



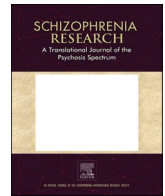
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Letter to the Editor

Worsening of psychotic experiences in college students during the COVID-19 pandemic

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To the Editors,

It has been well-established that traumatic experiences and overall adversity can increase risk for developing psychiatric illnesses, including psychotic disorders (Varese et al., 2012). Potentially related to such risk, transient increases in day-to-day stress have been linked to increases in subclinical psychotic symptoms or “psychotic experiences” (PEs) (Myin-Germeys and van Os, 2007). Given this and the various forms of adversity and distress associated with the COVID-19 pandemic (Shah et al., 2021), an open question is whether there has been an increase in the incidence of psychotic symptoms during the pandemic. Supporting this possibility, a recent cross-sectional survey of ~16,000 college students found links between pandemic-related anxiety, financial distress, and COVID infection and the frequency of PEs (Oh et al., 2021a, 2021b). To further investigate this question, we tested the prediction that the pandemic has been associated with an increase in PEs within college students who were assessed both before and during the pandemic.

College-age adults currently enrolled in one of three undergraduate institutions in the Boston area completed online self-report assessments of symptoms and other variables (Burke et al., 2020; DeTore et al., 2022) at three time points: before the pandemic, in October 2019 (T1), and during the pandemic, in July 2020 (T2) and February 2021 (T3). PEs and the distress, preoccupation and conviction associated with them (Peters et al., 2004), along with social and academic/employment functioning, were assessed at all three time points, as well as potential predictors of these outcomes (Supplementary Table 1). All significantly correlated pre-pandemic factors were entered stepwise into multiple linear regressions to assess potential predictors of changes in PEs.

448 Boston area college students (mean age 19.07; 62 % female; 54 % Caucasian; 84.8 % non-Hispanic) completed the T1 assessment; 303 of those completed the T2 assessment and 170 completed the T3 assessment. There were no significant demographic differences among the three samples.

Significant T1 to T2 increases in the levels of distress ($t(228) = -9.453, p < .001$), preoccupation ($t(228) = -9.983, p < .001$), and conviction ($t(228) = -12.053, p < .001$) associated with PEs were found, whereas the total number of PEs did not change ($t(228) = -0.350, p = .728$) (Fig. 1). Multiple regressions revealed that, of

potential predictors, the level of lifetime substance use significantly predicted worsening of PE-related distress ($\beta = 0.199, p = .015$), pre-occupation ($\beta = 0.289, p < .001$), and conviction ($\beta = 0.317, p < .001$) from T1 to T2. Also, the level of childhood emotional abuse ($\beta = 0.194, p = .018$) was a significant predictor of worsening PE-related distress ($\beta = 0.194, p = .018$) and preoccupation ($\beta = 0.178, p = .026$) from T1 to T2.

From July 2020 (T2) to February 2021 (T3), PE-related distress ($t(165) = 2.024, p = .045$) and at a trend level, PE-related conviction ($t(165) = 1.784, p = .076$), decreased slightly, whereas PE-related pre-occupation remained elevated ($t(165) = 1.502, p = .135$).

However, overall, in February 2021 (T3), PE-related distress ($t(168) = 5.524, p < .001$), preoccupation ($t(168) = -6.050, p < .001$), and conviction ($t(168) = -7.522, p < .001$) remained significantly elevated compared to the pre-pandemic baseline (T1). Moreover, these elevations in PE-related distress, preoccupation, and conviction (T1 to T3) were each significantly associated with lower levels of both social ($r = -0.290$ to -0.329 , all $ps < .001$) and academic/employment functioning ($r = -0.208$ to $-0.260, p = .001$ to 0.007) at T3 (Supplementary Table 2).

These findings suggest that the COVID-19 pandemic was associated with a significant increase in levels of distress, preoccupation, and conviction associated with PEs, but not in the number of PEs, in a cohort of young adults enrolled in college. Prior research has shown that higher levels of distress associated with PEs are linked with an increased risk for developing a psychotic disorder (Hanssen et al., 2005). Thus, the pandemic may represent an environmental stressor that could contribute to overall levels of risk for developing clinical psychosis or another serious mental illness.

In addition, childhood emotional abuse and lifetime frequency of substance use, both established risk factors for developing psychosis (Read et al., 2005; Rognli et al., 2017), significantly predicted worsening of PEs during the pandemic, suggesting that the stress associated with the pandemic may add to the risk associated with childhood trauma and substance abuse for the development of psychotic symptoms.

