Concerns about the social climate, finances, and COVID-19 risk on depression and anxiety: An analysis on U.S. young adults across two waves

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ABSTRACT

Concerns regarding contracting COVID-19 and finances may be risks to mental health during the COVID-19 pandemic. Social climate concerns may be another risk, given U.S. protests taking place during this period. We tested the hypothesis that concerns about COVID-19 risk, finances, and social climate would predict clinically significant levels of depression, anxiety, and comorbid depression and anxiety in young adults. A total of 782 U.S. young adults (18–30 years), initially recruited through convenience sampling (social media, email listservs), completed online surveys at Wave 1 (April–August 2020) and Wave 2 (September 2020–March 2021). The primary outcomes included scoring above the cut off for depressive (PHQ-8 $\geq$ 10) or anxiety symptoms (GAD $\geq$10). Approximately 41% reported depression and 47% reported anxiety at Wave 1; rates did not differ at Wave 2. Individuals with greater financial concerns were 14% more likely to score high on depressive symptoms; those with COVID-19 risk concerns and social climate concerns were 21% and 54% more likely, respectively, to score high on generalized anxiety. Those with social climate and financial concerns were 52% and 15% more likely, respectively, to score high on comorbid depressive and anxiety symptoms. Analyses controlled for Wave 1 symptoms. We provide evidence highlighting the roles of social climate and COVID-19 risk concerns on anxiety, and financial concerns on depression in young adults. Public health campaigns should acknowledge broader societal issues that have taken place as a source of mental health distress, beyond those driven by the pandemic (e.g., isolation and lockdowns).

1. Introduction

The COVID-19 pandemic has led to widespread mental health concerns across various segments of the population. U.S. young adults have shown the highest rates of depression and anxiety throughout 2020. According to the ongoing Household Pulse Survey conducted from April 23, 2020 by the Centers for Disease Control and Prevention (CDC; National Center for Health Statistics, 2021), an average of 51.7% of young adults aged 18–29 years experienced symptoms of depressive or anxiety disorder. The prevalence of symptoms is strikingly high when compared to that of other age groups within the same timeframe; for instance, 43.7% of adults aged 30–39 years and 40.7% of adults aged 40–49 years indicated high depressive or anxiety symptoms. Daly et al. (2021) discovered a marked increase of 13.4% in depressive symptoms among young adults from 2017-2018 to April 2020, with this increase statistically larger than the increase for other age groups. While these relatively high rates may be attributable to a pre-existing high prevalence of mental health problems among this age group with a rate of 21% for depression (Villarroel and Terlizzi, 2020) and 19.5% for anxiety in 2019 (Terlizzi and Villarroel, 2020), an escalating concern is the extent to which the COVID-19 pandemic might exacerbate these mental health concerns (Daly et al., 2021; Gruber et al., 2021; Holmes et al., 2020; Lee et al., 2020; Liu et al., 2020; Twenge and Joiner, 2020a).

The risk of contracting COVID-19 itself may account for increased mental health symptoms. Such risks have been an ongoing concern throughout the pandemic and one's attention to an immediate threat is a distinctive feature of anxiety. Perceived likelihood of contracting COVID-19 has been significantly associated with higher levels of anxiety for individuals under 50 years and younger (Wilson et al., 2021). In a study of parents, depression and anxiety levels were elevated among those expressing COVID-19 related health worries such as concerns about self or families or friends contracting COVID-19 (Liu et al., 2021).

However, young adults are less likely to contract more severe forms of COVID-19 (Brodin, 2020; Cunningham et al., 2021; Liao et al., 2020); thus, it is unclear the extent to which concern about health impacts lead to greater depression or anxiety in this group.

