknowledgement that death is an inevitable part of life, as opposed to a rejection of death. Mortality disempowerment is explained as the perception that the individual perceives themselves as insignificant and that all is meaningless in the face of death. Mortality disengagement, in this regard, refers to the act of not thinking about death, which is indicative of an individual ignoring the reality of death and focusing on the present moment.

In addition to the aforementioned factors, there are other factors that are hypothesised to be related to STS. Psychiatric symptomatology and gender are accepted to be significant predictors of stress following exposure to traumatic experiences, whether direct or indirect. [25-27]. Another salient factor associated with traumatic stress is the existence of past traumatic experiences [26-29]. A body of research has demonstrated an association between repetitive traumatic experiences and alterations in brain function, as evidenced even by neuroimaging studies. These alterations manifest as increased activity in the amygdala, reduced volume in the hippocampus, and impaired prefrontal cortex function [30].

In order to provide a coherent theoretical foundation, the present study draws on two complementary perspectives: stress and coping framework [31] and contemporary resilience models [32,33]. The former conceptualizes stress as occurring when perceived demands exceed available resources, with outcomes shaped by individuals' threat appraisals and coping strategies. The latter emphasizes the protective factors that enable individuals to adapt positively in the face of adversity. These models enable us to identify both the risk and protective factors associated with STS.

More specifically, the stress and coping framework highlights the role of risk appraisal in shaping stress responses in the context of stress and coping framework. Within this framework, disaster-related media exposure can be considered a type of stressor that heightens vulnerability through threat/risk appraisal processes. In particular, in the aftermath of large-scale disasters, there is a demonstrable

correlation between repeated exposure to graphic media content and the sustaining of mortality salience. This, in turn, has been shown to be associated with heightened acute stress and symptoms of PTSD-like conditions in the general population [9,34]. This exposure also maintains the cognitive accessibility of the inevitability of death and, consequently, may therefore create a psychological vulnerability of risk for STS. This framework is thought to be align with Terror Management Theory (TMT). TMT explains that when people are more aware of death, they often react defensively and this can make them more vulnerable to stress. For example, they may strongly defend their cultural values, show prejudice toward out-groups, or seek higher self-esteem as a way to manage their anxiety [35]. Therefore, mortality awareness is thought to represent a theoretically grounded risk factor for STS in the stress and coping framework [9,34].

The resilience perspective on the other hand emphasizes the protective coping resources that foster positive adaptation in the face of adversity. Within this framework, mindfulness can be conceptualized as a protective factor that mitigates vulnerability to stress responses subsequent to indirect trauma exposure. Empirical studies demonstrate that mindfulness may foster acceptance, emotion regulation, and adaptive coping, thereby enhancing resilience and reducing vulnerability to STS [36-38]. In this sense, mindfulness operates as a protective predictor in elucidating the construct of STS after disaster-related media exposure.

By situating mortality awareness within the stress–coping/TMT framework as a risk factor and mindfulness within resilience models as a protective factor, the present study seeks to offer a broad account of predictors of STS following the indirect disaster exposure. Examining both risk and protective predictors within the stress–resilience framework allows for a more comprehensive understanding of why some individuals develop STS following indirect disaster exposure, whereas others remain more resilient.

Considering the huge magnitude of the disaster, the main aim of this present study is to investigate the relationship between mindfulness and mortality awareness in individuals who were not personally exposed to the earthquake, and the subsequent emergence of STS symptoms. The present examination is exploratory in nature.

MATERIALS AND METHODS

Participants

The present study was conducted with the approval of the Hacettepe University Health Sciences Research Ethics Committee (GO 23/344). Online data collection was conducted over the period from 23/06/2023 to 14/05/2024. Participants were recruited via social media and completed the scales after their consent being obtained online. The study's sample is comprised of 96 individuals ranging in age from 18 to 26. In accordance with the validity and reliability study of the Secondary Traumatic Stress Scale for Social Media Users (STSS-SM) employed in the research, which was conducted with young adults, the present study included only participants from this age group. The mean age of the subjects was 23.09 years (SD = 2.23). Upon analysis of the gender distribution of the sample, it was observed that 83.3% (n=80) of the subjects were female and 15.6% (n=15) were male. (see Table 1) One participant did not wish to specify gender. The inclusion criteria were determined as being between the ages of 18 and 26. The exclusion criteria included a history of head trauma resulting in lifelong impairment, bereavement of a close relative (mother, father, spouse, child, sibling, partner, relative, or close friend) during the 6 February 2023 Kahramanmaraş earthquakes, being a resident in one of the 11 provinces at the time of earthquake, and engagement in volunteer aid activities in one of the 11 affected provinces. In accordance with these exclusion criteria, 75 participants were excluded from the study and thanked for their interest.