There was some symptomatic improvement from July 2020 to February 2021, possibly related to the introduction of the COVID-19 vaccination programs beginning in December 2020. However, despite this, levels of PE related distress, preoccupation, and conviction

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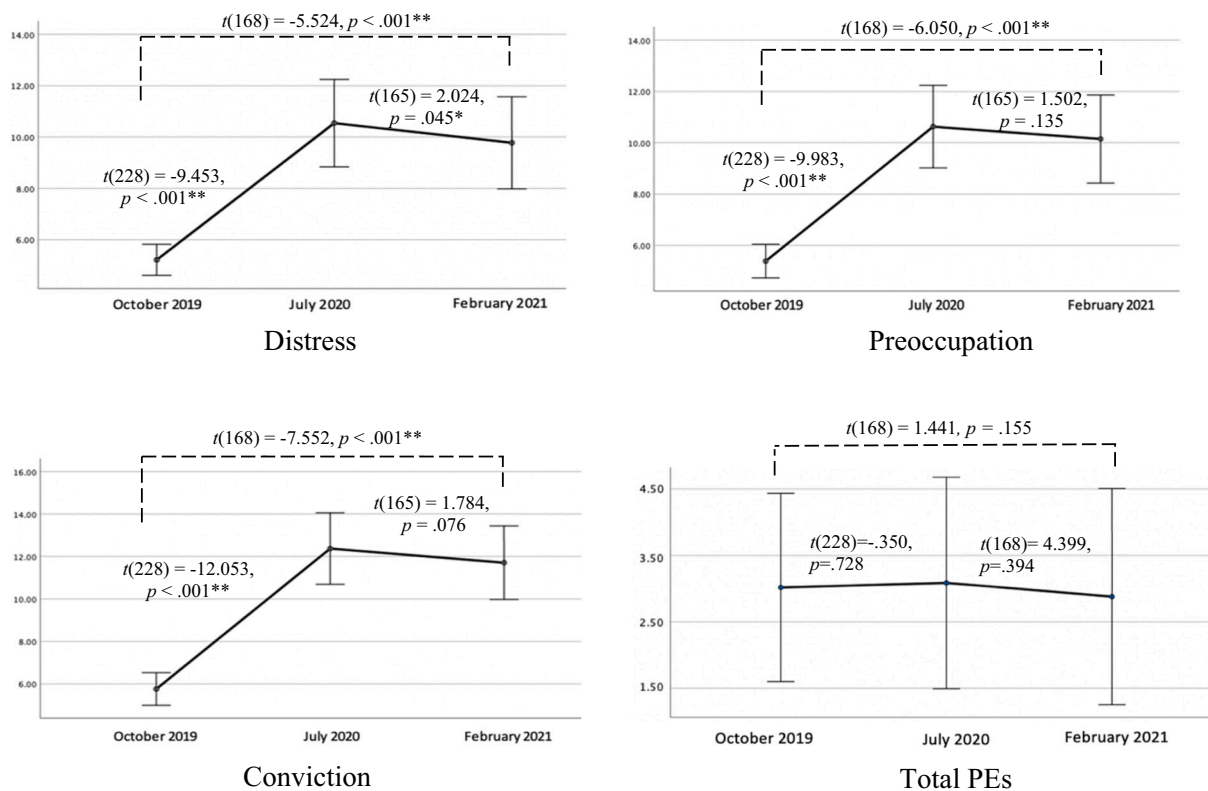


Fig. 1. Levels of distress, preoccupation, and conviction associated with psychotic experiences across all three time points. Note: * $p < .05$; ** $p < .001$.

remained significantly elevated compared to pre-pandemic levels, suggesting that the detrimental psychological effects of the pandemic may persist for some, even as the risk of becoming infected with the COVID-19 virus diminishes. Importantly, the persistence of these symptoms was correlated with lower levels of social and academic/employment functioning, both of which are known predictors of clinical psychosis (Granö et al., 2011). Thus, one testable prediction emerging from these findings is that the incidence of clinical psychosis increases in the coming months. Alternatively, this worsening of these symptoms in the context of the peak of the pandemic in the U.S. may resolve as the stress associated with this crisis diminishes.

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CRediT authorship contribution statement

Zimmerman conducted all analyses. Zimmerman, DeTore and Holt drafted the manuscript. All authors contributed to study design and execution and approved the final draft of the manuscript.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.schres.2022.06.020>.

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