Effects of the COVID-19 lockdown on mental health in a UK student sample.

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Abstract

Background

The COVID-19 pandemic and the resulting restrictions placed upon society have had a profound impact on both physical and mental health, particularly for young people.

Aims

The current study assesses the impact of COVID-19 on student mental health

Method:

Four hundred and thirty four first year Undergraduate students completed a battery of self-report questionnaires to assess the variables of interest with data being collected over a two year period. The data from each year was compared (216 and 218 students respectively).

Results

A MANOVA revealed that COVID-19 had a significant impact on self-reported levels of depression, anxiety and smartphone addiction – which all significantly increased from the 2020 to the 2021 cohort. The percentage of students who had a score which warranted a clinical diagnosis of depression increased from 30–44%, and for anxiety increased from 22 to 27% – those students who had a comorbid diagnosis rose from 12–21%. Smartphone addiction levels rose from 39–50%. Correlational analysis showed a significant relationship between Smartphone usage and depression and anxiety.

Conclusions

This research suggests that COVID-19 has had a major impact upon student mental health, and smartphone addiction. The importance of identifying predictive factors of depression and anxiety is emphasised, and suggestions for intervention are discussed.

Background

The coronavirus disease 2019 (COVID-19) pandemic has had a profound impact on the world's population. Furthermore, the consequent 'lockdowns' and social restrictions have had an unknown impact on the physical and mental health of society. In the UK, the first nationwide lockdown was imposed on March 23rd 2020, this closed all educational institutions including all Schools and Universities. Individuals were allowed to leave their homes just once a day for essential purchases

and/or exercise and all social gatherings were completely banned in any sphere of life. Children and adults alike were restricted to their homes and interactions limited to the online. Restrictions were partially relaxed later in the summer of that year, but a second partial lockdown was enacted on 2nd Dec 2020 and a 3rd full lock down on the 6th of January which returned the UK to the strict restrictions of the 1st lockdown. However, behind these closures and re-openings is a story of upheaval for many young people, particularly for University students. Even with partial lifting of restrictions at the beginning of the 20/21 academic year, the majority of students were taught in the main online and had none of the usual social interactions associated with University life – with many returning to their family home at some point during the academic year. We know very little about how the COVID-19 pandemic and ensuing restrictions have impacted mental health, in particular in our young people in Higher Education (H.E.).

As a result of COVID-19, Marshall et al.(1) have calculated a worsening of general Mental health by 8.1%, particularly affecting young adults and women. Salari et al. (2) identified in a meta-analysis of over 9000 people that prevalence rates for depression, anxiety and stress in the time of the pandemic were around 30%. Stress may be mediating this increase – Montano and Acebes (3) identified that COVID-related stress did indeed predict increased depression and anxiety. In an online survey of 2,000 participants, it was found that specifically the social isolation of the COVID-19 pandemic created feelings of anxiety and depression (4). This impacted how students were able to engage with their learning, as students refused to join online classes or were unwilling to participate in online activities due to the negative impact on their poor mental health. Elhai et al. (5) also identified that COVID-related anxiety positively correlated with smartphone use. However, there are few empirical comparisons of these factors pre- and post-COVID-19, from comparable samples, to provide quantitative evidence for COVID-19's effect on Mental health. One example that does measure the impact on mental health of the early lockdown in the UK comes from Evans et al. (6) – they found that early Covid restrictions had significantly increased levels of depression and surprisingly reduced alcohol consumption in a student population (the latter may be due to fewer opportunities for social interaction). Conversely, Fancourt et al.'s (7) longitudinal study suggested that depressive and anxious symptoms will decline as individuals acclimatise to the lockdown, thus comparing data from pre- and post-lockdown is of great interest.

We know that students in H.E. can experience a range of added risk factors, such as academic, financial and social pressures (8). These pressures can impact on a student's academic progression through higher education and can also lead to mental health problems including, specifically most commonly depression and anxiety (9). Wyatt and Oswalt (10) focused on the impacts of stress on mental health issues amongst university students compared to graduates. They found that undergraduates reported significantly higher rates of poor mental health, which led to a negative impact upon their academic performance. In particular they found that the transition to university life could have a huge impact on student's mental health. Therefore, it would seem important to research the specific predictors that contribute to the onset of anxiety and depression in university students, as this may be of importance for developing preventative measures and reducing the negative impacts of poor mental health.

