

Sequential Mediator Role of Emotion Management Skills and Negative Emotions Between Posttraumatic Cognitions and Somatization

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Abstract

Trauma is defined as intense stress experiences that have permanent mental, emotional and physical effects on individuals. Such experiences can dramatically alter individuals' cognition about the world and the self. Also, their impact on the body are undeniable. This study aimed to explore the sequential mediating role of emotion management skills and negative affect in the relationship between posttraumatic cognitions and somatization for adults who have at least one or more traumatic experiences. This research was conducted with cross-sectional, correlational research designs and the final sample consisted of 494 participants. The Posttraumatic Diagnostic Scale, Posttraumatic Cognitions Inventory, Emotion Management Skills Scale, Positive and Negative Affect Scale (Negative Affect Subscale), and Somatization Scale were used as data collection tools. It was found that there are moderate positive relationships emerged between posttraumatic cognitions, negative affect, and somatization scores; and significant moderate inverse relationships emerged between emotion management skills and others. According to the mediation analysis, emotion management skills and negative affection fully explains the relationship between posttraumatic cognitions and somatization. While posttraumatic cognitions have an indirect effect through emotion management skills and negative affect sequentially, there is no direct relationship between posttraumatic cognitions and somatization. The relationship between posttraumatic cognitions and somatization occurs in the context of emotion management skills and negative affect. This article explains the importance of emotions in the emergence of somatization on a theoretical basis and enhances our understanding of the relationship between trauma and somatization.

Keywords: trauma, cognition, posttraumatic cognitions, somatization, emotions, emotional regulation, negative affect

Öz

Travma Sonrası Bilişler Ve Somatizasyon Arasında Duyguları Yönetme Becerileri ve Olumsuz Duyguların Sıralı Aracı Rolü

Travma, bireyler üzerinde kalıcı zihinsel, duygusal ve fiziksel etkileri olan yoğun stres deneyimleri olarak tanımlanmaktadır. Bu tür deneyimler, bireylerin dünya ve benlik hakkındaki bilişlerini dramatik bir şekilde değiştirebilirken, bu tür deneyimlerin beden üzerindeki etkileri de yadsınmaz. Bu çalışmada en az bir ya da daha fazla travmatik deneyimi bulunan yetişkin bireylerde, travma sonrası bilişler ve somatizasyon düzeyleri arasındaki ilişkide duygu yönetme becerileri ile olumsuz duygulanımın sıralı aracı rolünün incelenmesi amaçlanmıştır. Bu araştırma, kesitsel ve ilişkisel araştırma desenleri ile yapılmış olup, nihai örneklem 494 katılımcıdan oluşmaktadır. Veri toplama araçları olarak Travma Sonrası Stres Tanı Ölçeği, Travma Sonrası Bilişler Ölçeği, Duygu Yönetme Becerileri Ölçeği, Pozitif ve Negatif Duygusallık Ölçeği (Negatif Duygusallık Altölçeği) ve Somatizasyon Ölçeği kullanılmıştır. Travma sonrası bilişler, olumsuz duygulanım ve somatizasyon puanları arasında orta düzeyde pozitif ilişkiler bulgulanırken; duygu yönetme becerileri ve diğer ölçekler arasında anlamlı orta düzeyde negatif yönlü ilişkiler söz konusudur. Yürütülen aracılık analizine göre travma sonrası bilişler ve somatizasyon arasında duygu yönetme becerileri ve olumsuz duygulanım değişkenlerinin tam aracı açıklayıcı olduğu görülmektedir. Travma sonrası bilişler, duygu yönetme becerileri ve olumsuz duygulanım üzerinden dolaylı ve sıralı etkiye sahipken, travma sonrası bilişler ile somatizasyon arasında doğrudan bir ilişki yoktur. Bu bulguya göre travma sonrası bilişler ile somatizasyon arasındaki ilişki, duygu yönetimi becerileri ve olumsuz duygulanım bağlamında ortaya çıkmaktadır. Bu makale, kuramsal olarak somatizasyonun ortaya çıkışında duyguların önemini açıklamakta, travma ve somatizasyon arası ilişkilere açıklık getirmektedir.

Anahtar Kelimeler: travma, biliş, travma sonrası bilişler, somatizasyon, duygu, duygu yönetme becerileri, olumsuz duygulanım

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INTRODUCTION

A traumatic event is defined as an intense stress experience in which people face an event that involves actual or threatened death, serious injury or other threat to one's physical integrity or sanity (American Psychiatric Association [APA], 2013). Large-scale studies show that approximately 7 out of 10 people face a traumatic experience in their lifetime (Darves-Bornoz et al., 2008; Kessler et al., 2017). While such traumatic experiences are quite common and ubiquitous, exposure to these kinds of events has been recognized as part of human life. Even though individual responses to trauma can vary widely, it seriously strains individuals' coping capacity and may have a life-long impact (Aker, 2012; Gerhart et al., 2015). These intense stress experiences inevitably have mental, emotional, physical or other effects on the person and threat well-being (SAMHSA, 2014).

One of the well-known adverse effects of exposing traumatic experiences is the negative changes on the individual's cognitions based on fundamental assumptions and appraisals which are established over the years (Ehlers & Clark, 2000; Epstein, 1991; Foa et al., 1999; Janoff-Bulman, 2010). Janoff-Bulman (1989, 1992) argues that after a traumatic experience, people may lose their fundamental belief that the world is a safe, fair and meaningful place. Also, the beliefs like other people are benevolent, inherently good and helpful can be shattered. After the event, people may define themselves as worthless beings. Similarly, Foa et al. (1999) claim that besides the cognitions about the self and others can change dramatically after the trauma, also people can blame themselves for the devastating consequences of events. As posttraumatic cognitions, people may infer overgeneralized meanings about the danger of daily activities and may perceive the world as a dangerous place than it is. They may perceive the probability of experiencing such catastrophic events in the future as very high and may think they attract disasters, as well. Also, due to the disturbing nature of the trauma and the trauma memory, people define themselves as weak and vulnerable. The posttraumatic, exaggerated and unrealistic appraisals can create a sense of current threat, besides the triggering of affect-laden traumatic memories. This sense of threat can be internal and about individuals' beliefs regarding their acceptableness or external, which includes beliefs about the world and safety (Ehlers & Clark, 2000).

