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Research Paper

Psychological distress related to COVID-19 – The contribution of continuous traumatic stress

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ABSTRACT

Objective: The novel coronavirus (COVID-19) is a substantial stressor that could eventuate in psychological distress. Evidence suggests that individuals previously exposed to traumatic events, and particularly to continuous traumatic stress (CTS), might be more vulnerable to distress when facing additional stressors. This study aimed to investigate these suppositions in the context of the ongoing shelling of Israel from the Israel-Gaza border, which continues even amidst the COVID-19 crisis.

Method: An online survey was conducted among Israel's general population. The sample included 976 participants. Seven-hundred-and-ninety-three participants had been exposed to traumatic events, with 255 participants reporting CTS. Trauma exposure, COVID-19-related stressors, and psychological distress related to COVID-19 (anxiety, depression, and peritraumatic stress symptoms) were assessed.

Results: Most participants reported experiencing at least one psychiatric symptom related to COVID-19. Being younger, female, not in a relationship, having a below-average income, being diagnosed with the disease, living alone during the outbreak, having a close other in a high-risk group, and negatively self-rating one's health status were associated with elevated distress. Individuals who had been exposed to trauma, and to CTS in particular, had elevated anxiety, depression, and peritraumatic stress symptoms compared to individuals without such a history or to survivors of non-ongoing traumatic events. CTS moderated the relations between PTSD symptoms, anxiety symptoms, and peritraumatic stress symptoms, with significantly stronger relations found among individuals exposed to CTS.

Limitations: This study relied on convenience sampling.

Conclusions: Trauma survivors, and particularly traumatized individuals exposed to CTS, seem at risk for psychological distress related to COVID-19.

1. Introduction

In December 2019, the novel coronavirus (COVID-19) appeared in Wuhan, China. Early stages of COVID-19 include severe acute respiratory infection, with some patients developing acute respiratory distress syndrome, acute respiratory failure, and other severe complications (Chen et al., 2020). This disease is highly infectious (Ryu and Chun, 2020), and after it was identified in Wuhan, it was identified in other parts of the world. On January 30, 2020, the World Health Organization (WHO) declared COVID-19 a "Public Health Emergency of International Concern" (World Health Organization Situation Report – 90, 2020).

In February 2020, the virus was identified in Israel, and by April 19th, the number of individuals diagnosed with the virus was 13,107, with 158 people deceased (World Health Organization Situation Report – 90, 2020). To slow down the spread of this highly contagious and potentially fatal virus, strict measures were taken in Israel, including restricting outdoor activities, cancelling gatherings, closing schools and institutes of higher learning, shutting down all "non-essential" businesses, minimizing public transportation, etc.

The outbreak itself and the measures taken to bring it under control have likely been highly stressful for many individuals. As such, it is reasonable to suggest that the COVID-19 pandemic will have implications not only for physical health, but also for mental health and well-being (Brooks et al., 2020; Lai et al., 2020; Mcewen et al., 2015; Shigemura et al., 2020). Furthermore, as with the SARS outbreak (Hawryluck et al., 2004; Wu et al., 2009), it would not be surprising to find that the COVID-19 pandemic has been experienced by many as a traumatic event, leading to trauma-related symptoms, namely peritraumatic stress reactions.

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Although research exploring psychological distress related to COVID-19 is only in its initial stages, recent studies have provided support for this view. A recent cross-sectional study of 1257 healthcare workers in hospitals equipped with clinics/wards for patients with COVID-19 in China found that a considerable proportion of these workers reported experiencing symptoms of depression, anxiety, insomnia, and distress (Lai et al., 2020). A longitudinal study conducted among the general population in China during the initial outbreak of COVID-19, and the epidemic's peak four weeks later, indicated clinically significant peritraumatic stress symptoms as well as moderate-to-severe stress, anxiety, and depression, which did not change significantly over time (Wang et al., 2020). A study among 6049 Chinese individuals ranging from 17 to 63 years of age uncovered three profiles of peritraumatic stress symptoms: mild (80.9%), moderate (13.0%), and high (6.1%; Jiang et al., 2020). Lastly, a nationwide large-scale survey of psychological distress in the general population of China indicated that almost 35% of respondents experienced psychological distress during the COVID-19 pandemic (Qiu et al., 2020).

The severity of an individual's psychological distress in response to COVID-19 may be related to specific COVID-19-related stressors. Being diagnosed with COVID-19, belonging to a risk group for COVID-19 complications, and perceiving one's physical health in a negative fashion may all raise substantial concerns during the pandemic and might intensify one's emotional plight (e.g., Shi et al., 2003). Having family members or close others who belong to a risk group for COVID-19 might also increase worries and generate or exacerbate psychological distress. Lastly, being quarantined or living alone during the pandemic might also have detrimental effects. Reduced social interactions and loneliness are well-known risk factors for psychopathology (Nolen-Hoeksema and Ahrens, 2002) and might increase individuals' vulnerability, particularly under conditions of exposure to stressors. Indeed, a recent review which included 24 studies, found posttraumatic stress symptoms, confusion, and anger among quarantined children and adults (Brooks et al., 2020).

That said, there are some individuals who might be even more vulnerable than others to the implications of the COVID-19 crisis. According to the "sensitization" hypothesis, individuals who have previously been exposed to traumatic events might react more severely to additional stressors due to heightened sensitivity to stress or depleted coping capacities (Resnick et al., 1995; Yehuda et al., 1995). Research has supported this claim. A meta-analysis that was based on 68 studies indicated that previous exposure to a traumatic event was related to an elevated risk for PTSD following a later trauma (Ozer et al., 2003). This association seems to be applicable when the additional stressor is a physical illness; for example, previous exposure to a traumatic event was found to be associated with psychiatric symptomatology, depression, and PTSD symptoms in women with breast cancer (Green et al., 2000). This heightened vulnerability of individuals previously exposed to trauma might be rooted in posttraumatic distress subsequent to trauma exposure. During its follow-up periods, a longitudinal study revealed that traumatized individuals with PTSD were at a higher risk for PTSD than were individuals with no history of trauma exposure (Breslau et al., 2008).

