

The Effects of COVID-19 Continuous Traumatic Stress on Mental Health: The Case of Syrian Refugees in Turkey

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COVID-19 presents continuous cumulative multilayered traumatic stressors that have a significant mental health impact on refugees and especially Syrian refugees. A sample of 417 Syrian refugees in Turkey participated in an online survey that included measures for COVID-19 traumatic stress (COVID-19TS), cumulative stressors and traumas, posttraumatic stress disorder (PTSD), depression, generalized anxiety, and existential death and status anxieties. We conducted an independent samples *t* test between those hospitalized due to COVID-19 infection ($N = 47$) and the others. Further, we conducted path analysis supplemented by PROCESS macro to identify the mediators. The path model included cumulative stressors and traumas and COVID-19TS as independent variables, existential status and death anxieties as mediating variables, and PTSD, depression, and anxiety as outcome variables. We conducted multigroup invariance to test the path model equivalence across genders and tortured and nontortured groups. Results indicated that the participants are highly traumatized and include a relatively high number of torture survivors ($N = 102$). Being tortured was a decisive risk factor for being hospitalized for COVID-19, with over 75% of the hospitalized being torture survivors. The sample participants have high rates of PTSD, depression, and anxiety, especially among those hospitalized due to COVID-19 and those with a history of torture. COVID-19TS has the highest association with its economic trauma. COVID-19TS is directly associated with elevated PTSD, depression, and anxiety comorbid symptoms and indirectly via existential death and status anxieties as mediators. The path model was strictly invariant across genders and tortured and nontortured groups.

Keywords: COVID-19, Syrian refugees, continuous traumatic stress, PTSD, Criterion “A”

COVID-19 was a continuous ongoing, global worldwide pandemic. It was affecting everybody either directly or indirectly through secondary and tertiary dynamics. In addition, it had a profound impact, especially on minorities and refugees, the focus of current research. COVID-19, although it was continuous, massive, multilayered, and global, maybe, hopefully, relatively limited in its timescale. COVID-19 threat, with the emergence of different vaccines, maybe or hopefully diminishes, was prolonged continuous traumatic stressors (CTS). CTS type is a type III trauma. Type III trauma is the most severe traumatic stress (Kira, 2021; Kira, Ashby, et al., 2013; Kira, Alpay, Ayna, et al., 2021; Kira et al.,

2008). Previous conceptualization and empirical studies on continuous traumatic stress/stressors were focused either on discrimination and oppression (Kira et al., 2015) or intergroup violence (Kira, Ashby, et al., 2013; Stein et al., 2018). However, type III continuous traumatic stress/stressors types can take different trajectories or pathways, including the COVID-19 multilayered traumatic stress/stressors type (Kira, 2021; Kira, Shuwiekh, Al-Huwailah, et al., 2020; Kira, Shuwiekh, Rice, et al., 2020). The distinction between CTS and current posttraumatic stress disorder (PTSD) criterion “A” that focuses on past traumas is essential.

According to Lahav (2020), CTS demands continuing attempts to cope; this may strain the persons coping capacities. Enduring further distress would be extremely taxing when one continues to be further exposed continuously to the trauma, intensifying one's vulnerabilities. In contrast, the stressor condition in PTSD criterion “A” is typically an event in the past in the context of a specific individual(s), relationship(s), and/or event(s). CTS involves anticipatory anxiety to determine the likelihood of present or future traumatization, which is realistic and ongoing rather than something that happened in the past, as with PTSD criterion “A.” The absence

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of continuous traumatic stress from PTSD criterion “A” was long critiqued (Brewin et al., 2009; Holmes et al., 2016; Kilpatrick et al., 2009; Kira, Fawzi, et al., 2019).

Mental health dynamics are more fluid and complex than our limited and still developing conceptualization of PTSD criterion “A.” PTSD symptom clusters and dysfunctions might also be more prevalent and concurrent regardless of the Criterion set by the diagnostic categories. CTS reactions are presented as distinct and sometimes more distressing psychological phenomena than those on PTSD with depression and anxiety comorbidity. Several studies (Goral et al., 2017; Kira, Ashby, et al., 2013) have found that when a traumatic experience is present and ongoing, posttraumatic stress disorder symptoms become more significant and severe. A systematic review of CTS-exposed adult civilian populations from Southern Israel found higher rates of probable PTSD when compared with counterparts that were not (Greene et al., 2018). Moreover, fear reactions to CTS exposure were found to be more chronic and associated with more significant impairment over time when compared with PTSD (Itzhaky et al., 2017; Nuttman-Shwartz & Shoval-Zuckerman, 2016). Reactions to CTS also include, in addition to PTSD, depression, anxiety, sleep problems, and somatization (Greene et al., 2018; Itzhaky et al., 2017).

Further, the future negative time perspective was the strongest predictor of perceived distress (Rönnlund et al., 2018). Negative anticipatory and expectancy feelings are states of awareness of physiological and neurocognitive changes in the form of a process of adapting to future adverse events. They encompass bodily-related interoceptive and affective components influenced by intrapersonal and dispositional factors, such as pessimism or worry. Biological psychology research has consistently found a link between time perspective and multisystemic chronic stress. For instance, maladaptive time perspectives are associated with allostatic load and cortisol dynamics (Bourdon et al., 2020; Olivera-Figueroa et al., 2015). There is evidence that the insula, the ventromedial prefrontal cortex, and the amygdala are the three brain regions involved in such future anticipatory feelings (Stefanova et al., 2020). These three regions are implicated in mental health disorders such as PTSD (Liberzon et al., 2003) and risky decision-making (Clark et al., 2008).