The role of cognitions on psychological disorders has received increased attention across a number of studies

in recent years. A considerable amount of literature has found that the posttraumatic cognitions play a crucial role in the emergence and maintenance of psychological distress through impairing emotion regulation (Barlow et al., 2017; Karatzias et al., 2018) and coping strategies (Samuelson et al., 2017; Sheerin et al., 2018). Also, these cognitions hinder the psychological healing process by directly producing negative emotions (Çakıl, 2018; Ehlers, 1999; Lyons et al., 2020). Given that the emotional processes are determined by one's cognitions (Moors & Scherer, 2013; Siemer, Mauss & Gross, 2007), it could be understood that negative cognitions about the self and the world would create difficulty for emotion regulation and may result in negative emotions. On account of this, both negative posttraumatic cognitions and accordingly weakened emotion regulation skills can be seen as an important cause of psychological distress. Recent studies demonstrate that posttraumatic cognitions are associated with a range of psychological symptoms, including PTSD (McLean et al., 2019), anxiety (Moser et al., 2007), depression (Beck et al., 2015; Lilly & Lim, 2013; Moser et al., 2007) and somatoform disorders (Koo et al., 2014; Lily & Lim, 2013).

Psychological distress has been thought of as a key factor in the development of somatic symptoms (Kirmayer, 1986; Woolfolk & Allen, 2007; Woolfolk, Allen & Tiu, 2007). In the history of somatization, existing research shows the impact of traumatic life experiences (Afari et al., 2014; Avdibegovic et al., 2010; Baylan, 2019; Kealy et al., 2018), especially for those whom have a limited emotional competence (De Gucht et al., 2004; 2003; Subic-Wrana et al., 2010). Studies such as that of Lilly and Valdez (2012) have shown that the individuals, who have at least one or more traumatic life experiences, emotion dysregulation positively predicts somatization, which means lesser emotion regulation skills lead to higher somatic symptoms. Supporting this, several studies have found an association between somatic complaints and inadequate emotion regulation ability with chronic negative affection (Bailey and Henry, 2007; Garnefski et al., 2017; De Gucht et al., 2004; Kealy et al., 2018; Lopez & Denny, 2019; Schwarz et al., 2017)

Although extensive research has revealed a link between somatization and trauma, far too little attention has been paid to posttraumatic cognitions and the somatization relationship. In a recent article, Koo et al. (2014) found that posttraumatic cognitions can lead to somatization after

the sexual trauma. This study suggests the posttraumatic cognitions and maladaptive beliefs about sexual assault are directly associated with somatic concerns and higher somatization. Supporting this, in another study conducted by Lilly & Lim (2013), it was found that the negative cognition about the world predicted the somatic symptom for interpersonal trauma survivors. These studies on somatization have heightened the need for further research to show its relation with cognition. Therefore, a systematic understanding of how posttraumatic negative cognitions contribute to somatization is still lacking and needs more investigation.

In the light of recent findings, it is becoming very challenging to ignore the relational existence of cognitions and emotional processes on somatic complaints. However, the impact of posttraumatic negative cognitions on somatization is underinvestigated, particularly its role with emotions. To date, there has been no comprehensive investigation of posttraumatic cognitions, emotion management, emotion, and somatization. This paper aims to explore the sequential mediating role of emotion management skills and negative affect in the relationship between posttraumatic cognitions and somatization for adults who have at least one or more traumatic experiences. This research proposes and investigates that posttraumatic cognitions positively predict somatization through emotion management skills and negative affection sequentially. Findings from the current study will provide a better understanding of people with different trauma histories and somatic complaints.

METHOD

Participants and Procedure

This research was a cross-sectional study, and the sample of this study was formed by adults who have at least one or more traumatic life experiences. The study was approved by the decision of the Research and Publication Ethics Committee of Marmara University with the number of 2020/0717 and all procedures were in accordance with the Declaration of Helsinki. Considering the pandemic circumstances and accessibility, the convenience sampling method was preferred, and the study was conducted as a web-based survey (Google Forms) in August 2020. Multiple entries from one account are restricted. Before data collection, the participants received an explanation of the research and were informed that they could

participate once. Then informed consent was obtained online. Participants were reached via mail groups, social media, etc. Participants who did not report any traumatic event were excluded from the analyses ($n=109$), and the final sample consisted of 494 (397 female; 94 male; 3 did not indicate gender) volunteer adults who met the criteria of having at least one or more traumatic life experiences.

Measures

Personal Information Form: To get personal data from participants, researchers developed a personal information form. The information form includes questions about gender, education level and history of consulting psychological help.

The Posttraumatic Diagnostic Scale: The original version of the scale was developed by Foa et al. (1997) and adapted to the Turkish language by Işikli (2006). The scale consists of 4 parts, and it provides both a measure of PTSD symptom severity and PTSD diagnosis. The first part of the scale aims to determine the type of traumatic event experienced by the person (such as war, natural disaster, accident, rape, etc.). Therefore, only the first part of the scale was used to scan participants' traumatic life experiences in this research.

Posttraumatic Cognitions Inventory (PTCI): PTCI was developed by Foa et al. (1999) to examine participants' negative posttraumatic cognitions about self and the world. The validity and reliability study of the Turkish form of PTCI was tested by Yağcı-Yetkiner (2010). It is a 7-point Likert-type self-report scale and has 33 items. The Cronbach's Alpha internal consistency coefficient (α) was found as 0.95 both in the original and current study.