Over the past decade Smartphone-use has become an essential part of young people's lives, for many it can be a positive addition to their lives, increasing connectivity and allowing people to share common experiences. This can create support through virtual environments, and potentially have a positive impact on Mental Health (11). However, when smartphone-use becomes excessive, it may consequently increase mental health problems. For instance, self-reports from a study by Elhai et al. (5) (with Chinese students) found that problematic smartphone-use amongst undergraduate student's led to an increase in depression and anxiety symptoms (See also Boumosleh & Jaalouk (12); Grant et al. (13)). These findings were supported by a meta-analysis of 41 studies by Sohn et al. (14), who found strong evidence that problematic smartphone use resulted in an increased risk for both depression and anxiety in young people. Furthermore, Elhai et al. (15) in a systematic review found that depression, and anxiety were consistently related to problematic smartphone usage with a small to medium effect size.

Problematic smartphone-use has been explained by the 'excessive reassurance pathway' (16). This states that smartphone-use becomes problematic when individuals feel the need to gain reassurance from others. This derives from a lack of emotional stability in 'real' life, thus causing individuals to strive to maintain relationships online. Consequently, 'dependent users' more likely display symptoms of depression and anxiety. Supporting qualitative research indicates that problematic smartphone-use is linked to the excessive reassurance pathway, where students experienced fear of missing out (FOMO) when they were not using their devices (17). While smartphone addiction is not a formal definition used by the DSM, it is known that young people have become more and more reliant on their smartphones. Notably, reports show that 63% of 18–24-year-olds cannot go more than two days without a smartphone, compared to 54% across all age groups (18), suggesting an addictive nature to their use in young people. In a sample of UK undergraduate students, smartphone addiction was present in 39% of participants (19).

The current study assesses the impact of the Covid-19 pandemic on student Mental health and Mobile phone use, and the relationship between these variables. Specifically we predict a significant increase in levels of depression, anxiety and mobile phone use (Post-COVID) and also a significant positive association between the 3 variables.

Method

Participants

434 first-year undergraduate students aged 17–35 were recruited via a research participation scheme for which they received credits for completing the questionnaire. The 2020 cohort comprised 216 students (M = 18.5 years, SD = .894, 83.3% female), the 2021 cohort comprised 218 students (M = 18.8 years, SD = 1.49, 86.2% female).

Measures

Patient Health Questionnaire (PHQ-9; Kroenke et al.(20)) was used as a self report measure of depression severity. The questionnaire focuses on diagnostic criteria for depression (DSM-IV), assessing severity via nine questions on a scale from experiencing a problem 'not at all' (0) to 'nearly every day' (3) over the last two weeks (e.g. 'Feeling down, depressed or hopeless'). Higher scores represent higher depression severity, the highest possible score is 27. Internal consistency was reviewed with a Cronbach's α coefficient of 0.86, with good test retest reliability. Beard et al. (21) identified good convergent and discriminant validity in a psychiatric sample.

Generalised Anxiety Disorder – 7 (GAD-7; Spitzer et al.(22)) was used as a self-report measure of anxiety. Seven symptoms of anxiety based on diagnostic criteria (DSM-IV) are measured, from the problem bothering an individual 'not at all' (0) to 'nearly every day' (3) over the last two weeks (e.g. 'Trouble relaxing'). Higher scores represent higher anxiety severity, the highest possible score is 21. Cronbach's α coefficient for internal consistency was measured at .92, and test-retest reliability correlated at .83, and good criterion and procedural validity was shown.

Smartphone Addiction Scale Short-Version (SAS-SV; Kwon et al. (24)) was used as a self-report measure of SA. The questionnaire contains 10 statements which are measured on a scale from 1 to 6 (strongly disagree to strongly agree; e.g. 'Using my smartphone longer than I had intended'), with a highly reliable Cronbach's α coefficient of .911. Higher scores represent higher SA, the highest possible score is 60. The cut-off value for considering an individual 'addicted' to their smartphone was 31 in males, and 33 in females. Andrade et al., (25) showed that the questionnaire had good predictive and convergent validity in adolescents.

Procedure

Participants volunteered to partake in the study via the University's website. Participants completed all sections of the questionnaire and submitted responses via Google Forms; completion took ~ 30 minutes. Results were collated and analysed.

Ethical Considerations

Ethical permission was obtained from the University of Birmingham's Ethics committee. Participants consented to participate and were informed of their right to withdraw data from analysis prior to a given date. Student ID numbers were used, maintaining confidentiality. A variety of Mental health service resources were highlighted should participants have any concerns relating to the content of the questionnaires.

All experimental protocols were approved by the University of Birmingham's ethics committee.

