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LONG-TERM MENTAL HEALTH IMPACTS OF THE COVID-19 PANDEMIC ON UNIVERSITY STUDENTS IN THE UK: A LONGITUDINAL ANALYSIS OVER 12 MONTHS

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ABSTRACT: University students in the UK have encountered many challenges as a result of the COVID-19 pandemic. This research aimed to track the mental well-being of a large sample of British university students ($n = 554$) over a one-year period of the COVID-19 pandemic, capturing data at four time points between May 2020 and May 2021. Overall retention after 12 months was 34.73%. Findings showed the COVID-19 pandemic has caused a significant, negative impact on the well-being of British university students. Students are suffering from prolonged and high levels of psychological distress and anxiety. Levels of flourishing in students are still very low. The different phases of the pandemic appear to have played an influential role in student mental health. The practical implications for higher education and recommendations for future research are discussed.

Keywords: Mental health, university students, Covid-19, anxiety, loneliness, psychological distress

INTRODUCTION

Covid-19 impacts in a higher education context

The COVID-19 pandemic created widespread challenges within the entire population, particularly surrounding health risks, financial strain, job changes and insecurity, social isolation and limited access to basic necessities (Wright *et al.*, 2020). On top of this, university students encountered major disruption to their education and future career prospects. The closure of campuses and suspension of in-person lectures, led to forced changes in teaching and learning (Schleicher, 2020). This meant that university students had to adjust to online forms of learning. Studying from home, often in isolation, is known to bring about certain challenges, particularly related to reduced motivation and self-control (Händel *et al.*, 2020). For many students, a lack of digital competency made adjustment to a wholly online approach to learning even harder (Farnell *et al.*, 2021). An overnight shift to distance learning also created issues due to some students having inadequate access to IT equipment and internet services (Browning *et al.*, 2021; Farnell *et al.*, 2021). Many students around the world

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and the UK have reported having an unsuitable home learning environment, often without a quiet place to study and without a desk or suitable IT equipment (Barada *et al.*, 2020). Despite a worldwide health pandemic that left students in prolonged periods of isolation with the challenge of adjusting to new ways of life, students have reported new assessment methods (Schleicher, 2020) and different workloads (Aristovnik *et al.*, 2020; Farnell *et al.*, 2021). There is also still a great amount of uncertainty about how the COVID-19 pandemic will impact on university students' careers prospects (Aristovnik *et al.*, 2020). Many students have expressed anxiety about graduating from university and being left to find employment in sectors that have been hard hit by the pandemic and are in a 'slack' labour market. Indeed, students have expressed deep worry about the implications of the pandemic on their future employment opportunities (Wang *et al.*, 2020).

Typical student life was severely interrupted throughout the COVID-19 pandemic. For many students, going to university was the first time they experienced living away from home. The social aspect of university life is a central pillar of the university experience and one that has been 'stripped' from current students during the pandemic (Aristovnik *et al.*, 2020; Elmer *et al.*, 2020). Common entertainment and socialisation facilities such as restaurants, bars, clubs and leisure centres were closed for long periods. Even more so, the COVID-19 pandemic forced students into isolation, often in small student accommodation rooms. This meant students were unable to rely on their usual routes for seeking physical or emotional support, often from close family and friends (Elmer *et al.*, 2020). The Student COVID-19 Insights Survey (SCIS) at the end of 2020, revealed that the majority of students were dissatisfied with their social experiences due to limited opportunities for social and recreational activities, and a lack of opportunities to socialise with or meet other students (ONS, 2021). Isolation and feelings of loneliness have been far-reaching among university students during the COVID-19 pandemic (Kannangara *et al.*, 2021), with significant impact particularly during periods of confinement (Allen *et al.*, 2022; Elmer *et al.*, 2020).

The mental health implications of the COVID-19 pandemic for university students in the UK

Already a population who are susceptible to poor mental health (Holm-Hadulla and Koutsoukou-Argyriaki, 2015; Neves and Hillman, 2019), university students have encountered additional stressors and challenges as a result of the COVID-19 pandemic and are considered to be an at-risk population (Glowacz & Schmits, 2020). Considering the extent to which university students' everyday lives and education have been impacted, it is not surprising that university students suffered increasing mental health problems throughout the COVID-