Further, COVID-19 is a multilayered, complex trauma with several psychological, economic, and social impacts (Kira, Barger, et al., 2020). Various measures focused mainly on the impact of COVID-19 specific fears, perceived risk, phobia, and anxiety around infection (Ahorsu et al., 2020; Arpacı et al., 2020; Kira, Shuwiekh, Rice, et al., 2020; Lee, 2020; Pérez-Fuentes et al., 2020; Taylor et al., 2020; Yıldırım & Güler, 2020). Kira, Shuwiekh, Rice, et al. (2020) and Kira, Alpay, Ayna, et al. (2021) identified and measured four components of COVID-19 traumatic stress that impact mental health (a) Fears of infections and death (Ornell et al., 2020); (b) the pervasive economic impact (Sukharev, 2020); (c) the social impact of lockdown, isolation (Mucci et al., 2020), and its consequential impact on social relations (Morgan & Boxall, 2020); (d) The mourning of loved ones who died from the virus (Kokou-Kpolou et al., 2020), in addition to lost personal projects that were interrupted by the eruption of the pandemic. The cumulative impact of COVID-19’s four main traumatic stressors, or even one of them, poses existential threats to the person’s life and social status (Kira et al., 2020a). Such continuous existential threats to life and status can generate severe

general anxiety, depression, and PTSD symptoms. The process will be even more complicated, with more symptoms from the actual infection and hospitalization. The role of existential threats to the person’s life and his/her socioeconomic status with the severe economic and continuous social impact may be incredibly unique in the pandemic and can mediate its effects on mental health symptoms (Kira, Shuwiekh, Al-Huwailah, et al., 2020). Uncontrolled COVID-19, with its extreme uncertainty, is a continuous existential threat to work and employment (Blustein & Guarino, 2020) and to self-existence triggering mortality salience and related existential anxiety (Courtney et al., 2020).

COVID-19 impact on mental health worldwide was overwhelming. A meta-analysis of the studies conducted on the mental health effects of COVID-19 (Vindegaard & Benros, 2020) consisted of 43 studies. Two assessed patients with COVID-19 infection, whereas 41 assessed the pandemic’s indirect effect (two on patients with preexisting psychiatric disorders who did not contact COVID-19, 20 on medical health-care workers, and 19 on the general public). The two studies researching COVID-19 patients found a high level of posttraumatic stress symptoms (96.2%) and a significantly higher level of depressive symptoms. Patients with preexisting psychiatric disorders reported worsening of psychiatric symptoms. Studies investigating health-care workers found increased depression/depressive symptoms, anxiety, psychological distress, and low sleep quality. Studies of the general public revealed lower psychological well-being and higher anxiety and depression scores than before COVID-19, whereas no difference when comparing these symptoms in the initial phase of the outbreak to 4 weeks later. Many factors were associated with a higher risk of psychiatric symptoms and low psychological well-being, including female gender, poor-self-related health, and relatives with COVID-19. A study on the United States on young adults after the COVID-19 eruption reported high levels of PTSD symptoms (45%), depression (43.3%), and high anxiety scores (45.4%; Liu et al., 2020). A study on seven Arab countries (Egypt, Kuwait, Saudi Arabia, Jordan, Algeria, Iraq, and Palestine) indicated that 36.6% scored at the cutoff score for probable PTSD diagnosis. For generalized anxiety disorder, 6.3% scored at a cutoff score of severe generalized anxiety disorder. For depression, 12.1% scored at the cutoff score for moderate depression, whereas 4.9% scored at the cutoff score for severe depression. Egyptians have the highest score on COVID-19 traumatic stress and the highest probable PTSD (49%; Shuwiekh et al., 2020). Further, Cénat et al. (2021) reported in a meta-analysis executed in May 2020, for all studies conducted on the impact of COVID-19 in different countries, the prevalence of depression was 15.97% (95% confidence interval [CI: 13.24, 19.13]). The prevalence of anxiety was 15.15% (95% CI [12.29, 18.54]), and the prevalence of PTSD was 21.94% (95% CI [9.37, 43.31]), which suggest that the short-term mental health consequences of COVID-19 are equally high across affected countries, and across gender (for more recent meta-analyses on COVID-19 mental health impact, see Marvaldi et al., 2021; Salehi et al., 2021; Yuan et al., 2021).

However, there is an apparent absence of empirical studies on the impact of COVID-19 on refugees and torture survivors; even COVID-19 was hitting minorities and refugees the hardest (Kirby, 2020). Refugees (such as Syrian refugees) live in crowded quarters and cannot self-isolate. In addition, there are no clear conceptual frameworks and related measurement strategies that explain how

COVID-19 affects an individual's mental health. COVID-19 is a new traumatic experience that hardly fits current relatively limited perspectives on traumatic stress. COVID-19 is a multilateral prolonged, collective and massive, disproportionately afflicting the minorities, exposing the limitations of the current trauma framework that ignored the Criterion of harm that trauma of discrimination inflicts on refugees and minorities and discounts it as a qualified traumatic event. Prior research on refugees' mental health has suggested that mental health's most reliable predictors include prerefuge, refuge, and postrefuge stressors and traumas (Steel et al., 1999). Some old studies found that prerefuge adversities accounted for the majority of variance in adult psychiatric symptoms. An additional 20% of the variance was related to post-refuge trauma, and ongoing refugee stressors contributed only 14% of the variance in symptoms (Nicholson, 1997; Steel et al., 1999). However, the more recent studies found that the postrefuge stressors, especially the ongoing discrimination, to be more salient, accounting for more variance (Chu et al., 2013; Edge & Newbold, 2013; Kim et al., 2019; Kira et al., 2010). The cumulative effects of prerefuge, postrefuge, and the process of refuge stressors and traumas have cumulative dynamics that negatively affect refugees' physical and mental health (Kira et al., 2014; Kira & Wroble, 2016; Porter & Haslam, 2005). The stressors and traumas incremental accumulation of past, present, and ongoing process may entail, as the case in the Syrian refugees, different dynamics than afforded by the dominant focus on single past traumas.

One refugee group that suffered severely is Syrian refugees. After the beginning of the civil war in Syria, many Syrian citizens have fled to neighboring countries due to violence and difficult living conditions, such as Turkey, Jordan, Lebanon, and Iraq. The Syrian conflict has killed hundreds of thousands of people and forced 12.5 million people (six out of 10 of the country's prewar population) from their homes in the world's worst refugee crisis (Connor & Krogstadl, 2016). The internationalized Syrian civil war is the deadliest conflict the 21st century has witnessed thus far. The immense suffering of the Syrians triggered an identity crisis as it threatened their personal and collective (e.g., national), as well as physical identities' mere existence, presenting serious existential identity threats (Al-Ibraheem et al., 2017; Kira et al., 2017; Kira, Shuwiekh, Al Ibraheem, & Aljakoub, 2019).