All methods were carried out in accordance with relevant guidelines and regulations.

Informed written consent was obtained from all participants.

Results

Descriptive statistics including means, standard deviations and ranges were calculated for both cohorts. Depression, anxiety and SA increased compared to the previous year (See Table 1). To check for significant effects of COVID-19, a MANOVA was conducted, with cohort as the between-subjects factor.

Table 1.

Descriptive Statistics of Both Cohorts of Data with the Means, Standard Deviations and Ranges, Including the Change in Mean from 2020 to 2021.

Variable	2020 Cohort (<i>N</i> = 216)		2021 Cohort (<i>N</i> = 218)	
	Mean (<i>SD</i>)	Range	Mean (<i>SD</i>)	Range
Depression**	8.11 (4.10)	19 (0–19)	9.56 (5.79)	27 (0–27)
Anxiety*	6.11 (4.11)	18 (0–18)	7.06 (5.11)	21 (0–21)
Smartphone Addiction**	30.34 (8.46)	43 (10–53)	32.63 (9.12)	45 (10–55)
* Significant change at $p < .05$, ** Significant change at $p < .01$				

The MANOVA revealed a significant main effect of cohort for depression ($F(1, 432)$

= 8.99, $p = .003$). The 2020 cohort ($M = 8.11$, $SD = 4.10$) experienced significantly lower levels of depression than the 2021 cohort ($M = 9.56$, $SD = 5.79$). A significant main effect of cohort was found for anxiety ($F(1, 432) = 4.53$, $p = .034$). The 2020 cohort ($M = 6.10$, $SD = 4.11$) experienced significantly lower levels of anxiety than the 2021 cohort ($M = 7.05$, $SD = 5.11$). A significant main effect of cohort was found for Smartphone use ($F(1, 432) = 7.36$, $p = .007$). The 2020 cohort ($M = 30.34$, $SD = 8.46$) experienced significantly lower levels of Smartphone use than the 2021 cohort ($M = 32.6$, $SD = 9.12$).

Clinical significance was explored by calculating the proportion of students who met clinical thresholds for a diagnosis of moderate to severe depression or anxiety. Manea et al. (23) identify an optimal cut-off score of 10 when diagnosing depression with the PHQ-9 with 88% sensitivity and 88% specificity. Spitzer et al. (22) identify a cut-off score of 10 when diagnosing anxiety with the GAD-7 with 89% sensitivity and 82% specificity. Using these figures, depression levels increased from 30–44%, anxiety from 22–27%, and the chance of reporting both rose from 12–21%. Smartphone addiction scores were compared to the cut-off value of 33 (Kwon et al. (24)), with the proportion of the samples meeting this criterion rising from 39–50% (see Table 2 & Fig. 1).

Table 2.

The Percentage Increase of Levels of Depression and Anxiety That Met Clinical Thresholds.

Mental Health Issue	2020 Cohort	2021 Cohort
Depression	30%	44%
Anxiety	22%	27%
Both Depression & Anxiety	12%	21%
Smartphone Addiction	39%	50%

In a second phase of analysis, Pearson correlations were conducted for both cohorts (see Tables 3 & 4). These revealed similar results – as expected anxiety and depression were significantly positively correlated, however it was also found for both cohorts that levels of Smartphone use were also significantly positively correlated with both depression and anxiety, on average the more students used their smartphones the higher their levels of depression and anxiety.

Table 3.

Correlations between All Variables, 2021 Cohort (N = 218).

1. Depression	–	.728**	.249**
2. Anxiety	.728**	–	.249**
3. Smartphone use	.249**	.249**	–

* Significant at $p < .05$,

** Significant at $p < .01$

Table 4.

Correlations between All Variables, 2020 Cohort (N = 216).

Variable	1	2	3
1. Depression	–	.647**	.255**
2. Anxiety	.647**	–	.210**
3. Smartphone Addiction	.255**	.210**	–

* Significant at $p < .05$,

** Significant at $p < .01$

Discussion

The current study assessed the effects of COVID-19 on student Mental health. Results showed that COVID-19 had a significant impact upon depression, anxiety and Smartphone use/addiction. The proportion of the 2021 cohort who met clinical thresholds for depression or anxiety was significantly higher, reaching 44% for depression and 27% for anxiety. Furthermore, worryingly, half of our COVID cohort were classified as being addicted to their smartphone. We also found significant correlation between mental health problems and Smartphone usage, showing a clear association between increases in Smartphone use and increases in depression and anxiety.