Table 1. Demographic characteristics of the sample

	Mean	**SD.**
Age	23.09	2.23
	N	**Percentage (%)**
Gender		
Female	80	83.3
Male	15	15.6
Do Not Want to Specify	1	

Instruments

Demographic information form

A demographic information form was utilized to obtain descriptive information regarding the participants' age, gender, current psychiatric diagnosis, history of head trauma, current psychiatric medication use, city of residence at the time of the 6 February 2023 Kahramanmaraş earthquakes, loss of relatives in the 6 February 2023 Kahramanmaraş earthquakes, and past traumatic experiences. Participants were asked to select from a list of traumatic life events if they had experienced similar events.

Brief Symptom Inventory-25

The Brief Symptom Scale-25 was developed by Blais et al. in 2015 to measure general psychiatric symptomatology [39]. The Cronbach's alpha internal consistency reliability coefficient of both the original scale and that of Turkish adaptation of the scale was found to be 0.92. Turkish adaptation of the scale was conducted by Gülüm and Soygüt in 2017 [40]. It is a 7-point Likert-type scale (1=not at all, 7=extremely) and consists of 25 items.

Multidimensional Mortality Awareness Measure

The Multidimensional Mortality Awareness Measure was developed by Levasseur et al. in 2015 [41]. The original scale consists of 36 items and has 5 sub-dimensions. It is a 7-point Likert-type scale (1=strongly disagree, 7=strongly agree). The Cronbach's alpha internal consistency reliability coefficient of the original scale is between 0.59 and 0.87. The scale was adapted into Turkish by Bulut et al. in 2017 [24]. The Turkish adaptation consists of 30 items and 5 sub-dimensions (mortality fearfulness, mortality legacy, mortality acceptance, mortality disempowerment and mortality disengagement) and is a 5-point Likert-type scale (1=strongly disagree, 5=strongly agree). The Cronbach's a internal consistency reliability coefficient of the Turkish adaptation was found to be 0.79 and the split-half reliability coefficient was found to be 0.74.

Secondary Traumatic Stress Scale for Social Media Users (STSS-SM)

The Secondary Traumatic Stress Scale for Social Media Users (SM-STSS) was developed by Mancini in 2019 to assess the symptoms that may arise in relation to traumatic experiences indirectly exposed through social media [42]. The Cronbach's alpha internal consistency reliability coefficient of the original scale is 0.92. The Turkish adaptation of the scale was conducted by Balcı Çelik and Altınışık in 2021 [43]. The scale consists of 17 items and is scored on a 5-point Likert-type scale (1=Never, 5=Very Often). The Turkish adaptation of the scale consists of a single factor and Cronbach's alpha internal consistency reliability coefficient is 0.95.

Five Facet Mindfulness Questionnaire (FFMQ)-Short Form

Five Facet Mindfulness Questionnaire (FFMQ)-Short Form is a 20-item version of the 39-item and 5-factor scale developed by Baer et al. in 2006 to measure people's mindfulness levels and shortened by Tran et al. in 2013 [44,45]. The Turkish adaptation of the scale was conducted by Ayalp and Hisli Şahin in 2018 [46]. It is a 5-point Likert-type scale (1=Never, 5=Always). The scale has 5 sub-dimensions: observing, describing, acting with awareness, nonjudging of inner experience, nonreactivity to inner experience. Cronbach's α internal consistency reliability coefficient is between 0.69 and 0.85. The Cronbach's α internal consistency reliability coefficient of the total score of the scale is .71.

Statistical analysis

The analysis was conducted using IBM SPSS 26.0. Prior to analysis, outliers were identified skewness and kurtosis values pointed out a normal distribution [47]. Pearson Correlation Coefficient Analysis was conducted to examine the relationships between the variables. An independent sample t-test was conducted to compare participants' STS scores. The present study employed Hierarchical Regression Analysis to investigate the hypothesis that mindfulness and mortality awareness would predict STS symptoms, controlling the effects of gender, past traumatic experience and the effect of general psychiatric symptomatology.

RESULTS

The mean, standard deviation, minimum and maximum values of the participants' scores from the scales are presented in Table 2.

