

Posttraumatic Stress in Youth during Covid-19: A Narrative Review

Tiffany Field

University of Miami/Miller School of Medicine and Fielding Graduate University, USA

ABSTRACT

The prevalence of post-traumatic stress (PTSS/PTSD) in youth during COVID-19 has widely ranged from 3% in China to 69% in Bangladesh. It has also varied by age group, type of questionnaire and whether it was assessed during a lockdown or during the non-lockdown pandemic. In several studies reviewed here, PTSS/PTSD has been highly correlated with anxiety, depression and sleep disturbances, suggesting the comorbidity of those problems. Risk factors or correlates of PTSS/PTSD in youth during COVID-19 have included older age, female gender, parent PTSD, loneliness, missing friends, fear of infection and lack of exercise. Methodological limitations of this literature include the cross-sectional nature of the data collection and the lack of studies on potential underlying mechanisms.

*Corresponding author

Tiffany Field, PhD, University of Miami/Miller School of Medicine and Fielding Graduate University, USA. E-mail: tfield@med.miami.edu

Received: January 29, 2022; **Accepted:** February 04, 2022; **Published:** February 15, 2022

Key words: Post-traumatic stress symptoms, Post-traumatic stress disorder, Youth, COVID-19

Introduction

Posttraumatic stress (PTSS) or post-traumatic stress disorder (PTSD) studies have frequently appeared in the COVID-19 literature but primarily on adults including healthcare workers, veterans, special populations and survivors of the Holocaust, earthquakes and hurricanes. For the purposes of this narrative review, the terms PTSS, PTSD, youth and COVID-19 were entered into PubMed and PsycINFO which yielded 59 papers. Following the exclusion of case studies and non-English papers, this narrative review is based on 27 papers. This literature has primarily addressed the prevalence and risk factors or correlates of PTSS/PTSD. This review is accordingly organized into sections on prevalence, risk factors/correlates and methodological limitations.

Prevalence

The prevalence of PTSS or PTSD in youth during COVID-19 has varied widely from 3% in China to 69% in Bangladesh [1,2]. Although many COVID-19 studies have referred to this negative mood state as PTSD, some have argued that because the symptoms are based on self-report and they involve psychological trauma, not physical trauma, they would not be diagnosed as PTSD [3]. Nonetheless, the symptoms are referred to as posttraumatic stress or posttraumatic stress disorder, and the terms used here are the terms of the authors of the different studies. In addition to varying across countries, PTSS/PTSD has also varied within countries. For example, within China, the prevalence of PTSS in youth has been reported in eight different studies as 3%, 7%, 8%, 10%, 14%,

17%, and 21% in two different studies [4-10]. The prevalence has averaged 14% across these eight different studies from China. The prevalence in other countries has been noted as 23% in a study that included six countries 27% in Saudi Arabia, 29% in Turkey, 32% in the U.S., 50% in Italy and 69% in Bangladesh [2,11-15].

Other Mood States Correlated With PTSS/PTSD

Other mood states that are correlates of PTSS/PTSD are a second focus of this literature on PTSD in youth during COVID including anxiety and depression. In a recent COVID-19 survey, PTSD scores were significantly correlated with other negative emotions including anxiety ($r=.59$) and depression ($r=.61$) as well as sleep disturbances ($r=.59$) [16]. Similar correlations have been reported in the more limited literature on PTSD in youth. As can be seen in Table 1, the rank order prevalence of anxiety and depression approximates that of PTSD. The lowest prevalence of PTSD in youth has appeared in studies from China including 3%, 8% and 17% [3,5,8]. The prevalence of anxiety has been 7% and 8% respectively and the prevalence of depression has been 9%, 7% and 13% respectively. In contrast, the prevalence of PTSD, anxiety and depression has been greater in Turkey, the U.S. and Bangladesh [2,13,14]. Of course, with the reporting of prevalence data, it is not clear if the same youth are scoring consistently low or consistently high across the three measures (PTSD, anxiety and depression). And even just the PTSD scores cannot be compared across samples, as the age varies from seven-years-old to adolescents attending universities. And, the measures are also variable from the Global Psychotrauma Screen for Teenagers to the Impact of Events Scale to The PTSD Checklist-Civilian scale. And, the anxiety and depression scales varied across samples as well.

Table 1: Prevalence (%) of PTSD, anxiety and depression in various countries (references as superscripts).