Despite the evidence regarding the effects of prior trauma and posttraumatic distress on the distress of individuals who are facing an additional stressor, to the best of my knowledge no study to date has explored this subject with regard to a worldwide pandemic such as COVID-19. Furthermore, to date the research has been focused on the effects of additional stressors on survivors of *past traumatic events* (i.e., events that came to an end), and not on survivors of *continuous traumatic stress*.

Continuous traumatic stress (CTS) or Type III trauma exposure (Kira et al., 2013) reflects a situation in which individuals repeatedly face an ongoing and protracted threat, typically lasting several years (Straker, 1987). Continuous traumatic stress is a common phenomenon worldwide (Heidelberg Institute of International Conflict Research HIIK, 2016), and can result from various traumatic situations, such as living under conditions of constant urban violence (Roach, 2013), or being exposed to continuous rocket shellings (Greene et al., 2018), the latter of which was the focus of the current study.

Living under conditions of ongoing exposure to traumatic events involves constant uncertainty, as well as constant alertness and preparedness (Ruby, 2002). Recurrent exposure to traumatic stress impairs people's ability to maintain a stable routine and creates a sense of threat, vulnerability, anxiety, confusion, uncertainty, and helplessness (Zimbardo, 2002). Research has indeed documented elevated distress among individuals exposed to CTS situations, including PTSD symptomatology, anxiety, depression, and helplessness, as well as somatization (Hobfoll et al., 2006; Itzhaky et al., 2017).

The ramifications of ongoing and unceasing exposure to trauma might not be limited to CTS-related psychological distress; rather, CTS may very well affect one's ability to adjust to new challenges and stressors, such as the COVID-19 threat. Given that CTS demands an ongoing effort to cope, individuals in CTS situations might be worn down and depleted of coping capacities, and thus particularly vulnerable to COVID-19-related stressors. Furthermore, it is reasonable to assume that suffering from posttraumatic distress would be particularly difficult and painful when one continues to be exposed to the trauma, with such continuous exposure heightening one's vulnerability in the context of new challenges. Thus, the negative effects of PTSD symptoms on psychological distress related to COVID-19 might be particularly prominent among individuals exposed to CTS, and more so than among individuals who were exposed to traumatic events that came to an end.

2. The current study

Sadly, the situation in southern Israel today allows us to examine the aforementioned postulations. For the past almost two decades, as part of the Israeli-Palestinian conflict, individuals living in this region have been subjected to frequent rocket shelling from the Gaza side of the border, with more than 17,000 rockets and mortars fired (Israel Ministry of Foreign Affairs). Although there have been some relatively quiet periods, there have also been several intensive armed conflicts, each interspersed with varying amounts of shelling, right before and during the conflicts. These attacks have resulted in death, injury, damage, and disruption to the everyday life of Israelis living in the "Gaza envelope." These attacks have continued, even now, at a time when Israelis are also contending with the COVID-19 disaster.

The present study aimed to explore whether individuals previously exposed to traumatic events, and particularly those previously *and* currently exposed to CTS as part of their living in the "Gaza envelope," suffer from increased vulnerability when facing COVID-19. Specifically, the current investigation strove to explore the contribution of PTSD symptoms as a result of past trauma exposure versus as a result of CTS in explaining psychological distress (peritraumatic stress symptoms, anxiety symptoms, and depression symptoms) in the face of COVID-19. Being the first, presumably, to address this subject matter, the current study was exploratory in nature. Three main objectives were set:

(1) To describe the prevalence of COVID-19-related stressors as well as the levels of psychological distress (peritraumatic stress symptoms, anxiety symptoms and depression symptoms) related to COVID-19.
(2) To explore the contribution of trauma exposure in explaining psychological distress related to COVID-19, above and beyond demographic characteristics and COVID-19-related stressors.
(3) To explore the moderating role of trauma type (CTS versus past trauma exposure) in the associations between PTSD symptoms and psychological distress related to COVID-19, above and beyond demographic characteristics and COVID-19-related stressors.

3. Methods

3.1. Participants and procedure

An online survey was conducted among a convenience sample of Israeli adults. The survey was accessible through Qualtrics, a secure web-based survey data collection system. The survey took an average of 25 min to complete and was open from April 2, 2020 to April 19, 2020. It was anonymous, and no data were collected that linked participants to recruitment sources. The Tel Aviv University institutional review board (IRB) approved all procedures and instruments. Clicking on the link to the survey guided potential respondents to a page that provided information about the purpose of the study, the nature of the questions, and a consent form (i.e., the survey was voluntary; respondents could quit at any time; responses would be anonymous). The first page also offered researcher contact information. Each participant was given the opportunity to take part in a lottery that included four $60 gift vouchers.

A total of 1263 people participated in the survey. Of them, only 976 (77.3%) participants who provided data regarding the study variables were included. No differences were found between participants who were included in the study and those who were not in terms of relationship status, education, or income ($P_s > 0.05$). Yet there were significant differences between the groups in terms of age, $t(1261) = -2.07$, $p = .04$; gender, $\chi^2(1, n = 1263) = 4.94$, $p = .03$; and religiosity, $\chi^2(1, n = 1263) = 4.08$, $p = .04$. The average age among the current sample was higher ($M = 44.37$, $SD = 14.28$) than among the group of participants who were not included in the study ($M = 42.37$, $SD = 14.78$), and the proportion of women and secular individuals among the current sample was higher (81.6%, 69.4%, respectively) than among the group of participants who were not included in the study (75.6%, 62.9%, respectively).