The disruption of school, work, and plans as a result of the lockdowns can result in financial consequences that further contribute to mental health concerns; therefore, financial concerns may be particularly salient in studying the mental health of young adults. Unemployment rates for young workers aged 16–24 years have almost triple-folded from 8.4% to 24.4%, with increases observed from 2.8% to 11.3% for those aged 25+ years during the beginning of the pandemic (Gould and Kassa, 2020). The uncertainty and worry brought by COVID-19-induced unemployment are linked to increased psychological distress (Achdut and Refaeli, 2020) such as feelings of hopelessness or depression; such associations between unemployment and mental health is consistent with pre-pandemic studies (Reneflot and Evensen, 2014; Taht et al., 2019). A growing concern is the chronic nature of financial concerns on young adult mental health. To illustrate, young adults are overrepresented in occupations most impacted by the pandemic (e.g., service industry) (Gould and Kassa, 2020). The length of time it will take for the job market to return to pre-coronavirus recession levels suggests that financial concerns may endure beyond the resolution of the pandemic (Kwong et al., 2020). Altogether, the stresses related to social isolation, health, and economic concerns are believed to contribute to increases in mental health problems (Twenge and Joiner, 2020a). These concerns are particularly relevant to the young adult population as they transition to establishing a career, finding intimacy, and achieving autonomy, which includes developing financial security.

An additional source of stress and risk to U.S. young adult mental health may be the social climate. The killing of George Floyd by Minneapolis police officers on May 25, 2020 set off several weeks of protests against racism and police violence within the U.S. and across the world, which coincided with the COVID-19 pandemic. Notably, the protests were composed of many young adults. In the American Psychological Association (APA) survey "Stress in America™ 2020" which included adults over the age of 18 years, 59% of those surveyed, regardless of race, indicated that concerns about police violence towards minorities was a major stressor (American Psychological Association, 2020). Exposures to social unrest in other countries before and during the pandemic, particularly those that have taken place in Hong Kong, have been linked to elevated depression and anxiety (Fine et al., 2020; Hou et al., 2021; Ni et al., 2020a, 2020b; Wong et al., 2021). Concerns about social impact may be a significant stressor that negatively impacts mental health, as it may represent a sense of hopelessness or uncertainty regarding the future of society beyond the impact and implications of the pandemic itself.

While studies to date have considered the role of pandemic-based stressors such as health and economic concerns on mental health, and despite documented links between social unrest and mental health, to our knowledge, there are no empirical studies that consider the role of the social climate on U.S. young adult mental health during the pandemic. Through our longitudinal assessment of depressive and anxiety symptoms among young adults from spring/summer of 2020 (Wave 1) to fall/winter of 2020 and early 2021 (Wave 2), we tested the hypothesis that concerns pertaining to COVID-19 risk, social climate, and finances would be associated with clinically relevant depressive and anxiety symptoms at Wave 2, while accounting for depressive and anxiety symptoms at Wave 1 (i.e., those scoring above the clinical cut off) in the fall/winter 2020 and early 2021.

2. Methods

2.1. Study population

The present longitudinal study assessed potential risk factors for depression and anxiety outcomes based on the COVID-19 Adult Resilience Experiences Study (CARES) 2020 data obtained from Wave 1 data collection conducted from April 13, 2020 to August 31, 2020, and Wave 2 data collection conducted from September 21, 2020 to March 15, 2021. Participants were recruited to participate in Wave 1 of the study through email list serves, social media, and word-of-mouth. Young adult participants who agreed to be recontacted in the CARES Wave 1 survey were invited via email to complete the Wave 2 survey, a 30-minute online Qualtrics survey inquiring about COVID-19-related experiences, risk and resilience, and physical and mental health outcomes. Initial invitation of the second survey was sent 5.5 months after the participant completed the Wave 1 survey. Attention checks were implemented three times in the survey to ensure data quality. Upon completion of the survey, participants were compensated with $10 Amazon gift cards. A total of 782 participants had Wave 2 data with the available variables for this present analysis. Based on t-tests and chi-square analyses, those lost to attrition from Wave 1 and Wave 2 were more likely to be younger (on average 23.7 years versus 24.3 years of age at Wave 1, $p < .01$), those identifying as male (15.6% of the overall sample at Wave 1 versus 11.1% at Wave 2, $p < .05$); and those who had a pre-existing mental health diagnosis (49.5% of the overall sample at Wave 1 versus 41.3% of Wave 2). Those who were lost to attrition at Wave 2 did not differ on race and their clinically significant levels of anxiety and depression compared to those who completed the Wave 2 survey.