19 pandemic (Browning *et al.*, 2021; Kohls *et al.*, 2021). Mental well-being in British university students started declining rapidly in the very early stages of the pandemic (Cao *et al.*, 2020; Elmer *et al.*, 2020; Kannangara *et al.*, 2021). According to the ONS, university students' wellbeing continues to languish more so than the general adult population in the UK (ONS, 2021). This gains support from other research that consistently shows university students in the UK are experiencing poorer personal well-being than young adults, of a similar age, in the general population (Bonsaksen *et al.*, 2022; Tinsley, 2020). For instance, a large-scale cross-national study found that students reported poorer mental health than non-students and the wider population (Bonsaksen *et al.*, 2022). Also, 57% of students reported that their mental health had deteriorated, with lower levels of life satisfaction, happiness and heightened levels of anxiety, compared to the general population (Office for National Statistics, 2020). For a start, disruption to education is known to create various issues relating to reduced motivation, loss of independence, as well as detrimental effects on self-identity and mental health (Cao *et al.*, 2020). Online learning has meant students are spending most of their time studying online, with one study showing that spending eight or more hours on screens each day is a contributing factor towards heightened psychological distress (Browning *et al.*, 2021). One study has shown that a quarter of students were experiencing anxiety associated with academic concerns, financial worries and the impact of the outbreak on their daily life (Cao *et al.*, 2020). Further, those students who were living away from home during this time were more likely to suffer from increasing levels of anxiety (Cao *et al.*, 2020). Academic concerns and isolation have played a toxic role in university students' mental health (Visser and Law-van Wyk, 2021). Another study found that university students were increasingly worried about the health and safety of themselves and their loved ones, were finding it particularly difficult to concentrate, and were increasingly concerned about their academic performance (Farnell *et al.*, 2021). There have been widespread reports of increased levels of depression, anxiety and stress since the COVID-19 outbreak (Aristovnik *et al.*, 2020; Kohls *et al.*, 2021; Visser and Law-van Wyk, 2021). Moreover, drastic changes to university students' social life and changes to the existence and utilisation of social support networks have been associated with increased stress, anxiety, loneliness and depression (Elmer *et al.*, 2020). One study indicated that prolonged periods of isolation and loneliness, limited social contact and perceived stress were associated with greater levels of depression, alcohol use and binge eating (Kohls *et al.*, 2021). Research has divulged that around 22% of university students have found their experiences during the COVID-19 pandemic 'traumatic' (Visser and Law-van Wyk, 2021).

The present study

Building on the work of Antonovsky (1979), this study is underpinned by the ‘two continua’ model (Keyes, 2002), that argues mental well-being and mental illness are, while strongly related, two independent dimensions (Huppert and Whittington, 2003; Westerhof and Keyes, 2010). In support of the ‘two continua’ model is profound empirical evidence that demonstrates the bidirectional relationship between mental health and mental illness (Margraf *et al.*, 2020). After all, levels of mental illness can co-exist with levels of mental health, creating different states of subjective wellbeing (Visser and Law-van Wyk, 2021). Contrary to early theories that dictated mental health was simply defined as the absence of psychopathology (Keyes, 2005; Wittchen *et al.*, 2011); promoting well-being is considered just as, if not more important, than treating mental illness (Slade, 2010). Nonetheless, research into clinical mental health and well-being still favours an examination of the presence or absence of mental illness and disregards the role of positive mental health. Additionally, much research uses these such terms interchangeably (Barkham *et al.*, 2019; Burns *et al.*, 2020) and lack definitions of their terminology, which has led to inconsistencies and difficulties in synthesising the literature to draw conclusions (Barkham *et al.*, 2019). Subsequently, there has been a recent call for research to contribute towards a better understanding of student mental health that can provide greater clarity in order for the field of student mental health to progress (Burns *et al.*, 2020). Therefore, in this study, the concept of mental health describes the presence or absence of mental illness and mental well-being. More specifically, mental health refers to the continuum between flourishing and languishing and includes the presence or absence of mental illness (psychological distress and generalised anxiety) alongside the presence or absence of mental well-being (flourishing).

University students’ mental health was of increasing concern prior to COVID-19 (Hubble & Bolton, 2020). There is evidence that the COVID-19 pandemic has exacerbated such mental health issues in university students (Kannangara *et al.*, 2021). An assessment of university students’ mental health in the UK over the course of the COVID-19 pandemic can offer fruitful knowledge and understanding of how such a broad and vulnerable population has fared in such unprecedented times. The potential long-term mental health implications are significant and universities must be equipped to support a population of university students who are suffering from increasingly poor mental health. Protecting and improved student well-being should be a target and priority of policy changes within higher education in its own right (du Toit *et al.*, 2022). Insufficient efforts to acknowledge and address the mental health support needs of university students in the UK, particularly amidst and beyond a pandemic, could lead to long-term mental health consequences (Browning *et al.*, 2021).