Participants' ages ranged from 18 to 79 ($M = 44.37$, $SD = 14.28$), with the majority of the sample being below the age of 50 (61.6%). Most of the participants were Jewish (96.4%) women (81.6%); were secular (69.4%); had a high school degree or under (52.2%); were in a relationship (64.7%); and had an average or above-average income (50.3%).

Of the total sample, 793 participants (81.3%) were classified as having been exposed to traumatic events based on the Trauma History Screen (THS; Carlson et al., 2011). The average age of this subgroup was 45.54 (SD = 14.12). Most of this sub-group were women (81.3%); were secular (69.3%); had a high school degree or under (53.5%); and had an above-average income (50.1%).

Regarding type of traumatic event, 255 participants (31.5%) reported continuous exposure to rocket attacks (thus, CTS), and the rest of the 543 participants reported exposure to a traumatic event that had ended. The latter category (i.e., a traumatic event that had ended) included accidents (24.1%), a physical or sexual assault during childhood (26.9%), natural disasters (2.5%), a physical or sexual assault in adulthood (20.7%), being attacked with a gun, knife, or weapon (6.6%), the sudden death of a family member or close friend (69.1%), seeing someone die or get badly hurt or killed (20.8%), and seeing something horrible during military service (17.0%). The vast majority of participants reported two traumatic events or more (66.2%).

3.2. Measures

3.2.1. Background variables

Participants completed a brief demographic questionnaire that assessed age, gender, education, relational status, religiosity, and income.

3.2.2. COVID-19-related stressors

Specific stressors related to the COVID-19 pandemic were measured via nine items designed by the research team. Participants were asked (1) how they perceived their own physical health, (2) whether they were diagnosed with the disease, (3) whether they were quarantined, (4) whether they were living alone during the outbreak, (5) whether they belonged to a high-risk group for COVID-19, (6) whether they had close others who belonged to a high-risk group, (7) whether they had close others who had been diagnosed with the disease, (8) whether they had close others who had been hospitalized due to the disease, and (9) whether they had experienced the loss of close others as a result of the disease. Given that only four participants reported experiencing the last three stressors (having close others who were diagnosed with the disease, having close others who were hospitalized due to the disease, experiencing a loss of close others due to the disease), these specific stressors were not included in the present analyses.

3.2.3. Anxiety and depression symptoms related to COVID-19

Levels of anxiety and depression symptoms in response to COVID-19 were assessed by the anxiety and depression subscales of the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2001). The BSI-18 is a self-report symptom checklist measure consisting of 18 items, each describing a psychiatric symptom. Anxiety and depression subscales consist of six items each. Participants were asked to indicate the extent to which they had been bothered by the symptom in the prior week, on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Mean scores on each subscale reflect the respondent's level of anxiety or depression symptoms, with higher scores reflecting greater symptoms. The raw scores are converted to T scores, with an accepted cutoff point of 63 for psychopathology on depression and anxiety subscales (Derogatis, 2001). The BSI-18 has been found to have adequate convergent and discriminant validity and good reliability (Derogatis, 2001). Internal consistency reliabilities in this study were good for both the depression ($\alpha = 0.86$) and anxiety subscale ($\alpha = 0.89$).

3.2.4. Peritraumatic stress symptoms related to COVID-19

Peritraumatic stress symptoms in response to COVID-19 were measured via a modified version of the PTSD Checklist (PCL-5) (Weathers et al., 2013). This 20-item self-report measure asks participants to indicate the extent to which they experienced each PTSD symptom, on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Items correspond to the newly approved PTSD symptom criteria in the Diagnostic and Statistical Manual of Mental Disorders (5th ed., DSM–5; American Psychiatric Association, 2013). The original version was adapted so that the timeframe for experiencing each symptom was changed from "in the past month" to "since the outbreak of the COVID-19 pandemic," and the index event was the COVID-19 pandemic. A total score of peritraumatic stress symptoms was calculated by summing all 20 items. Although not a definitive diagnostic measure, preliminary research suggests a cutoff score of 33 is a useful threshold to indicate symptomatology which may be at clinical levels (Bovin et al., 2016). The PCL-5 demonstrates high internal consistency and test-retest reliability (Bovin et al., 2016). Internal consistency reliabilities in this study for the PCL-5 total score was excellent ($\alpha = 0.94$).

3.2.5. Trauma exposure

Exposure to traumatic events was measured via a modified version of the Trauma History Screen (THS; Carlson et al., 2011). The THS was developed as a brief, easy-to-complete self-report measure of exposure to high-magnitude stressor events that could be traumatic. Only 11 items (of the original 15 items) which reflect traumatic events according to the DSM-5 criteria were included. In addition, "continuous exposure to rocket attacks" was added to the list of events. For each event, respondents are asked to indicate whether the event occurred ("yes" or "no").

3.2.6. PTSD symptoms as a result of trauma exposure

PTSD symptoms were measured via the PCL-5 (Weathers et al.,

Table 1
Univariate Associations between demographic characteristics, COVID-19-related stressors, and psychological distress outcomes (n = 976).

