ISTSS International Society for Traumatic Stress Studies

Peritraumatic Distress and Posttraumatic Stress Symptoms During the COVID-19 Pandemic: The Contributions of Psychosocial Factors and Pandemic-Related Stressors

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The present study aimed to identify the contributions of sociodemographic factors, psychological hardiness, and pandemic-related stressors to the development of peritraumatic distress and posttraumatic stress symptoms (PTSS) during the peak of the COVID-19 pandemic. We also examined the mediating contribution of peritraumatic distress with respect to the associations between PTSS and (a) individual characteristics and (b) pandemic-related stressors. A total of 1,238 participants (82.1% women, 17.9% men) aged 18–75 years were included in the study. Participants completed the Dispositional Resilience Scale, Peritraumatic Distress Inventory, and Posttraumatic Stress Disorder (PTSD) Checklist. The results showed that 11.5% of participants scored above the clinical cutoff for peritraumatic distress, and 12.8% of participants scored above the clinical cutoff for PTSS. Regression models showed that higher levels of peritraumatic distress were statistically predicted by female gender, $\beta = -.12$, $p < .001$; exposure to more than one stressor, $\beta = .21$, $p < .001$; lower levels of commitment to people and activities, $\beta = -.12$, $p = .002$; and resistance to challenges, $\beta = -.17$, $p < .001$. Additionally, male gender, $\beta = .05$, $p = .007$; younger age, $\beta = -.05$, $p = .005$; lower levels of commitment to people and activities, $\beta = -.11$, $p < .001$; lower ratings of hardiness with regard to challenge, $\beta = -.04$, $p = .043$; and more severe peritraumatic distress, $\beta = .75$, $p < .001$, predicted more severe PTSS during the pandemic. Peritraumatic distress mediated the associations between PTSS and both the number of experienced stressors and psychological hardiness.

Severe acute respiratory syndrome coronavirus 2 SARS-CoV-2, the virus that causes COVID-19, spread throughout the world and caused far-reaching consequences for the mental and physical health of billions of individuals (Fiorilo & Gorwood, 2020). At the time of this writing, over 77,000,000 individuals have been infected, and more than 1,700,000 have died from COVID-19 (Worldometer, 2020). In addition, a variety of pandemic-related stressors may lead to mental health problems, some of which are directly related to the public health crisis caused by the threat of COVID-19; for example, virus exposure or the threat of virus exposure may lead to concern for one's own health and the health of loved ones, especially among those who are elderly or suffer from comorbid physical illnesses (Fiorilo & Gorwood, 2020). Individuals have been plagued by other stressors, such as isolation or quarantine (i.e.,

isolation from others when infected; self-isolation or quarantine when one has been in close contact with an infected individual); concern for the future; inadequate supplies, including food, water, clothes, and medical supplies; and inadequate information, such as poor information from public health authorities, insufficiently clear guidelines about actions to take, or confusion about the purpose of quarantine, as well as financial loss and stigma (Brooks et al., 2020).

In general, an increasing number of studies have demonstrated the negative psychological effects of pandemics, including panic disorder, anxiety, depression (Qiu et al., 2020), confusion, anger (Brooks et al., 2020), and poor sleep quality (Huang & Zhao, 2020; Lai et al., 2020). Other studies have reported symptoms of posttraumatic stress disorder (PTSD) among affected individuals (Sprang & Silman, 2013; Liu et al., 2020). These findings are in accordance with previous studies showing that PTSD was the most common long-term psychiatric disorder following the 2002–2004 SARS outbreak (Mak et al., 2010). Similarly, Liu et al. (2020) found that 7% of the participants in their sample of individuals living in the hardest-hit areas of China reported posttraumatic stress symptoms (PTSS) 1 month after the start of the COVID-19 outbreak (Liu et al.,

2020). Although numerous studies have aimed to elucidate the nature of the psychological aspects of pandemics, its full impact remains unclear. For instance, it is difficult to determine whether the current pandemic may be considered to be a large-scale traumatic event.