Emotion Management Skills Scale: The 5-point Likert-type scale had developed by Çeçen (2002). It is a 28 item self-report scale that measures adults' emotion management skills. In the development study, Emotion Management Skills Scale was demonstrated to have good internal reliability ($\alpha=0.83$; test-retest: 0.81). Also, in the present study, Cronbach's Alpha internal consistency coefficient was found at an acceptable level, indicating good reliability ($\alpha=0.86$).

Positive and Negative Affect Schedule (PANAS): The negative affection of participants was measured with PANAS' Negative Affect subscale, which is consisted of 10 items and 5 point Likert-type (Watson et al., 1988).

In the Turkish language adaptation study (Gençöz, 2000), the Cronbach's Alpha internal consistency coefficient was calculated as 0.86 and the reliability coefficient after the test-retest was found to be 0.54. In the current study, the internal consistency coefficient was found at an acceptable level ($\alpha=0.83$).

Somatization Scale: Somatization Scale was used to scan the somatic symptoms of the participants. This scale was adapted to the Turkish language by Dülgerler (2010), by based on the Somatization Disorder items of the Minnesota Multiphasic Personality Inventory (MMPI). It is a 28 item self-report scale, and responses are given by true or false. In the original study, the Kuder Richardson-20 coefficient was 0.83, and in the current study, Cronbach's Alpha internal consistency coefficient was found 0.86.

Data Analysis

All statistical analysis was performed using the licensed SPSS-22 package program with PROCESS-v3.5 macro software. Firstly, the data were calculated to check normality before the correlational analyses, and it was seen that the assumptions of parametric tests were met. Then, Spearman correlation analysis was used to investigate the relationships between the variables. A p-value less than 0.05 was considered significant. In order to examine the sequential mediator role of emotion management skills and negative affect between posttraumatic cognitions and somatization, SPSS macro PROCESS-v3.5 (model-6) was used. PROCESS conducts observed-variable mediation, moderation, and conditional process analysis by bootstrapping method (Hayes, 2018). The significance level from indirect effects is determined using the bootstrap analysis (MacKinnon, Lockwood, & Williams, 2004).

RESULTS

Four hundred ninety-four volunteers over the age of 18 had participated in the study. Personal characteristics of the participants are summarized in Table 1. According to this, most of the participants have a bachelor's degree ($n=295$, 59.7%) or higher ($n=83$, 16.8%). Almost three-fourths of the participants (73.7%) are single. The majority of the participants did not report any deliberate self-injury behaviour ($n=419$, 84.8%), and just over half of all have no history of professional psychological help ($n=280$, 56.7%). In addition to these, the type of traumatic event that the participants were exposed to was examined (Table 2). Accordingly,

Table 1: Personal characteristics of participants (N=494)

	N	%
Gender		
Male	94	19
Female	397	80.4
Not specified	3	0.6
Education		
Primary education	8	1.6
Secondary education	75	15.2
Associate degree	33	6.7
Bachelor degree	295	59.7
Graduate level	83	16.8
Marital status		
Single	364	73.7
Married	130	26.3
Self-injury behavior		
Yes	75	15.2
No	419	84.8
Psychological help		
Yes	214	43.3
No	280	56.7
Descriptive statistics		

Table 2: The type of traumatic event exposure

	N	%	% _{cum}
Natural disaster trauma (earthquake, flooding, life-threatening illness, unexpected loss etc.)	199	40.3	40.3
Human-caused trauma (car accidents, workplace accident, harassment, rape, explosion, torturing, war etc.)	110	22.3	62.6
Both trauma types	185	37.4	100.0
Descriptive statistics			

199 had a naturally occurring traumatic experience (s) only, while 110 participants merely had a human-caused traumatic experience (s). Lastly, 185 participants had both types of traumatic experiences.

A Pearson product-moment correlation analysis was conducted to examine whether there is a statistically significant relationship between the posttraumatic cognitions, emotion management skills, negative affect and somatization scores. According to the analysis, there was a significant difference between all the variables (Table 3).

As Table 3 shows, significant and moderate positive relationships emerged between posttraumatic cognitions, negative affect and somatization scores; and significant moderate inverse relationships emerged between emotion management skills and others.

Table 3: Correlation among the scales

Variables	1.	2.	3.	4.
1. Post-traumatic cognitions	1			
2. Emotion management skills	-0.68*	1		
3. Negative affect	0.60*	-0.53*	1	
4. Somatization	0.44*	-0.50*	0.45*	1

Pearson's correlation coefficient test. *% 95 confidence interval (CI).

We examined the indirect sequential mediating role of emotion management skills and negative affect on the associations between posttraumatic cognitions and somatization using the PROCESS procedure in SPSS-22 (Figure 1).

Regression analysis was used to predict somatization. The results are shown in Figure 1, which indicated that Posttraumatic Cognitions could positively predict

somatization; when treating Posttraumatic Cognitions, Emotion Management Skills and Negative Affect as predictors, their effects on somatization were all significant. It is apparent from this figure that the statistical significance of Posttraumatic Cognitions on Somatization disappear after the mediating variables enter the model. 5,000 bootstrap samples were created to test the indirect sequential mediating role of emotion management skills and negative affect. As seen in Table 4, the results showed that the indirect effect was statistically significant (indirect effect=0.5, 95% ; BootLLCI=0.0425; BootULCI=0.0750), and the ratio of indirect to total effect of Posttraumatic Cognitions on somatization was 30% [$R^2=0.30$; $F(1.492)=71.02$; $p<0.05$]. These results indicated that emotion management skills and negative affect serves a full mediating function in the relation between Posttraumatic Cognitions and Somatization.

