The Effects of COVID-19 Traumatic Stress and Cumulative Trauma on PTSD in a Sample of Internally Displaced Syrian Teenagers

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Abstract

Studies have investigated the relationship between the COVID-19 pandemic and mental health and have shown evidence for the relationship between pandemic-related stress, trauma, and PTSD symptoms. Some have noted that the pandemic may put already vulnerable populations, such as internally displaced persons, at greater risk of developing mental health issues such as PTSD. The purpose of the present cross-sectional study was to examine the relationship between COVID-19 traumatic stress, cumulative trauma, and PTSD symptoms in a sample of internally displaced Syrian teenagers residing in refugee camps on the Turkish-Syrian border. The study investigated whether COVID-19 traumatic stress predicted PTSD symptoms after controlling for cumulative trauma, and whether a moderation effect existed between COVID-19 traumatic stress and cumulative trauma in the prediction of PTSD symptoms. Regression results revealed that while COVID-19 traumatic stress explained a statistically significant amount of the variance in PTSD beyond the effects of cumulative trauma alone, no statistically significant interaction existed between the two predictors. Current results extend knowledge of the pandemic's impact on PTSD symptoms to a population already highly vulnerable to the psychological consequences of traumatic events (Norwegian Refugee Council, n.d.).

Keywords: Internally displaced populations; Teenagers; COVID-19 traumatic stress; Cumulative trauma; PTSD

Abbreviations

IDPs: Internally Displaced Persons; PTS: Post-Traumatic Stress; DBTF: Development-Based Trauma Framework; CST-S: Cumulative Stressors and Trauma–Scale; ITQ: International Trauma Questionnaire; DSO: Disturbances in Self-Organization; LCA: Latent Class Analysis.

Introduction

IN 2020 ABOUT 40.5 MILLION NEW PEOPLE BECAME INTERNALLY DISPLACED DUE TO CONFLICT and disasters worldwide [1-4]. In addition, when considering the recent war in Ukraine of 2022, the total number has increased by about 7 million [4]. Internally displaced persons (IDPs) are people who have been forced to flee their homes for a variety of reasons including armed conflict or natural disaster, but who have stayed within the borders of their country [1]. Authors have noted that while the numbers of refugees who are relocated outside of their home country has plateaued, the amount of internally displaced people has reached unparalleled numbers and currently represents more than 65% of the total displaced population across the globe [5]. Of the many countries where IDPs live, Syria accounts for

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a staggering 20% of the global total, which has made it the country with the most internally displaced people in the world [6]. With the decade long war in the country, Syria's internally displaced population has been exposed to ongoing traumatic experiences [7]. With more than half of Syria's population being displaced, some have considered them one of the most traumatized populations [8].

While all displaced populations are at heightened risk for mental health difficulties, research indicates that people who have been internally displaced are at greater risk compared to other internationally displaced populations [9]. A possible reason for this may be the volatile political and economic circumstances in the country of origin of displaced persons [9]. When considering the most common mental health difficulties, a systematic review by Morina, et al. [5] reported that of the mental health issues identified across 30 studies, PTSD was the most commonly found disorder (with prevalence rates between 2.2% and up to as much as 88.3%).

A particularly vulnerable group within internally displaced populations are children and teenagers [10,11] who according to a report by the UN make up about 30.5 million of the total internally displaced population [12]. Internally displaced minors are at an even greater risk of going through potentially traumatic experiences such as marginalization, exploitation, or abuse [6]. A number of studies have found high levels of mental health difficulties in internationally displaced (refugee) minors [13-16]. Fazel, et al. [14] for instance indicated an 11% PTSD prevalence in refugee children across studies. However, limited data are available on the mental health of minors who have been internally displaced, with most studies focusing on adults [17].