Although research on both past pandemics (Lam et al., 2009; Mak et al., 2010) and the current COVID-19 pandemic (Bridgland et al., 2020; Karatzias et al., 2020; Liu et al., 2020; Sun et al., 2020) has consistently indicated an increased incidence of PTSS in the population, there have been disagreements regarding whether exposure to COVID-19 stressors should be considered traumatic stressors consistent with what is required for fulfilling the criteria for the PTSD diagnosis. According to the PTSD diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders* (fifth ed.; *DSM-5*; American Psychiatric Association [APA], 2013), psychological trauma occurs when an individual is exposed to death or the threat of death as well as after having been directly exposed to a traumatic event, having witnessed or learned about a relative or close friend experiencing a traumatic event, or being directly exposed to aversive details of violent or accidental traumatic events (Criterion A, APA, 2013). Accordingly, Van Overmeire (2020) argued that simply experiencing the COVID-19 pandemic is not sufficient to meet the trauma exposure criterion for a PTSD diagnosis given that individuals' COVID-19 experiences vary greatly, with very few people outside the medical profession experiencing direct contact with COVID-19–infected individuals. Therefore, the question has arisen as to whether COVID-19 experiences are life-threatening or extremely stressful, which would be necessary for them to fulfill the requirement for Criterion A (APA, 2013). On the other hand, Bridgland et al. (2020) proposed that traumatic stress reactions to the COVID-19 pandemic in the general population may relate more to the future than the past (e.g., fear of being infected) and more to indirect exposure (e.g., via media coverage) versus direct exposure (e.g., contact with the virus). In addition, Bridgland et al. included in their list of potential traumas stressful events that occurred during the pandemic, particularly at the beginning, such as lockdowns, unemployment, isolation, and nonsudden illness or death, which do not meet the strict definition of *DSM* Criterion A (i.e., actual or threatened death, injury, or sexual violation),. When considering the experience of the pandemic in Croatia specifically, the onset was characterized by a high degree of general panic and a feeling of catastrophe, partly because of the unfamiliarity of the virus. Moreover, public officials referred to individuals who exited their homes during the self-isolation period as "bioterrorists," which potentially created a feeling of being endangered when exiting one's home. Consequently, regardless of the "objective" danger the virus may have posed, many individuals' personal experiences were very intense, negative, and, as suggested by Bridgland et al. (2020), potentially traumatic.

Previous studies have identified pretrauma variables independent of trauma exposure that are important in the devel-

opment of PTSS, including genetic factors, a perceived lack of parental care, a history of trauma exposure and psychological problems, an unhealthy lifestyle, certain personality traits (Jakovljević et al., 2012; Yehuda & McFarlane, 1995), and resilience (Bonnano et al., 2011), all of which potentially contribute to the occurrence and maintenance of both peritraumatic distress and PTSS. Given that less than 1 year has passed since the beginning of the COVID-19 pandemic, empirical findings on the association between exposure to pandemic-related stressors and traumatic responses are not yet well-established. Taking into account the scale of the pandemic, this is a highly relevant question due to its potential practical impact on planning and organizing the treatment of peritraumatic distress and PTSS in everyday clinical practice. Peritraumatic distress reactions that occur during or immediately following exposure to traumatic events are one of the strongest predictors of PTSD (Kessler et al., 2014; Ozer et al., 2003; Shiban et al., 2018). Thus, we were interested in exploring whether exposure to the COVID-19 threat would be shown to cause peritraumatic reactions and PTSS as well as whether prominent peritraumatic reactions increase the likelihood of developing PTSS.

Peritraumatic reactions encompass an individual's responses during or immediately following exposure to a traumatic event and are associated with the development and severity of PTSD and related psychological difficulties (Bunnell et al., 2018). Bovin and Marx (2011) proposed a model describing different types of peritraumatic responses and exploring the way that these responses, separately and together, may confer the risk of developing PTSD. According to the model, this set of complex peritraumatic responses involves an individual's appraisal regarding the degree to which the event taxes their resources, along with a range of other cognitions, emotions, physiological reactions, and behaviors (Bovin & Marx, 2011). In addition to individuals' responses, the model discusses the contribution of contextual factors involved in coping with traumatic events, such as an individual's psychiatric history (Hao et al., 2020), prior trauma exposure (Lancee, 2008; Wang et al., 2020), personality characteristics (Reis et al., 2016), and characteristics of the index traumatic event (Dutheil et al., 2020; Wang et al., 2020). Therefore, peritraumatic responses must be considered within the context of these potential modifiers to fully understand how they increase one's risk of developing PTSD (Gorman et al., 2015). According to Shiban et al (2018), certain peritraumatic variables might influence PTSS directly, whereas others might do so indirectly. In the present study, we aimed to identify the contribution of sociodemographic factors and pandemic-related stressors in the development of peritraumatic distress and PTSS during the peak of the COVID-19 pandemic.