	Anxiety symptoms		Depression symptoms		Peritraumatic stress symptoms	
	β	*t*	β	*t*	β	*t*
Age	−0.22***	−7.16***	−0.27***	−8.78***	−0.17***	−5.35***
Gender						
Female	.17***	5.24***	.11**	3.44**	.10**	3.17**
Male	reference		reference		reference	
Relationship status						
In relationship	−0.13***	−4.09***	−0.25***	−8.11***	−0.14***	−4.41***
Not in relationship	reference		reference		reference	
Education						
Higher education	−0.02	−0.67	−0.05	−1.47	−0.07*	−2.20*
High school degree or under	reference		reference		reference	
Religiosity						
Secular	−0.01	.30	.03	.96	−0.04	−1.10
Religious/traditional	reference		reference		reference	
Income						
Average income or above	−0.17***	−5.49***	−0.22***	−7.11***	−0.19***	−6.18***
Below-average income	reference		reference		reference	
COVID-19 diagnosis						
Yes	.08**	2.62**	.05	1.41	.07*	2.30*
No	reference		reference		reference	
In quarantine						
Yes	.02	.68	−0.01	−0.39	.08**	2.64**
No	reference		reference		reference	
Belong to risk group						
Yes	.03	.34	−0.01	−0.39	.08*	2.50*
No	reference		reference		reference	
Perceived health	−0.20***	−7.38***	−0.19***	−6.09***	−0.19***	−6.06***
Living alone during outbreak						
Yes	.06*	1.90*	.14***	4.64***	.06	1.83
No	reference		reference		reference	
Close other in risk group						
Yes	.10**	3.02**	.08*	2.43*	.05	1.68
No	reference		reference		reference	

*p < .05, **p < .01, ***p < .001.

2013). Participants were asked to anchor responses to "stressful life experiences" on a scale ranging from 0 (*not at all*) to 4 (*extremely*). A total score is also calculated to assess the overall PTSD severity. Internal consistency reliability in this study for the PCL-5 total score subscales was excellent (α = 0.95).

3.3. Analytic strategy

The current analyses were conducted using SPSS 25 and PROCESS computational macro (Hayes, 2012). To assess the univariate associations between background characteristics and COVID-19-related stressors, on the one hand, and psychological distress outcomes (i.e., anxiety symptoms, depression symptoms, and peritraumatic stress symptoms) on the other, linear regressions were conducted.

To explore the unique contribution of trauma exposure in explaining psychological distress related to the COVID-19 pandemic above and beyond background characteristics and COVID-19-related stressors, three multiple regression analyses were conducted. Anxiety symptoms, depression symptoms, and peritraumatic stress symptoms were treated as dependent variables. Trauma exposure, COVID-19-related stressors, and the background variables of age, gender, relationship status, and income – all four of which variables had the largest contribution in explaining psychological distress outcomes compared to the other background variables – were treated as independent variables.

To explore the moderating role of trauma type (CTS versus previous non-ongoing trauma exposure) in the associations between PTSD symptoms and psychological distress related to the COVID-19 pandemic, moderation analyses were conducted via PROCESS (Model 1) computational macro (Hayes, 2012). These analyses were conducted only among participants who reported a trauma history and had data regarding PTSD symptoms (n = 543, 68.5%). Scores of all the variables were standardized. Significant interactions were probed using the PROCESS (Model 1) computational macro (Hayes, 2012).

To determine whether including the independent variable and covariates in the current analyses was adequate, we assessed for multicollinearity, and examined the variance inflation factors (VIFs) for the study variables. Findings indicated that all were within the acceptable range (all VIFs were smaller than 2), indicating that multicollinearity was not a problem in our analyses.

4. Results

4.1. COVID-19-related stressors

Respondents reported several COVID-19-related stressors. These consisted of being diagnosed with the disease (n = 5, 0.5%), being quarantined (n = 93, 9.5%), living alone during the outbreak (n = 144, 14.8%), belonging to a high-risk group for COVID-19 (n = 320, 33.6%), perceiving one's physical health in a negative fashion (n = 69, 7.0%), having a close other who was diagnosed with COVID-19 (n = 67, 6.9%), and having a close other who belonged to a high-risk group (n = 817, 83.7%).

4.2. Psychological distress related to COVID-19

The majority of the sample (n = 824, 84.4%) reported experiencing at least one anxiety symptom since the outbreak of the pandemic, and the average of the levels of anxiety symptoms was 0.92 (± .84). Moreover, 101 (10.3%) participants met the anxiety criteria. Similarly, the majority of the sample (n = 838, 85.9%) reported experiencing at least one depression symptom since the outbreak of the pandemic. The average of the levels of depression symptoms was 0.85 (± .77), and 99 (10.1%) participants met the depression criteria. Among participants who suffered from clinically significant anxiety symptoms since the

outbreak of the pandemic, 86.1% had a history of exposure to prior trauma; among participants who suffered from clinically significant depression symptoms since the pandemic's outbreak, 88.9% had a history of exposure to prior trauma.

The vast majority of the sample (n = 749, 76.7%) reported experiencing at least one peritraumatic stress symptom specifically related to COVID-19, and the average of the levels of peritraumatic stress symptoms was 15.39 (± .13.28). Furthermore, 11.5% (n = 112) of the participants had a peritraumatic stress symptom total score of 33 and above, indicating that their symptoms were clinically significant. Among participants who suffered from clinically significant peritraumatic stress symptoms in relation to COVID-19, 90.2% had a history of exposure to prior trauma.

4.3. Background characteristics, COVID-19-related stressors, and psychological distress

Table 1 presents the association between demographic characteristics and COVID-19-related stressors, on the one hand, and psychological distress on the other. As can be seen in the table, age, gender, relationship status, and income were related to all outcomes. Being younger was associated with higher anxiety, depression, and peritraumatic stress symptoms related to the pandemic. It should be noted that the current study's exploration of psychological distress among the different age groups (18–29, 30–39, 40–59, 60–79) corroborated the existence of this trend, indicating higher distress among younger people. Being female, not being in a relationship, and having a below-average income were also associated with higher anxiety, depression, and peritraumatic stress symptoms related to COVID-19. Having a high school degree or below was related to elevated peritraumatic stress symptoms only, and religiosity was unrelated to any of the psychological distress outcomes.