Country	PTSD	Anxiety	Depression	Age group	N	Scale
China ¹	3		9	university	2,485	PCL-C
China ⁵	8	8	47	7-18-year-olds	152	CPTSDS
China ⁸	17	7	13	high school	57,948	GPST
Turkey ¹³	29	28	38	adolescents	447	PCL-C
U.S ¹⁴	32	45	43	university		PCL-C
Bangladesh ²	69	23	47	university	505	IES

PCL-C=PTSD Checklist Civilian version

CPTSDS=Child PTSD Symptom Scale

GPST=Global Psychotrauma Screen for Teenagers

IES=Impact of Event Scale

Risk Factors/Predictors

Risk factors are the third most frequent focus of COVID studies on youth. This literature is also sparse, likely because as the term post-traumatic stress suggests, it is commonly experienced following a traumatic event. Although the traumatic event of COVID was expected to end, it has continued in the form of various variants, suggesting that PTSD research will only happen more frequently as the variants and the numbers decrease. This may be especially true for youth as they are not in lockdown as they were in the beginning of COVID and they have returned to school in many countries, which has likely reduced the prevalence of post-traumatic stress in youth, although it may have increased the prevalence of social anxiety.

Several risk factors/predictors, nonetheless, have been the focus of the limited number of COVID-19 publications on PTSS/PTSD in youth. They can be grouped into several categories including demographics including older age and female gender, family factors including divorce and parents' PTSD, variables related to friends including loneliness, fears of infection and financial loss and activities that have been affected by COVID including exercise and sleep.

Demographic Risk Factors

Demographic risk factors have been mentioned in several papers, most especially age. Although age has differed across several studies, PTSD is rarely compared across ages within a study. Some exceptions have occurred. In a study from China, the Children's Revised Impact of Event Scale (CRIES) was administered to different age students (N= 197 adolescents) and their results suggested that the junior high students were experiencing more PTSD than the younger children [5]. In another study from China by a different group, 7-to-15-year-olds completed questionnaires on post-traumatic stress and depression [9]. The results of this study suggested that middle-school children were experiencing more PTSD than the primary school children. And, as many as 23% of senior high school students in a sample from China (N=7769) reported PTSD symptoms [10]. In contrast, no age or school grade differences were noted on PTSD in a sample of children and adolescents from Saudi Arabia (N=537) [12]. This sample completed a novel UCLA Brief Covid-19 Screen for Child and Adolescent PTSD. Mild PTSD was noted in 27% of the sample while potential PTSD was noted in 13%. No gender differences were also reported in the sample from Saudi Arabia [12]. The absence of demographic differences in this study is unusual and may relate to the unique scale that was being used.

Gender differences were noted in at least three studies showing greater PTSD symptoms in female students. This included a study from France (N= 22,883) and a study from China where PTSD symptoms were more frequently reported by female students based on the CRIES [10, 17]. And in the study on six different countries (Germany, Poland, Russia, Slovenia, Turkey and Ukraine), females reported more PTSD symptoms on the PCL-C [11]. In this study, different cut-off scores were used. At the lowest cut-off score, 78% reported PTSD symptoms, while at the highest cut-off score, only 23% were experiencing PTSD (N = 1741). A sample that was not only female gender but also considered a minority on sexual orientation was noted to have a high incidence of PTSD (N=981) [18]. In this sample from the US, PTSD was assessed by the PCL-C and was accompanied by depression as measured by the Personal Health Questionnaire Depression Scale (PHQ-8) as well as COVID-related worries and grief.

Family Risk Factors

Family risk factors for PTSD in youth during COVID-19 include negative relationships with parents, lack of social support, divorce, PTSD in a parent and ACES. In a large sample study on high school students in China (N=57,948), the students' responses to the Global Psychotrauma Screen for Teenagers were entered into a regression [8]. The significant predictors of PTSD included negative family relationships and lack of social support. Divorce has also been a significant risk factor for the prevalence of PTSD in youth during COVID-19. In the study from Italy (N=1059), PTSD was more prevalent in middle school children of divorced [13]. The mental health of parents has also been a risk factor for children's mental health. In another study from China (N= 152 children who were 7-18 years-old), the children's anxiety and severity of sleep problems were associated with parents' depression and PTSD [5]. Divorce is one of the adverse childhood experiences (ACES) along with other early childhood experiences like various forms of abuse and different kinds of neglect. ACES were given as a risk factor in one of the only longitudinal studies in the literature on PTSD in youth during COVID-19 [19]. That study took place in February and then again in August 2020 in China (N= 1160 college students). ACES in the first assessment predicted post-traumatic stress at the second assessment. In this study, the prevalence of posttraumatic stress decreased from wave one to wave two, although it remained high.

Friends as a Risk Factor

Social distancing, loneliness, living alone and losing friends have been given as risk factors for the development of posttraumatic stress in youth during COVID-19. In a study on the impact of social distancing which was also called alienation in that research, a conditional process model analysis was conducted (N =7145) [20]. Both negative emotions and alienation were significant predictors of PTSD. In the study from France, living alone and having poor social ties were risk factors for posttraumatic stress (N= 22,883) [17]. Loneliness has also been a risk factor for the development of PTSD based on the PCL-C in a sample of youth from the US [14]. In that study, loneliness was a risk factor while social support from family members but not a partner or peers was considered a buffer for distress. The actual loss of friends/relatives in the six-country study was a significant risk factor for the development of post-traumatic stress [11].