Turkey has hosted a great majority of the Syrian refugees since 2011. According to the United Nations Refugee Agency (2020), Turkey hosts 3,621,968 Syrian refugees and asylum seekers as of September 2020 (<https://data2.unhcr.org/en/situations/syria>), and most of them are living outside of the camps and dispersed in host communities in Turkey's 81 provinces. This displacement and resettlement have resulted in several mental health issues in Syrian refugees. According to the Organization for Economic Cooperation and Development, Syrian refugees resettled in Turkey had a higher prevalence of mental health disorders than refugees who settled in Western countries such as the United States, Australia, or Canada (Karaman & Ricard, 2016).

Various studies conducted in Turkey found that depression rates among the Syrian refugees ranged from 22.5% to 47.7%, and PTSD rates from 9% to 36.5% were reported (Al-Nuaimi et al., 2018; Alpak et al., 2015; Kaya et al., 2019; Önen et al., 2014). A review study (Peconga & Høgh Thøgersen, 2019) reported prevalence rates of 43.0% (range: 23.4–83.4%) for PTSD, 40.9% (range: 20–44.1%) for depression, and 26.6% (range: 19.30–31.8%) for

anxiety morbidity in adult Syrian refugees. The review study authors concluded that Syrian refugees could be over 10 times more likely to develop PTSD, depression, and anxiety disorders than the general population with some gender differences. There are no studies that we know of on how COVID-19 affected Syrian refugees who are currently exposed to existential identity threats otherwise (Kira et al., 2017). The current research aims to study the impact of COVID-19 on Syrian refugees in Turkey's mental health regardless of gender.

Hypothesis 1: COVID-19 continuous traumatic stress will be associated with higher PTSD, depression, and anxiety symptoms regardless of previous cumulative stressors and traumas.

Hypothesis 2: In addition to the direct effects of COVID-19 impact on PTSD, depression, and anxiety, existential anxiety around death and status mediates its indirect effects on them.

Hypothesis 3: The model of the dynamics of these relationships is stable and invariant between genders and other main groups within the sample.

Method

Procedure

The research team designed the study and developed the questionnaire structure. The questionnaire included measures for COVID-19 traumatic stress, PTSD, depression, anxiety, and cumulative stressors and traumas. We collected the data between August and September 2020 in two Turkish cities, Kilis and Hatay, where two of the highest numbers of Syrian refugees (Kilis 108,925; Hatay 433,167) live outside the refugee camps (most Syrian refugees in Turkey, as a rule, do not live in refugee camps). We collected the data from Syrian refugees who migrated to these cities in Turkey after Syria's conflicts started in 2011. The survey team was two Bilingual Arabic/Turkish who works in a nongovernmental organization that serves refugees who received a full day of training on survey administration. They directly contacted the participants directly (350) or through a family visit (50 family visits). In the family visit approach, they left gifts for family and children upon visit (from resources obtained from the nongovernmental organization and personal funds that may value about five \$ in total for each family). There no direct incentives provided for participation. In the visit and for each individual, they explained the research project, then left the survey link on the persons' computer or one of the family members' computers to be completed by eligible family members and sent to their relatives and friends. Inclusion criteria were (a) 18 years of age or older and (b) Syrian refugee status.

We used Google Drive and developed a survey link. Once the participant completed the survey, it was sent anonymously to Gmail, then downloaded to the Excel file. All questionnaires were administered individually to participants. Participation was voluntary with built-in informed consent; each person took approximately 20 min to complete the entire questionnaire. The sponsoring university institutional review board approved the research protocol as part of a cross-cultural study of the impact of COVID-19.

Participants

Participants included 417 Syrian refugees, 59.5% of females. Age ranged between 18 and 80 ($M = 30.76$, $SD = 10.62$). For work, 59.2% are students, 20.1% are government employees, 8.2% private work, 2.2% retired, and 10.3% unemployed. For marital status, 59.7% are married, 28.5% single, 7.0% widowed, and 4.8% divorced. For socioeconomic status (SES), 20.9% report ever low SES, 43.6% low SES, 32.6% middle SES, 2.2% high SES, and .7% very high SES. For education, 36.9% have good reading and writing abilities, 31.9% have high-school-level education, 28.5% have college-level education, and 2.6% have graduate-level. For religion, 97.6% were Muslims and 2.4% were Christians.

Measures

COVID-19 Traumatic Stress Scale

COVID-19 Traumatic Stress Scale is a 12-item scale including three subscales (a) "Threat/Fear of the Present and Future Infection and Death" (five items), (b) "Traumatic Economic Stress" (four items), and (c) "Isolation and Disturbed Routines" (three items; Kira, Shuwiekh, Rice, et al., 2020). Items are scored on 5-point scale, ranging from 1 (*not at all*) to 5 (*very much*). Examples of items include "How concerned are you that you will be infected with the coronavirus?" "The Coronavirus (COVID-19) has impacted me negatively from a financial point of view." "Over the past two weeks, I have felt socially isolated as a result of the coronavirus." In the initial study (Kira, Shuwiekh, Rice, et al., 2020), the scale showed good construct convergent-divergent and predictive validity. In the current study, the scale had an α of .93. Its three subscales had Cronbach's α of .91, .83, and .88, respectively.

Cumulative Stressors and Traumas Scale (36 Items)

The Cumulative Stressors and Traumas Scale (CST-S) is based on the development-based trauma framework (Kira, 2001, 2019; Kira et al., 2008, 2018; Kira, Shuwiekh, Kucharska, & Al-Huwailah, 2019). The scale is designed to measure seven types of stressors/traumas. In addition, it includes three items that measure chronic and significant life stressors. The seven types of stressors/traumas include collective identity traumas (e.g., discrimination and oppression). They include personal identity trauma (e.g., early childhood traumas such as child neglect and abuse).