COVID-19-related stressors were associated with psychological distress as well. Negative perceived health was related to elevated anxiety, depression, and peritraumatic stress symptoms. Being diagnosed with the disease was related to elevated anxiety and peritraumatic stress symptoms, and living alone during the outbreak was related to elevated depression and anxiety symptoms. Being quarantined and belonging to a high-risk group for COVID-19 were both related to elevated peritraumatic stress symptoms. Lastly, having a close other who belonged to a high-risk group was associated with elevated anxiety and depression symptoms.

4.4. Psychological distress when facing COVID-19 and history of trauma exposure

Three multiple linear regressions exploring the contribution of trauma exposure history in explaining psychological distress, above and beyond demographic characteristics (age, gender, relationship status, income) and COVID-19 related stressors, were conducted. Results of the analyses are presented in Table 2. As can be seen in the table, younger age, being female, and having a lower-than-average income were related to elevated anxiety, depression, and peritraumatic stress symptoms during the pandemic. Not having a relationship was related to elevated depression symptoms. Being diagnosed with COVID-19 was related to increased anxiety symptoms, and living alone during the outbreak was associated with elevated depression symptoms. Negative perceived health was associated with elevated anxiety, depression, and peritraumatic stress symptoms. More importantly, a history of exposure to a traumatic event had a significant effect in explaining anxiety, depression, and peritraumatic stress symptoms, above and beyond the other variables in the model, so that individuals who were classified as having been exposed to traumatic events had higher levels of anxiety, depression, and peritraumatic stress symptoms during the COVID-19 pandemic than did individuals who had not previously been exposed to traumatic events.

4.5. Psychological distress when facing COVID-19 and PTSD symptoms subsequent to prior trauma

Of the 793 participants who were classified as having been exposed to traumatic events, only 543 participants (68.5%) provided data regarding PTSD symptoms subsequent to these events. Of them, 243 participants (44.8%) reported continuous exposure to rocket attacks, whereas the rest (n = 300, 55.2%) reported exposure to traumatic events that had ended. The average of the levels of PTSD symptoms subsequent to prior trauma was 12.43 (± .14.01), and 9.9% (n = 54) of the participants had a PTSD symptom score of 33 and above, indicating that their symptoms were clinically significant.

Exploring psychological distress among this subgroup indicated that 12.2% (n = 66) suffered from either clinically significant anxiety or depression symptoms since the outbreak of the pandemic, and 13.3% (n = 72) suffered from clinically significant peritraumatic stress symptoms in relation to COVID-19. Among participants who had clinically significant anxiety or depression symptoms since the outbreak of the pandemic, 39.4% and 45.5% (respectively) had PTSD symptoms at a clinical level subsequent to prior trauma. Supplementary logistic analyses indicated that the risk for clinically significant anxiety or depression symptoms since the outbreak of the pandemic was more than 10 or 15 times higher, respectively, among participants with clinically significant PTSD symptoms subsequent to prior trauma than among participants with PTSD symptoms below a clinical level (odds ratio = 10.42, 95% confidence interval: 5.58 −19.46; odds ratio = 15.73, 95% confidence interval: 8.84 −29.68, respectively).

Among participants who had clinically significant peritraumatic stress symptoms in relation to COVID-19, 41.7% had clinically significant PTSD symptoms subsequent to prior trauma. The proportion of clinically significant peritraumatic stress symptoms in relation to COVID-19 was higher among participants who had PTSD symptoms at a clinical level subsequent to prior trauma than among participants with PTSD symptoms below a clinical level (55.6% vs. 8.6%). A supplementary logistic analysis indicated that the risk for clinically significant peritraumatic stress symptoms in relation to COVID-19 was more than 13 times higher among participants with clinically significant PTSD symptoms subsequent to prior trauma than among participants with PTSD symptoms below a clinical level (odds ratio = 13.30, 95% confidence interval: 7.13 −24.80).

4.6. Psychological distress when facing COVID-19 and PTSD symptoms: the moderating role of trauma type

To explore the moderating role of trauma type in the relations between PTSD symptoms and psychological distress during the pandemic, moderation analyses were conducted among this group of participants (n = 543). Results of the moderation analyses are presented in Table 3. As can be seen in the table, younger age was associated with higher levels of anxiety, depression, and peritraumatic stress symptoms. Being female was associated with elevated anxiety symptoms, and not having a relationship was associated with elevated depression symptoms. Negative perceived health was associated with elevated anxiety, depression, and peritraumatic stress symptoms, and living alone during the outbreak was associated with elevated depression symptoms. Trauma type and PTSD symptoms had a significant effect in explaining anxiety, depression, and peritraumatic stress symptoms. Individuals exposed to CTS had more elevated psychological distress during the COVID-19 pandemic than did individuals exposed to traumatic stress that had ended. Additionally, higher levels of PTSD symptoms subsequent to trauma exposure were related to elevated psychological distress manifested in anxiety, depression, and peritraumatic stress symptoms during the COVID-19 pandemic.

Furthermore, trauma type significantly moderated the relations between PTSD symptoms on the one hand, and anxiety and peritraumatic stress symptoms during the COVID-19 pandemic on the other.

Table 2
Regression models exploring the contribution of trauma exposure history in explaining psychological distress, above and beyond background characteristics and COVID-19-related stressors (n = 976).