Little research has followed the same sample of students from early 2020 when the pandemic was in its infancy and arguably in its peak, to 2021 when social distancing rules were relaxing for the final time. Few studies have observed the state of university students' mental health throughout the pandemic using a large sample across multiple universities. Highlighting the mental health needs of students through capturing a comprehensive picture of student mental illness and well-being over a one year period could be crucial to informing and shaping targeted and relevant support initiatives. More expansive longitudinal research is needed to capture a broader picture of how university students in the UK have coped at different stages of the pandemic, capturing data over several time points during the pandemic.

This study is part of a wider research program that is conducting quantitative and qualitative investigations into the impacts of COVID-19 on university students in the UK, Germany, Italy and Spain. This study aimed to track a large sample of university students in the UK over a one-year period of the COVID-19 pandemic, capturing data at four time points. Indeed, this study aimed to monitor the mental illness and mental well-being of university students over twelve months of the COVID-19 pandemic. The research question for this longitudinal study was: How has the mental health of university students in the UK changed after 12 months of the COVID-19 pandemic?

MATERIALS AND METHODS

Design

This study adopted a repeated measures design that aimed to track the mental health of university students in the UK after one year of the COVID-19 pandemic. Data were collected online at four time points over a one-year period. Data were first collected between 14th and 16th of May 2020 ($n = 1578$), when the UK was in the 7th week of confinement (T1). Students were assessed again after 6 weeks, between 25th June and 15th July 2020 ($n = 1281$), when lockdown measures were beginning to change (T2). Six months later, between 17th Nov and 21st Dec 2020 ($n = 852$), students completed the survey again when there were harsh lockdown restrictions in the lead up to Christmas (T3). After 12 months students were asked to complete the survey for a final time (T4), between 14th May 2021 and 4th June 2021 ($n = 554$), when the UK was at Step 3 of the roadmap to come out of lockdown restrictions indefinitely. Data were collected through Prolific, which is an online crowdsourcing platform that was specifically designed for use in a research context. Certain features available to researchers such as pre-screening and 'whitelisting' participants, permits the collection of longitudinal data (Palan and Schitter, 2018).

TABLE 1. Demographic characteristics of the participant sample at each time point

Demographic Characteristic		T1%)	T2%)	T3%)	T4%)
		n=1578	n=1281	n=852	n=554
Gender	Female	1074 (68.1)	877 (68.5)	605 (71)	402 (72.6)
	Male	498 (31.6)	398 (31.1)	243 (28.5)	146 (26.4)
	Missing	6 (.4)	6 (.4)	4 (.5)	6 (1.1)
Age	18–19	379 (24)	307 (24)	205 (24.1)	40 (7.3)
	20–21	593 (37.6)	468 (36.6)	305 (35.8)	199 (36)
	22–23	265 (16.8)	219 (17.1)	136 (16)	138 (24.9)
	24–30	174 (12.3)	159 (11.3)	112 (13.2)	97 (17.6)
	31–40	97 (6.1)	87 (6.7)	61 (7.2)	52 (9.3)
	41+	70 (3.2)	41 (4.3)	33 (3.7)	26 (5)
	Mean	22.9	23	23.2	23.6

Participants

Participants at the final phase of data collection (T4) were 554 university students in the UK between the ages of 18 and 76 (mean age was 24.6). Participants at the final point of data collection (T4) were both male ($n = 146$) and female ($n = 402$); six chose not to identify as male or female. The mean age of participants was 23.6 (see Table 1 for demographic characteristics of the sample). Table 1 also demonstrates the demographic characteristics of the sample at each stage of data collection, but any further analysis and discussion are based on the participant sample at T4.

Measures

At each phase of data collection, participants were asked to complete a series of mental health related standardised measures.