They include status identity/achievement trauma (e.g., failed business, fired, and drop out of school; noncriterion A traumas). They also include survival trauma (e.g., get involved in combat, car accidents, and natural disasters). They include attachment trauma (e.g., abandonment by parents), secondary trauma (i.e., indirect trauma impact on others), and gender discrimination. The CST-S evaluates cumulative stressors and traumas concerning its mere occurrence, frequency, type, and negative and positive appraisals, and age of happening. However, in this short survey study, we used only frequency and occurrence questions. To answer each question on the scale, contributors were asked to specify their experience with an event on a 5-point Likert-type scale (0 = *never*; 4 = *many times*). The CST-S includes two overall measures for cumulative stressors and traumas' dose: occurrence and frequency. Investigators can compute subscales for each of the

stressor/trauma types. The CST-S has shown adequate internal consistency ($\alpha = .85$), and test-retest stability (.95 in 4 weeks), and predictive, convergent, and divergent validity in different studies (Kira, Barger, et al., 2019; Kira, Fawzi, & Fawzi, 2013; Kira et al., 2020b; Kira et al., 2018; Kira, Shuwiekh, Kucharska, & Al-Huwailah, 2019). The measure has been translated and validated into different languages, including Arabic, Polish, Spanish, Turkish, Korean, Burmese, and Yoruba. In the present analysis, we used the cumulative stressors and trauma occurrence subscale. The current alpha of cumulative stressors and traumas occurrence is .97.

Posttraumatic Stress Disorder Checklist for DSM-5

The Posttraumatic Stress Disorder Checklist for *DSM-5* (*Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*; PCL-V) is a 20-item self-report measure (Blevins et al., 2015). Each item is scored on a 5-point scale, ranging from 0 (*not at all*) to 4 (*extremely*). Initial research suggests that a PCL-V cutoff score between 31 and 33 is indicative of PTSD. A provisional PTSD diagnosis can be made by treating each item rated as 2 = "Moderately" or higher as a symptom endorsed, then following the *DSM-5* diagnostic rule, which requires at least: one B item (Questions 1-5), one C item (Questions 6-7), two D items (Questions 8-14), two E items (Questions 15-20). The Arabic version of PCL-V has been previously validated in Arabic samples (Ibrahim et al., 2018). Cronbach's α reliability of the scale in the current study was .95.

Generalized Anxiety Disorder-7

Generalized Anxiety Disorder-7 (GAD-7) is a seven-item self-report questionnaire that assesses general anxiety (Spitzer et al., 2006). Items are scored on a 4-point scale, ranging from 0 (*does not exist*) to 3 (*nearly every day*). The scores range between 0 and 21, with a cutoff point of 15, indicating severe GAD. The GAD-7 has a sensitivity of 89% and a specificity of 82%. Increasing scores on the scale have been strongly associated with multiple domains of functional impairment (Spitzer et al., 2006). The Arabic version of GAD-7 was previously validated in Arabic samples (Sawaya et al., 2016). Cronbach's $\alpha = .91$ for the scale in the current study.

Patient Health Questionnaire-9

Patient Health Questionnaire-9 (Kroenke et al., 2001) is a nine-item self-report questionnaire that objectifies the degree of depression severity. Items are scored on a 4-point scale ranging from 0 (*does not exist*) to 3 (*nearly every day*). The scores range between 0 and 27, with a cut-off range of 15-19 indicating moderately severe depression and 20 and above indicating severe depression. The Arabic version of Patient Health Questionnaire-9 was previously validated in Arabic samples (Sawaya et al., 2016). Cronbach's α reliability for the instrument in the current study was .88.

Existential Anxieties Related to Status and Physical Identity

We used two subscales of the existential annihilation measure (Kira et al., 2020a; Kira, Shuwiekh, Kucharska, & Al-Huwailah, 2019). One subscale measures existential annihilation anxiety

related to identity status (four items). Examples of the items are “My previous or current loss of job/business made me feel worthless, nothingness, emptiness, fragmented, self-disintegrated, and the loss in my ability to function.” and “Being disadvantaged because of my particularly unequal lower status, makes me feel dissolving, disappearing or losing my value of existence.” The second subscale measures existential anxiety related to death (three items). An example of the items in this subscale is “Because of what had happened or happening to me, I am terrified of death.” Items scored on a 4-point scale, ranging from 0 (*completely disagree*) to 3 (*completely agree*). The measure and its subscales were validated in different languages, including Arabic, in previous studies. The two subscales have $\alpha = .834$ for the Status Existential Annihilation Anxiety subscale and $\alpha = .843$ for the Death Existential Annihilation Anxiety subscale in current data.

Statistical Data Analysis

We used Cohen’s (1992, p. 158) criteria and recommendations to confirm the sample size necessary to detect a medium population effect size at power = .80 for $\alpha = .05$ for the number of variables in the study. The data were analyzed utilizing IBM-SPSS 22. The missing data was less than 1% and were replaced by means as recommended. In addition to descriptives and correlations, we conducted an independent samples *t* test between those hospitalized due to COVID-19 infection ($N = 47$) and the others on their level of traumatization, COVID-19 traumatic stress, PTSD, depression, and anxiety. We used Cohen’s formula to calculate Cohen’s *d* effect size. Cohen’s (1992) suggested that effect sizes of .20 are small, .50 is medium, and .80 is large. Further, to test the model of the effects of COVID-19 traumatic stress on mental health as mediated by existential status and death anxieties, we conducted a mediated path analysis. The path model included cumulative stress and traumas and COVID-19 as independent variables and existential status and death anxieties as mediating variables, and PTSD, depression, and anxiety as outcome variables. We reported direct, indirect, and total effects as standardized regression coefficients. We used a bootstrapping procedure with 10,000 bootstrap samples to examine the significance of direct, indirect (mediated effects), and total effects and 95% bias-corrected CI for each variable in the model. To simplify the presentation, we trimmed the model by eliminating the nonsignificant paths. Further, we tested alternative models to explore potentially better fitted or equally fitted models.

Although path analysis can analyze several independent and dependent variables simultaneously and identify the total direct and indirect effects, it cannot identify the mediators that contribute to the indirect effects or specifies the effect size of each. For this reason, we supplemented path analysis by SPSS PROCESS macro (Hayes, 2013; Model 4) to test the COVID-19 indirect effects through the mediators and the relative strength of each (effect size and CIs). We controlled for age, gender, marital status, income, and being hospitalized due to COVID-19 as covariates and utilized bootstrapping sampling ($n = 5,000$) distributions to calculate the direct and indirect effects and CIs (95%) of the estimated effects. The point estimate is considered significant when the CI does not contain zero.

