Regular Article

Mental health, loneliness and stress of Asian, Black and White UK university students before and during the COVID-19 pandemic

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A B S T R A C T

The COVID-19 pandemic has negatively impacted the mental health of UK university students. However, the knowledge on the impact on students from different ethnic groups is limited. We investigated mental health, loneliness, and perceived stress in 656 university students with an Asian, Black and White ethnic background across three cohorts, before (2019-2020), during (2020-2021), and at the end of the pandemic (2021-2022). Students at City, University of London completed an online study, including the Counseling Center Assessment of Psychological Symptoms, the UCLA loneliness scale, the perceived stress scale, and questions about COVID-19. Substance-use concerns were highest before the pandemic compared to during the pandemic. Academic distress and loneliness were higher during the pandemic than before. COVID-19 related anxiety was significantly related with poor mental health across groups. Students with an Asian or Black ethnic background had slightly lower reported mental health difficulties than White students, which appeared to be partly driven by lower substance-use concerns. However, students from an Asian or Black ethnic background reported being more financially impacted by the pandemic and reported more loneliness than White students. The findings reflect pandemic-related changes in student life, characterized by reduced socializing with fellow students and suggest that overall students adapted well to these changes in terms of their mental health.

1. Introduction

Students face unique pressures and challenges at university and are at an increased risk of developing mental health disorders, such as depression and anxiety, compared to the general population (Chelidoni et al., 2022; Farrer et al., 2016). Studies have found that levels of psychological distress increase upon entering university, where students face new academic, social, and financial pressures (Bewick et al., 2010). Approximately one in five students experiences a mental health disorder (Campbell et al., 2022). As a result, the mental wellbeing of university students has been an ongoing area of concern, a concern which has been further increased because of the COVID-19 pandemic (Weber et al., 2022).

Research has indicated a rising prevalence of mental health problems amongst university students, including anxiety, depression, and self-harm (Sivertsen et al., 2019). For example, over a thirteen-year period, the number of students experiencing depression doubled and the number of students with suicidal ideation tripled (Benton et al., 2003). At the same time there was an increase in student participation from ethnic minority groups and underprivileged backgrounds (Arday, 2018). These students may experience additional challenges at university and therefore may be more vulnerable to mental health problems

(Macaskill, 2013). Financial concerns as a result of higher tuition fees and living expenses, adjusting to living independently, and developing new social networks increase stress and exert negative effects on student mental health generally (Campbell et al., 2022). The COVID-19 pandemic exacerbated financial, social, and emotional pressure on students (Chen & Lucock, 2022). Data from the UK Office for National Statistics indicated that, after several lockdowns, university students in the UK reported higher anxiety scores than the general population, and more than half indicated that they experienced mental health deterioration during that period (Tinsley, 2020; Ypsilanti et al., 2021).

Similar findings come from other countries (Grubic et al., 2020; Hu et al., 2022). A longitudinal study which investigated the changes in mental health in German university students during the COVID-19 pandemic (Weber et al., 2022), showed that symptoms of depression and anxiety during the second lockdown in November 2020 more than doubled compared to pre-pandemic levels. The pattern persisted even when the lockdown was eased in July 2020. The findings are in line with the results of a survey from the National Union of Students which showed that for over half of UK students, their mental health worsened after the start of the pandemic (National Union of Students, 2020).

Importantly, some of the research findings related to COVID-19 and mental health were mixed. For example, Meda et al. (2021), found that

depression levels increased, but that anxiety levels did not. Conversely, Saraswathi et al. (2020), found increased levels of anxiety but no increase in depression among undergraduate students during the pandemic. Work by our group explored the relationship between the COVID-19 pandemic, loneliness, and schizotypy in UK students (Christensen et al., 2022) and found that symptoms of depression and loneliness were higher during the pandemic than before. A similar finding was reported by Weber et al. (2022) who showed that loneliness significantly increased during the pandemic and that loneliness was significantly associated with anxiety and depressive symptoms. Interestingly, reported stress levels did not differ during the pandemic, as compared to before. The results highlight the need for further research into the disparity of findings and possible subgroups of students.

Research showed that the effects of COVID-19 were more severe in ethnic minority groups (Proto & Quintana-Domeque, 2020). Even before the pandemic, poorer mental health in university students from non-White backgrounds has been reported (Campbell et al., 2022). Some evidence indicates that the risk of depression was 1.21 times greater for non-White students compared with White students (Honney et al., 2010). During the COVID-19 pandemic, students from ethnic minorities and low-income groups were likely to have experienced heightened stress and anxiety due to additional barriers accessing food, medication, and mental health treatment (Liu et al., 2022). Several studies from the UK showed that individuals from an Asian and Black ethnic background were more likely to die from COVID-19 than the White-British population. One study reported that mortality was two to three times higher in the Asian and Black population (Aldridge et al., 2020). Dewa et al. (2021) examined the mental health in individuals aged sixteen to twenty-four in the UK and found that young people identifying as being of Black/Black-British ethnicity had the highest increased odds of experiencing poor mental health since the first COVID-19 lockdown. Overall, students in this demographic may therefore have experienced higher stress and anxiety levels than the remaining student population during the pandemic (Bhatia, 2020). These findings highlight the importance of understanding the degree to which ethnic disparities among university students contribute to their stress levels and mental health.