Psychological distress (CORE-10)

Devised by Barkham *et al.* (2013), the Clinical Outcomes in Routine Evaluation (CORE-10) is a 10-item measure of psychological distress. This scale is rated on a five-point frequency of occurrence basis, from ‘not at all’ to ‘most or all of the time’. The reliability and validity of this scale have been extensively tested and confirmed (Barkham *et al.*, 2013). Internal reliability analysis using T4 data from the present study revealed a Cronbach’s alpha estimate of .86

Flourishing (PERMA-Profilier)

The PERMA Profiler is a 23-item measure of flourishing, developed by Butler and Kern (2016). Overall flourishing scores consists of positive emotions (3

items), engagement (3 items), relationships (3 items), meaning (3 items), accomplishments (3 items) and overall happiness (1 item). This scale also measures physical health (3 items), negative emotion (3 items) and loneliness (1 item). The PERMA-Profilier is scored in the form of a 10-point rating scale and has shown acceptable reliability and validity (Bartholomaeus *et al.*, 2020; Wammerl *et al.*, 2019) and has been validated in a number of population groups (Chaves *et al.*, 2023). Previous research by the authors (Carson *et al.*, 2020) also used the PERMA-Profilier. The study had a sample size of 1608. Internal reliabilities from this study were, Positive Emotions $\alpha = .90$, Engagement $\alpha = .73$, Relationships $\alpha = .84$, Meaning $\alpha = .91$ and Accomplishments $\alpha = .81$. The figure for all 15 PERMA items was $\alpha = .95$. As one might predict total PERMA correlated positively with the ONS4 Happiness measure, 'How happy were you yesterday,' $r = .65$ and negatively with CORE-10, $r = -.64$ (Carson *et al.*, 2020). Internal reliability analysis of overall flourishing in the current study (PERMA + Item 23) using the concrete data from T4 revealed a Cronbach's alpha estimate of .95. While the PERMA-Profilier has five PERMA subscales each with three items, no factor analysis has ever produced a solution to match this, yet inevitably some factors are more important than others, and thus require more items to match their importance, than less important factors. Ryan *et al.* (2019), failed to find either a five-factor solution or a single-factor solution, while Bartholomaeus *et al.* (2020), suggested it best reflected a single-factor model of well-being. Diener and colleagues developed a short eight-item measure of flourishing, which provides an alternative measure of flourishing (Diener *et al.*, 2010).

Generalised anxiety (GAD-7)

Originally developed by Spitzer *et al.* (2006), the Generalised Anxiety Scale-7 (GAD-7) is a 7-item self-rated measure of generalised anxiety disorder and is often used as a screening tool and symptom severity measure for clinically significant anxiety disorders in outpatient settings. This scale is rated on a four-point frequency of occurrence basis, from 'not at all' to 'nearly every day'. The GAD-7 has been shown to have good internal consistency (Tiirikainen *et al.*, 2019), good criterion validity (Spitzer *et al.*, 2006) and good construct validity (Tiirikainen *et al.*, 2019). Internal reliability analysis using the T4 data from the present study revealed a Cronbach's alpha estimate of .90.

Procedure

The study survey was created on Qualtrics and uploaded to Prolific, an online platform designed to recruit participants for online research. Only prolific users who were eligible to participate were invited to complete the online survey. In order to be eligible to participate, Prolific users needed to be

residents of the UK and studying at university at the Time 1 (T1) recruitment stage. Therefore, this study adopted a convenience sampling technique. The sample size at baseline was determined based on the funding available at that time. Participants were provided with a Participant Information Sheet (PIS) that clearly outlined the aim of the study and what their participation would involve. In particular, they were informed of the longitudinal nature of the research and that they would be asked to complete the survey at four different time points. Participation in this research was voluntary and after participants read the study information and consented to take part, they were asked to provide basic demographic information including age and gender. Participants were then asked to complete a series of questionnaires: CORE-10, PERMA-Profiler and GAD-7. Participants were paid £1.25 for each time they completed the survey. Tracing efforts were used to contact participants who were lost to follow-up phases of the research. These lost participants were contacted once with study information and were offered a further invitation to participate with a link to the study provided. Attrition between T1 ($n = 1578$) and T2 ($n = 1281$) was 18.8%. Between T2 and 6 months later at T3 ($n = 852$), attrition was 33.4%. Attrition between T3 and T4 ($n = 554$) was 34.9%. Overall attrition, over a one-year period of the COVID-19 pandemic, from T1 to T4, was 64.9%. Ethical approval for the study was obtained in line with British Psychological Society guidelines.

Statistical analysis

To investigate whether, and how, psychological distress, anxiety, flourishing and well-being were impacted after 12 months of the COVID-19 pandemic, a series of paired samples t-tests were carried out. Further, to determine whether mental health outcomes in university students had significantly changed between T1 (May 2020) and T4 (May 2021), a series of one-way repeated measures ANOVAs were conducted. Post hoc tests were carried out to explore mental health changes by each time point. A chi-square test was performed to determine gender differences in drop out and an independent samples Kruskal–Wallis test was carried out to look for age differences in drop out.