In addition, we examined the mediating contribution of peritraumatic distress with respect to the associations between PTSS and (a) individual characteristics and (b) pandemic-related stressors.

Method

Participants

Due to government protection measures enacted to prevent the spread of COVID-19 infection via physical contact, we used a web-based survey to collect data; therefore, the present analyses included data from a nonprobabilistic convenience sample of participants. A total of 1,238 individuals (82.1% women, 17.9% men) who completed the questionnaires were included in the analysis. The mean participant age was 39.70 ($SD =$ 12.60, range: 18–75 Most respondents reported having completed a university education (56.1%) or secondary education (29.6%), whereas 13.1% of respondents reported having completed some postgraduate education; the smallest number of participants had completed primary school (1.2%). Most participants were employed (60.7%), 28.6% were students, 6.5% were unemployed, and 4.2% were retired. In addition, 395 (32.0%) participants physically worked at their place of employment during the lockdown, whereas the remaining 839 (68.0%) stayed at home either because they could work from home or they were not employed.

Participants answered the questionnaires anonymously on the Internet between April 17, 2020, and April 27, 2020, approximately 1 month after the beginning of the pandemic in the Republic of Croatia. According to government measures, Croatian citizens had strict stay-at-home orders from mid-March 2020 to early May 2020, and, by then, the number of infected individuals had risen to 2,100, with approximately 100 COVID-19–related deaths reported (Croatian Institute of Public Health, 2020) among the country's 4,290,000 citizens.

Participants experienced at least one of the following pandemic-related stressors: potential virus exposure, a loved one's potential virus exposure, actual exposure to or infection with COVID-19, a loved one's actual exposure to or infection with COVID-19, a life-threatening COVID-19 infection or a loved one's life-threatening COVID-19 infection, or witnessing exposure or infection during one's professional duties. In addition, approximately one third of the participants were directly exposed to a series of strong earthquakes that occurred in Zagreb, the capital of Croatia, at the same time the pandemic was at its peak.

Procedure

A correlational, cross-sectional research design was used in the present study. A web-based survey that included items related to COVID-19 was sent electronically through the Google docs platform and mainstream social media. The survey was available to all individuals who used Facebook, WhatsApp, or other social media tools and could be accessed by clicking a relevant link. All participants reported their demographic data and COVID-19–related information and completed several standardized questionnaires used to assess their personality characteristics and mental health status. This research took place during the peak of the pandemic, during which the most

intense pandemic-related emotional reactions and early signs of PTSS were potentially already detectable.

The present study was conducted in accordance with the Declaration of Helsinki and approved by the University of Split Department of Health Studies according to their code of biomedical research. The study was not endorsed by any particular funding nor was it preregistered. Electronic informed consent was obtained from each participant before the start of the investigation. Participants could withdraw from the survey at any moment without providing justification.

Measures

Demographic and COVID-19–Related Information

A general information questionnaire was prepared for the purpose of this research. Participants were asked to report demographic data (i.e., age, gender, educational attainment, socioeconomic status, and work status), information on their exposure to stressful and/or traumatic events during the COVID-19 pandemic, and previous treatment for a mental health–related concern. Exposure to stressful and traumatic experiences was assessed via an item in which the participants were asked to state whether they had been exposed to a number of potentially traumatic pandemic-related stressors, such as being infected with the SARS-CoV-2 virus or having a loved one suffering from COVID-19, experiencing psychological discomfort due to being forced to remain indoors, feeling intense fear of getting infected by SARS-CoV-2, feeling isolated from their loved ones, the potential to need to engage in self-isolation due to potential exposure to SARS-CoV-2, not being able to return to Croatia after the borders were closed, or experiencing the earthquake in Zagreb that occurred during that time. When reporting their current work status, the participants were asked to indicate whether they were working from their workplace or from home; participants were also able to indicate that they were unemployed, retired, or a student. Finally, with respect to previous mental health–related treatment, participants were asked to state whether they had ever been treated by a psychotherapist or psychiatrist. Although participants were able to elaborate on the type of treatment they had received (e.g., inpatient, outpatient, group sessions, individual therapy), we merged all participants who endorsed any psychological treatment to form a group characterized by having received any mental health treatment and compared these participants to those who had not.