Table 2. Descriptive statistics regarding participants' scores on the scales

Variable	Mean	SD	Range
BSI	74.77	27.35	25-132
STS	45.39	14.47	19-80
M-Legacy	33.42	9.39	11-49
M-Fearfulness	41.06	15.59	12-75
M-Acceptance	27.39	3.41	16-33
M-Disempowerment	8.31	3.78	3-21
M-Disengagement	15.02	4.77	4-26
FFMQ-Observing	15.23	3.25	5-20
FFMQ-Describing	14.20	3.70	6-20
FFMQ-Acting with awareness	10.90	3.96	4-20
FFMQ-Nonjudging of inner experience	12.66	4.04	4-20
FFMQ-Nonreactivity to inner experience	12.27	3.35	4-20

SD: Standard Deviation, SD: Standard Deviation, BSI: Brief Symptom Inventory Total Score, STS: Secondary Traumatic Stress Scale for Social Media Users Total Score, M-: Multidimensional Mortality Awareness Measure sub-dimensions, FFMQ-: Five Facet Mindfulness Questionnaire (FFMQ)-Short Form sub-dimensions.

Table 3. Comparison of STSS-SM scores according to various variables

		N	Mean	SD.	Std. Error Mean.	t	p
Past Trauma History	Yes	23	52.00	13.32	1.67	2.58	.011
	No	73	43.30	14.27	2.78		
Gender	Female	80	47.24	14.00	1.57	2.80	.006
	Male	15	36.20	14.03	3.62		

N: Number of Participants, SD: Standard Deviation, Std. Error Mean.: Standard Error Mean, STSS-SM: Secondary Traumatic Stress Scale Score for Social Media Users, t: independent samples t test, F: One-way analysis of variance (ANOVA), p: significance value.

The findings of the independent samples t-test demonstrated that the STS scores of the participants with (mean=52.00, SD=13.32) and without a history of past traumatic history (mean=43.30, SD=14.27) statistically significantly differed (t(94)=2.58, p=.011). Furthermore, the analyses indicated that the STS levels of female (Mean = 47.24, SD = 14.00) and male (Mean = 36.20, SD = 14.03) participants statistically significantly differed (t (93)=2.80, p=.006) (see Table 3).

The correlational analyses indicated that STS was positively associated with psychiatric symptomatology and legacy and fearfulness subscales of MA suggesting that greater psychological distress and heightened death-related concerns are linked to higher levels of STS. Conversely, describing, nonjudging of inner experience, acting with awareness subscales of mindfulness facets of showed negative correlations with STS, indicating that a mindfulness practices may buffer against STS. In addition, gender was significantly correlated with STS, meaning that being female was associated with higher levels of stress. These results demonstrate that the key study variables are meaningfully interrelated at the bivariate level (see Table 4).

In the hierarchical regression analysis, STS level was included as the dependent variable, with gender, general psychiatric symptomatology, the presence of past traumatic history, the mindfulness and mortality awareness sub-dimensions included in the analysis as predictor variables. The subdimensions of mortality awareness and mindfulness, which showed a statistically significant correlation with the dependent variable, were included in the hierarchical regression analysis as predictor variables. In the first step of the analysis, gender, general psychiatric symptomatology, and the presence of past traumatic history were included as predictors. In the second step, the analysis incorporated the mindfulness and mortality awareness sub-dimensions. The results of the Hierarchical Regression Analysis demonstrate that gender, general psychiatric symptomatology and the presence of past traumatic experiences collectively accounted for 30% of the variance, and were statistically significant ($R2$= .30, F(3,92)=13.16, p< .001). The association between being female

Table 4. Results of correlational analyses

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. STS	—	.46**	-.28**	.26**	.21*	.37**	**-.07**	**.10**	**-.08**	**.16**	**-.19***	**-.33****	**-.24***	**-.17**
2. BSI		—	-.06	.14	.13	.25**	**-.05**	**.36****	**-.09**	**.01**	**-.32****	**-.37****	**-.47****	**-.18**
3. Gender			—	-.18*	.07	.06	**.09**	**.15**	**.07**	**-.13**	**.19***	**.08**	**.30****	**.24****
4. PTH				—	-.01	-.12	**.07**	**.05**	**.06**	**.14**	**.03**	**.04**	**-.18***	**-.06**
5. M-L					—	.08	**.35****	**-.19***	**.11**	**.14**	**.10**	**.11**	**.23***	**-.00**
6. M-F						—	**.17**	**.10**	**-.31****	**-.01**	**-.05**	**-.15**	**-.08**	**-.11**
7. M-A							—	**-.02**	**.24***	**.02**	**.29****	**.07**	**.12**	**.09**
8. M-DISEMP								—	**.05**	**.09**	**.10**	**.11**	**.05**	**.09**
9. M-DISENG									—	**.15**	**.16**	**.15**	**.18**	**.24***
10. F-OBS										—	**.10**	**-.15**	**-.12**	**-.11**
11. F-DES											—	**.07**	**.12**	**.09**
12. F-NONJ												—	**.12**	**.09**
13. F-ACTWA													—	**.09**
14. F-NONR														—