For the UK, there is little research uniquely focused on the effect of COVID-19 on the mental health of university students from different ethnic groups. Therefore, the objective of this study was to investigate the degree to which COVID-19 affected mental health, loneliness, and perceived stress amongst university students, and specifically the possible differences in impact on students with a White ethnic background compared to students from an Asian or Black ethnic background. To accomplish this, we examined these factors in students across three cohorts: before (2019–2020), during (2020–2021) and at the end (2021–2022) of the COVID-19 pandemic. We compared different indices of mental health, measured with the Counseling Center Assessment of Psychological Symptoms instrument, the UCLA Loneliness Scale, and the Perceived Stress Scale between cohorts and by ethnicity group (i.e., White and Asian, Asian British or Black, African Carribean or Black British ethnic background). In line with earlier literature, we predicted increased reporting of mental health difficulties among university students over the course of the pandemic. In addition, we expected this effect to be more pronounced in students from an Asian, Asian British or Black, African Carribean or Black British ethnic background, as compared to White students.

2. Method

2.1. Sample

The sample consisted of 656 students from City, University of London (9.3% males, 90.3% females, and 0.4% others) aged 17–54 ($M = 19.66$, $SD = 3.38$). Of those, 37.8% identified as being of White and 62.1% identified as being of Asian or Asian British (53.0%) or Black,

African Caribbean or Black British (9.1%) ethnicity. The majority of the students were undergraduates (97.1% undergraduates, 2.9% postgraduates). Data for 222 participants (32.2%) was collected between November 2019 and January 2020, the period just before the first cases of COVID were identified in the UK, where lockdown restrictions came into force in March 2020. In this cohort, 88 (39.6%) students identified as White and 134 (60.4%) as Asian or Asian British (84.3%) or Black, African Caribbean or Black British (15.7%) ethnicity. Data for 225 participants (34.1%) was collected between November 2020 and January 2021, corresponding to the period of the 2nd national lockdown in the UK. In this cohort, 84 (37.3%) students identified as being of White and 141 (62.7%) as being of Asian or Asian British (65.8%) or Black, African Caribbean or Black British (14.2%) ethnicity. Data for the remaining 209 (33.7%) participants was collected between November 2021 and January 2022, when most COVID-related restrictions had been lifted (except for the requirement to wear face masks in certain areas). In this cohort, 76 (36.4%) students identified as being of White and 133 (63.6%) as being of Asian or Asian British (85.7%) or Black, African Caribbean or Black British (14.3%) ethnicity.

Participants were recruited through a university call conducted via email, campus news and social media. Questionnaires were presented online using the Qualtrics software. Participants were required to be above 17 years old and fluent in English. All participants gave informed consent prior to participation. This study was approved by the City University of London Psychology Ethics Committee.

2.2. Measures

2.2.1. Gender & ethnicity

Participants were asked to indicate their gender from the options 'Male,' 'Female' or 'Other.' Participants were asked to indicate their ethnic identity from the options 'Black, African Caribbean or Black British,' 'Asian or Asian British,' 'White,' 'Multiple ethnicity (please specify),' and 'Other (please specify).' For the purpose of this study, we included 'White' and 'Asian or Asian British' and 'Black, African Caribbean or Black British' students in two groups, hereafter referred to as 'White' and 'Asian or British'.

2.2.2. Mental Health

The Counseling Center Assessment of Psychological Symptoms (CCAPS-62) was used to measure mental health (Locke et al., 2011). The CCAPS-62 is a 62-item instrument with eight subscales related to psychological symptoms or distress in university students. The eight subscales are: (1) depression, (2) generalised anxiety, (3) social anxiety, (4) academic distress, (5) eating concerns, (6) family distress, (7) hostility, and (8) substance use. An overall index of mental health was computed as average of all subscales. The instrument includes items such as "I feel helpless" and "I am enthusiastic about life" for which participants responded on a 5-point Likert scale ranging from 0 (not at all like me) to 4 (extremely like me). Additionally, each subscale of the CCAPS-62 has interpretive Cut Points, used to facilitate interpretation. The CCAPS-62 showed excellent internal consistency in the current sample $\alpha = 0.93$. A meta-analysis demonstrated that the CCAPS-62 is a valid and useful measure of psychological symptoms in university and college counseling settings (McAleavey et al., 2012).