PTSS

The PTSD Checklist (PCL-5; Weathers et al., 2013) is a 20-item, self-report measure that is used to assess PTSS based on the PTSD criteria in the *DSM-5*. The measure is used for a variety of purposes, including monitoring symptom change during and after treatment. In the present study, participants were asked to assess their own reactions to possible or actual COVID-19 exposure, a life-threatening disease that can cause severe human suffering. Participants were asked to keep the

Table 1

Descriptive Properties and Reliability Coefficients

Measure	*M*	*SD*	Minimum	Maximum	Cronbach's α
Hardiness					
DRS Commitment	11.01	2.57	3	15	.70
DRS Control	10.93	2.44	0	15	.66
DRS Challenge	6.25	2.70	0	12	.75
Peritraumatic distress (PDI)	4.67	5.04	0	21	.89
PTSS (PCL-5)	11.95	9.21	0	51	.95

Note. DRS = Dispositional Resilience Scale; PDI = Peritraumatic Distress Inventory; PTSS = posttraumatic stress symptoms; PCL-5 = Posttraumatic Stress Disorder Checklist for *DSM*-5.

following statement in mind when completing the assessment (translated to English): "Estimate to which degree you experienced these sensations in the last week in relation to situations associated with coronavirus." Respondents rated each item using a scale of 0 (*not at all*) to 4 (*extremely*). The PCL-5 yields a total symptom severity score (range: 0–80), which can be obtained by summing the scores for each of the 20 items. Initial research has suggested that a PCL-5 cutoff score between 31 and 33 is indicative of probable PTSD across samples (Blevins et al., 2015). In line with recommendations made by Sun et al. (2020), a score of 33 or higher was used to indicate a high level of PTSS. Previous studies have indicated that the PCL-5 demonstrates good psychometric properties and reliability. In the present study, Cronbach's alpha was .95 (Table 1).

Peritraumatic Distress

The Peritraumatic Distress Inventory (PDI; Brunet et al., 2011) is a 13-item self-report questionnaire that is used to assess the level of distress an individual has experienced during and shortly after a traumatic event. Participants were asked to rate the extent to which they experienced each item during or immediately after the start of the pandemic. As with the PCL-5, participants were instructed to use situations associated with the coronavirus pandemic as a reference for their responses. Items were scored on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely true*), with higher scores indicating a higher level of distress. Example items include "I felt ashamed of my emotional reactions" and "I felt worried about the safety of others." Previous data have indicated that a cutoff score of 23 maximizes the balance between sensitivity (77%) and specificity (82%) in identifying peritraumatic distress (Nishi et al., 2010). The instrument was translated to Croatian for the purpose of the present investigation using standard back-translation procedures. In the present sample, Cronbach's alpha was .89 (Table 1).

Resilience

The Dispositional Resilience Scale (DRS; Bartone,1995) is an instrument used for assessing individuals' psychological hardiness. The total scale contains 15 items broken into three subscales used to assess commitment, control, and challenge;

each subscale contains five items. Scores for each subscale range from 0 to 15, with a total possible composite hardiness score of 0 to 45. Participants were asked to assess the degree to which each item describes them, rating answers on a 4-point scale ranging from 0 (*completely not true*) to 3 (*completely true*). An example item is, "Most of my life gets spent doing things that are meaningful." The scale contains six items that are reverse-coded. A total hardiness score was obtained by summing responses to all items, and subscale scores were created by summing the relevant five items on each subscale. In the present sample, Cronbach's alpha values for the Commitment, Control, and Challenge subscales were .70, .66, and .75, respectively (Table 1).