Fears of Financial Stress

Fears of financial uncertainty and actual job loss have been risk factors for post-traumatic stress in youth during COVID-19. Financial uncertainty and the fear of an adequate food supply were risk factors in the study from Bangladesh on university

students (N= 505) [2]. Actual loss of income was a risk factor in the study from France and job loss and worsening economic status were similarly predictors of post-traumatic stress in the six-country study [11,17].

Fear of Covid Infection

Surprisingly, the fear of COVID infection has emerged as a risk factor in only a few studies on post-traumatic stress in youth during COVID. In the study from Bangladesh, fear of infection and perceiving physical symptoms of COVID were associated with all of the negative mood states including not only PTSD but also anxiety and depression [2]. In the study from China on students from six universities (N=2485), fear of COVID was a risk factor for PTSD as well as depression [1]. Similarly, PTSD was associated with fear of exposure to COVID in the study from France [17]. In an unusual finding, PTSD and worry about COVID infection predicted post traumatic growth but so did resilience and family connectedness (N= 805) [21]. This study exemplifies the complexity of the relationships between the various emotions and experiences during COVID.

Inactivity and Sleep Problems as Risk Factors

Inactivity and sleep problems have emerged as risk factors in regressions and mediation analyses of data on PTSD in youth during COVID. Surprisingly, however, these have appeared only in a few studies. In the Bangladesh study, the absence of exercise and limited recreational activity were risk factors for high scores on the IES [2]. In the study on students from six universities in China, sleep duration was a mediator of the relationship between fear of COVID infection and the prevalence of PTSD [1]. And in the study on 7-to-18-year-old children in China, the severity of sleep problems was associated not only with anxiety, depression and PTSD in the youth but also with the parents' depression and PTSD [5]. And, in the study on high school students in China, the incidence of daytime sleepiness (20%) was associated with PTSD symptoms which was moderated by problematic smart phone use [4]. In middle-school students in China (N= 631), PTSD led to boredom which was mediated by dependence on the mobile phone [22].

Methodological Limitations of this Literature

The small number of studies on PTSS/PTSD was surprising. Although, PTSD has often been studied following not during traumatic events, as in hurricanes and earthquakes. But with this pandemic ongoing, it may be that PTSD may become more prevalent as the pandemic continues and the research on PTSD may become more prevalent as researchers expect to find a greater prevalence of PTSS or PTSD in youth.

The similar prevalence of PTSD and its associated anxiety and depression within individual studies highlights the comorbidity of these negative mood states in youth during COVID-19. Comorbidity of these emotions would be expected, although it's difficult to determine the directionality of these or whether they have co-occurred from their onset. Pre-existing depression and anxiety may predispose individuals to PTSD. The comorbidity of these mood states suggests more sophisticated forms of analyses such as latent profile analysis that would determine the relative levels of these as was used in at least one study [23]. And the profiles of PTSS/PTSD itself as in mild, moderate or severe would be useful for determining the level of need for intervention [24].

Despite the similar prevalence of these emotions within studies, variability has appeared on virtually every other aspect of this literature including variability across cultures and even within

countries as was noted for China. The variability appears to derive not only from different cultural norms but also from the different age groups that were being surveyed within studies and across studies, suggesting a lack of generalizability across age groups.

Variability in findings also relates to the timing of the study including whether sampling was conducted during a lockdown or during a non-lockdown period. Further, researchers used a variety of different measures to assess PTSD and the related anxiety and depression problems. Some of these were novel scales that were lacking reported psychometric properties [25]. And, except for one longitudinal study, the studies were cross-sectional which have been limited by not having baseline data to determine the relative increase in PTSD in youth that has related specifically to the pandemic.

The variety of predictors/risk factors may relate to researchers' unique interests or differences in cultural values. For example, a study from Japan focused on premenstrual symptoms that was the primary risk factor for PTSS [26]. Pre-existing conditions were rarely considered with only one study addressing PTSD in parents as a predictor variable. And, surprisingly, only one study focused on youth who had actually been infected with COVID-19 and would be expected to have a greater prevalence of PTSS/PTSD [27]. Potential underlying mechanisms or biomarkers that have been frequently explored in pre-COVID studies, e.g. cortisol, were not assessed inasmuch as the data sources for these studies were typically surveys.

The variability on so many factors limited the ability to conduct meta-analyses for more valid, reliable conclusions to be made about these data. Nonetheless, some general conclusions were made by authors of these papers, highlighting the risk factors and the related negative mood states experienced by youth during COVID-19. Although further research is needed to address these questions, the already existing data will likely inform future research and potential interventions for reducing PTSS/PTSD in youth during pandemics.

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