2.2.3. Loneliness

The UCLA Loneliness Scale Version 3 (Russell, 1996) is a 20-item scale designed to measure one's subjective feelings of loneliness and social isolation. Participants were asked to rate each item on a scale from 1 (Never) to 4 (Often). The UCLA Loneliness Scale showed excellent internal consistency in the current sample $\alpha = 0.90$. Russell (1996) illustrated the convergent and construct validity of this scale by demonstrating its significant correlations with other measures of loneliness, health, and well-being.

2.2.4. Perceived stress

The Perceived Stress Scale (PSS-10) (Cohen et al., 1983) is a 10-item questionnaire that evaluates the degree to which an individual has perceived life as unpredictable, uncontrollable, and overloading over the previous month. Participants were asked how often they felt a certain way on a five-point scale from 'never' to 'very often'. The PSS-10 showed good internal consistency in the current sample α = 0.84. The PSS-10 shows good construct, convergent, and concurrent validity (Lee, 2012; Liu et al., 2020).

2.2.5. COVID-19 related information

Additional COVID-19 related questions were assessed in the pandemic cohort (2021–2022). The questions assessed whether students had been infected with COVID-19, had been vaccinated against COVID-19, had been financially impacted by the pandemic, and had experienced COVID-19 related anxiety. To measure COVID-19 related anxiety we used the COVID-19 related psychological distress in healthy public (CORPD) scale (Feng et al., 2020). Items were rated on a five-point Likert scale (strongly disagree, disagree, not sure, agree and strongly agree), where a higher severity of COVID-related psychological distress was reflected by higher scores. The scale included items such as 'When I see an increase in the number of COVID-19 patients on the news, I feel anxious'. Research has found that the scale provides a valid scale for measuring psychological distress related to COVID-19 (Duong, 2022).

2.3. Statistical analyses

Statistical analyses were conducted using SPSS 27. First, differences between cohorts (cohort 1 2019–2020, cohort 2 2020–2021 and cohort 3 2021–2022) and ethnicity group (Asian or Black vs. White ethnic background students) in demographic characteristics were analysed with Chi-squared tests and t-tests, where appropriate. Second, ANOVA was used to investigate potential differences in mental health (average overall CCAPS score and all subscales), loneliness and perceived stress between the three student cohorts and ethnicity groups. We were interested in investigating whether group differences in mental health were due to differences in perceived stress between Asian or Black and White students. Additionally, we report on the severity of mental health problems as indicated by the CCAPS-62 Elevated Scores (bold in Table 1) and we show minimum and maximum scores along the lines of a recent publication by Broglia et al. (2017). Significant interactions were followed up with simple effects analysis, where applicable. Where applicable, Bonferroni corrected pair-wise comparisons were conducted following significant main effects to identify which groups differed from each other. The data relating to the COVID-19 infection rate, the vaccination rate, living situation, and the economic impact were analysed using Chi-squared tests.

3. Results

3.1. Sample characteristics and group differences

The gender distribution did not differ significantly between cohorts ($\chi^2(2, 656) = 4.55, p = .336$). The cohorts also did not differ significantly in the composition of Asian or Black and White ethnic background students ($\chi^2(2, 656) = .534, p = .77$). Further sample characteristics by cohort and ethnicity group are displayed in Table 1.

3.2. Overall CCAPS scores, CCAPS subscales, UCLA loneliness scale and PSS

There was no significant interaction effect between cohort and ethnicity group on the average overall CCAPS score ($F(2, 608) = 0.06, p = .94$). Main effects analysis showed that there was no significant cohort effect ($F(2, 608) = 0.59, p = .55$), but there was a significant ethnicity group effect ($F(1, 608) = 5.37, p = .02$). Specifically, students with an

Table 1
CCAPS-62, UCLA Loneliness scale, Perceived Stress scale and COVID-19 anxiety scale scores by cohort and ethnicity group