N=96. *p<.05, **p<.01. BSI: Brief Symptom Inventory Total Score, STS: Secondary Traumatic Stress Scale Total Score, PTH: Past Traumatic History, M-: Multidimensional Mortality Awareness Measure sub-dimensions (Legacy, Fearfulness, Acceptance, Disempowerment, Disengagement), FFMQ-: Five Facet Mindfulness Questionnaire sub-dimensions (Observing, Describing, Nonjudging of Inner Experience, Acting with Awareness, Nonreactivity to Inner Experience).

and higher levels of STS was found to be statistically significant (β =-0.23, p=.012). The general psychiatric symptomatology (β =0.43, p<.001) were found to be positive predictor of STS symptoms. In the subsequent phase, the analysis encompassed the sub-dimensions of mindfulness and mortality awareness. The statistically significant contribution of these variables to the initial model was 16% (*R(2) (change)* =.16, *F(change)* (4,88)=6.60, p<.001). The total variance explained at the conclusion of the second model was 46% *(R(2)* =.46, *F*(7,88)=10.78, p<.001). In the context of the present study, the presence of a history of traumatic experiences (β =0.24, p=.005) and sub-dimensions of mortality awareness such as mortality legacy (β=*0*.17, p=.044) and mortality fearfulness (β=*0*.31, p<.001) were found to positively predict STS symptoms. Conversely, nonjudging of inner experience (β=*-0*.23, p=.013) from the sub-dimensions of mindfulness was found to negatively predict STS symptoms (see Table 5).

Table 5. Results of hierarchical regression analysis conducted on the prediction of secondary traumatic stress symptoms

	Dependent Variable	**Predictor Variable**	**β**	**t**	**p**	**Tolerance**	**R**	**R^2**	**F**
Model 1	Secondary Traumatic Stress	Gender	-0.23	-2.57	**.012***	.965			
		Psychiatric Symptomatology	0.43	4.83	**.000****	.980	.548	.300	13.16
		Past Trauma History	0.16	1.75	.083	.950			
Model 2	Secondary Traumatic Stress	Gender	-0.26	-3.13	**.002***	.877			
		Psychiatric Symptomatology	0.28	2.80	**.006***	.637			
		Past Trauma History	0.24	2.87	**.005***	.906			
		Mortality Legacy	0.17	2.05	**.044***	.867	.679	.462	10.78
		Mortality Fearfulnes	0.31	3.72	**.000****	.905			
		Nonjudging of inner experience	-0.23	-2.53	**.013***	.769			
		Acting with awareness	0.09	0.91	.365	.580			

Note: * p<.05; ** p<.001.

DISCUSSION

Exposure to traumatic content through the media has been demonstrate to pose a risk for developing STS, thus emerging as a significant public health concern. The findings of the study reveal that both past traumatic experience, current psychiatric symptoms and gender, as well as mindfulness and mortality awareness are significant predictors of STS.

The present study provides further support to the findings in the literature [26,28,29]. by demonstrating that a history of traumatic experiences is a significant predictor of STS. On the other hand, another outcome of this study is that being female is a risk factor for STS. This finding regarding gender is consistent with the results reported in the existing literature [26]. As asserted by Bangasser and Wicks in 2017, research has indicated that the hypothalamic-pituitary-adrenal (HPA) axis, a regulatory system for the stress response, would exhibit greater dysregulation in women compared to men in response to traumatic events [48]. This biological difference has the potential to cause heightened sensitivity to stress in women, both emotionally and physiologically [48]. As demonstrated in the research by Bangasser and Valentino in 2014, hormonal fluctuations, particularly those associated with estrogen and oxytocin, have the potential to amplify the intensity of women's stress responses to traumatic stimuli [49]. In addition to these biological factors, research has demonstrated that women exhibit higher levels of empathy compared to men [50]. This higher empathic tendency in women compared to men may be a contributing factor to heightened emotional responses to traumatic experiences and the exacerbation of STS symptoms. Furthermore, the predominance of psychiatric symptomatology as a risk factor for STS symptoms is consistent with the findings of previous studies [27].