	Anxiety symptoms		Depression symptoms		Peritraumatic stress symptoms	
	β	R^2	β	R^2	β	R^2
Age	−0.24***	.15	−0.27***	.20	−0.18***	.13
Gender	.14***		.08*		.07*	
Relationship status	03		−0.12***		−0.05	
Income	−0.08**-.		−0.10**		−0.10**	
COVID-19 diagnosis	.07*		.02		.05	
In quarantine	−0.01		.03		.04	
Belong to risk group	.03		−0.03		.05	
Perceived health	−0.19***		−0.21***		−0.16***	
Living alone during outbreak	.05		.11**		.03	
Close other in risk group	.06*		.05		.03	
A history of trauma exposure	.08*		.06*		.11***	

*p < .05, **p < .01, ***p < .001.

Probing these interactions revealed a similar trend which is depicted in Figs. 1 and 2: Although PTSD symptoms subsequent to trauma exposure had a significant effect in explaining anxiety and peritraumatic stress symptoms during the pandemic among participants exposed to CTS as well as participants exposed to traumatic events that had ended, this effect was significantly stronger among participants exposed to CTS (β = 0.69, p < .001; 0.70, p < .001, respectively) than among participants exposed to traumatic events that had ended (β = 0.47, p < .001; 0.44, p < .001, respectively).

5. Discussion

This study described the impact of the COVID-19 outbreak on the mental health of Israel's general population. The study's results indicated that the majority of the sample reported experiencing at least one symptom of anxiety, depression, or peritraumatic stress. Furthermore, around one tenth of the sample had peritraumatic stress symptoms above the cutoff of 33, and another 10% of the sample met the criteria for anxiety or depression. These findings demonstrate the potential negative implications of COVID-19 for mental health and are in line with recent studies that were conducted in China revealing anxiety, depression, and peritraumatic stress symptoms among general population samples as a result of COVID-19 (Jiang et al., 2020; Qiu et al., 2020; Wang et al., 2020).

Several demographic characteristics were associated with elevated distress. Consistent with a previous study (Wang et al., 2020), the present results indicated that female participants had a higher degree of psychological distress related to COVID-19 than did male participants. This finding coincides with previous studies that found women to be at an elevated risk for depression and anxiety (Bekker and van Mens-Verhulst, 2007; Lim et al., 2018), findings which might be rooted in biological and socioeconomic factors (Albert, 2015). The lack of being in a relationship and having a below-average income were also associated with intensified distress. In terms of explaining these associations, the lack of being in a relationship might have limited social support and exacerbated loneliness, particularly under the current circumstances of social distancing, and having a below-average income might have increased financial worries and concerns stemming from the COVID-19 crisis, and potentially exacerbating distress. The current results, indicating a relation between younger age and elevated distress, are also consistent with a previous study that found respondents aged 12–21.4 years to suffer from a higher psychological impact of COVID-19 than did older respondents (Wang et al., 2020). This finding suggests that although people in the 65+ age group are actually the ones most at risk of suffering from COVID-19 complications, they might not be particularly susceptible to potential psychopathology. Young adults, on the other hand, showed elevated vulnerability, which may have been rooted in obtaining a large amount of information via social media (Roberts et al., 2018).

Exploring the univariate relations between COVID-19-related stressors and the psychological distress connected with the pandemic revealed significant associations between all of the stressors and psychological distress outcomes. Nevertheless, when demographic characteristics and trauma exposure were also included in the analyses, only four stressors had a significant effect in explaining the levels of psychological distress. Specifically, being diagnosed with the disease, living alone during the outbreak, having a close other who belonged to a high-risk group, and negatively self-rating one's health status – all of which have been documented in previous studies (e.g., Fiorillo and Gorwood, 2020; Wang et al., 2020) – were found to significantly

Table 3
The moderating role of trauma type in the relations between PTSD symptoms and COVID-19-related psychological distress among trauma survivors (n = 543).

	Anxiety symptoms		Depression symptoms		Peritraumatic stress symptoms	
	β	R^2	β	R^2	β	R^2
Age	−0.22***	.42	−0.25***	.43	−0.16***	.42
Gender	.11**		.06		−0.06	
Relationship status	.01		−0.10*		−0.01	
Income	−0.03		−0.06		−0.05	
COVID-19 diagnosis	.06		.02		.04	
In quarantine	.00		.05		.04	
Belong to risk group	.01		−0.06		.03	
Perceived health	−0.09*		−0.14***		−0.09*	
Living alone during outbreak	.04		.07*		.01	
Close other in risk group	.02		.04		.00	
Trauma type	.13***		.47***		.11***	
PTSD symptoms	.52***		.10**		.51***	
Trauma type X PTSD symptoms	.10**		.04		.11**	

*p < .05, **p < .01, ***p < .001.