In addition, to assess the generality of the path structural model, we conducted multigroup invariance analysis to test the model invariance (equivalence) across genders and across the groups of those Syrians who have been tortured and those who have not (Byrne et al., 1989; Meade & Lautenschlager, 2004; Sarstedt et al., 2011; van de Schoot et al., 2012). Four nested models were tested sequentially: a configural invariance model, a metric invariance model, a scalar invariance model, and a strict invariance model. We assumed no differences across the groups in the path model, and, therefore, we applied a very stringent set of nested models to test not only for metric invariance as is commonly done in path models but also strict invariance where the residuals are equal across groups. According to Chen et al. (2020), the null hypothesis of invariance should not be rejected when changes in comparative fit index (CFI) are less than or equal to 0.01 and if root mean square error of approximation (RMSEA) is less than or equal to 0.015.

Results

Descriptives Results

The sample participants are highly traumatized. Cumulative trauma occurrence, $M = 10.84$, $SD = 10.47$, Cumulative trauma frequency, $M = 23.98$, $SD = 27.25$. Of the sample, 24.5% reported a history of being tortured. Further, of the participants, 11.3% reported that they had been previously hospitalized due to COVID-19 infection (33 of them are torture survivors). Of those hospitalized, 70% are torture survivors and constitute 32.4% of the sample’s torture survivors ($N = 102$). They were compared with 4.7% of the rest of the nontortured hospitalized in the sample ($N = 315$). Being tortured is a strong risk factor for being hospitalized for COVID-19 in the sample. Similar risk factors with lesser degrees were found for discrimination, poverty, community violence exposure, and gender discrimination that may intersect. Of the sample, 47.7% scored at 33 or above the cutoff point of probable PTSD, 13.9% scored at or above the cutoff score of 15, indicating moderate to severe depression, whereas 12.7% scored at or above the cutoff score of 15, which indicates severe anxiety. For COVID-19 traumatic stress ($M = 38.96$, $SD = 12.38$, maximum = 65, minimum = 13), over 70% scored on the high end of scale (above the 50%). For torture survivors in the sample, 74% scored 33 or above the cutoff point of probable PTSD.

The Differences Between Hospitalized Due to COVID-19 Infection and Nonhospitalized

The hospitalized group, due to COVID-19, has much higher cumulative stressors and traumas, which probably made them more vulnerable. Further analysis indicated that 70% of the hospitalized group were torture survivors who seem to be a more vulnerable category to COVID-19 infection. The hospitalized group has much higher PTSD and depression symptoms. However, the difference in anxiety symptoms was not significant. They have higher existential death anxiety but not existential status anxiety. While, and probably because they suffered the actual COVID-19 infection, their actual traumatic stress around COVID-19 is less than those not hospitalized for the COVID-19. Table 1 presents the

Table 1

T Test for the Difference Between the Hospitalized Due to COVID-19 Infection and Those Who Were Not Hospitalized in Their PTSD, Depression, Anxiety, Previous Cumulative Stressors and Trauma, and COVID-19 Stressors

Variable	Groups	N	M	SD	SE	M difference	t	p	Cohen's d effect size
CSTF	Group 1: COVID-19 hospitalized	47	23.64	13.18	1.92	14.42	9.88	.000	.53
	Group 2: Nonhospitalized	370	9.22	8.85	.46				
PTSD	Group 1: COVID-19 hospitalized	47	35.00	20.95	3.06	8.41	3.09	.002	.47
	Group 2: Nonhospitalized	370	26.59	17.14	.89				
Depression	Group 1: COVID-19 hospitalized	47	11.13	6.29	.92	2.86	3.39	.001	.52
	Group 2: Nonhospitalized	370	8.27	5.33	.28				
Anxiety	Group 1: COVID-19 hospitalized	47	8.72	5.85	.85	1.18	1.347	.179	.21
	Group 2: Nonhospitalized	370	7.55	5.60	.29				
Status EAA	Group 1: COVID-19 hospitalized	47	4.36	3.41	.50	.640	1.256	.210	.20
	Group 2: Nonhospitalized	370	3.72	3.28	.17				
Death EAA	Group 1: COVID-19 hospitalized	47	3.66	2.59	.38	.81	2.0	.042	.31
	Group 2: Nonhospitalized	370	2.85	2.57	.13				
COVID-19 Fears	Group 1: COVID-19 hospitalized	47	12.50	5.22	.76	-1.75	-2.1	.037	.32
	Group 2: Nonhospitalized	370	14.25	5.40	.28				
COVID-19 Economic trauma	Group 1: COVID-19 hospitalized	47	10.87	4.39	.64	-1.13	-1.76	.079	.27
	Group 2: Nonhospitalized	370	12.00	4.11	.21				
COVID-19 Social trauma	Group 1: COVID-19 hospitalized	47	11.64	4.73	.69	-1.58	-2.34	.020	.36
	Group 2: Nonhospitalized	370	13.21	4.29	.22				
COVID-19 Traumatic Stress Scale	Group 1: COVID-19 hospitalized	47	35.01	13.16	1.92	-4.45	-2.33	.020	.36
	Group 2: Nonhospitalized	370	39.46	12.21	.64				

Note. CSTF = cumulative stress and traumas frequency; PTSD = posttraumatic stress disorder; EAA = existential annihilation anxiety.

independent samples *t* test results between hospitalized and nonhospitalized groups.

Correlation Results

COVID-19 cumulative traumatic stress has the highest association with its Economic Trauma Subscale (.93). It is positively associated with anxiety (.55), existential death anxiety (.44), depression (.44), and PTSD (.40). COVID-19 Fears subscale has the highest correlation with anxiety, existential death anxiety, generalized anxiety, depression, and PTSD. COVID-19 Economic Trauma Subscale has the highest correlation with anxiety, existential death anxiety, PTSD, and status existential anxiety. COVID-19 Social Trauma Subscale has the highest correlation with generalized anxiety, existential death anxiety, depression, existential status anxiety, and PTSD. Existential Status anxiety has the highest correlation with depression (.60), generalized anxiety (.59),

and PTSD (.57; its highest correlation was with existential death anxiety (.68). Existential death anxiety has the highest correlation with anxiety (.65), depression (.60), and PTSD (.58). Table 2 presents these correlations.