Variable	Cohort 1						Cohort 2						Cohort 3					
	Asian or Black		White		Overall		Asian or Black		White		Overall		Asian or Black		White		Overall	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Overall CCAPS-62	1.54	0.52	1.65	0.49	1.58	0.51	1.52	0.45	1.62	0.46	1.56	0.46	1.51	0.46	1.58	0.45	1.53	0.46
Generalised anxiety	1.66	0.89	1.78	0.93	1.71	0.9	1.68	0.87	1.71	0.96	1.69	0.91	1.71	0.87	1.73	0.95	1.72	0.9
Social anxiety	2.17	0.59	2.22	0.56	2.19	0.58	2.03	0.57	2.18	0.53	2.09	0.56	2.1	0.59	2.1	0.56	2.1	0.58
Academic distress	2.01	0.57	2.06	0.53	2.03	0.55	2.1	0.59	2.28	0.55	2.19	0.55	2.1	0.6	2.15	0.54	2.12	0.58
Eating concerns	1.49	0.76	1.61	0.84	1.54	0.79	1.41	0.73	1.34	0.78	1.38	0.75	1.37	0.79	1.36	0.8	1.37	0.79
Hostility	1.18	0.93	1.12	0.84	1.16	0.89	1.11	0.86	1.1	0.79	1.1	0.83	1.09	0.84	1.08	0.72	1.1	0.8
Substance use	0.47	0.82	0.97	0.93	0.67	0.9	0.17	0.53	0.84	0.88	0.43	0.76	0.24	0.5	0.82	0.85	0.45	0.71
Family distress	1.79	0.55	**1.88**	0.46	**1.83**	0.51	1.75	0.5	**1.83**	0.43	**1.78**	0.47	1.77	0.47	1.81	0.52	1.78	0.49
Depression	1.55	0.73	1.54	0.72	1.55	0.72	1.72	0.69	1.66	0.75	1.7	0.71	1.67	0.7	1.58	0.64	1.64	0.68
Loneliness	41.60	9.83	40.99	12.30	41.36	10.85	44.30	10.28	42.17	10.21	43.49	10.28	44.52	10.64	42.54	9.81	43.8	10.36
Perceived stress	29.87	7.44	30.41	7.89	30.08	7.61	31.19	7.69	31.1	7.89	31.15	7.75	30.55	7.62	31.06	7.0	30.74	7.38
COVID anxiety													38.32	8.44	38.23	11.14	38.28	9.48
COVID infection %													30.9		37.4		33.3	
Vaccination %													79.4		81.9		80.4	

*Note. Abbreviations: CCAPS-62 = Counseling Center Assessment of Psychological Symptoms.
Values in bold exceed the CCAPS-62 Elevated Cut Point.

Asian or Black ethnic background scored significantly lower than White students (see Table 1), suggesting that the former experienced overall less mental health difficulties than the latter (see Fig. 1, A).

3.2.1. Generalised anxiety

There was no significant interaction effect between cohort and ethnicity group on generalised anxiety ($F(2, 608) = 0.19$, $p = .82$). There was no significant cohort effect ($F(2, 608) = 0.06$, $p = .95$), and no significant ethnicity group effect ($F(1, 608) = 0.51$, $p = .48$).

3.2.2. Social anxiety

There was no significant interaction effect between cohort and ethnicity group on social anxiety ($F(2, 608) = 0.9$, $p = .41$). There was no significant cohort effect ($F(2, 608) = 1.74$, $p = .18$), and no significant ethnicity group effect ($F(1, 608) = 1.68$, $p = .2$).

3.2.3. Academic distress

There was no significant interaction effect between cohort and ethnicity group on academic distress ($F(2, 608) = 0.17$, $p = .84$). However, there was a significant cohort effect on academic distress ($F(2, 608) = 10.26$, $p < .001$). A Bonferroni corrected post-hoc test showed that cohort 2 experienced significantly greater academic distress than cohorts 1 and 3 ($p < .001$ and $p = .006$, respectively). Cohorts 1 and 3 did not differ significantly. There was no significant ethnicity group effect on academic distress ($F(1, 608) = 0.34$, $p = .56$) (see Fig. 1, B).

3.2.4. Eating concerns

There was no significant interaction effect between cohort and ethnicity group on eating concerns ($F(2, 608) = 0.76$, $p = .47$). There was a significant cohort effect ($F(2, 608) = 3.59$, $p = .03$). A Bonferroni corrected post-hoc test showed only marginally significant differences between cohort 1 and 3 ($p = .79$). There was no significant ethnicity group effect ($F(1, 608) = 0.04$, $p = .84$).

3.2.5. Hostility

There was no significant interaction effect between cohort and ethnicity group on hostility ($F(2, 608) = 0.06$, $p = .94$). There also was no significant cohort effect ($F(2, 608) = 0.3$, $p = .75$), and no significant ethnicity group effect ($F(1, 608) = 0.19$, $p = .66$).

3.2.6. Substance use

There was no significant interaction effect between cohort and ethnicity group on substance use ($F(2, 608) = 0.56$, $p = .57$). However, there was a significant cohort effect ($F(2, 608) = 4.89$, $p = .008$). A Bonferroni corrected post-hoc tests showed that substance use concerns in cohort 1 were significantly greater than in cohorts 2 and 3 ($p = .004$ and .011, respectively). Cohorts 2 and 3 did not differ significantly. There also was a significant ethnicity group effect ($F(1, 608) = 90.48$, $p < .001$). Specifically, students from an Asian or Black ethnic background reported less substance use concerns than White students (see Fig. 1, C).