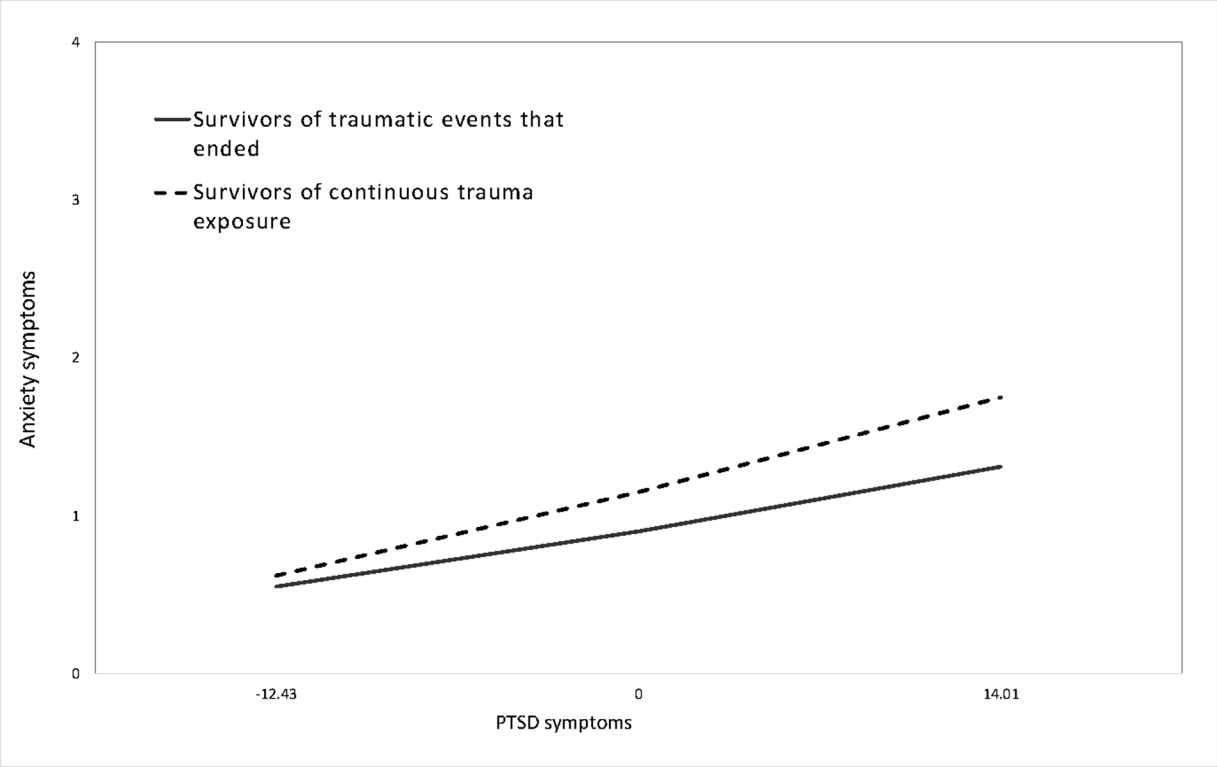

Fig. 1. The moderating role of trauma type in the associations between PTSD symptoms and COVID 19 related anxiety symptoms controlling for demographic characteristics and COVID-19-related stressors.

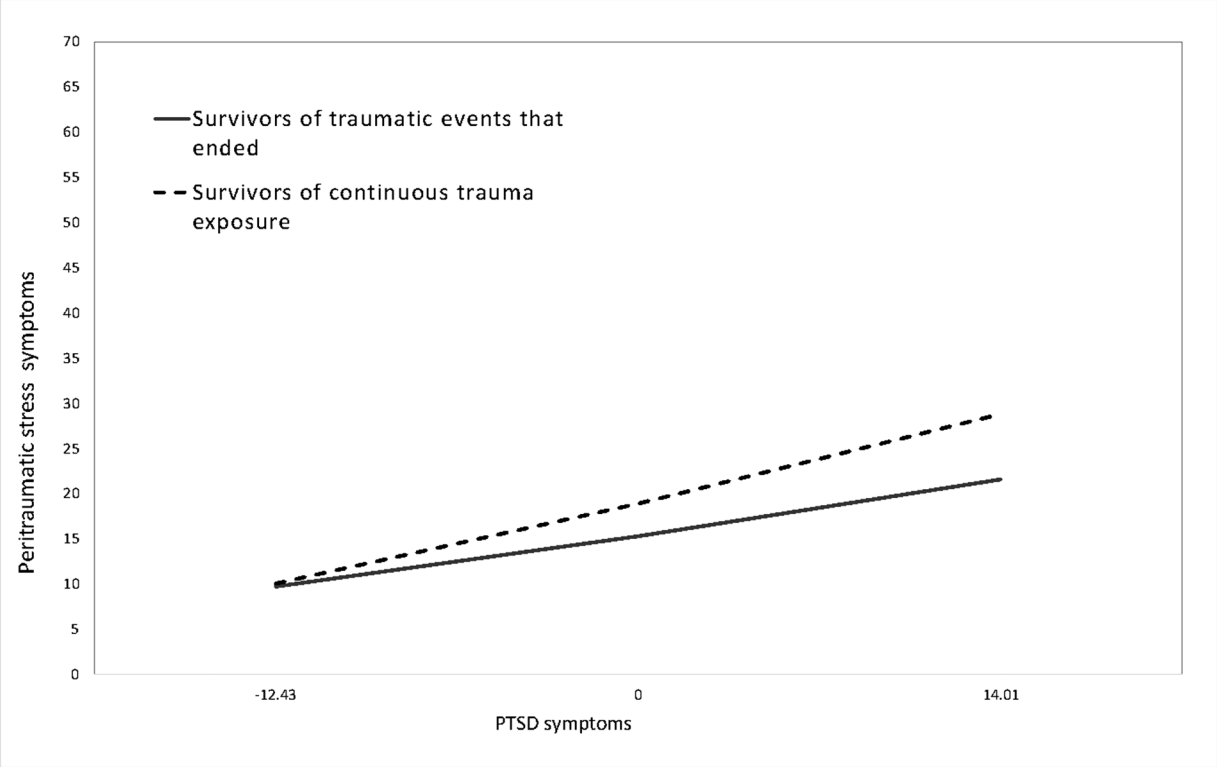

Fig. 2. The moderating role of trauma type in the associations between PTSD symptoms and COVID 19 related peritraumatic stress symptoms controlling for demographic characteristics and COVID-19-related stressors.

explain the levels of psychological distress. Whereas negatively self-rating one's health status was related to all psychological distress outcomes, the other three COVID-19-related stressors were associated with specific types of symptomatology. Namely, being diagnosed with the disease and having a close other who belonged to a high-risk group, which could intensify tension and worries, were related to anxiety

symptoms. Living alone during the outbreak, a condition that could deepen feelings of loneliness, was linked to elevated depression.