Path Analysis Results

The model fit well (chi square = 3.527, *df* = 3, *p* = .317, CFI = 1.00, RMSEA = .021). COVID-19 cumulative traumatic stressors have direct effects on existential status anxiety and direct and indirect effects on existential death anxiety, PTSD, depression, and anxiety. Its indirect effects on anxiety and depression are over two-thirds of its total effects, whereas its indirect effects on PTSD are over half of its total effects. Using PROCESS analysis existential status and death anxieties mediated the effects of COVID-19 traumatic stress on PTSD (Status existential annihilation anxiety [EAA]: Effect = .17, SE = .04, *z* = 4.52, *p* = .000, lower limit CI

Table 2

Zero-Order Correlations Between the Main Variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. COVID-19 traumatic stress	38.96	12.39	1									
2. COVID-19 fears	14.05	5.41	.86***	1								
3. COVID-19 economic trauma	11.88	4.15	.93***	.68***	1							
4. COVID-19 social trauma	13.04	4.37	.89***	.56***	.86***	1						
5. Cumulative stressors and traumas	10.84	10.47	.30***	.24***	.30***	.26***	1					
6. Status EAA	7.68	5.64	.38***	.29***	.37***	.36***	.42***	1				
7. Death EAA	3.79	3.29	.44***	.38***	.43***	.38***	.41***	.68***	1			
8. PTSD	27.54	17.78	.40***	.36***	.38***	.32***	.55***	.57***	.58***	1		
9. Depression	8.59	5.51	.44***	.38***	.43***	.37***	.48***	.60***	.60***	.75***	1	
10. Anxiety	7.68	5.64	.51***	.45***	.48***	.43***	.45***	.59***	.65***	.76***	.78***	1

Note. EAA = existential annihilation anxiety; PTSD = posttraumatic stress disorder. * *p* < .05. ** *p* < .01. *** *p* < .001.

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[LLCI] = .10, upper limit CI [ULCI] = .24; Death EAA: Effect = .19, SE = .04, z = 4.54, p = .000, LLCI = .12, ULCI = .28). They also mediated the effects of COVID-19 traumatic stress on depression (Status EAA: Effect = .06, SE = .01, z = 4.80, p = .000, LLCI = .04, ULCI = .09; Death EAA: Effect = .05, SE = .01, z = 4.27, p = .000, LLCI = .03, ULCI = .09) and on anxiety (Status EAA: Effect = .04, SE = .01, z = 4.00, p = .000, LLCI = .02, ULCI = .07; Death EAA: Effect = .08, SE = .01, z = 5.71, p = .000, LLCI = .05, ULCI = .10).

Cumulative stressors and traumas had direct effects on existential status anxiety and direct and indirect effects on PTSD, and indirect effects on depression and anxiety. Its indirect effects on existential death anxiety are well over half of its total effects, and its indirect effect on PTSD is about a third of its total effects, whereas most of its effect on PTSD is direct. Using PROCESS analysis, existential status and death anxieties mediated the effects of cumulative stressors and traumas on PTSD (Status EAA: Effect = .16, SE = .04, z = 4.41, p = .000, LLCI = .10, ULCI = .25; Death EAA: Effect = .19, SE = .04, z = 4.91, p = .000, LLCI = .10, ULCI = .27). They also mediated the effects of cumulative stressors and traumas on depression (Status EAA: Effect = .06, SE = .01, z = 4.69, p = .000, LLCI = .04, ULCI = .09; Death EAA: Effect = .06, SE = .01, z = 4.93, p = .000, LLCI = .04, ULCI = .09) and on anxiety (Status EAA: Effect = .05, SE = .01, z = 3.97, p = .000, LLCI = .03, ULCI = .07; Death EAA: Effect = .09, SE = .02, z = 6.25, p = .000, LLCI = .06, ULCI = .12).

Existential status anxiety had direct effects and existential death anxiety. It had direct and indirect effects on PTSD and depression and indirect effects on generalized anxiety. Its direct effect on

PTSD was over 70% of its total effect. Its indirect effects on depression accounted for over 60% of its total effects. Existential death anxiety had direct effects on PTSD and direct and indirect effects on depression and anxiety. Table 3 presents the standardized direct, indirect, and total effects and the 95% confidence intervals of each variable. Figure 1 presents the standardized direct effect for each path in the model.

Multigroup Structural Invariance Results

The path model’s structural invariance analysis indicated that the path model of COVID-19 dynamics is strictly invariant between genders and between the tortured and nontortured groups. Table 4 included the structural fit indexes on the four levels (configural, metric, scalar, and strict) for each analysis, which did not significantly differ from each other according to the criteria previously discussed in the analysis section.

Discussion

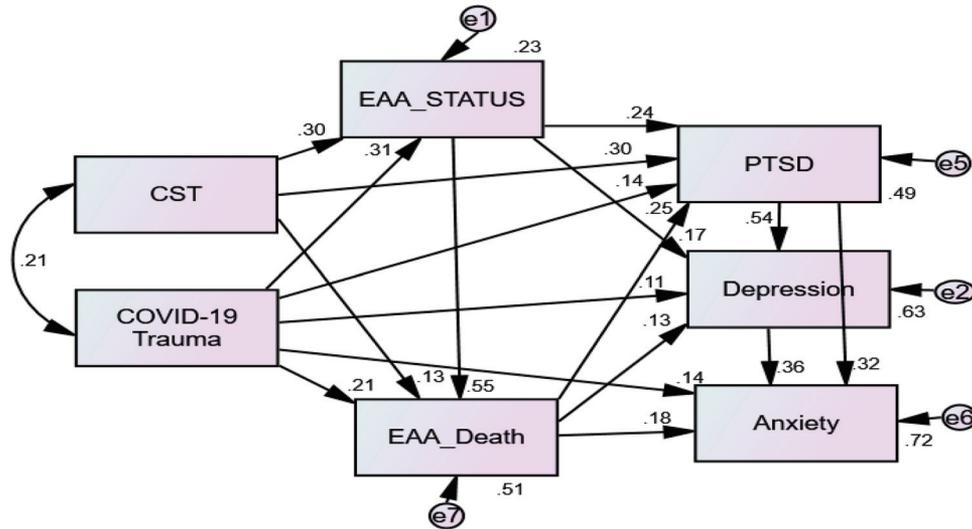
To conclude, the sample participants were highly traumatized with high cumulative trauma occurrence and frequency and a high percentage of individuals with a history of torture and hospitalization due to COVID-19 infection. The current study is the first research that empirically explored the impact of COVID-19 on Syrian refugees and found that being discriminated against, being tortured, and extremely poor are strong risk factors for hospitalization due to COVID-19 infection.