Given the multiple possibly traumatic experiences internally displaced minors face [6], one way to better understand the mental health of internally displaced minors is by investigating the impact of cumulative trauma. Cumulative trauma is generally understood as the combined effect of all the types of traumatic experiences a person has experienced during their life [18]. Scholars have argued that understanding the effects of cumulative trauma is especially important as trauma survivors often experience more than one form of trauma [19-21]. Various studies have supported this argument. For instance, Mullet-Hume et al. found an interaction between levels of cumulative trauma and exposure to the traumatic events of 9/11 on PTSD in a group of teenagers [22]. Schock, et al. [23] found that new stressful or traumatic life events significantly increased levels of post-traumatic stress (PTS) in refugees who had experienced PTS in the past as compared to those refugees who had not experienced new traumatic events [23]. Yet another study by Kinzie, et al. [24] found similar results, indicating

that refugees previously diagnosed with PTSD were more negatively affected by the events of 9/11 than those who did not have the diagnosis [24]. Additional research findings suggest that exposure to multiple or repeated forms of traumatic incidents in childhood may lead to more severe and qualitatively different consequences in emotional and interpersonal functioning as compared to a single traumatic event [19].

A relatively new and unique ongoing stressor is COVID-19 stress, which can be defined as a stress reaction due to the COVID-19 pandemic [25]. COVID-19 stress has been identified by numerous scholars as best conceptualized as a traumatic stressor despite it not fitting the traditional PTSD definitions as identified by the DSM-5 [25]. A traumatic stressor is defined by the DSM-V as an "Exposure to actual or threatened death, serious injury, or sexual violence" [26], and assumes past and largely direct exposure [25]. However, researchers have identified that traumatic stress symptoms emerge as a response to the COVID-19 pandemic [25]. Some have also noted that the pandemic may put already vulnerable displaced populations at greater risk of developing mental health issues such as PTSD [3]. Studies across the world have investigated the relationship between the COVID-19 pandemic and mental health [27-29] and findings have shown evidence for the relationship between the pandemic and PTSD symptoms [2].

More specifically, research on COVID-19 has supported the sensitization model of stress (with its theoretical origins, in regard to psychopathology, in Post's 1992 model [30] and has found increased levels of distress symptoms in the face of COVID stressors for those who had been previously exposed to continuous traumatic events and dealt with PTSD symptoms [29,31]. The sensitization model of stress proposes that people are more likely to experience negative outcomes after facing stressors such as potentially traumatic experiences if they have been previously exposed to traumatic incidents. Kira, et al. [32] explored the sensitization model in relation to the impact of COVID-19 and looked at the extent to which ongoing trauma, such as COVID stress, differed in its impact on complex PTSD (CPTSD) when compared to other forms of trauma in internally displaced populations. Similar to prior studies on PTSD [33], the researchers found that continuous traumatic stressors had a larger effect size in predicting complex PTSD than a single traumatic event or a sequence of related events that occurred in the past. The study furthermore indicated that COVID-19 was a strong predictor of CPTSD. These findings suggest that COVID-19 can be considered an ongoing traumatic stressor that has an effect on the development of CPTSD and is different from the impact of accumulated individual (non-continuous) trauma occurrences.

Previous research has investigated the relationship between COVID-19, cumulative trauma and PTSD. For instance, Ashby, et al. [34] found that in a sample of North American adults the stressors caused by the COVID pandemic explained significant additional variance of PTSD above and beyond levels of cumulative trauma. Furthermore, they identified a significant three-way interaction effect between cumulative trauma, COVID-19 traumatic stress, and race/ethnicity in the prediction of PTSD symptoms. Another study by Shuwiekh, et al. [35] explored the impact of COVID-19 on mental health in various Arab countries (not including Syria) and found that COVID traumatic stress contributed to increased PTSD symptoms above and beyond previous trauma experiences.

Previous studies have also identified ways in which COVID-19 traumatic stress impacts PTSD symptoms beyond that explained by cumulative trauma. However, no previous studies have assessed the relationship between these variables in teenage populations that have been internally displaced. The purpose of this study is to examine the relationship between the traumatic stress of COVID-19, cumulative trauma, and symptoms of post-traumatic stress disorder in a sample of internally displaced Syrian adolescents residing in refugee camps. With internally displaced teens already a highly vulnerable group [10,11] who get exposed to potentially traumatic stressors on an ongoing basis, it is important to understand the impact of COVID-19 traumatic stress on their mental health and risk for PTSD. Understanding the impact of COVID-19 traumatic stress in a population of displaced teenagers, may help provide a better understanding of the unique traumatic stress caused by COVID-19, and shed light on whether stress sensitization continues to occur even for those who have been exposed to high levels of previous traumatic experiences. Additionally, understanding the relationship between COVID-19 traumatic stress and cumulative trauma, and the differential effect of COVID-19 traumatic stress on the development of PTSD, is particularly relevant for those providing mental health services to internally displaced youth. Understanding these relationships may provide useful insight in the planning of intervention and treatment programs for displaced minors [20].