The importance of this study, however, lies in its discovery of the effects of previous trauma exposure in the context of the COVID-19 pandemic. The present findings indicated that individuals who had previously been exposed to traumatic events had elevated levels of anxiety, depression, and peritraumatic stress symptoms as related to COVID-19, compared to individuals who had not previously been exposed to traumatic events, even after taking into account demographic characteristics and COVID-19-related stressors. Furthermore, PTSD symptoms subsequent to prior trauma were associated with elevated symptomatology in the face of the pandemic.

These findings suggest that prior trauma exposure and subsequent posttraumatic reactions might intensify one's vulnerability when facing a substantial additional stressor, such as the COVID-19 threat. Prior trauma exposure and subsequent PTSD might lead to physiological alterations that could increase one's vulnerability in the face of an additional stressor (Resnick et al., 1995). Additionally, depletion of coping capacities and resources following trauma exposure (Resnick et al., 1995; Yehuda et al., 1995) might increase negative reactions in the face of COVID-19, eventuating in elevated distress and psychopathology.

Going a step further, the present study demonstrated that the impact of trauma exposure on the psychological distress connected with COVID-19 depended upon the nature of the exposure. In comparison to exposure to traumatic events that had ended, exposure to CTS was related to elevated levels of anxiety, depression, and peritraumatic stress symptoms. Furthermore, exposure to CTS moderated the relations between PTSD symptoms on the one hand, and anxiety and peritraumatic stress symptoms during the COVID-19 pandemic, on the other. Although PTSD symptoms had a significant effect in explaining anxiety and peritraumatic stress symptoms during the pandemic among trauma survivors in general, its effect was significantly stronger among participants who were exposed to CTS than among participants who had been exposed to traumatic events that had ended.

Suffering from PTSD symptoms is highly debilitating. Vivid intrusive recollections, emotional numbness, and hyperreactivity in response to trauma reminders severely interfere with the daily lives of affected individuals (American Psychiatric Association, 2013) and are likely to take a toll when such individuals are exposed to an additional stressor (Breslau et al., 2008; Kessler et al., 2018). That said, coping with such difficulties while still being exposed to an ongoing trauma could be even more devastating. Unceasing exposure to trauma leads to a substantial degradation of individuals' psychological, social, and economic resources (e.g., Hobfoll et al., 2008), and this degradation could in turn limit one's capacity to handle a new stressor. Furthermore, the reality of ongoing threat/danger not only deprives one of the opportunity to experience recovery in a safe and protected environment (Lahad and Leykin, 2010; Nuttman-Shwartz and Shoval-Zuckerman, 2016), but also repeatedly confirms a sense of threat and helplessness. As such, the negative effects of the ongoing trauma and subsequent PTSD symptoms on coping with an additional stressor might be particularly potent.

Although the current study contributes to the understanding of psychological distress related to the COVID-19 pandemic among individuals previously exposed to trauma and CTS, it has several limitations. First, the cross-sectional design precludes any conclusions regarding causal relations between the study variables. Second, this study relied on convenience sampling and, similar to other surveys conducted during the COVID-19 pandemic (Lai et al., 2020; Wang et al., 2020), suffered from an overrepresentation of the female gender which might reflect higher response rates in surveys among women (Underwood et al., 2000). Furthermore, only participants who provided data regarding the study variables were included in this study: a group that was characterized by greater proportions of female and secular individuals as well as by a higher average age compared to participants who were not included in the study. Although religiosity was not associated with psychological distress outcomes, and gender and age were controlled for in the present analyses, this limitation should be acknowledged prior to generalizing from the results to the population at large. Third, this study did not include measures of potential protective factors, such as social support. Lastly, this study was based on self-reported data which may be subject to response biases and shared method variance. Future studies among a variety of populations, and specifically among gender-balanced samples, should include data from clinical interviews.

Despite these limitations, this study represents a step towards understanding the relations between trauma exposure and psychological distress in the face of an additional stressor. The present findings suggest that trauma survivors might be at risk for elevated distress following COVID-19, and that individuals who are exposed to ongoing traumatic stress and who suffer from PTSD symptoms might be the most vulnerable to psychiatric symptomatology related to COVID-19.

The present study has important clinical implications. Its results point to the need to provide clinical interventions to trauma survivors during this pandemic, and particularly to individuals exposed to CTS. Survivors of previous traumatic events (that are not ongoing) might benefit from evidence-based treatments such as trauma-focused cognitive behavior therapy (TF-CBT; Hobfoll et al., 2008), which could be provided online and would tap specific challenges that survivors might experience when dealing with the pandemic. Individuals exposed to CTS, on the other hand, need specific clinical interventions that are tailored to the particular struggles that they face (Nuttman-Shwartz and Shoval-Zuckerman, 2016). Treatment for individuals exposed to CTS should be directed towards managing anxiety and physical symptoms, and the acquisition of day-to-day coping skills, and not on a reprocessing of the trauma, as is generally done when treating survivors of traumatic events that are not ongoing (Diamond et al., 2010). One of the main goals of CTS treatment is to teach patients to differentiate between adapting to an actual danger versus symptomatic reactions to trauma reminders. Core elements of stress management therapy such as relaxation, breathing exercises, and mindfulness-based practices might be beneficial (e.g., Nuttman-Shwartz and Shoval-Zuckerman, 2016) and a biopsychosocial approach, which is based on cognitive behavioral methods (Hamblen et al., 2012), might also be effective for individuals exposed to CTS. Given that numerous populations around the world are exposed to CTS, providing these clinical tools via online mental health services during the ongoing COVID-19 pandemic is of substantial value. Although some nations are beginning to see the end of the pandemic's first wave, it is generally believed that another and potentially worse second wave will return in the fall, a situation which calls urgently for preparation and precautions.

Declaration of Competing Interest

The author does not have any conflict of interests to disclose.

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