Table 3
The Standardized Direct, Indirect, and Total Effects and 95% Confidence Intervals for Each Variable in the Path Model

Causal variables	Endogenous variables				
	Status EAA	Death EAA	PTSD	Depression	Anxiety
COVID-19 cumulative traumatic stress					
Direct effects	.31* (.23/.39)	.21* (.13/.28)	.14* (.05/.24)	.11* (.04/.19)	.14** (.09/.23)
Indirect effects	–	.17* (.13/.24)	.17** (.13/.23)	.26* (.21/.32)	.30* (.23/.36)
Total effects	.31* (.23/.39)	.38* (.30/.46)	.31* (.23/.39)	.37* (.28/.45)	.44* (.37/.52)
Cumulative stressors and traumas					
Direct effects	.30* (.25/.38)	.13** (.07/.20)	.30* (.23/.35)	–	–
Indirect effects	–	.17** (.13/.24)	.16** (.11/.19)	.32* (.27/.39)	.32* (.26/.37)
Total effects	.30* (.25/.38)	.30** (.24/.39)	.44* (.38/.51)	.32* (.27/.39)	.32* (.26/.37)
Status EAA					
Direct effects	–	.55* (.46/.63)	.24* (.13/.32)	.17* (.06/.26)	–
Indirect effects	–	–	.14** (.08/.23)	.27* (.19/.34)	.38* (.31/.45)
Total effects	–	.55* (.46/.63)	.38* (.28/.48)	.44* (.35/.54)	.38* (.31/.45)
Death EAA					
Direct effects	–	–	.25** (.14/.37)	.13* (.03/.21)	.18* (.10/.26)
Indirect effects	–	–	–	.13** (.07/.20)	.18** (.11/.27)
Total effects	–	–	.25** (.14/.37)	.26** (.15/.38)	.36* (.26/.45)
PTSD					
Direct effects	–	–	–	.54* (.46/.63)	.32** (.23/.47)
Indirect effects	–	–	–	–	.20** (.11/.27)
Total effects	–	–	–	.54* (.46/.63)	.52* (.43/.62)
Depression					
Direct effects	–	–	–	–	.36** (.22/.47)
Indirect effects	–	–	–	–	–
Total effects	–	–	–	–	.36** (.22/.47)
R ²	.231	.513	.486	.632	.716

Note. EAA = existential annihilation anxiety; PTSD = posttraumatic stress disorder.
* p < .01. ** p < .001. *** p < .05.

Figure 1
Path Model for the Standardized Direct Effects of COVID-19 Cumulative Traumatic Stress Coupled With (Controlling for) Previous Cumulative Stressors and Traumas and Mediated by Existential Anxieties, on the Mental Health of Syrian Refugees



Note. $N = 417$ Syrian refugees in Turkey; chi square = 3.527, $df = 3$, $p = .317$, CFI = 1.000, RMSEA = .021. CFI = comparative fit index; RMSEA = root mean square error of approximation; EAA = existential annihilation anxiety; PTSD = posttraumatic stress disorder; CST = cumulative stressors and traumas.

Vulnerable groups are often hit hardest by disease, a pattern further underscored during the COVID-19 pandemic. Infectious diseases often impact marginalized populations disproportionately, highlighting inequities in access to care and the importance of social determinants of health (Edmonds & Flahault, 2021). Population statistics indicated that being a newcomer was a risk factor, with areas with more recent immigrants had significantly more COVID-19 cases (Edmonds & Flahault, 2021). Although our study replicated and confirmed previous findings and statistics of COVID-19 disproportionate impact on minorities (Kirby, 2020), our results shed light on the dynamics of such impacts. *Discrimination, previous oppression, and social structural violence of*

poverty, which are the worse types of trauma (Kira, Ashby, et al., 2013), are associated with more vulnerability to infection. Discriminations, oppression, and social structural violence of poverty induce, regulate, and prime the system toward susceptibility to disease and the onset of psychopathology throughout life. Syrian refugees have a history of oppression, intersected and systemic discrimination, and torture. Risk for COVID-19 infection and psychopathology happens through a common pathway shaped by structural intersected discrimination and social disadvantage that shaped the gradient of social hierarchy and caused consequential inequities in social contingencies. Chronic activation of the continuous cascade of COVID-19 stressors leads to long-term changes

Table 4
Multigroup Structural Invariance of the Path Model of the Effects of COVID-19TS and CST on Mental Health Between Genders and Between Tortured and Nontortured Groups

The model	CMIN	df	p	CMIN/df	TLI	CFI	RMSEA
Multigroup structural invariance between genders							
Configural (structure)	11.873	6	.065	1.979	.975	.996	.049
Metric (weights)	42.855	23	.007	1.863	.978	.988	.046
Scalar (intercepts)	50.857	26	.002	1.956	.976	.985	.048
Strict (residuals)	58.934	31	.002	1.901	.977	.983	.047
Multigroup structural invariance between tortured ($N = 102$) and nontortured groups ($N = 315$)							
Configural (structure)	8.345	6	.214	1.391	.992	.997	.027
Metric (weights)	33.090	23	.080	1.439	.990	.995	.029
Scalar (intercepts)	41.109	26	.030	1.581	.987	.992	.034
Strict (residuals)	55.290	31	.005	1.784	.983	.987	.039

Note. COVID-19TS = COVID-19 traumatic stress; CST = cumulative stressors and traumas; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; CMIN = a chi-square statistics value comparing the default model and the independence model with the saturated model.

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in neural circuitry responsible for regulating emotional regulation (Gur et al., 2019). Both viral and psychosocial stressors of discrimination can trigger changes in biological processes that affect immunity and inflammation and vulnerability to infection (Dedoncker et al., 2021). Higher levels of social discrimination in minoritized populations were correlated with increased amygdala activity and increased functional connectivity with other brain regions, particularly the thalamus (Clark et al., 2018).