All procedures were approved by the Institutional Review Board at Boston University.

2.2. Measures

2.2.1. Covariates

Age. Participants were asked to provide their date of birth in both the CARES Wave 1 and Wave 2 survey. Age of the participant was then calculated by subtracting the date of birth from the Wave 2 survey completion date.

Gender. Gender identity of the participants were inquired in the CARES Wave 1 survey. Options included "*Woman,*" "*Man,*" "*Trans woman,*" "*Trans man,*" and "*Other,*" followed by an open field. Options other than "*Woman*" and "*Man*" were collapsed into "*Other*" for analyses.

Race. Participants indicated their race and ethnicity in the CARES Wave 1 survey with options including "*Asian or Asian American,*" "*Black or African American,*" "*Hispanic or Latinx,*" "*White or Caucasian; not Hispanic,*" "*American Indian/Native American,*" "*Mixed,*" and "*Other.*" The variable was recoded into three categories "*White,*" "*Asian,*" and "*Other*" for analyses.

Family income. Participants were asked to provide their parents' total annual income in the CARES Wave 2 survey. Responses were collapsed into three levels: " < *$75,000,*" "*$75,000 - $124,*999," and "≥ *$125,000.*"

Student status. Participants were asked to disclose whether they were affiliated with schools as students in the CARES Wave 1 survey and to provide an update of their student status if they graduated when completing the CARES Wave 2 survey.

Pre-existing mental health diagnosis. Participants indicated whether they had ever received mental health diagnoses prior to the COVID-19 pandemic in the CARES Wave 1 survey. Participants could select from options such as *"No"*; *"Suspected, but not diagnosed"*; *"Yes, diagnosed but not treated"*; or *"Yes, diagnosed and treated"* for each condition. Responses were collapsed into "*No*" and "*Yes*" for analyses.

2.2.2. Predictors

Concern about COVID-19 risk. Participants' reported risk of contracting COVID-19 was assessed. Participants indicated the extent to which they agreed with the following statement, "I am highly likely to contract COVID-19 during this pandemic," on a scale of 1–5, with 1 = *strongly disagree* and 5 = *strongly agree.*

Concern about the social climate. The question regarding how the

current social climate (e.g., racial, societal, and political current events) has affected participants' well-being was included. Responses options were from 1 = *not at all* to 5 = *to a very great extent.*

Concern about finances. Lastly, two questions related to financial stress were used to measure participants' financial stress. Questions include "I feel stressed about my personal finances in general," and "I worry about being able to pay monthly expenses." Participants were asked to rate using a four-point Likert-type scale with 1 = *strongly disagree* to 4 = *strongly agree*. Two items were summed to create the total score.

2.2.3. Outcomes

Depression. Current depressive symptoms were assessed in both Wave 1 and Wave 2 surveys using the 8-item Patient Health Questionnaire (PHQ-8; Kroenke et al., 2009). Participants rated their frequency of depressive symptoms in the past two weeks on a scale of 0–3, with 0 = "*not at all*" and 3 = "*nearly every day.*" Possible sum score outcomes range from 0 to 24. Using a cut off score of 10 or higher (Wu et al., 2019), scores above the cut off indicate clinically significant depressive symptoms. Cronbach's alpha was .87 indicating good reliability.

Anxiety. The General Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) was administered in both Wave 1 and 2 surveys to assess the current anxiety symptoms of the participants. This widely used measure asked for the frequency of seven anxiety symptoms in the past two weeks using a 4-point scale, with 0 = "*not at all*" and 3 = "*nearly every day.*" Possible total score ranges from 0 to 21. A clinically significant anxiety variable was created using a cut off score of 10 or higher (Plummer et al., 2016). Cronbach's alpha was .90 indicating good reliability.