Based on previous research and the identified gap in the literature, the first research question of this study was: "In Syrian teenagers who have been internally displaced, does COVID-19 stress explain additional variance in PTSD symptoms above and beyond the effect of previously experienced cumulative trauma?". Consistent with the findings of Ashby, et al. [34], we hypothesized that we would find a positive significant relationship between the variables with COVID-19 traumatic stress significantly predicting PTSD symptoms after controlling for cumulative trauma.

While the study by Ashby, et al. [34] found a three-way interaction effect between cumulative trauma, COVID-19 traumatic stress, and race/ethnicity in the prediction of PTSD symptoms, Mullet-Hume, et al. [22] identified a two-way interaction effect between levels of cumulative trauma and exposure to the traumatic events of 9/11 on PTSD in a group of teenagers. Therefore, the second research question of this study was "Is there an interaction effect present between cumulative trauma and COVID-19 traumatic stress in the prediction of PTSD symptoms for internally displaced Syrian teenagers?". We hypothesized, consistent with the findings of Mullet-Hume, et al. [22], that COVID-19 traumatic stress would significantly moderate the relationship between cumulative trauma and PTSD.

Method

Participants

The study sample consisted of teenagers drawn from a larger pool of participants recruited for a cross-cultural study on COVID-19, including refugees living in refugee camps on the Syrian-Turkish border. Participants were 138 Syrian internally displaced teenagers, whose ages ranged from 14-17 years (M=15.06, SD=1.14). 47.8% identified as male, 52.2% identified as female. Of the sample 89.1% identified as Muslim and 10.9% identified as Christian. Regarding education level, 47.1% identified as having basic reading and writing skills, 29.7% reported having elementary school level education, 10.9% reported middle school level education, and 8.7% reported having high school education.

Procedures

The Institutional Ethics Board of the University of Fayoum, Egypt, authorized the study protocol as part of a cross-cultural research project on COVID-19. The original sample included non-refugee teenage and adult participants from several countries, including Syria. For the present study, eligibility criteria included those who were Syrian, internally displaced, residents of the governorates of Idlib and Aleppo, and below 18 years of age. In terms of informed consent, the parent's and minors' assent were obtained prior to participation in the study.

Setting

In October 2021, upon IRB approval, a research team collected data from refugee camps on the Syrian-Turkish border. The identified camps represented the Syrian internally displaced population, in the governorates of Idlib and Aleppo. In addition, data was also collected from Idlib city and the rural villages around the city of Aleppo.

Data collection

For the data collection of the sample relevant to this study, the field research team consisted of five professionals holding graduate degrees who live in the area, who had received a one-day training on the survey. Data was collected with assistance from refugee camp- and international organization employees. Sample recruitment was performed by means of snowball sampling, relying on the participants' network and highlighting their crucial role in the research process. A financial incentive of $1 American Dollar in the local currency equivalent was provided to each subject upon participation. Participants completed the study questionnaire in Arabic on an iPad provided by the team members. Some required minimal help to enter information on the iPad, for whom the field team provided assistance. The survey entry was anonymous, and the data entered was uploaded to an Excel file readable by SPSS. Only the research team had access to the data, in which a number was assigned to each subject.

Statistical Methods

IBM SPSS Statistics for Macintosh (Version 29) was utilized to perform statistical analyses. Descriptive statistics were analyzed first. No missing data was identified. A hierarchical linear regression was performed to assess our first research question, followed by a moderation analysis for the second research question.