3.2.7. Family distress

There was no significant interaction effect between cohort and ethnicity group on family distress scores ($F(2, 608) = 0.1$, $p = .90$). There also was no significant cohort effect ($F(2, 608) = 0.67$, $p = .51$), and no significant ethnicity group effect ($F(1, 608) = 2.96$, $p = .09$). While group differences did not reach significance, examination of the means showed that White students in cohort 1 and cohort 2 exceeded the Elevated Cut Point threshold, indicating more severe levels of distress (see Table 1).

3.2.8. Depression

There was no significant interaction effect between cohort and ethnicity group on depression ($F(2, 608) = 0.12$, $p = .89$). There also was no significant cohort effect ($F(2, 608) = 2.17$, $p = .12$), and no significant ethnicity group effect ($F(1, 608) = 0.76$, $p = .38$).

3.2.9. Percentage of students scoring maximum and minimum scores

We explored the percentage of students that obtained a maximum
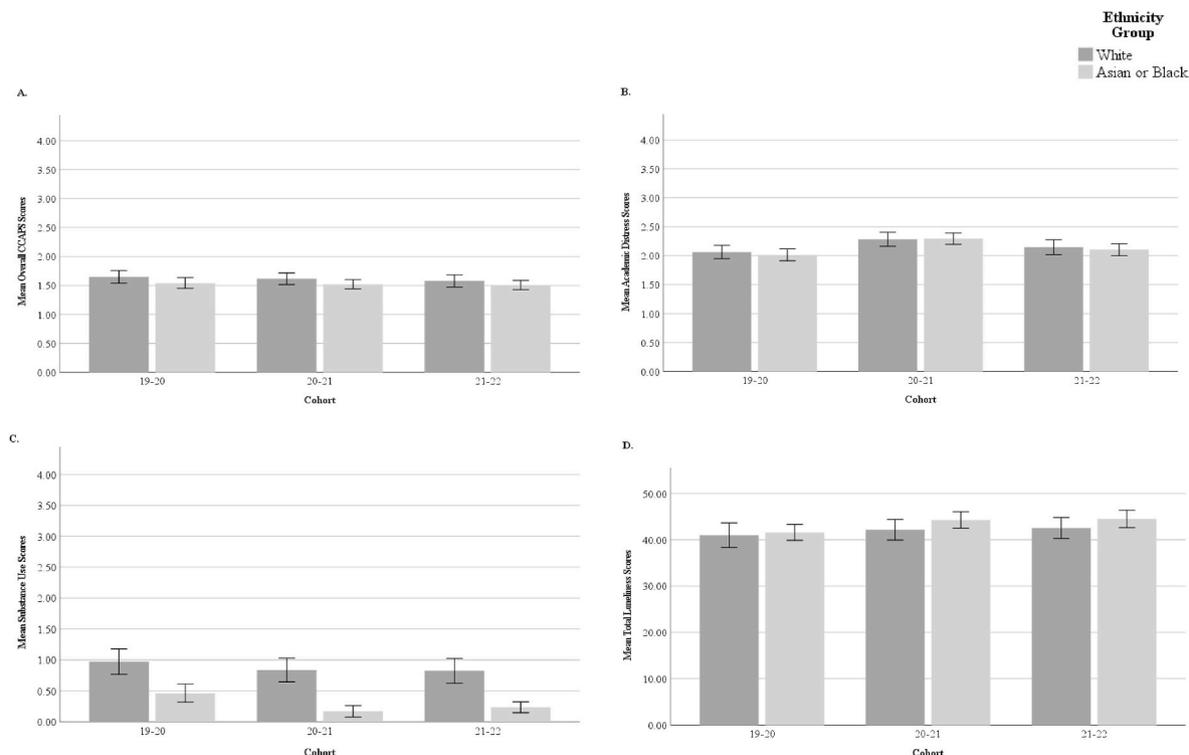

Fig. 1. Mental health outcomes and loneliness by cohort and ethnicity group. A. Overall CCAPS, B. Academic Distress, C. Substance Use, D. UCLA Loneliness Scale. Note: Error bars represent 95% confidence intervals.

score (4 = extremely like me) on the CCAPS sub-scales. Maximum scores were only observed for generalised anxiety (n = 1, 0.2%) and hostility (n = 1, 0.2%). There were no maximum scores for any other CCAPS sub-scale. Floor effects were explored by calculating the percentage of students that obtained a minimum score (0 = not at all like me) on any scale. Minimum scores were met on all subscales, except for academic distress, family distress, and depression, in the following descending order: substance use (n = 339, 55.2%), hostility (n = 56, 9.1%), generalised anxiety (n = 9, 1.5%), eating concerns (n = 1, 0.2%), and social anxiety (n = 1, 0.2%).