2.3. Statistical analyses

We generated descriptive characteristics (means and proportions) for participants who completed both T_1 (Wave 1) and T_2 (Wave 2) surveys. The McNemar test for paired comparisons was used to determine whether the proportion of clinically significant levels of depressive and anxiety symptoms at T_2 was different from those reported at T_1. Next, a series of logistic regression analyses were performed to identify predictors of clinically significant levels of depressive and anxiety symptoms at T_2. Three areas of concerns were tested as predictors: COVID-19 risk (i.e., contracting COVID-19), finances (i.e., general personal finances stress and stress about paying monthly expenses), and social climate (i.e., racial, societal and political current events) were included as key predictors. We first conducted two unadjusted models to examine the effects of these three predictors on depression and anxiety, followed by two adjusted models which included the following covariates: participants age at T_2, gender at T_1, race at T_1, family income at T_2, student status at T_2, pre-existing diagnosis at T_1, and participants' depressive and anxiety symptoms at T_1. Given the comorbid nature of depression and anxiety, we considered the effect of these predictors on profiles based on such comorbidity. As such, we conducted a multinomial logistic regression model to examine the effects of predictors on participants with high depression/low anxiety, low depression/high anxiety, and high depression/high anxiety relative to those with low depression/low anxiety. Statistical significance was set at $p < .05$. SPSS 28.0 was used for all analyses.

3. Results

Table 1 shows the descriptive data on our participants' demographic characteristics at T_1 and T_2. Table 2 presents proportions and mean scores for key variables at T_1 and T_2. Among our sample, 40.7% had clinically significant levels of depressive symptoms at T_1 compared with 41.4% at T_2, and 44.1% had clinically significant levels of anxiety symptoms at T_1 compared to 47.2% at T_2. McNemar tests demonstrated no statistically significant differences in these rates ($p > .05$).

Table 3 provides unadjusted and adjusted models from the logistic

Table 1
Key demographic characteristics of respondents with data from Wave 1 and 2 of CARES 2020 (N = 782).

Variables	Means ± SD or % (n)
Age at T_2 (years)	24.76 ± 3.29
Gender	
Men	11.1 (87)
Women	85.0 (665)
Other	3.8 (30)
Race	
White	61.4 (480)
Asian	21.7 (170)
Other	16.9 (132)
Family income at T_2	
< $75,000	27.9 (218)
$75,000 – $124,999	28.0 (219)
≥$125,000	44.1 (345)
Student status at T_2	
No	44.4 (347)
Yes	55.6 (435)

Table 2
Key variable characteristics from Wave 1 and 2 of CARES 2020 (N = 782).

	Wave 1	Wave 2
Variables	Means ± SD or % (n)	
Pre-existing diagnosis		
No	58.7 (459)	–
Yes	41.3 (323)	–
Depression (PHQ-8)		
≥10	40.7 (318)	41.4 (324)
Anxiety (GAD-7)		
≥10	44.1 (345)	47.2 (369)
Concerns about COVID-19 risk	–	2.63 ± 0.98
Concerns about finances	–	5.08 ± 1.76
Concerns about social climate	–	3.48 ± 0.98

McNemar tests yielded no difference in Wave 1 and Wave 2 proportions of clinically significant levels of depressive and anxiety symptoms.

regression analysis to determine the effect of sources of stress (COVID-19 risk, financial stress, and social climate concerns) as predictors on participants' depression and anxiety at T_2. Here, we describe only the adjusted model. As expected, young adults who reported clinically significant levels of depression at T_1 were more likely to be in the clinically significant levels of depression range at T_2 (OR = 5.53, CI = 3.74–8.16, $p < .001$). Anxiety at T_1 was also a significant predictor of clinically significant levels of depression at T_2. (OR = 2.42, CI = 1.68–3.76, $p < .001$). Concerns regarding finances at T_2 were associated with clinically significant levels of depression at T_2 (OR = 1.14, CI = 1.02–1.28, $p < .05$). Concerns about COVID-19 risk and social climate did not significantly predict young adults' clinically significant levels of depression at T_2.