Measures

COVID-19 Traumatic Stress: As we assume that COVID-19 traumatic stress is a unique traumatic stressor, COVID-19 traumatic stress was measured by means of the COVID-19 Cumulative Stressors scale [36]. The COVID-19 Cumulative Stressors scale is a measure partially adapted from a questionnaire developed by Conway, et al. [37] to assess COVID-19 stressors. The scale consists of 17 items and contains four subscales ("threat/fear of the present and future infection and death" (five items), "traumatic economic stress" (four items), "isolation and disturbed routines" (three items), and "grief for lost ones to COVID infection" (five items) [32]. Kira, et al. [32] found evidence that the "threat/fear of the present and future infection and death" subscale has higher internal consistency than the other subscales [38]. Due to this, and consistent with the study by Ashby, et al. [34], analyses were limited to this subscale in the current study.

The scale asks respondents to indicate the extent to which they agree with statements on COVID-related stress on a 5-point scale from 1 (not at all) to 5 (very much). Examples of the subscale items in English include, "I am stressed around other people because I worry I'll catch the coronavirus (COVID-19)", and "Thinking about the coronavirus (COVID-19) makes me feel threatened".

The COVID-19 Cumulative Stressors scale was developed in English and later translated and back-translated to and from Arabic [38]. In the initial study by Kira, et al. [36] the scale showed good predictive, construct divergent, and convergent validity (for more information see Kira, et al. [36]. Building on these findings, a follow-up study tested structural and predictive validity with a sample gathered in eleven Arab countries [35]. The study found evidence for structural and criterion validity, good internal consistency reliability (alpha of .88), and invariance across genders. Additionally, in a previous study, a coefficient alpha of .72 was reported for the "threat/fear of the present and future infection and death" subscale [32]. The omega coefficient of the current study, calculated instead of alpha coefficient given assumptions alpha requires, was .79.

Cumulative Trauma

To assess the existing cumulative trauma, separate from COVID-19 traumatic stress, we used the Cumulative Stressors and Trauma–Scale–Short form (CST-S). The CTS-S is a scale developed by Kira, et al. [39]. The CST-S is a 36-item scale that measures stressors and traumas identified by the Development-Based Trauma Framework (DBTF). The framework was developed to provide a conceptually and empirically based classification of traumatic stressors [39]. The framework maintains a developmental perspective (focused on the life course) and goes beyond the "Criterion A" definition of trauma as defined by the DSM-5. The DBTF framework includes events such as attachment disruptions, social structural violence (e.g., extreme poverty), oppression, discrimination, pandemics, and other chronic stressors not included in the current PTSD criterion "A" list of qualified events [39]. The scale was designed to measure seven types of stressors/traumas (e.g., torture, war, sexual and physical abuse, exposure to racism and natural disasters) as well as three significant chronic life stressors.

Item examples include "I have been discriminated against because of my sexual preference", and "I have had to harm another person". Respondents indicate if they have experienced the stressor (occurrence), if so, how frequently they experienced the stressor, and the impact of the stressor. In this study only the occurrence variable was used, as an increasing amount of literature has argued that the occurrence of different types of trauma (cumulative trauma) during childhood leads to more severe and complex trauma responses [19]. A large (N=2732) initial validity study in 11 Arab countries provided evidence for the construct and predictive validity of the measure [40] and reported

a Cronbach's alpha of .97. As per the Cumulative Stressors and Trauma-Scale instructions, the total cumulative trauma occurrences for minors was calculated by taking all occurrences excluding items 28 ("I experienced the loss of a child or spouse"), 29 ("I experienced sudden unexpected employment termination, been laid off, or failed in business or big market loss") and 30 ("I remarried"). The scale's Cronbach alpha in the current study, excluding items 28, 29, and 30, was .96.