3.2.10. Loneliness

There was no significant interaction effect between cohort and ethnicity group on loneliness (F(2, 608) = 0.32, p = .73). There was a marginally significant cohort effect (F(2, 608) = 2.65, p = .07), which became significant when the interaction was removed from the model (p = .04). Bonferroni corrected post-hoc tests showed that loneliness was significantly lower in cohort 1 than in cohorts 2 and 3 (p = .04 and .02, respectively). Cohorts 2 and 3 did not differ from each other significantly. There was also marginally significant ethnicity group effect (F(1, 608) = 3.3, p = .07). Specifically, White students reported less loneliness than students from an Asian or Black ethnic background (see Fig. 1, D).

3.2.11. Perceived stress

There was no significant interaction effect between cohort and ethnicity group on perceived stress (F(2, 608) = 0.11, p = .90). There was no significant cohort effect (F(2, 608) = 0.92, p = .40), and no significant ethnicity group effect (F(1, 608) = 0.26, p = .61). Given the non-significant findings with respect to perceived stress, we did not run further analyses to investigate whether possible ethnicity group differences in aspects of mental health were explained by group differences in perceived stress.

3.3. COVID-19 related questions

Reported COVID-19 infection or vaccination rate did not differ significantly between students from an Asian or Black and White ethnic background. The ethnicity groups differed significantly in terms of how they felt that they have been financially impacted by the pandemic ($\chi^2(3, 219) = 7.428, p = .05$). Specifically, 21 (15.3%) of students from an Asian or Black ethnic background reported being very significantly financially impacted by the pandemic, vs. 5 (6.1%) of White students.

3.3.1. COVID-19 anxiety

COVID-19 related anxiety was significantly associated with all CCAPS-62 subscales and the overall score, with the exception of substance use (see Table 2 for intercorrelations). COVID-19 related anxiety did not differ significantly between ethnicity groups (F(1, 200) = 0.0, p = .95).

Table 2
COVID anxiety and CCAPS-62 correlations

	COVID Anxiety
CCAPS mean	0.25*
Depression	0.23*
Family distress	0.13*
Substance use	−0.05
Hostility	0.16*
Eating concerns	0.12*
Academic distress	0.22*
Social anxiety	0.23*
Generalised anxiety	0.26*

*Significant at the 0.05 level.

4. Discussion

Our study's objective was to investigate differences in mental health, loneliness and perceived stress of university students from different ethnic groups before and during the COVID-19 pandemic. We predicted that mental health would be worse among students from an Asian or Black ethnic background compared to White students, and we also predicted that this difference would be heightened during the COVID-19 pandemic as compared to before. However, the results did not corroborate our hypotheses. There were no cohort effects on overall mental health, as measured by the CCAPS, although interestingly there was an ethnicity effect across the three cohorts, whereby the Asian and Black ethnicity group had overall slightly better mental health scores than the White students.

While we did find a significant cohort difference in both academic distress - which was increased during the pandemic, as well as substance use which decreased during the pandemic, overall, we observed little difference in the mental health indicators before and during the COVID-19 pandemic. Regarding differences between the cohorts and ethnicity groups, we found that loneliness was higher in the pandemic cohorts and among Asian or Black, as compared to White students. In the two COVID-19 cohorts we saw no ethnicity group differences in reported infection and vaccination rates or COVID-19 anxiety. However, Asian or Black students reported a more severe financial impact of the pandemic on their families.

4.1. The pandemic and mental health

Contrary to our predictions, we did not find any significant cohort effect on overall mental health, or on the CCAPS subscales for generalised anxiety, social anxiety, eating concerns, hostility, depression, and perceived stress more generally. This conflicts with existing literature. For example, an online survey that was completed by university students in the UK during the pandemic found significantly elevated levels of anxiety and depression as compared with pre-pandemic levels, with over fifty percent experiencing levels above the clinical cut offs (Chen et al., 2020). A similar study conducted in the US also found high levels of mental health distress among university students during COVID-19, with depression being associated with difficulties focusing on academic work (Kecojevic et al., 2020). However, another study surveying 1281 UK university students during the first lockdown and again after the first lockdown found that well-being, anxiety, and levels of flourishing actually improved between the two time points. Furthermore, levels of positivity about the pandemic also increased over time and were associated with better mental health outcomes (Kannangara et al., 2021). Kannangara et al. (2021) argued that the pandemic may have had a positive impact on student mental health in some ways, as it encouraged a sense of community and togetherness, and created opportunities to develop a sense of purpose. This may explain the non-significant findings in our study and suggests that perhaps COVID-19 produced both negative as well as protective factors against mental health difficulties.