The study yielded additional findings, though contrary to expectations, these were less robust than the initial set of findings. It is found that nonjudging of inner experience, a component of mindfulness, functions as a negative predictor for the development of STS. The " nonjudging of inner experience " sub-dimension of mindfulness suggests that mindfulness may play a protective role against STS as a variable having the potential to increase emotion regulation capacity. This finding is consistent with the findings of researchers who have demonstrated that mindfulness-based interventions have a positive effect on emotional well-being [17-19]. Mindfulness has been shown to facilitate the development of an acceptance-based approach to traumatic thoughts, thereby reducing the impact of ruminative thought patterns [51]. In addition, when intrusive thoughts inevitably arise, mindfulness can increase the ability to tolerate related emotional arousal by facilitating the processing of distressing emotions [52]. The findings of the study indicate that certain sub-dimensions of mortality awareness, namely "mortality fearfulness" and "mortality legacy", predict STS. Therefore, these sub-dimensions can be regarded as risk factors for STS. When evaluated within the framework of TMT [22,23], the awareness of inevitability of death may increase the level of (death) anxiety in individuals. In this way, it can be assumed that fear of death intensifies STS reactions following exposure to traumatic material by excessively depleting the individual's cognitive and emotional resources.

On the other hand, when examined the findings of the present study, the necessity to establish a mortality legacy has been observed to emerge within the context of the individual's pursuit of continuity subsequent to death is found to be a risk factor for STS symptoms. The mortality legacy dimension is associated with the desire to create a legacy to ensure survival after death, as well as the endeavour to leave a lasting impression after death. However, given the age range of the participants in this study, it can be assumed that this dimension has not yet been fully developed. This incompleteness has the potential to act as a significant source of stress for the individual. Besides, this finding may also be related to the magnitude of the earthquake. In the face of the substantial destruction, it is thought that individuals may have sought to leave a record, yet found themselves powerless in doing so. Therefore, this increased risk of STS due to mortality legacy may be attributable to the aforementioned feelings of helplessness.

Upon comprehensive consideration of all the findings, it is imperative to identify individuals who are predisposed to STS within the context

of factors such as gender, the presence of past traumatic experiences, and the extent of psychiatric symptoms. The implementation of enhanced monitoring strategies for these individuals during the post-disaster phase has the potential to prevent the chronicity of the problem. The findings of this study also demonstrate that practices aimed at cultivating mindfulness in individuals function as a preventative and curative resource not only for those who have been directly exposed to trauma, but also for individuals who have been *indirectly* exposed to traumatic content. Besides, it is acknowledged that mortality awareness may serve a significant role in elucidating psychological responses to trauma experienced indirectly. Therefore, findings postulated that integrated practices of mindfulness and mortality awareness within the intervention programs are assumed to have a preventive role in terms of secondary traumatization, especially in individuals who follow media intensively after disasters.

The present research provides important findings within limitations. Firstly, the majority of the sample consists of women (83.3%) and young adults who are university students or graduates. This particular sample structure has the effect of limiting the generalizability of the findings to different age groups, socioeconomic levels or occupational groups. In 1995, Porst and von Briel posit that, in addition to personal and situational factors, women are more likely to respond to surveys due to altruism as cited in Becker' study [53]. Therefore, the higher number of female participants in this study is consistent with this finding. Secondly, the cross-sectional nature of this study does not permit the establishment of causal relationships between variables. The causal relationships between predictive variables and STS symptoms can be explained by conducting longitudinal studies in future research. Utilization of self-report data is another limitation for the study including confinements to the boundaries of social desirability.

Recommendations for future research

As previously stated, this study makes a significant contribution to the existing literature by demonstrating a relationship between STS symptoms and an individual's level of mindfulness. The development of short-term, group and/or online mindfulness-based psychoeducation programs would be a valuable for individuals who have been exposed to traumatic content through the media, particularly in the aftermath of traumatic events that have a societal impact. It is thought that these programs can assist in improving emotion regulation skills, reducing avoidant coping strategies, and enhancing the psychological resilience of the individuals. Alongside these programs, mental health professionals can prepare psychoeducational programmes for mass media as part of public health initiatives. Furthermore, TMT-based approaches or existential-based interventions would be incorporated into these psychoeducation programs to focus on awareness of mortality of the target groups. In order to mitigate the psychological impact on individuals, public service announcements informing the public about media use during disasters and about awareness of exposure to traumatic content, and mental health-based social media campaigns, can be prepared. To sum up, the presence of past traumatic experiences and the female sex are identified as risk factors for STS. The creation of preventative psychological support systems for these groups is recommended.

Author contribution

Study conception and design: ZSG, TD; data collection: ZSG, TD; analysis and interpretation of results: ZSG, TD; draft manuscript preparation: ZSG, TD. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Hacettepe University Health Sciences Research Ethics Committee (Protocol no. GO 23/344/18.04.2023).

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Conflict of interest

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