Table 4: The indirect effect of emotion management skills and negative affect

	Bootstrap coefficient*	Standard error	T	p	BootLLCI**	BootULCI**
Total effect	0.0742	0.0068	10.89	<0.05	0.0608	0.0875
Direct effect	0.0157	0.0092	1.7	>0.05	-0.0024	0.0338
Total indirect effect	0.585	0.0425			0.0425	0.0750
Indirect effect (x→m ₁ →y)	0.0360	0.0237			0.0237	0.0499
Indirect effect (x→m ₂ →y)	0.0164	0.0081			0.0081	0.0261
Indirect effect (x→m ₁ →m ₂ →y)	0.0064	0.0024			0.0027	0.0100

PROCESS macro test.
 *Based on 5,000 bootstrap samples.
 **% 95 confidence interval (CI).

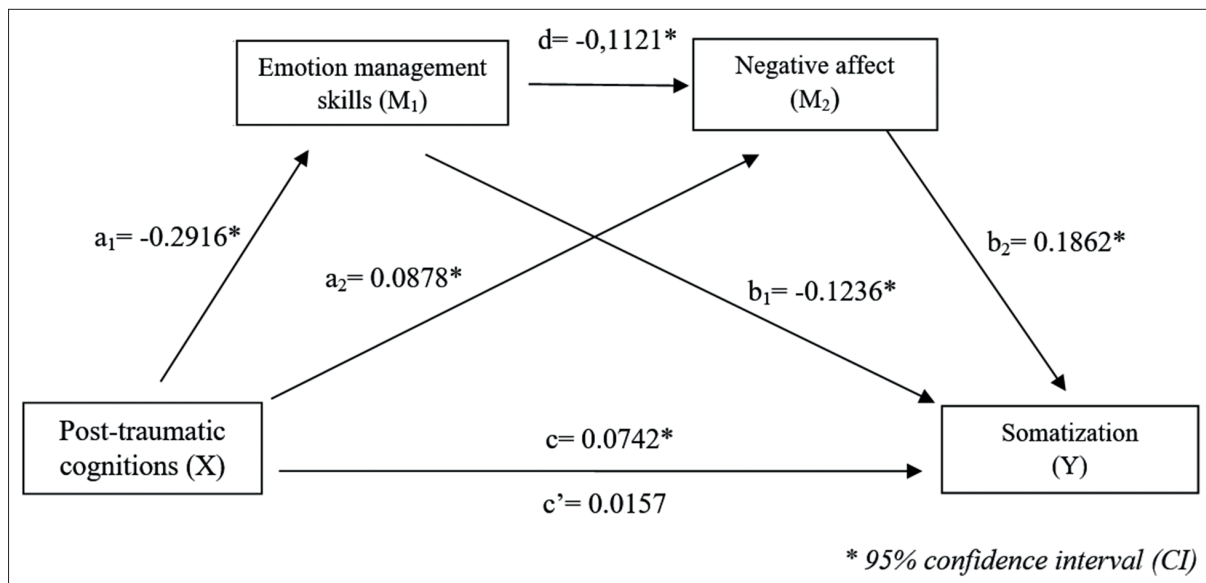


Figure 1. The sequential mediating role of emotion management skills and negative affect in the relationship between post-traumatic cognitions and somatization.

DISCUSSION

This study aimed to explore the relationship between posttraumatic cognitions and somatization and the mediating factors between the bivariate links. It is proposed that posttraumatic cognitions positively predict somatization through emotion management skills and negative affection sequentially. Therefore, the relationships between posttraumatic cognitions, emotion management skills, negative emotions and somatization variables were examined in accordance with the research question of the study.

Firstly, moderate and significant relationships were found between posttraumatic cognitions, emotion management skills, negative affect and somatization. Given the potentially physical, cognitive, and emotional impact of a traumatic experience on the individual (APA, 2013; SAMHSA, 2014), these relations observed between variables were revealed as hypothesized and were consistent with the trauma literature (Doctor & Shiromoto, 2009; Ehlers & Clark, 2000; Gordon, 2019; Stora, 2018). One of the most significant findings from the present analysis is the role of emotion management skills and negative affection in posttraumatic cognitions and somatization relationships. According to the mediation analysis, emotion management skills and negative affection fully explains this relationship, which means without the emotion management skills and negative affection in the model, there is no direct relationship between posttraumatic cognitions and somatization. In other words, posttraumatic cognition has an indirect effect through emotion management skills and negative affect sequentially.

This study sheds light on the nature of the relationship between posttraumatic cognitions and somatization. Although a strong relationship between trauma and somatization has been widely reported in the literature (Afari et al., 2014; Baylan, 2019; Garnefski et al., 2017; Iloson, Möller, Sundfeldt & Bernhardsson, 2021; Kealy et al., 2018; Piontek, Wiesmann, Apfelbacher, Völzke & Grabe, 2021; Tarsitani et al., 2020), current study differs from the others by showing there is also a relationship between posttraumatic cognitions and somatization. According to this finding, negative cognitions and somatization show a parallel change after a traumatic experience. Even though there are very limited number of studies in the literature between posttraumatic cognitions and somatization, the other findings support this study (Koo et al., 2014; Lily & Lim, 2013). For example, in a study conducted by Koo et al. (2014), the negative cognitions of women, who were

exposed to sexual assault, predicted their somatic symptoms significantly. This study shows a linear relationship between high-level negative cognitions and somatization (Koo et al., 2014). Supporting this in another study, it was found that negative cognitions about the world predict the somatization level in individuals who were exposed to interpersonal trauma (Lilly & Lim, 2012).