The findings of the current study corroborated both Fried (26) and Evans et al (6) findings that depressive symptoms have increased during COVID-19. Of particular interest was the significant increase in moderate-severe depression and anxiety levels between cohorts: an increase of 14.0% for moderate-severe depression and of 4.4% in moderate-severe anxiety. There are no studies to date which have examined differences between cohorts of UK students cross-sectionally before and during the full pandemic. However, studies such as Elmer et al. (2020) do report similar findings in a Swiss sample, showing increased depression and anxiety in an 'early' COVID-19 cohort compared cross-sectionally with pre-COVID-19 students. This converging evidence highlights the clear negative impact of the pandemic on mental health and should trigger future research to investigate this further. There was also as expected a strong significant positive correlation between depression and anxiety, indicating a high level of comorbidity for these conditions. Importantly, the prevalence rates for depression and anxiety in the 2020 cohort was already higher than in the general population (see also the findings of Thorley (9) showing that students on average have poorer mental health in comparison to the adult population). This could be due to the students being part of a rigorous course which has become increasingly complex with the challenge of remote learning. Therefore, this sample may not generalize to the general population. Moreover, due to the anonymous nature of the study, students may have been more inclined to give truthful responses, which could further account for the high prevalence rates.

The results from the current study support Ithnain et al's. (27) findings that university students were prone to smartphone addiction since students on average were obtaining moderate scores on the SAS-SV. And also Elhai et al. (17) who found that depression and anxiety were related to problematic smartphone use.

The significant increase in problematic smartphone use between cohorts aligns with reports of smartphone use increasing during the pandemic (e.g., Zuckerman (28)) and could be due to the lack of opportunities for face-to-face communication. However, one limitation of measuring 'Smartphone use' is that this term can cover a range of areas that may have variable effects on mental health. Indeed, evidence has found that social networking was the preferred activity for problematic smartphone users (Sohn et al. (21)), with gaining peer acceptance as the primary cause of smartphone overuse (Lee & Lee, (29)). Therefore, it could be that social media use is driving the high prevalence rates of mental health problems, rather than smartphone use per se.

Limitations of the current study arise in terms of the overrepresentation of female participants in both cohorts. It is reported that females experience more mental health problems than males (e.g., Kuehner (30); Li & Graham (31)), however this could be due to an increased likelihood of disclosure. Furthermore, there could be gender differences in smartphone use, such that male students with smartphone addiction are more likely to use gaming apps, whereas females prefer to use social media (Chen et al.(32)). The present findings should be of interest to universities, highlighting a critical time to intervene to safeguard their students. We recommend that they should create campus environments to promote positive mental health, emphasising time away from smartphones. From a clinical perspective, these findings are particularly concerning, reflecting an urgent need for interventions. In addition to CBT and mindfulness interventions to improve mental health, research (e.g., Lan et al, (33); Young (34)) also suggests that mindfulness and cognitive-behavioural techniques can be utilised as smartphone addiction interventions, to indirectly treat depression and anxiety in students. These findings should be used to demonstrate a growing public health concern that should inform public health policy to prevent a post-COVID-19 mental health crisis in UK universities.

Declarations

Ethics approval and consent to participate

Ethics approval was sought for this study from the University of Birmingham Ethics committee – Review ERN_20-1093

Ethical permission was obtained from the University of Birmingham's Ethics committee. Participants consented to participate and were informed of their right to withdraw data from analysis prior to a given date. Student ID numbers were used, maintaining confidentiality. A variety of Mental health service resources were highlighted should participants have any concerns relating to the content of the questionnaires.

All experimental protocols were approved by the University of Birmingham's ethics committee.

All methods were carried out in accordance with relevant guidelines and regulations.

Informed written consent was obtained from all participants.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article

Competing interests

The authors declare there were no financial or non-financial competing interests.

Funding

There was no funding associated with this research

Authors' contributions

JC was responsible for the conception and design of the study

JC, AB, ZB, CW & AW collected all data

JC, AB, ZB, CW & AW undertook the statistical analysis and interpretation of the data

JC, AB, ZB, CW & AW contributed equally to the drafting of the paper

JC was responsible for the redrafting of the paper

JC, AB, ZB, CW & AW approved the submitted version

JC, AB, ZB, CW & AW have agreed both to be personally accountable for their own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Not applicable

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Figures

Figure 1

Proportions of 2020 and 2021 Cohorts who Met Clinical Thresholds for a Diagnosis of Depression, Anxiety, Both, and Smartphone Addiction.