The sample participants have high levels of PTSD, depression, and anxiety, especially among those hospitalized due to COVID-19 and those with a history of discrimination and torture. COVID-19 cumulative, continuous traumatic stressors have the highest association with its COVID-19 economic trauma, which is salient in refugees. COVID-19 cumulative, continuous traumatic stress is associated with elevated PTSD, depression, and anxiety comorbid symptoms, either directly or via existential death and status anxieties as mediators. COVID-19 traumatic stressors have direct and indirect effects on PTSD, depression, and anxiety. Its indirect effects were mediated by existential death and status anxieties. These dynamics were stable and strictly invariant across genders and subgroups. The study confirmed all its three hypotheses.

The results highlighted the significance and primacy of existential status anxiety related to the discrimination and COVID-19 cumulative stressors threats to already compromised social status. Another significant variable that was associated with COVID-19 is existential death anxiety. Death and mortality salience were long investigated in different contexts. Posttraumatic stress reactions were conceptualized as a disruption in the functioning of anxiety-buffer that shield the person against the threats of mortality salience (Abdollahi et al., 2011.)

The current study is the first study that systematically measured and examined COVID-19 as continuous traumatic stress in a refugee population and in Syrian refugees who have significant COVID-19 infection. A recent study found that refugees' anxiety and depression levels severely worsened due to the pandemic (Serafini, Powell, et al., 2021). Further, recent research found that the impact of COVID-19 traumatic stressors negative impact extends to cognition and is associated with impaired working memory and inhibition (Kira, Alpay, Ayna, et al., 2021; Kira, Alpay, Turkeli, et al., 2021; Kira, Shuwiekh, et al., 2021).

The current study has several conceptual and clinical implications. Conceptually, the results question some current trauma paradigms that ignored the CTS such as COVID-19 and discrimination and drew attention to its severity. COVID-19 pandemic is disproportionately affecting refugees and minorities' victims of discrimination, oppression, and torture. Such prolonged traumatic stress can add to those refugees suffering who are already previously multiply traumatized. Continuous traumatic stress or type III trauma is the most severe trauma type (Kira, 2021; Kira, Ashby, et al., 2013). Their mental health condition was not affected only severely by previous severe traumas such as torture and intersected discrimination but even worse by the prolonged concurrent COVID-19 traumatic stress. However, Hecker et al. (2017) cautioned that symptom-like responses might be regarded as appropriate responses to real danger in the context of continuous trauma exposure. In this context, the possibility that symptom changes respond to real threats should be considered to avoid the overestimation of PTSD prevalence.

However, over 11% of our sample has been previously hospitalized for COVID-19, which had a further potential impact. In comparison, those who have a history of being hospitalized due to COVID-19 have higher PTSD and depression symptoms and relatively lower COVID-19 traumatic stress, possibly since they have already been infected, and the fear part of this trauma has been reduced. COVID-19 is a new type of traumatic stress that is multi-layered, continuous, and has profound social status adverse effects with its economic impact. There is empirical evidence that COVID-19 creates a vicious cycle, with disparities/inequalities increasing infection and death from COVID-19 and COVID-19, increasing disparities/inequalities further (Kira, Shuwiekh, Al-Huwailah, et al., 2020). A recent study found that COVID-19 has direct effects on increasing working memory and inhibition deficits in addition to its indirect effects on them via its mental health impact (Kira, Shuwiekh, et al., 2021). Only serious type III traumas directly affect executive functions, whereas all other traumas' impact on executive functions is only indirect via their mental health effects (Kira, Shuwiekh, Al-Huwailah, Elwakeel, et al., 2020). COVID-19 traumatic stress and pandemics' impact on mental health has never been studied before in history. Further, it invited a paradigm shift in trauma research toward including intersected discrimination, oppression, and continuous traumatic stress in the mainstream PTSD trauma research as part of Criterion "A" of PTSD and complex PTSD.

Clinically, the study highlighted the urgent need for innovations in prevention and intervention with this new trauma type that is continuous, multilayered, and severe, especially with refugee and torture survivors. It indicates the need for modified new models and treatment protocols of continuous and cumulative trauma-focused interventions that reach refugees virtually, face to face, in-group, or through all traditional and social media and academic, community mental health, and international organizations to help alleviate their suffering. Modified new models of individual and group interventions using continuous and cumulative trauma-focused cognitive behavior therapy approaches are emerging to deal with the new types of traumas and heal the injured/challenged social identities (Kaminer et al., 2018; Kira et al., 2012, 2015; Kira & Tummala-Narra, 2015; Kira & Wroble, 2016; Murray et al., 2013; Pat-Horenczyk et al., 2013; Yochman, & Pat-Horenczyk, 2020). Others suggested adding to the cognitive-behavioral interventions a precognitive component to enhance the will to exist, live, and survive. The will to exist, live, and survive is associated with resilience and posttraumatic growth (Kira et al., 2020b). Lifestyle interventions, such as exercise and diet (Fernández-Abascal et al., 2021), and cognitive training were suggested to enhance executive functions that were negatively affected by COVID-19 stressors and infection (Kira, Alpay, Ayna, et al., 2021). In addition, extreme sensory processing patterns (hypo- and hypersensitivity) show a robust and complex association with psychopathology (Serafini et al., 2017). Interventions that help modulate extreme sensory patterns may help modulate the threshold of stress tolerance and increase resiliency.

Further, critical consciousness frames how professionals and people who are marginalized deeply understand, feel empowered to be proactive, and take collective action to redress perceived inequities. Building a critical consciousness in training programs among providers and patients can enhance practice effectiveness (Diemer et al., 2021). We emphasize the need for innovations and

explore new and all potential avenues to enhance the effectiveness of current treatment protocols for such severe types of traumas.

The current study has several limitations. One of the limitations is that the study was conducted using convenient samples with limited and biased representation. Another limitation is that the measures used are based on participants' self-reports, which are subject to under-or over-reporting due to social desirability. Another limitation is that the study utilized a cross-sectional design. Further, we have to caution that when we talk about direct and indirect effects, we talk about statistical probabilistic stochastic terms used in PROCESS analysis that do not mean the same thing in deterministic sciences of cause and effect. Regardless of these limitations, the study has significant contributions to understanding the impact of COVID-19 on Syrian refugees' mental health.

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