Data Analysis

Data were recoded, sorted, and prepared for analysis using SPSS (Version 25.0). There were no missing data in the dataset. Descriptive statistical procedures were used to describe the demographic characteristics and COVID-19–related stressors in Croatian citizens. After the descriptive statistical analyses, first-order correlations among all variables were explored using the Pearson correlation coefficient. Next, two hierarchical regression analyses were conducted to determine the contributions of demographic factors, the number of stressors an individual had experienced, and the three dimensions of hardiness to peritraumatic distress and PTSS during the COVID-19 pandemic. Among the included demographic variables in the analyses, gender, education, work status, and history of psychological problems were treated as nominal, binary variables. With respect to education, participants were divided into groups comprising those with lower (i.e., elementary or high school, $n = 379$, 31.0%) and higher (i.e., graduate or postgraduate education, $n = 855$, 69.0%) educational attainment status. For work status, participants were grouped by whether they worked outside their home ($n = 395$, 32.0%) or did not need to leave their home for work purposes during the lockdown ($n = 839$, 68.0%). We conducted a mediation analysis to explore these effects in more detail and address the postulated hypotheses regarding the mediating effects of peritraumatic distress in the associations between PTSS and both the number of experienced stressors

Table 2
Correlation Matrix for the Tested Variables

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Number of stressors	−.07[*]	−.08[**]	.02	.22[**]	.17[**]	.01	−.09[**]	.08[**]	.01	−.03
2. Hardiness: DRS Commitment	−	.68[**]	.00	−.18[**]	−.28[**]	−.06[*]	−.01	.09[**]	.04	.03
3. Hardiness: DRS Control		−	−.19[**]	−.14[**]	−.21[**]	−.04	−.04	.05	.02	.02
4. Hardiness: DRS Challenge			−	−.15[**]	−.15[**]	−.01	.06[*]	.06[*]	.01	−.04
5. Peritraumatic distress (PDI)				−	.78[**]	−.11[**]	−.02	−.04	−.02	−.04
6. PTSS (PCL-5)					−	−.03	−.07[*]	−.07[*]	−.04	−.02
7. Gender						−	.02	−.05	.01	.03
8. Age							−	.18[**]	.10[**]	−.06[*]
9. Education								−	.10[**]	−.01
10. Employment status									−	.00
11. History of psychological problems										

Note. DRS = Dispositional Resilience Scale; PDI = Peritraumatic Distress Inventory; PTSS = posttraumatic stress symptoms; PCL-5 = Posttraumatic Stress Disorder Checklist for *DSM*-5.
[*]$p < .05$. [**]$p < .01$.

and psychological hardiness. We considered *p* values of less than .05 to be statistically significant.

Results

When specifying pandemic-related trauma exposure, participants reported the number of stressors they had experienced ($M = 1.97$, $SD = 0.99$, range: 1–7). Specifically, 474 (38.4%) participants reported exposure to one stressor, 442 (35.8%) reported exposure to two stressors, and 98 (8.0%) had been exposed to four or more stressors. The most commonly endorsed pandemic-related stressor was significant psychological discomfort due to being forced to remain indoors, which 855 (69.3%) participants endorsed; this was followed by feeling stressed because of an intense fear of getting infected by SARS-CoV-2 ($n = 348$ 28.2%) and experiencing discomfort due to feeling isolated from loved ones ($n = 401$, 32.5%). Regarding previous mental health concerns, 846 (68.6%) participants reported not having experienced previous psychological problems, whereas 388 (31.4%) participants reported previous mental health concerns. Of the participants who experienced previous mental health challenges, most were treated either as inpatients in a hospital or outside of a hospital setting. In the present sample, 11.5% of participants scored above the cutoff score on the PDI, indicating significant peritraumatic distress, and 12.8% of participants scored above the cutoff score on the PCL-5, indicating probable PTSD.

Because 82.1% of the participants were women, we conducted two separate hierarchical regression analyses: one using women only and one using the whole sample. The results showed that the associations between variables remained comparable after excluding male participants from the analysis; thus, the results of the main analyses of interest were consistent across the two samples. As such, the results reported herein reflect the analyses performed on the full sample.

Correlation analyses were conducted as the first step in the investigation of the relations among the explored variables (Table 2). Next, these associations were explored in more detail using hierarchical regression analyses. Two separate analyses were conducted: one using peritraumatic distress and the other using PTSS as criteria.

The first regression model showed that higher levels of peritraumatic distress could be predicted by female gender, $\beta = -.12$, $p < .001$; exposure to more than one stressor, $\beta = .21$, $p < .001$; and lower ratings of commitment, $\beta = -.12$, $p = .002$, and resistance to challenges, $\beta = -.17$, $p < .001$. This model explained 12% of the variance in peritraumatic distress (Table 3).