According to the predictive analysis, posttraumatic cognitions emerged as a predictive factor in emotion management skills and negative affect. Consistent with the present study, Blanco & Joorman (2017) found that negative cognitions such as “I am not a worthy person” or “I do not deserve anything good” cause difficulties in regulating emotions, and that evokes negative emotions (Joormann & Gotlib, 2010). In a study conducted with trauma survivors, it has been observed that high-level negative cognition towards the world and people, and also self-blame cognitions are associated with negative affect (Moser et al., 2007). In furtherance of these, another study examining posttraumatic assumptions and emotions noted similar findings (Lilly et al., 2011). Cognitive assumptions and depression levels of 97 women who survived intimate partner violence were examined. According to the predictive analysis conducted in this study, it was revealed that negative beliefs about the world fully mediated the relationship between trauma exposure and the severity of negative affect (Lilly et al., 2011). Considering the determining role of cognitive evaluations of events on emotions (Joormann & Gotlib, 2010; Moors & Scherer, 2013), it is also theoretically supported as posttraumatic negative cognitions towards self and the world contribute to negative emotional tendencies such as feelings of self-blame, shame, insecurity, hostility or inadequacy (DePrince et al., 2010; Ehlers & Clark, 2000), in a way that supports the findings of this study.

Analysis that examining the sequential predictive relationship between emotion management skills and negative affect show that part of the negative affect level in trauma survivors is explained by their emotion management skills. High emotion management skills are associated with low levels of negative emotion, while increased negative emotion is explained by decreased emotion management skills. The finding of this study is supported by the findings of many studies in the field (Dryman & Heimberg, 2018; Goldsmith, Chesney, Heath & Barlow, 2013; Lee et al., 2016; Schäfer et al., 2017; Young, Sandman & Craske, 2019). In the study conducted by Goldsmith et al. (2013),

it was observed that emotion regulation difficulties in individuals with trauma history significantly and positively predict negative emotions. At the same time, emotion regulation difficulties play a mediating role in the relationship between trauma experience and negative affect in individuals exposed to domestic trauma in this study (Goldsmith et al., 2013). Similarly, in another study, childhood traumatic experiences of individuals were examined with various variables in Turkey. Accordingly, a positive, moderate relationship is observed between emotion regulation difficulties and negative emotions (Küçük, 2019).

The current study shows that posttraumatic cognitions, emotion management skills, negative emotions and somatization are related to each other in various ways. Mediation analyzes revealed that posttraumatic cognitions have predictive power on somatic symptoms only through emotion management skills and negative affect, respectively. Taken together, this finding suggest that there is a more linear relationships association between emotion management, negative emotion and somatization. On the other hand, posttraumatic cognitions have an indirect role on somatization through other emotional processes. More specifically, the impact of posttraumatic cognitions on somatization is expected to be decreased in the context of a higher level of emotion management skills and correspondingly less negative affect. In accordance with the present finding, studies associate that inadequate emotion regulation skills (Berking & Wupperman, 2012; DeJonghe, 2020; Seligowski et al., 2015) and the negative affect (Constantinou, 2018; Kleinstäuber et al., 2019; Rief & Broadbent, 2007) with the development and persistence of many mental health problems, including somatization disorders. Furthermore, findings from our research are supported by Schwarz et al. (2017) who found that negative affect is a mediator between emotion regulation and somatic symptoms also

Even the present research has offered a framework for the explanation of posttraumatic somatization, several questions remain unanswered. This research was conducted on trauma victims via a convenience sample. The data in this study are based on self-report, and the generalisability of findings is limited by participants. Therefore, further structured investigations are needed to provide greater insight into emotion and somatization experience.

Emotions are a crucial part of the human condition (Ford & Gross, 2018). According to many approaches, somatization is closely related to various emotional difficulties

(Constantinou, 2018; Kirmayer, 1986; Waller & Scheidt, 2006; Woolfolk & Allen, 2007; Woolfolk et al., 2007). Consistent with the literature, the present study contributes in several ways to our understanding of post-trauma somatization and provides crucial insights into the role of emotions and cognitions. The most notable finding is that while posttraumatic cognitions have no direct role on somatization, emotional management skills and negative emotions showed more robust predictive and the full mediator role on it. A further study about somatization with more focus on emotional experiences is therefore suggested. We believe that findings from our research are beneficial to both practitioners and policy-makers, also will help other researchers design further research.

Ethics Committee Approval: The study was approved by the Research and Publication Ethics Committee of Marmara University (date and number of approval: 2020 / 0717).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors declare no conflict of interest.

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REFERENCES

- Afari, N., Ahumada, S. M., Wright, L. J., Mostoufi, S., Golnari, G., Reis, V., & Cuneo, J. G. (2014). Psychological trauma and functional somatic syndromes: a systematic review and meta-analysis. *Psychosom Med*, 76(1), 2. <https://doi.org/10.1097/PSY.0000000000000010>
- Aker AT. (2012) *Temel sağlık hizmetlerinde ruhsal travmaya yaklaşım*, 1. Baskı. Uzerler Matbaacılık, Ankara. <http://koutab.kocaeli.edu.tr/dosyalar/TREP.pdf>
- American Psychiatric Association (2013) *Diagnostic and statistical manual of mental disorders*, 5th ed. (DSM-5). American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>
- Avdibegovic, E., Delic, A., Hadzibeganovic, K., & Selimbasic, Z. (2010). Somatic diseases in patients with posttraumatic stress disorder. *Med Arb*, 64(3), 154-157. <https://pubmed.ncbi.nlm.nih.gov/20645508/>
- Bailey, P. E., & Henry, J. D. (2007). Alexithymia, somatization and negative affect in a community sample. *Psychiatry Res*, 150(1), 13-20. <https://doi.org/10.1016/j.psychres.2006.05.024>
- Barlow, M. R., Turow, R. E. G., & Gerhart, J. (2017). Trauma appraisals, emotion regulation difficulties, and self-compassion predict posttraumatic stress symptoms following childhood abuse. *Child Abuse & Neglect*, 65, 37-47. <https://doi.org/10.1016/j.chiabu.2017.01.006>
- Baylan, N. (2019) *Çocukluk çağı travmalarının somatizasyon ile ilişkisinde aleksitiminin aracı rolü*. Unpublished master's thesis. Işık Üniversitesi. <https://acikerisim.isikun.edu.tr/xmlui/bitstream/handle/11729/2169/2169.pdf?sequence=4&isAllowed=y>