Post-Traumatic Stress Disorder (PTSD)

PTSD was measured by the International Trauma Questionnaire (ITQ). The ITQ is an 18-item self-report instrument developed by Cloitre, et al. [41] designed to measure the core features of PTSD and Complex PTSD (CPTSD), consistent with the ICD-11. Numerous studies have offered evidence for the discriminant, concurrent, predictive and cross-cultural validity of the measure [42]. More specifically, the ITQ has been translated and validated in twenty-five languages, including Arabic [43], and has been validated in a sample of Syrian refugees [44]. Respondents are first instructed to identify an experience that troubles them most and indicate when it occurred. They are then asked to indicate how much in the last month they have been bothered by various symptoms in relation to the identified experience, on a scale ranging from 0 (not at all) to 4 (extremely) [19]. Example items include "Having

upsetting dreams that replay part of the experience or are clearly related to the experience?", and "Being 'super-alert', watchful, or on guard?". Scores can be calculated for PTSD and Disturbances in Self-Organization (DSO) for calculation of CPTSD score. For the purpose of this study, only the PTSD subscale was used. In previous studies the Cronbach's Alpha for each of the subscales were reported as ≥ 0.77 except for the Avoidance items (a = 0.67) [17]. The Cronbach's Alpha for the PTSD subscale in the current dataset was .84. The ITQ was developed for adults, and an ITQ-CA was developed for Children and Adolescents. Because the primary focus of the larger study was adults, the ITQ was used in data collection for both adults and adolescents. The ITQ-CA is a more simply worded version of the ITQ, with the same number of items. Due to good reliability of the ITQ in this sample (.84), the similarity of the two versions of the measure and the uniform scoring across versions, the general ITQ measure for adults was accepted for our analyses.

Results

Descriptive Analyses

Table 1 displays descriptive statistics of the sample (M, SDs) and correlations between the variables as used in the model. Correlations between the variables were found to be statistically significant and in the expected positive direction, with effect sizes ranging between moderate and large.

Variable	Min	Max	Mean	SD	1	2	3
1 Cumulative Trauma	0	30	17.08	11.7	1	.30**	.60**
2 COVID traumatic stress	18	85	48.53	12.6		1	.39**
3 PTSD	0	21	8.83	5.13			1

Note: Descriptive statistics are listed on the left; inferential statistics are identified on the right. Numbering on right corresponds with variables on left.
** Correlation is significant at .01 level
Table 1: Descriptive statistics and correlations.

Regression analysis

The research question "Does COVID-19 traumatic stress add additional variance in the prediction of PTSD symptoms above and beyond cumulative trauma, in a sample of internally displaced Syrian teenagers?" was tested through a hierarchical regression, using IBM SPSS Statistics for Macintosh (Version 29). PTSD was used as the dependent variable in the model, cumulative trauma was entered in the first step, and COVID-19 traumatic stress was added in the second step.

Data screening and testing of assumptions

Prior to testing of the model, data was screened and assumptions for regression analyses were tested. Upon

screening the data distribution of each of the variables, it was found that the Cumulative Trauma variable was not normally distributed. Initial screening indicated that the distribution of the variable was bimodal, while the other two variables maintained a normal distribution. In determining ways to manage this distribution, rigorous tests such as a Latent Class Analysis (LCA) to assess whether latent groups existed within the variable were considered, however LCA requires a significantly larger sample size than available in this study [45], and was therefore not a feasible solution.

Scholars have often argued for the superiority of using continuous measures rather than artificially categorized measures [46] due to a possible loss of power and increase

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of Type I error [47]. However, a review of the literature also indicates that the approach is still extensively used [48] and there are no widely accepted strategies for dealing with bimodal data. The median split is a procedure in which scores of an independent variable are divided into two groups, a "low" and "high" category, based on whether the score is below or above the median [47,48]. Despite the concerns about categorizing a continuous variable, to our knowledge no clear solutions have been reported for the management of a bimodal indicator variable. As a result, we analyzed the data both way. First, we used the categorical cumulative trauma variable. A median split for the bimodal Cumulative Trauma variable created two categorical variables: a 'low levels of cumulative trauma' group, and 'high levels of cumulative trauma' group. The median was identified at a cumulative trauma score of 21, which was based on visual inspection of the histogram aligned with the start of the second curve. Second, we ran the model with a continuous cumulative trauma variable.