In the adjusted model, young adults with pre-existing mental health diagnoses were more likely to score in the clinically significant anxiety range at T_2 (OR = 1.58, CI = 1.09–2.30, $p < .01$). Also, as expected, young adults who reported clinically significant levels of depression at T_1 were more likely to be in the clinically significant levels of depression and anxiety at T_2. Anxiety at T_1 was also a significant predictor of clinically significant levels of depression and anxiety at T_2. Young adults with COVID-19 risk concern were more likely to score in the clinically significant anxiety range (OR = 1.21, CI = 1.01–1.46, $p < .05$). Concerns about finances were not significantly associated with clinically significant levels of anxiety but clinically significant levels of depressive symptoms (OR = 1.14, CI = 1.02 - 1.28). Finally, those reporting concern about the social climate were more likely to have clinically significant levels of anxiety (OR = 1.54, CI = 1.26-1.88, $p < .001$).

Table 4 displays the proportion of individuals based on depression and anxiety comorbid profiles at T_2. While 44.5% of the participants scored low for both depression and anxiety, 33.1% of the participants

Table 3

Unadjusted and adjusted logistic regression displaying odds ratios (OR) and confidence intervals (CI) for depression and anxiety at Wave 2 (N = 782).

Variables	Depression at T_2 Unadjusted OR (95% CI)	Depression at T_2 Adjusted OR[d] (95% CI)	Anxiety at T_2 Unadjusted OR (95% CI)	Anxiety at T_2 Adjusted OR[d] (95% CI)
Age at T_2	–	0.96 (0.90–1.02)	–	0.99 (0.93–1.06)
Gender				
Men	–	1.0	–	1.0
Women	–	1.01 (0.55–1.84)	–	0.97 (0.54–1.71)
Other	–	1.40 (0.49–4.00)	–	2.24 (0.74–6.78)
Race				
White	–	1.0	–	1.0
Asian	–	1.34 (0.85–2.12)	–	1.13 (0.72–1.76)
Other	–	1.27 (0.77–2.09)	–	0.72 (0.44–1.18)
Family income at T_2				
< $75,000	–	1.0	–	1.0
$75,000 – $124,999	–	0.70 (0.43–1.12)	–	1.13 (0.70–1.82)
≥$125,000	–	1.16 (0.74–1.81)	–	1.06 (0.68–1.66)
Student status at T_2				
No	–	1.0	–	1.0
Yes	–	1.06 (0.73–1.55)	–	1.22 (0.84–1.77)
Pre-existing diagnosis at T_1				
No	–	1.0	–	1.0
Yes	–	1.34 (0.92–1.96)	–	1.58[b] (1.09–2.30)
Depression at T_1 (PHQ-8)				
Low <10	–	1.0	–	1.0
High ≥10	–	5.53[c] (3.74–8.16)	–	2.55[c] (1.71–3.81)
Anxiety at T_1 (GAD-7)				
Low <10	–	1.0	–	1.0
High ≥10	–	2.42[c] (1.68–3.76)	–	4.44[c] (3.00–6.57)
Concerns about COVID-19 risk	1.13 (0.97–1.32)	1.11 (0.93–1.34)	1.24[b] (1.06–1.46)	1.21[a] (1.01–1.46)
Concerns about finances	1.30[c] (1.18–1.42)	1.14[a] (1.02–1.28)	1.24[c] (1.13–1.36)	1.07 (0.96–1.20)
Concerns about social climate	1.43[c] (1.21–1.68)	1.18 (0.96–1.44)	1.82[c] (1.54–2.16)	1.54[c] (1.26–1.88)

Nagelkerke R square: 0.13 (unadjusted depression at T2), 0.40 (adjusted depression at T2), 0.18 (unadjusted anxiety at T2) and 0.42 (adjusted anxiety at T2).