- Beck, J. G., Reich, C. M., Woodward, M. J., Olsen, S. A., Jones, J. M. ve Patton, S. C. (2015). How do negative emotions relate to dysfunctional posttrauma cognitions? An examination of interpersonal trauma survivors. *Psychological Trauma: Theory, Research, Practice, and Policy*, 7(1), 3. <https://doi.org/10.1037/a0032716>
- Berking, M., & Wupperman, P. (2012). Emotion regulation and mental health: recent findings, current challenges, and future directions. *Curr Opin Psychiatry*, 25(2), 128-134. <https://doi.org/10.1097/YCO.0b013e3283503669>
- Constantinou, E. (2018). *Negative affect and medically unexplained symptoms*. In Somatoform and Other Psychosomatic Disorders. Springer, Cham. https://doi.org/10.1007/978-3-319-89360-0_4
- Çakıl, G. (2018). *Üniversite örnekleminde travma sonrası bilişler ile intihar olasılığı arasındaki ilişki*. Unpublished master's thesis. İstanbul Gelişim Üniversitesi. <http://acikerisim.gelisim.edu.tr/xmlui/handle/11363/1352>
- Çeçen, A. R. (2002). Duyguları yönetme becerileri ölçeğinin geliştirilmesi: Geçerlik ve güvenilirlik çalışmaları. *Türk Psikolojik Danışma ve Rehberlik Derg*, 3(26), 101-113. <https://dergipark.org.tr/tr/download/article-file/200038>
- Darves-Bornoz, J. M., Alonso, J., de Girolamo, G., Graaf, R. D., Haro, J. M., Kovess-Masfety, V., ..., & Gasquet, I. (2008). Main traumatic events in Europe: PTSD in the European study of the epidemiology of mental disorders survey. *J Trauma Stress*, 21(5), 455-462. <https://doi.org/10.1002/jts.20357>
- De Gucht, V., Fischler, B., & Heiser, W. (2004a). Neuroticism, alexithymia, negative affect, and positive affect as determinants of medically unexplained symptoms. *Pers Individ Diff*, 36(7), 1655-1667. <https://doi.org/10.1016/j.paid.2003.06.012>
- DeJonghe, E. S. (2020). Emotion Regulation and Psychopathology. In *The Wiley Encyclopedia of Personality and Individual Differences: Clinical, Applied, and Cross-Cultural Research*, 133-137. <https://doi.org/10.1002/9781119547181.ch286>
- DePrince, A. P., Zurbriggen, E. L., Chu, A. T., & Smart, L. (2010). Development of the trauma appraisal questionnaire. *J Aggress Maltreat Trauma*, 19(3), 275-299. <https://doi.org/10.1080/10926771003705072>
- Doctor, R. M., & Shiromoto, F. N. (2009). *The encyclopedia of trauma and traumatic stress disorders*. Facts On File, Inc.
- Dryman, M. T., & Heimberg, R. G. (2018). Emotion regulation in social anxiety and depression: a systematic review of expressive suppression and cognitive reappraisal. *Clin Psychology Rev*, 65, 17-42. <https://doi.org/10.1016/j.cpr.2018.07.004>
- Dülgerler, Ş. (2000). *İlköğretim okulu öğretmenlerinde somatizasyon ölçeğinin geçerlik ve güvenilirlik çalışması*. Unpublished master's thesis. Ege Üniversitesi. <https://toad.halileksi.net/sites/default/files/pdf/somatizasyon-olcegi-toad.pdf>
- Ehlers, A. (1999). A cognitive approach to the understanding and treatment of posttraumatic stress disorder. In E. J. Hickling, & E. B. Blanchard (Eds.), *The international handbook of road traffic accidents & psychological trauma: Current understanding, treatment and law* (pp. 397-408). Emerald Publishing; 1st ed. Elsevier Science.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behav Res Ther*, 38(4), 319-345. [https://doi.org/10.1016/S0005-7967\(99\)00123-0](https://doi.org/10.1016/S0005-7967(99)00123-0)
- Epstein, S. (1991). Impulse control and self-destructive behavior. In L. P. Lipsitt ve L. L. Mitick (Ed.), *Self-regulatory behavior and risk-taking: Causes and consequences* (pp. 273-284). Praeger; Ablex.
- Foa, E. B., Cashman, L., Jaycox, L. & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychol Assess*, 9, 445-451. <https://doi.org/10.1037/1040-3590.9.4.445>
- Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S.M. (1999). The Posttraumatic Cognitions Inventory (PTCI): Development and Validation. *Psychol Assess*, 11, 303-314. <https://doi.org/10.1037/1040-3590.11.3.303>
- Ford, B. Q., & Gross, J. J. (2018). Emotion regulation: Why beliefs matter. *Can Psychology / Psychologie Can*, 59(1), 1-14. <https://doi.org/10.1037/cap0000142>
- Garnefski, N., van Rood, Y., De Roos, C., & Kraaij, V. (2017). Relationships between traumatic life events, cognitive emotion regulation strategies, and somatic complaints. *J Clin Psychology Med Settings*, 24(2), 144-151. <https://doi.org/10.1007/s10880-017-9494-y>
- Gençöz, T. (2000). Pozitif ve negatif duygu ölçeği: geçerlik ve güvenilirlik çalışması. *Türk Psikoloji Derg*, 15(46), 19-26. <https://toad.halileksi.net/sites/default/files/pdf/pozitif-ve-negatif-duygu-olcegi-toad.pdf>
- Gerhart, J. I., Canetti, D., & Hobfoll, S. E. (2015). Traumatic stress in overview: *Definition, context, scope, and long-term outcomes*. In *Traumatic stress and long-term recovery* (pp. 3-24). Springer. https://doi.org/10.1007/978-3-319-18866-9_1
- Goldsmith, R. E., Chesney, S. A., Heath, N. M., & Barlow, M. R. (2013). Emotion regulation difficulties mediate associations between betrayal trauma and symptoms of posttraumatic stress, depression, and anxiety. *J Trauma Stress*, 26(3), 376-384. <https://doi.org/10.1002/jts.21819>
- Gordon, J. (2019). *Transforming trauma: discovering wholeness and healing after trauma*. Hachette; UK.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*, 2nd ed. The Guilford Press.
- Iloson, C., Möller, A., Sundfeldt, K., & Bernhardsson, S. (2021). Symptoms within somatization after sexual abuse among women: A scoping review. *Acta Obstet Gynecol Scand*, 100(4), 758-767. <https://doi.org/10.1111/aogs.14084>
- İşıklı, S. (2006). *Travma sonrası stres belirtileri olan bireylerde olaya ilişkin dikkat yanlılığı, ayrışma düzeyi ve çalışma belleği uzamı arasındaki ilişkiler*. Unpublished doctoral thesis. Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezDetay.jsp?id=JLlCkSY-5fadwMFH140h5g&no=1XxEjgy90uZfoT0tztAbag>
- Janoff-Bulman, R. (1989). Assumptive worlds and the stress of traumatic events: Applications of the schema construct. *Soc Cogn*, 7, 113-136. <https://doi.org/10.1521/soco.1989.7.2.113>
- Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. Free Press. <https://psycnet.apa.org/record/1992-97250-000>
- Janoff-Bulman, R. (2010). *Shattered assumptions*. Simon and Schuster. Free Press.
- Joormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: Relation to cognitive inhibition. *Cognition and Emotion*, 24(2), 281-298. <https://doi.org/10.1080/02699930903407948>