After initial data screening, the regression assumptions were tested. An analysis of standard residuals indicated that one outlier existed that needed to be removed. Testing of the assumption of collinearity identified no concerns regarding multicollinearity (Cumulative Trauma, PTSD = .95, VIF = 1.05; COVID-19 traumatic stress = .95, VIF = 1.05). The data also met the assumption of independent errors (Durbin-Watson value = 1.79), and the assumption of non-zero variances (COVID-traumatic stress, Variance = 21; Cumulative Trauma, Variance = 163.42; PTSD, Variance = 26.35). The scatterplot of standardized residuals furthermore indicated that the data met the assumptions of homogeneity of variance and linearity. The histogram of standardized residuals showed that the data contained approximately normally distributed errors, as did the normal P-P plot of regression standardized residuals.

Hierarchical Regression Analysis

Utilizing two categories of cumulative trauma resulting from the median split, our final regression model included two cumulative trauma groups: a low trauma group (N=67) with a cumulative trauma mean of 5.30 and SD of 4.64, and a high trauma group (N=71) with a cumulative trauma mean of 24.85 and SD of 3.52. The results of the linear regression were statistically significant (R^2 =.31, F [1,135] = 59.83, p<0.001) with COVID-19 traumatic stress explaining a statistically significant additional amount of the variance in PTSD above and beyond the cumulative trauma categories alone (ΔR^2 = .04, F [1,134] = 37.64, p=0.007). Second, to explore whether the regression results were significantly impacted by the split of the cumulative trauma variable into categories, an additional hierarchical regression was run, which included the original continuous cumulative trauma measure. The

findings for this analysis were also statistically significant (ΔR^2 = .054, F [2,135] = 44.73, p < 0.001).

Moderation Analysis

A moderation analysis, adding the interaction term (Cumulative Trauma x COVID-19 traumatic stress) to the model, was performed to investigate the second research question, "Is there an interaction effect present between Cumulative Trauma and COVID-19 Traumatic Stress in the prediction of PTSD symptoms in internally displaced Syrian teenagers?". The interaction term included in the model was the product of the sour expectations, regression results indicated no statistically significant interaction between Cumulative Trauma and COVID-19 traumatic stress (ΔR^2 = .0011, F [133] = 24.43, p =.126). In other words, higher levels of COVID-19 traumatic stress did not significantly increase PTSD symptoms as a function of Cumulative Trauma. To further investigate whether the dividing of the cumulative trauma variable into categories significantly impacted the interaction effect, an additional moderation analysis was run that included the original continuous cumulative trauma measure. The findings for this analysis were also not statistically significant (b = .006, t (134) = .84, p = .405).

Discussion

Research has suggested that PTSD symptoms increase when traumatic experiences are ongoing [33] and that exposure to previous traumatic experiences makes one more vulnerable to the effects of new potentially traumatic experiences [22-24]. Over the past years of the COVID-19 pandemic, researchers have argued that COVID-19 can be thought of as a new traumatic stressor [25] and a unique trauma type due to its continuous and ongoing nature [38]. Several studies have provided evidence in favour of this argument. For instance, speaking to the experiences of children and adolescents, a study by Sayed, et al [49]. Investigated 'COVID-19 related PTSD' in Saudi children and adolescents and identified that 71.5% of participants reported experiencing varying levels of COVID-19 related PTSD levels. Kira, et al. [35] found that continuous traumatic stressors, such as COVID-19, had a larger effect size in predicting complex PTSD than a single traumatic event in a sample of internally displaced Syrian adults. In addition, studies such as the meta-analysis by Cénat, et al. identified a fivefold increase of PTSD during the COVID-19 pandemic, while Alpay, et al. [27] also found that for Syrian refugees COVID-19 continuous traumatic stress was directly related to increased PTSD levels. Considering previous exposure to traumatic experiences, a study by Ashby, et al. [34] found that COVID-19 traumatic stress was not only a predictor of PTSD symptoms but explained additional variance even after controlling for previous cumulative trauma.