While there were no cohort differences in overall mental health from before to during the pandemic, there was a difference in mental health between Asian or Black and White groups. Across the three cohorts, students who identified as being of Asian or Black ethnicity scored slightly lower on the CCAPS-62 questionnaire than White students, indicating lower levels of mental health distress. This is in line with data from the Center for Collegiate Mental Health (CCMH) 2012 Annual Report on CCAPS-34, which found that White students were more likely than Students of Colour to have higher mean scores on generalised anxiety, social anxiety, eating concerns, and alcohol use. In our sample, the effect seemed to be mostly driven by lower substance use in the Asian and Black compared to the White students. It also has been suggested that individuals from non-White ethnic backgrounds may be less likely to report experiencing symptoms of mental illness (Arday et al., 2022). In many Asian and Black communities, stigma around mental

health disorders is considered a significant barrier to talking openly about mental health (Simkhada et al., 2021). However, participants in our study reported on their mental health anonymously, as opposed to the study by Simkhada and colleagues, in which participants were interviewed regarding their willingness to seek help in person for their mental health. Thus, it is less likely that their answering would have been influenced in this way. Interestingly, we found significant cohort effects on the CCAPS substance use concerns. Substance use scores were highest before the pandemic in our 2019–2020 cohort and decreased significantly following the onset of the COVID-19 pandemic. This was possibly related to changes in student behavior and the culture of going out and socializing, which is associated with alcohol and substance use (Chaffee et al., 2021). A possible explanation for the low substance use concerns in our results is that the sample was mostly consisting of female students, and data from an Australian study showed that young women decreased their drinking more during the pandemic than young men (Callinan et al., 2021). However, these results contradict other studies that found a significant increase in substance abuse among young adults as a result of COVID-19. For example, an US study which found a general increase in alcohol consumption of university students, particularly among white students, during the pandemic (Charles et al., 2021). A similar trend was also reflected by another US study that found that a quarter of college students reported using substances to cope with the pandemic (Zimmermann et al., 2021). Indeed, across the board, research relating to substance use during the pandemic is mixed (Zolopa et al., 2022). Fifteen publications found a decline in alcohol use during the pandemic compared to the pre-pandemic period, whereas six publications found an increase in alcohol consumption during the pandemic (Zolopa et al., 2022). Similarly, mixed findings also emerged with respect to other substances, including cannabis (Hammond et al., 2020) cocaine, ecstasy, and LSD, with some groups showing increased and others showing decreased use (Zolopa et al., 2022).

We found that students from and Asian or Black ethnic background reported less substance use across all cohorts compared with White students. In 2018/19, 54.6% of City students identified as Black, Asian and Minority Ethnic, and 36.3% identified as White (City University of London, 2021). A possible explanation for this is that Muslim students make up a significant proportion of the Asian or Black student population at City, University of London. Generally, Muslim students do not drink alcohol or consume substances as this is considered a transgression according to the Quran (Hopkins, 2011; Michalak & Trocki, 2006). Further, Edlund et al. (2010), found that religiosity in general is strongly associated with the decision to abstain from using alcohol or drugs.

One of the areas that we found COVID-19 to impact, albeit with marginal significance, was loneliness. Our study found an increase in loneliness after the start of the COVID-19 pandemic. This may be explained by the changes to online learning and the social isolation that ensued. While the drastic decrease in socializing may have caused some positive effects, such as a decline in substance use, it simultaneously caused loneliness levels to increase. Several studies aligned with our findings and revealed that social and physical isolation and lack of interaction and emotional support were associated with negative mental health outcomes as a result of the pandemic (Elmer et al., 2020; Simegn et al., 2023).

Our findings are in line with a substantial amount of evidence to suggest that higher academic pressure was felt by students during the COVID-19 pandemic (Clabaugh et al., 2021; Husky et al., 2020; Ruiz-Robledillo et al., 2022; Wu & Liu, 2023; Yang et al., 2021). We found that reported academic distress in students was higher during the pandemic, as compared to before. Taken together, it is evident that students experienced a heightened level of academic distress as a result of additional burdens brought about by the changes that came with the COVID-19 pandemic.

4.2. COVID-19

Students from an Asian or Black ethnic background reported more often that their families were very significantly financially impacted by the pandemic than White students. This finding is in line with UK nationwide data which found that Asian and Black individuals were more likely than White individuals to experience job loss, income loss, and faced increased financial hardship during the COVID-19 pandemic (Hu, 2020). This suggests that the pandemic exacerbated pre-existing economic inequalities among these ethnic groups, which may impact on students from these backgrounds over the coming years. Future research should study the long-term consequences on mental health and academic attainment among ethnic minorities.