[a] $p < .05$.
[b] $p < .01$.
[c] $p < .001$
[d] Adjusted covariates include age, gender, race, family income, student status, pre-existing mental health diagnosis, depressive and anxiety symptoms at T_1.

Table 4

Proportions scoring at clinically significant levels of GAD-7 and PHQ-8 at Wave 2.

PHQ-8	GAD-7	
	<10	≥10
<10	348 (44.5%)	110 (14.1%)
≥10	65 (8.3%)	259 (33.1%)

McNemar test demonstrated differences in rates at $p < .001$.

Table 5

Adjusted multinomial model displaying odds ratios and confidence intervals (CI) relative to those with Low Depression and Low Anxiety at Wave 2 (N = 782).

Variables	High Depression/ Low Anxiety at T_2 (95% CI)	Low Depression/ High Anxiety at T_2 (95% CI)	High Depression/ High Anxiety at T_2 (95% CI)
Age at T_2	0.93 (0.84–1.02)	1.00 (0.93–1.08)	0.97 (0.90–1.04)
Gender			
Men	1.0	1.0	1.0
Women	0.85 (0.15–4.69)	0.41 (0.12–1.45)	0.92 (0.51–1.66)
Other	0.86 (0.13–5.73)	0.45 (0.10–1.90)	2.13 (0.71–6.42)
Race			
White	1.0	1.0	1.0
Asian	1.71 (0.83–3.53)	0.67 (0.33–1.36)	1.17 (0.75–1.83)
Other	1.57 (0.77–3.18)	1.10 (0.60–2.00)	0.74 (0.45–1.21)
Family income at T_2			
< $75,000	1.0	1.0	1.0
$75,000 – $124,999	1.10 (0.55–2.22)	0.98 (0.53–1.83)	1.13 (0.70–1.82)
≥ $125,000	0.87 (0.41–1.87)	1.64 (0.88–3.05)	1.06 (0.68–1.65)
Student status at T_2			
No	1.0	1.0	1.0
Yes	0.76 (0.41–1.39)	1.02 (0.63–1.67)	1.21 (0.83–1.75)
Pre-existing diagnosis at T_1			
No	1.0	1.0	1.0
Yes	2.00[b] (1.08–3.69)	2.15[b] (1.30–3.53)	1.61[b] (1.11–2.33)
Depression at T_1 (PHQ-8)			
Low <10	1.0	1.0	1.0
High ≥10	4.26[c] (2.20–8.24)	1.18 (0.66–2.11)	2.37[c] (1.57–3.58)
Anxiety at T_1 (GAD-7)			
Low <10	1.0	1.0	1.0
High ≥10	1.31 (0.67–2.59)	3.62[b] (2.09–6.26)	4.28[c] (2.89–6.34)
Concerns about COVID-19 risk	1.10 (0.82–1.47)	1.23 (0.96–1.58)	1.25 (1.00–1.56)
Concerns about finances	1.20[a] (1.00–1.44)	1.07 (0.92–1.24)	1.15[a] (1.00–1.31)
Concerns about social climate	0.95 (0.70–1.30)	1.49[b] (1.14–1.94)	1.52[c] (1.20–1.95)

Nagelkerke R square: 0.46.
Covariates include age, gender, race, family income, student status, pre-existing mental health diagnosis, depressive and anxiety symptoms at T_1.

[a] $p < .05$.
[b] $p < .01$.
[c] $p < .001$

scored high for both depression and anxiety.

Table 5 displays the results from the multinomial logistic regression model which tested the association between the three predictors of interest and comorbid profiles (high depression/low anxiety, low depression/high anxiety, and high depression/high anxiety) relative to those with those with the low depression/low anxiety profile at Wave 2. Concern about finances was associated only with profiles that had high depression (high depression/low anxiety: OR = 1.20, $p < .05$; high

depression/high anxiety: OR = 1.15, $p < .05$), and concern about the social climate was associated only with profiles that had high anxiety (low depression/high anxiety: OR = 1.49, $p < .01$; high depression/high anxiety: OR = 1.52, $p < .001$). In contrast, no statistically significant associations between COVID-19 risk and any profile was observed.