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The current study aimed to add to the literature by replicating and extending the findings by Ashby, et al. [34] who found evidence for COVID-19 traumatic stress as a unique stressor that explains significant additional variance of PTSD above and beyond levels of cumulative trauma. The present study sheds light on the relationship between these factors in a unique population of internally displaced teenagers. To our knowledge, no previous studies have investigated the impact of COVID-19 traumatic stress on internally displaced teenagers, nor in other teenage populations who have high exposure to potentially traumatic experiences. The results of our study suggest that indeed even for teenagers who have been exposed to high amounts of potentially traumatic events - the sample had an average exposure to 17 different kinds of traumatic experiences – COVID-19 traumatic stress is a significant traumatic stressor that can explain variation in PTSD levels above and beyond what is explained by cumulative trauma. These findings add to the body of literature that offers evidence for the idea that COVID-19 can be considered a traumatic stressor [25].

More specifically, our results indicated that about 4% of additional variance in PTSD experienced by the Syrian displaced teenagers was explained by COVID-19 traumatic stress, above and beyond what was already explained by cumulative trauma. This percentage is slightly higher than the 2.5% variance identified by Ashby, et al. [34] and appears to suggest that the sensitization model of stress [50] is also present in internally displaced minors. Previous research such as the study by Grasso, et al. [51] has provided similar support for the sensitization model in minors in the United States. Their findings indicated that children who had previous exposure to potentially traumatic experiences experienced elevated levels of psychological difficulties when faced with new stressors as compared to children without such previous exposure and children without current stressors. Our study outcomes support and extend these findings by indicating for the internally displaced minors in our sample, COVID-19 traumatic stress caused an increase in PTSD levels above and beyond what was already explained by previous traumatic experiences. This information suggests that COVID-19 can be considered a unique stressor even in populations with ample exposure to other severe stressors. Our study may help emphasize that there is a need to support internally displaced minors in managing the specific stressors of COVID-19 in the context of a complex set of other stressors.

Regarding our second research question, as we surmised that our study sample consisted of participants who would have relatively high levels of exposure to previous traumatic experiences, we expected that an interaction effect similar to that identified by Mullet-Hume, et al. [22] might be detected. Their study indicated that the presence of previous cumulative trauma had a significant impact on PTSD symptomatology levels in immigrant children after exposure to the traumatic events of 9/11. Children with higher levels of historical cumulative trauma experienced significantly higher levels of PTSD after 9/11 as compared to those with lower levels of cumulative trauma [22]. Contrary to these findings and our expectations, however, the results of our study did not provide evidence for an interaction between COVID-19 traumatic stress and cumulative trauma in the prediction of PTSD. Our findings indicated that while both cumulative trauma and COVID-19 traumatic stress predict PTSD, teenagers with higher cumulative trauma exposed to COVID-19 traumatic stress did not experience higher levels of PTSD than those with lower levels of cumulative trauma. While this is inconsistent with Mullet-Hume et al.'s findings [22], these findings align with the study by Ashby, et al. [34] where no significant interaction between the two variables was detected.

While the current study may not have included an adequate sample size to detect an interaction, a study by Benjet, et al. [52] offers another potential way to understand the discrepancies between study findings. The authors highlight the need to consider the interrelatedness of stressors and, in the prediction of the onset of psychopathology, the need to consider both frequency and type of adversity. One consideration is whether COVID-19 traumatic stress, as a continuous stressor, and the traumatic events of 9/11 are differentially related to the traumatic stressors measured in the cumulative trauma scale. In addition, as Benjet, et al. [52] mention, different adversities may not have the same amount of effect on the development of psychopathology. In other words, the differences between the traumatic experiences themselves may have an impact on whether interaction effects exist between the stressor and cumulative trauma. Consistent with this view, Kira, et al. [53] found differences in the types of trauma profiles in American and Syrian refugee samples. They found that the Syrian sample had higher levels of intergroup conflict stressors while the profile of the American sample included more intersected discrimination and childhood adversities as central stressors. These finding suggest that differences in trauma profile may impact whether an interaction between cumulative trauma and COVID-19 might be detected.