- Karatzias, T., Shevlin, M., Hyland, P., Brewin, C. R., Cloitre, M., Bradley, A., ..., & Roberts, N. P. (2018). The role of negative cognitions, emotion regulation strategies, and attachment style in complex post-traumatic stress disorder: Implications for new and existing therapies. *Br J Clin Psychology, 57*(2), 177-185. <https://doi.org/10.1111/bjc.12172>
- Kealy, D., Rice, S. M., Ogrodniczuk, J. S., & Spidel, A. (2018). Childhood trauma and somatic symptoms among psychiatric outpatients: investigating the role of shame and guilt. *Psychiatry Res, 268*, 169-174. <https://doi.org/10.1016/j.psychres.2018.06.072>
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., ..., & Florescu, S. (2017). Trauma and PTSD in the WHO world mental health surveys. *Eur J Psychotraumatology, 8*(Sup 5), 1353383. <https://doi.org/10.1080/20008198.2017.1353383>
- Kirmayer, L. (1986). Somatization and the social construction of illness experience. In *Illness behavior* (pp. 111-133). Springer. https://doi.org/10.1007/978-1-4684-5257-0_7
- Kleinstäuber, M., Gottschalk, J. M., Ruckmann, J., Probst, T., & Rief, W. (2019). Acceptance and Cognitive Reappraisal as Regulation Strategies for Symptom Annoyance in Individuals with Medically Unexplained Physical Symptoms. *Cogn Ther Res, 43*(3), 570-584. <https://doi.org/10.1007/s10608-018-9973-y>
- Koo, K. H., Nguyen, H. V., Gilmore, A. K., Blayney, J. A., & Kaysen, D. L. (2014). Posttraumatic cognitions, somatization, and PTSD severity among Asian American and White college women with sexual trauma histories. *Psychol Trauma: Theory, Research, Practice, and Policy, 6*(4), 337-344. <https://doi.org/10.1037/a0033830>
- Küçük, T. (2019). *Çocukluk çağı örseleyici yaşantıları: Geçerlilik döneminde duygu düzenleme, psikolojik uyum ve sağlamlık*. Ankara Üniversitesi. <https://dspace.ankara.edu.tr/xmlui/bitstream/handle/20.500.12575/69193/564890.pdf?sequence=1&isAllowed=y>
- Lee, M., Pekrun, R., Taxer, J. L., Schutz, P. A., Vogl, E., & Xie, X. (2016). Teachers' emotions and emotion management: Integrating emotion regulation theory with emotional labor research. *Soc Psychol Educ, 19*(4), 843-863. <https://doi.org/10.1007/s11218-016-9359-5>
- Lilly, M. M., & Hong (Phyllice) Lim, B. (2013). Shared pathogenesis of posttrauma pathologies: Attachment, emotion regulation, and cognitions. *J Clin Psychology, 69*(7), 737-748. <https://doi.org/10.1002/jclp.21934>
- Lilly, M., & Valdez, C. (2012). The unique relationship of emotion regulation and alexithymia in predicting somatization versus PTSD symptoms. *J Aggress Maltreat Trauma, 21*(6), 609-625. <https://doi.org/10.1080/10926771.2012.686964>
- Lilly, M. M., Valdez, C. E., & Graham-Bermann, S. A. (2011). The mediating effect of world assumptions on the relationship between trauma exposure and depression. *J Interpersonal Violence, 26*(12), 2499-2516. <https://doi.org/10.1177/0886260510383033>
- Lopez, R. B., & Denny, B. T. (2019). Negative affect mediates the relationship between use of emotion regulation strategies and general health in college-aged students. *Pers Individ Diff, 151*, 109529. <https://doi.org/10.1016/j.paid.2019.109529>
- Lyons, R., Haller, M., Rivera, G., & Norman, S. (2020). Negative affect mediates the association between posttraumatic cognitions and craving in veterans with posttraumatic stress disorder and alcohol use disorder. *J Dual Diagn, 16*(3), 292-298. <https://doi.org/10.1080/15504263.2020.1741754>
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behav Res, 39*(1), 99-128. https://doi.org/10.1207/s15327906mbr3901_4
- McLean, C. P., Zang, Y., Gallagher, T., Suzuki, N., Yarvis, J. S., Litz, B. T., ... & STRONG STAR Consortium. (2019). Trauma-related cognitions and cognitive emotion regulation as mediators of PTSD change among treatment-seeking active-duty military Personnel with PTSD. *Behav Ther, 50*(6), 1053-1062. <https://doi.org/10.1016/j.beth.2019.03.006>
- Moors, A., & Scherer, K. R. (2013). The role of appraisal in emotion. In *Handbook of cognition and emotion* (pp. 135-155). New York: Guilford Press. https://ppw.kuleuven.be/okp/_pdf/Moors2013TROAI.pdf
- Moser, J. S., Hajcak, G., Simons, R. F., & Foa, E. B. (2007). Posttraumatic stress disorder symptoms in trauma-exposed college students: The role of trauma-related cognitions, gender, and negative affect. *J Anxiety Disord, 21*(8), 1039-1049. <https://doi.org/10.1016/j.janxdis.2006.10.009>
- Samuelson, K. W., Bartel, A., Valadez, R., & Jordan, J. T. (2017). PTSD symptoms and perception of cognitive problems: The roles of posttraumatic cognitions and trauma coping self-efficacy. *Psychol Trauma: Theory, Research, Practice, and Policy, 9*(5), 537-544. <https://doi.org/10.1037/tra0000210>
- Schäfer, J. Ö., Naumann, E., Holmes, E. A., Tuschen-Caffier, B., & Samson, A. C. (2017). Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of Youth And Adolescence, 46*(2), 261-276. <https://doi.org/10.1007/s10964-016-0585-0>
- Schwarz, J., Rief, W., Radkovsky, A., Berking, M., & Kleinstäuber, M. (2017). Negative affect as mediator between emotion regulation and medically unexplained symptoms. *J Psychosom Res, 101*, 114-121. <https://doi.org/10.1016/j.jpsychores.2017.08.010>
- Seligowski, A. V., Lee, D. J., Bardeen, J. R., & Orcutt, H. K. (2015). Emotion regulation and posttraumatic stress symptoms: A meta-analysis. *Cogn Behav Ther, 44*(2), 87-102. <https://doi.org/10.1080/16506073.2014.980753>
- Sheerin, C. M., Chowdhury, N., Lind, M. J., Kurtz, E. D., Rappaport, L. M., Berenz, E. C., ..., & Amstadter, A. B. (2018). Relation between coping and posttrauma cognitions on PTSD in a combat-trauma population. *Military Psychology, 30*(2), 98-107. <https://doi.org/10.1080/08995605.2017.1420980>
- Siemer, M., Mauss, I., & Gross, J. J. (2007). Same situation - Different emotions: How appraisals shape our emotion. *Emotion, 7*(3), 592-600. <https://doi.org/10.1037/1528-3542.7.3.592>
- Stora, J. B. (2018). *When the body displaces the mind: stress, trauma and somatic disease*. Routledge. <https://doi.org/10.4324/9780429484926>
- Subic-Wrana, C., Beutel, M. E., Knebel, A., & Lane, R. D. (2010). Theory of mind and emotional awareness deficits in patients with somatoform disorders. *Psychosom Med, 72*(4), 404-411. <https://doi.org/10.1097/PSY.0b013e3181d35e83>
- Substance Abuse and Mental Health Services Administration [SAMHSA] (2014). *Trauma-Informed Care in Behavioral Health Services* (TIP). Substance Abuse and Mental Health Services Administration. <https://store.samhsa.gov/sites/default/files/d71prv/sma14-4816.pdf>