The regression coefficients predicting levels of PTSS are presented in Table 4. According to this model, male gender, $\beta = .05$, $p = .007$; younger age, $\beta = -.05$, $p = .005$; lower levels of commitment, $\beta = -.11$, $p < .001$; resistance to challenges, $\beta = -.0$, $p = .043$; and higher levels of peritraumatic distress, $\beta = .75$, $p < .001$, predicted more severe PTSS during the pandemic. This model explained 63% of the variance in peritraumatic distress (Table 4).

To explore the potential mediating role of peritraumatic distress with respect to the associations between PTSS and (a) the number of experienced stressors, (b) one's history of psychological problems, and (c) psychological hardiness, we conducted a mediation analysis (Table 5). The number of experienced stressors, history of psychological problems, and three dimensions of hardiness were used as predictors; peritraumatic distress was entered as a mediator; and PTSS was entered as the criterion variable. We utilized the bootstrapping method for testing mediation (Hayes, 2009; Preacher & Hayes, 2008) and calculated indirect effects, as other approaches have been criticized for their inability to directly evaluate the potential mediation and underlying assumptions

Table 3

Results of the Hierarchical Regression Analysis Using Peritraumatic Symptoms as a Criterion

Predictor	Step 1(β)	Step 2(β)	Step 3(β)
Gender	−.11[**]	−.11[**]	−.12[**]
Age	−.02	.01	.01
Education	−.03	−.06	−.03
Employment status	−.01	−.01	.01
History of psychological problems	−.04	−.03	−.03
Number of stressors		.22[**]	.21[**]
Hardiness: DRS Commitment			−.12[**]
Hardiness: DRS Control			−.07
Hardiness: DRS Challenge			−.17[**]
R	.12	.25	.34
R^2	.02	.06	.12
ΔR^2		.05[**]	.05[**]
$F(df)$	3.64[**](5, 1225)	13.84[**](6, 1224)	17.81[**](9, 1221)

Note. DRS = DRS = Dispositional Resilience Scale.
[*]$p < .05.$ [**]$p < .01.$

(MacKinnon et al., 2002). Using this method, we calculated the mediating effects using 1,000 samples of the original size and the corrected and accelerated bootstrapped 95% confidence intervals. When interpreting the obtained results, mediation is considered significant if the lower and upper boundaries of the intervals do not contain 0. The obtained results revealed that peritraumatic distress mediated the associations between PTSS and the number of experienced stressors and psychological hardiness, but not the association between PTSS and a history of psychological problems treatment.

Discussion

Although the prevalence results reported herein must be interpreted with care due to the nature of the utilized sample, it is worth noting that 11.5% and 12.8% of participants scored above the cutoff on the PDI and PCL-5, respectively. These results are in accordance with previous studies that have demonstrated higher levels of PTSS during the COVID-19 pandemic in China (Liu et al., 2020) and SARS epidemic (Lam et al., 2009; Mak et al., 2010; Wu et al., 2009) as well as among survivors of the H1N1 flu pandemic (Xu et al., 2011). Regarding exposure to

Table 4

Results of the Hierarchical Regression Analysis Using Posttraumatic Stress Symptoms as a Criterion

Predictor	Step 1(β)	Step 2(β)	Step 3(β)	Step 4(β)
Gender	−.03	−.03	−.04	.05[**]
Age	−.06[*]	−.04	−.04	−.05[**]
Education	−.05	−.07[*]	−.04	−.02
Employment status	−.03	−.03	−.02	−.02
History of psychological problems	−.02	−.01	−.01	.01
Number of stressors		.17[**]	.15[**]	.00
DRS: Hardiness: Commitment			−.20[**]	−.11[**]
Hardiness: DRS Control			−.09[*]	−.04
Hardiness: DRS Challenge			−.16[**]	−.04[*]
Peritraumatic distress (PDI)				.75[**]
R	.10	.20	.36	.79
R^2	.01	.04	.13	.63
ΔR^2		.03[**]	.09[**]	.50[**]
$F(df)$	2.52[*]	8.54[**]	20.26[**]	205.92[**]
	(5, 1225)	(6, 1224)	(9, 1221)	(10, 1220)

Note. DRS = Dispositional Resilience Scale; PDI = Peritraumatic Distress Inventory.
[*]$p < .05.$ [**]$p < .01.$

Table 5

Results of Mediation Analyses of the Mediating Influence of Peritraumatic Symptoms on the Associations Among Pandemic Stressors, Hardiness, and Posttraumatic Stress Symptoms