Last, it is also possible that the difference in results could be related to the difference in measures used to assess cumulative trauma. The study by Mullet-Hume, et al. [22] utilized the The New York University Child and Adolescent Stressors Checklist—Revised (NYU–CASC) and reported excluding the categories of life adversities such as divorce, and including only traumatic stressors identified by the DSM-V as potentially traumatic (domestic violence, community and school violence, illness/death of family member, accidents/

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injury to self, natural disaster, and war). The Cumulative Stress scale utilized in this study however, based on the Development-Based Trauma Framework (DBTF) [39,54] goes beyond the "Criterion A" definition of trauma as defined by the DSM-5 and includes significant life stressors.

Limitations

The current study sheds light on a unique and understudied population, yet the findings need to be considered within a set of limitations. The first limitation concerns elements of the study design. The cross-sectional nature of the study does not provide evidence for causality, which needs to be considered when interpreting our findings. Furthermore, our study participants were teenage participants drawn from a sample recruited for another study. Due to this, the subset of teenagers was relatively small and may not have been large enough to detect a smaller interaction effect. In addition, due to the original study being adult-focused, all participants completed the International Trauma Questionnaire, which targets adults. While the International Trauma Questionnaire (ITQ) measuring PTSD has been internationally validated, used in diverse settings, and had adequate reliability in our adolescent sample, the use of the adult rather than the adolescent version of the questionnaire may have impacted our results.

Another limitation was the bimodal distribution of the continuous cumulative trauma variable. The cumulative trauma variable was therefore transformed into a categorical variable consisting of two (low and high) levels of cumulative trauma. Scholars have argued against the use of a median split to create artificial groups, as it may increase Type I error and cause a loss of power [47]. Despite this limitation, significant results in the prediction of PTSD symptoms were identified with both the categorical and continuous data.

Future Research

Future studies should be conducted to address the limitations of this study and move the field forward toward a better understanding of the relationship between COVID-19 traumatic stress, cumulative trauma, and PTSD in vulnerable populations. First, studies using a longitudinal design need to be conducted to be able to assess whether causal relationships may exist between cumulative trauma, COVID-19 traumatic stress and PTSD. Second, studies could explore whether the use of the child and adolescent version of the ITQ and a larger sample size would allow for a more robust test for an interaction effect similar to the one detected by Mullet-Hume, et al. [22]. Lastly, future research might replicate the present study with a larger sample to assess whether the cumulative trauma variable will yield a continuous variable, and to address whether the same overall results will be obtained in the hierarchical regression analysis when the cumulative trauma scale is a continuous variable with a normal distribution.

Future research going beyond addressing of the outlined limitations, could also look further into the reasons for the contradictory findings around the interaction effect between COVID-19 traumatic stress and cumulative trauma. As we are looking at a fourth year with COVID-19 in our midst, understanding the ways that COVID-19 traumatic stressors might differ from the traumatic stressors on the cumulative trauma scale would help gain a better understanding of a traumatic stressor that seems to have decided to stick around. Additional studies investigating the possible ceiling effect in the sensitization model of stress and if people become less sensitive to negative outcomes of subsequent traumatic experiences once they have been previously exposed to a certain number or kind of traumatic experiences.

Conclusions

The objective of the present study was to examine the relationship between COVID-19 traumatic stress, cumulative trauma, and PTSD symptoms in a sample of internally displaced Syrian teenagers. Despite the limitations of the study, the findings of this study extend our knowledge of the pandemic's impact on PTSD symptoms to this population already highly vulnerable to the psychological consequences of traumatic events [6,8]. Our findings suggest that COVID-19 can be conceptualized as a unique stressor even in a population with high levels of previous cumulative trauma. In addition to contributing to the literature on this at-risk population, our findings have implications for mental health prevention and intervention programs geared towards displaced minors. Understanding the impact of COVID-19 traumatic stress on PTSD symptoms may help clinicians and researchers better understand the mental health needs of displaced teenagers [55-57]. The results of this study suggest a need to tend to the effects COVID-19 in addition to the mental health consequences of ongoing exposure to traumatic events. This could be achieved by including a brief evaluation of COVID-19 stress when assessing the mental health needs of minors who have been affected by various traumatic stressors. Equipped with an improved understanding of the impact of COVID-19 traumatic stress on displaced teenagers, clinicians and aid workers alike can identify psychological needs more efficiently and provide more effective psychosocial support to this underserved group.

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