- Piontek, K., Wiesmann, U., Apfelbacher, C., Völzke, H., & Grabe, H. J. (2021). The association of childhood maltreatment, somatization and health-related quality of life in adult age: results from a population-based cohort study. *Child Abuse Neglect*, 120, 105226. <https://doi.org/10.1016/j.chiabu.2021.105226>
- Rief, W., & Broadbent, E. (2007). Explaining medically unexplained symptoms-models and mechanisms. *Clin Psychology Rev*, 27(7), 821-841. <https://doi.org/10.1016/j.cpr.2007.07.005>
- Tarsitani, L., Todini, L., Roselli, V., Serra, R., Magliocchetti, V., D'Amore, D., ..., & Biondi, M. (2020). Somatization and traumatic events in asylum seekers and refugees resettled in Italy. *J Psychopathol* 26, 41-45. <https://doi.org/10.36148/2284-0249-374>
- Waller, E., & Scheidt, C. E. (2006). Somatoform disorders as disorders of affect regulation: a development perspective. *Int Rev Psychiatry*, 18(1), 13-24. <https://doi.org/10.1080/09540260500466774>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *J Pers Soc Psychology*, 54 (6), 1063-1070. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Woolfolk, R. L., & Allen, L. A. (2007). *Treating somatization: A cognitive-behavioral approach*. Guilford Press. <https://psycnet.apa.org/record/2006-21626-000>
- Woolfolk, R. L., Allen, L. A., & Tiu, J. E. (2007). New directions in the treatment of somatization. *Psychiatr Clin North Am*, 30(4), 621-644. <https://doi.org/10.1016/j.psc.2007.07.001>
- Yağcı-Yetkiner, D. (2010). *Traumata sonrası bilişler ölçeği (posttraumatic cognitions inventory) Türkçe uyarlama ve üniversite öğrencileri üzerinde geçerlik güvenirlik çalışması*. Unpublished master's thesis. Kocaeli Üniversitesi. <https://toad.halileksi.net/sites/default/files/pdf/travma-sonrasi-bilisler-olcegi-posttraumatic-cognitions-inventory-toad.pdf>
- Young, K. S., Sandman, C. F., & Craske, M. G. (2019). Positive and negative emotion regulation in adolescence: links to anxiety and depression. *Brain Sci*, 9(4), 76. <https://doi.org/10.3390/brainsci9040076>