Unlike predicted, we did not find ethnicity group differences in COVID-19 anxiety (Boserup et al., 2020). However, we found that higher COVID-19 related anxiety was significantly associated with poorer mental health on all CCAPS subscales, thus students with lower reported mental health tended to worry more about COVID-19. This finding is in line with work by Catling et al. (2022), which showed that COVID-19 had a significant impact on self-reported levels of depression and anxiety, which had significantly increased from the 2020 to the 2021 sample. It is possible that COVID-19 anxiety contributed to a deterioration in mental health, for instance due to excessive worrying or changes in social behavior. However, it is also possible that mental health concerns and COVID-19 anxiety were driven by shared underlying mechanisms (e.g., such as a tendency to worry or ruminate).

According to our results there was no difference in COVID-19 infection or vaccination rates between students from an Asian or Black and White ethnic background. These findings were in contrast with a review of Pan et al. (2020), which showed that Asian or Black individuals were at an increased risk of contracting a COVID-19 infection compared to White individuals. The authors suggest that there is evidence of a relationship between ethnicity and risk factors for poor clinical outcomes in COVID-19, driven by both biological and socio-economic mechanisms. However, Baggett et al. (2020) also reported no association between ethnicity and COVID-19 infection rate. Likewise, evidence in relation to COVID-19 vaccination rates in different ethnic groups has been mixed. According to one UK study, lower vaccination rates are consistently observed amongst all ethnic minorities (Gaughan et al., 2022). There is evidence that Black individuals who were more deprived and living in urban environments were most likely to not receive a vaccine, while another study found that in the UK, non-White individuals reported higher vaccination rates than White individuals (Nguyen et al., 2021).

4.3. Strengths and limitations

There are several strengths to our study. First, we recruited a large sample of students within each cohort year, enabling a more systematic understanding of the changes in mental health, loneliness and stress related to the COVID-19 pandemic. Second, we used well known and validated measures, which can be compared against the literature from other countries. Finally, City, University of London has a uniquely diverse student population, which allowed us to generate new insights into student mental health at an inner London University across a variety of ethnic backgrounds. However, the current findings also need to be interpreted in the light of several limitations. First, while the cross-sectional data can show cohort differences, it does not allow for conclusions about individual changes in mental health within a specific cohort. Secondly, in this study, we sampled students only from City, University of London, within a large metropolitan and culturally diverse city and university, which may not be representative of student experiences before and during COVID-19 elsewhere, as also suggested by higher percentage of maximum scores on the CCAPS sub-scales reported by Broglia et al. (2017), for their sample as compared to ours. Furthermore, most of our respondents were female psychology students. This

limits the generalizability of findings, given that this group is particularly educated about mental health and related topics. Further, recent research suggests that mental health difficulties may be over-represented among Psychology students (Victor et al., 2022). Second, female students might experience different mental health difficulties to male students and/or report on them differently due to increased stigma in the male population (Vidourek et al., 2014). For instance, a survey across fifteen countries found that in all countries, women had more anxiety and mood disorders than men, and men had more substance use disorders than women (Seedat et al., 2009). However, as mentioned previously, the risk of stigma may have been mitigated in our study as participants reported anonymously. Another limitation to bear in mind is that considering Asian and Black students in one ethnic category may impact the generalizability of the results. While both groups represent a relative minority, it is possible that each group is facing unique pressures on mental health, loneliness and distress that we could not show in the current study. Our decision to combine the group was motivated by the fact that the proportion of Black students in the study was relatively small, which would have prohibited meaningful analysis in the current sample. Nonetheless, we recognise that the experience might be different for Asian and Black students, and future studies will be necessary to further investigate this. Additionally, future studies may benefit from a mixed-methods approach in order to gain further insights into the unique experiences of mental health, loneliness and stress of students of different ethnic backgrounds at university. Furthermore, the application of a relevant theoretical framework could provide another layer of depth, for example by conducting research through the lens of critical race theory (Savas, 2014). A theoretical framework might be useful to guide future analysis of qualitative and quantitative data.

4.4. Conclusion

In sum, our hypotheses about the negative impact of COVID-19 in general and on students with an Asian or Black and White ethnic background in particular were mostly not corroborated. Our data suggests that despite increased academic distress, students generally adapted well to the pandemic in terms of their mental health. While students from an Asian or Black ethnic background reported a more severe impact of the pandemic in some respects, within our specific sample there were little differences in mental health between the different ethnicities, which might be explained by the specific multicultural setting. Future studies should examine the impact of the pandemic in more representative groups and examine whether those with heightened mental health and COVID-19 concerns bounced back in terms of their mental wellbeing after the pandemic.

CRediT authorship contribution statement

Esther Schochet: Writing – review & editing, Formal analysis, Conceptualization. **Corinna Haenschel:** Writing – review & editing, Conceptualization. **Sebastian Gaigg:** Writing – review & editing, Conceptualization. **Anne-Kathrin Fett:** Writing – review & editing, Conceptualization, Formal analysis.

Declaration of competing interest

No potential conflict of interest was reported by the authors.

Acknowledgements

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