4. Discussion

Through our two waves of data collected between 2020 and 2021, we first examined the difference in depression and anxiety rates across

time. The rates of clinically significant depression and generalized anxiety at both time points (40.7–41.4% for depression, 44.1–47.2% for generalized anxiety) are consistent with rates obtained from population level data (National Center for Health Statistics, 2021), which altogether highlight high levels of mental health problems faced by U.S. young adults. While some suggest that there may be a lessening of anxiety symptoms and possibly an increase in depressive symptoms over time (Twenge and Joiner, 2020b), such change in rates were not observed in our data.

Next, our study sought to determine whether one's concerns regarding COVID-19 risk, finances, and the social climate contribute to clinically significant levels of depression and generalized anxiety (Wave 2: September 2020–March 2021) after accounting for the depressive and anxiety symptoms reported in the earlier phase of the pandemic (Wave 1: April–August 2020). This question was predicated by concerns pertaining to contracting COVID-19 and finances, and the fact that the pandemic period within the U.S. coincided with one of largest social protests related to racism in recent U.S. history.

Our hypotheses regarding the association between the areas of concern and depressive and anxiety symptoms were partially confirmed as they appeared to have a differential effect on outcomes. Notably, our analyses demonstrate the role of the U.S. social climate in its unique contribution to anxiety in young adults. Those who endorse the social climate as a concern for their well-being were 54% more likely to score in the clinically significant range for anxiety and 52% more likely to be associated with those comorbid with high levels of depressive and anxiety symptoms. Our analyses suggest that such concerns may lead to greater vulnerability for those with high anxiety as well as high depressive symptoms. This link is consistent with prior research documenting links between social unrest and mental health problems (Fine et al., 2020; Hou et al., 2021; Ni et al., 2020a, 2020b; Wong et al., 2021). The witnessing of the events that represent the U.S. social climate from 2020 to 2021 may confer symptoms of anxiety, posing as threats to one's sense of stability or physical or emotional safety or reminders of traumatic experiences. The problems regarding the social climate may also feel out of one's control and thus lead to uncertainty. To date, most of the literature on mental health has focused on pandemic-specific stressors. However, based on our data, researchers would be remiss for not evaluating the effects of these circumstances during the pandemic on mental health.

The results indicate that concerns about finances may be a driver of depression in young adults, as those reporting financial concerns were 14% more likely to score in the clinically significant range for depressive symptoms. Published work has shown economic disruption from the pandemic to be associated with internalizing symptoms in 22 year-old young adults (Shanahan et al., 2020) and with both depressive and anxiety symptoms in a general U.S. population (Ettman et al., 2021). Our findings are also consistent with a study by Kujawa et al. (2020) which showed financial strain to predict depressive symptoms in May 2020 among U.S. 18-25-year olds; however, in contrast to these results, we did not observe a link with anxiety (Kujawa et al., 2020). Given that we assessed financial concerns at Wave 2 of data collection, it is possible that those who report financial concerns reflect a sense of hopelessness given the length of the pandemic, rather than feeling a sense of threat consistent with anxiety symptoms.

Assumptions have been made about the lack of concerns among young adults regarding the direct effects of the virus on their health. In our data, those who expressed COVID-19 risk concerns were 21% more likely to score in the clinically significant range for anxiety symptoms. While such concerns about contracting COVID-19 have been associated with greater anxiety (Bakioğlu et al., 2020; Bergman et al., 2020; Liu et al., 2021; Wilson et al., 2021), this relationship has not been consistently observed across studies (Kujawa et al., 2020; Palgi et al., 2020; Shanahan et al., 2020). Our data does suggest that among young adults, those who express such concerns may be greater at risk for elevated anxiety only, not elevated comorbid depressive and anxiety symptoms.