Predictor	Direct effect	*SE*	Indirect effect	95% CI	Total effect	*SE*
Number of stressors	0.06	0.286	2.61	[1.890, 3.347]	2.66	0.439
History of psychotherapy	0.41	0.597	−1.01	[−2.391, 0.389]	−0.60	0.950
DRS: Hardiness: Commitment	−0.82	0.107	−0.83	[−1.115, −0.540]	−1.66	0.165
Hardiness: DRS Control	−0.65	0.113	−0.67	[−0.985, −0.358]	−1.31	0.177
Hardiness: DRS Challenge	−0.18	0.104	−0.65	[−0.891, −0.403]	−0.83	0.162

Note. The reported values represent unstandardized respective estimates. DRS = Dispositional Resilience Scale.

COVID-19-related stressors, the frequency of PTSS has been shown to vary by world region, with rates of 4.6%–7% reported in China (Liu et al., 2020; Sun et al., 2020) and rates of 13.2%–17.7% reported in Western societies (Bridgland et al., 2020; Karatzias et al., 2020), similar to the present findings. All previously mentioned studies used online convenience samples of the general population that included individuals who were directly or indirectly exposed to COVID-19–related stressors, with the exception of Karatzias et al. (2020), who used a stratified quota sampling method. Moreover, all of these study authors evaluated PTSS severity using the PCL-5 (i.e., according to *DSM-5* criteria) except Karatzias et al. (2020), who used the International Trauma Questionnaire (Cloitre et al., 2018), which is based on the criteria in the 11th revision of the *International Classification of Diseases*. Given the predominance of convenience samples in the reported studies, it is not possible to reach credible conclusions regarding the prevalence of PTSS in the general population in Croatia or other countries. In addition, given that the COVID-19 pandemic may not have exposed many individuals to life-threatening situations or directly exposed them to others' such experiences, different authors have suggested numerous arguments why COVID-19-related stressors should or should not be considered to be potentially traumatic (Bridgland et al., 2020; Karatzias et al., 2020; Van Overmeire, 2020). Despite these disagreements, the fact remains that COVID-19 provokes the threat of death and causes PTSS in a significant portion of the population. This, together with arguments presented earlier in this paper, indicates the need for a broader scientific discussion of the justification of the previously described Criterion A, which goes beyond the scope of this article.

To our knowledge, no previous studies have compared the frequency of peritraumatic distress symptoms during pandemics; however, as individuals in many areas affected by COVID-19 have reported experiencing feelings of helplessness, fear for themselves and others, and various psychosomatic symptoms (Dubey et al., 2020), we expected participants in the present sample would develop emotional reactions, which we assessed using the PDI. The present findings indicated that sociodemographic and psychological factors contributed to the severity of both peritraumatic distress and PTSS during the

COVID-19 pandemic to different degrees. Female gender, exposure to more pandemic-related stressors, and lower ratings of commitment and resilience to challenge were identified as potential risk factors for more severe peritraumatic distress, together explaining 12% of the variance in this variable. Previous studies have also reported higher degrees of peritraumatic responses in women (Boisclair Demarble et al., 2020; Irish et al., 2011), indicating increased peritraumatic vulnerability in women regardless of whether they have been exposed to pandemic-related stressors or other traumatic experiences. Moreover, Irish et al. (2011) found that gender differences in peritraumatic responses to a traumatic event served as partial mechanisms through which women were more likely to develop PTSS.

The present results also demonstrated a significant effect of exposure to multiple pandemic-related stressors on the severity of peritraumatic distress symptoms. Although social distancing, fear of infection, and witnessing or learning about the negative consequences of the pandemic in other countries represented common stressors in the full sample, only a portion of participants reported exposure to pandemic-specific stressors, such becoming infected, a loved one's infection, the death of family members, and experiencing the earthquakes that occurred during the pandemic in Zagreb. We did not find any studies that compared the effects of single versus multiple traumatic events to peritraumatic experiences during pandemics, but prior studies have reported that cumulative trauma exposure affects PTSD and depression, with a higher number of traumatic experiences linearly associated with an increase in PTSD symptoms (Suliman et al., 2009). Finally, psychological factors, such as lower ratings of psychological commitment and resistance to challenges, were found to be significant predictors of both peritraumatic distress and PTSS. That is, individuals who reported lower levels of purpose and commitment, perceived changes as threats to security or survival rather than as opportunities, and invested less in interpersonal relationships were found to have a higher risk of experiencing peritraumatic distress and PTSS during the COVID-19 pandemic. To date, previous research has not fully examined the effects of personality characteristics on mental health outcomes during pandemics, although Jakšić et al. (2012) demonstrated that

PTSD was related to negative emotionality and neuroticism as well as other personality factors, such as hardiness and optimism. Future research should further explore the importance of personality characteristics as possible predisposing factors to individuals' emotional and cognitive reactions to pandemics.