The covariates in our analyses, specifically pre-existing mental health diagnoses and depressive and anxiety symptoms at Wave 1, warrant comment as they yield meaningful information regarding their effects on mental health. Those who scored in the clinically significant range for depression and generalized anxiety in the earlier phase of the pandemic (April–August 2020) were more likely to also score in the clinically significant range for depression and anxiety in the subsequent phase of the pandemic (September 2020–March 2021). Specifically, individuals scoring in the clinically significant range for depressive symptoms in the earlier phase were more than five times likely to score in this range in Wave 2. This likelihood was also high for those with anxiety; individuals scoring in the clinically significant range for anxiety in the Wave 1 were more than four times likely to score above the threshold anxiety in Wave 2. Together, these results reflect the persistent nature of such symptoms over time (Fancourt et al., 2021; Li et al., 2021). We note that those who scored above the cut off for anxiety were also more than two times more likely to score above the threshold for depressive symptoms, and vice versa, thus demonstrating the comorbidity between depression and generalized anxiety (Moffitt et al., 2007; Preisig et al., 2001).

Our study includes the following limitations. First, a convenience sample was used and thus our study findings may not necessarily be generalizable to U.S. young adults. Second, the self-reported symptoms were used to determine depression and generalized anxiety which may be prone to recall bias; responses may also be affected by social desirability. As well, reported diagnoses of mental health were not confirmed by a trained clinician. While standardized measures were used when possible, we were limited in the number of items that could be included in the survey given concerns about participant burden. As such, we relied on one or two items to assess concerns related to COVID-19 risk, social climate, and financial concerns. We note that our assessment of financial concerns did not reference the pandemic, as such it is uncertain whether such concerns were specifically attributed to the pandemic. Furthermore, other events which took place prior to Wave 2 (e.g., the approval of vaccines in the US), were not assessed, although such current events could have affected mental health symptoms. Finally, we acknowledge that other experiences and perceptions that have taken place during the pandemic, such as worrying about the health of others, and not just one's own health (Grossman et al., 2021), the use of social media (Haddad et al., 2021) or negative perceptions of media (Levaot et al., 2022), the direct or indirect experiences of racial discrimination (Hahm et al., 2021a; 2021b) may play a role on one's mental health, or sleeping disorders. For college students, mandated relocation from campuses (Conrad et al., 2021) are among many other sources of peritraumatic distress (Grossman et al., 2021; Haddad et al., 2021; Hahm et al., 2021a, 2021b; Levaot et al., 2022) that pertain to young adults. Future research to understand the effects of these exposures should include standardized measures with additional items.

Numerous calls have been made to address the mental health crisis among young people with the pandemic being attributable as the source of the current problems. However, identifying the specific risks to mental health symptoms may be critical given the prolonged nature of the pandemic and the fact that mental health concerns predated the pandemic within this population. Our study provides new evidence that highlights the role of the social climate concerns on anxiety, while reinforcing the role of financial concerns on young adult depression, as well as these two factors on those comorbid with depression and anxiety.

Based on our findings, mental health interventions should not only attend to prior history of mental health experiences but also to individual concern about issues that have occurred throughout 2020 and 2021. A concern is that the financial repercussions from the pandemic could outlast the actual pandemic itself and providers should be aware of this in their work with patients. While providers may be perhaps more accustomed to inquiring about their patients' current financial situation, our findings suggest that they would be remiss if they did not inquire about patient experience of the social climate as well. Some patients may

not readily disclose such feelings to a provider as it may not feel like a personal issue to bring up in a therapeutic setting; it may not be disclosed given uncertainty about how it would be received by others, especially if it is racial or political in nature. Because it may also be difficult for one to cope when it comes to concerns about the social climate given the lack of control one has over societal issues, any anxiety that arises from this may be a viable target for intervention. At a broad level, public health campaigns aimed at addressing mental health should acknowledge broader societal issues that have taken place as a source of mental health distress, beyond those driven by the pandemic (e.g., isolation and lockdowns).

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Declaration of competing interest

There are no potential conflicts of interest for any author.

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