Regarding PTSS, we identified peritraumatic distress as the strongest predictor of posttraumatic stress during the pandemic, thus replicating earlier findings indicating that peritraumatic psychological processes rather than personality characteristics are the strongest predictors of PTSS (Kessler et al., 2014; Ozer et al., 2003; Shiban et al., 2018). In addition, peritraumatic distress mediated the associations between pandemic-related stressors and psychological hardiness and PTSS, suggesting that some personal characteristics and experiences can make individuals more prone to developing peritraumatic distress, which, if not handled properly, may later develop into PTSD. This suggests that not only is the association between peritraumatic distress and PTSS particularly strong but also that levels of peritraumatic distress can be predicted by pandemic-related stressor exposure and personality attributes, which, in turn, may elevate PTSS severity during the COVID-19 pandemic.

Apart from symptoms of peritraumatic distress, male gender, younger age, lower levels of psychological commitment, and resistance to stress also significantly contributed to PTSS, together explaining 63% of the variance in this variable. The present findings demonstrated that male participants were more vulnerable to PTSS, contrary to the results of previous research that has indicated that women are more likely to develop PTSS during the pandemic (Jiang, 2020; Sun et al., 2020). However, this finding should be interpreted with caution, as its contribution was small and depended on the inclusion of other variables in the model. Regardless, any potential inconsistencies of research findings across different studies regarding gender could indicate that the risk for PTSD has more to do with the intensity and frequency of the traumatic experience (i.e., peritraumatic reactions) than with gender, as suggested by Haskell et al. (2010). Final insights into the impact of gender on pandemic-related PTSS remains an important area for further research.

Similar to Jiang et al. (2020), the present findings also confirmed younger age to be a risk factor in predicting PTSS during a pandemic, indicating that older individuals who have experienced previous collective trauma, such as war, are able to cope with current potentially traumatic stressors in a more adaptive way than younger individuals who have previously not experienced such traumatic events. In addition, differences in PTSS among participants of different age groups may be related to daily habits. Specifically, younger individuals typically use the internet more than older individuals and, consequently, have a higher chance of experiencing "information overload," which has been shown to increase anxiety and fear of the disease (Qiu et al., 2020; Jiang et al., 2020).

When interpreting the present results, several limitations should be taken into consideration. Using an online survey resulted in a predominance of women and respondents with grad-

uate or postgraduate levels of education, which could have been a source of bias. Therefore, the convenience sampling method may have influenced the prevalence rates of peritraumatic distress and PTSS reported herein; thus, these results should be interpreted with caution. Although similar studies have shared this limitation, which, given the conditions during which the study was conducted, could not have been avoided, any generalizations of these results should be made with care. In addition, measuring peritraumatic distress and PTSS at the same assessment point could be viewed as a study limitation. Although the emphasis was on detecting symptoms that occurred immediately after the peak of the pandemic, when psychological reactions were already evident, a follow-up study could provide data on the temporal stability of symptoms and the incidence of PTSD development. Future research could also focus on confirming or disputing the mediating effects of peritraumatic symptoms on PTSS in other populations affected by the pandemic as well as investigating additional effects of the COVID-19 pandemic on mental health.

Over the next several years, it will become clearer how individuals and societies responded during the pandemic and whether the predicted psychosocial and health responses are ultimately observed (Jeronimus, 2020). At the time of this writing, the number of infected individuals continues to grow, with the whole of society entering a phase of cohabiting with the virus. These circumstances pose new challenges with which individuals will need to cope, which may be the subject not only of future research but also novel interventions that can be developed to decrease the negative effects of pandemics on human mental health.

Open Practices Statement

The study reported in this article was not formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive; requests for the data or materials should be sent via email to the lead author at vesna.anticevic@ozs.unist.hr .

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