RESULTS

This study aimed to track the mental health of university students in the UK over a 12-month period of the COVID-19 pandemic by capturing data at four time points.

University students' Mental Health Outcomes After 12 Months of the COVID-19 Pandemic

Data were analysed using the Statistical Package for the Social Sciences (IBM SPSS, version 25). Skewness was used to measure the asymmetry of data distribution and kurtosis was used to measure whether or not the data distribution is heavy or light-tailed relative to a normal distribution. Age was non-normally distributed, with skewness of 2.67 (SE = .104) and kurtosis of 8.52 (SE = .207). Skewness and Kurtosis statistics were within the commonly accepted thresholds of ± 2 and ± 7 (Byrne, 2010; George and Mallery, 2010; Hair *et al.*, 2010) respectively, for each of the dependent measures at T4 (CORE-10, GAD-7, PERMA-Profilier) and so normal univariate distribution was assumed.

A series of paired-samples t-tests were conducted to compare mental health outcomes in university students in the UK at Time 1 (May 2020) and Time 4

TABLE 2. Mental health comparisons between May 2020 and May 2021 in British University students

Measure	T1			T4		<i>t</i>	<i>p</i>	<i>d</i>
	N	M	SD	M	SD			
Psychological Distress	539	13.79	7.24	15.61	5.71	-6.605	.001	.20
Anxiety	545	7.57	5.15	7.14	5.02	-2.032	.031	.08
Flourishing	545	102.12	25.67	98.73	27.51	3.638	.001	.13

T1 was responses captured between 14–16 May 2020, T4 was responses captured between 14th May –4th June 2021. N = number of respondents. M = Mean. SD = Standard Deviation. *t* = paired samples t-test statistic. *p* = significance (2-tailed). *d* = effect size (Cohen's *d*).

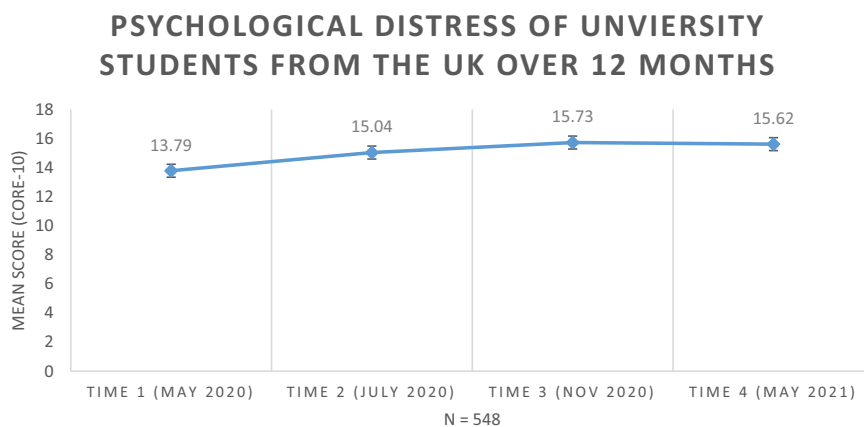


Figure 1. Psychological distress of university students in the UK over 12 months

(May 2021). Findings showed a significant difference in psychological distress ($t(539) = -6.605, p < .001, d = 0.20$), flourishing ($t(545) = 3.638, p < .001, d = .13$) and generalised anxiety ($t(545) = -2.032, p < .05, d = .08$). See [Table 2](#) for descriptive statistics.

[Figure 1](#) clearly depicts an increase in psychological distress over 12 months of the COVID-19 pandemic. According to pre-pandemic data, the normative mean score for psychological distress is 4.70 (Barkham *et al.*, 2013), which is considerably below the mean scores at all time-points. Further analysis was carried out to determine whether mental health outcomes in university students had significantly changed between T1 (May 2020) and T4 (May 2021), considering data from all four time points. A one-way repeated measures analysis of variance (ANOVA) revealed a significant increase in psychological distress after 12 months, Wilks' Lambda = .90, $F(1, 539) = 19.58, p < .001, \eta_p^2 = .10$. While this suggests that psychological distress significantly increased between May 2020 and May 2021, Post hoc tests revealed that psychological distress significantly increased between T1 and T2 ($p < .001$) and between T2 and T3 ($p < .05$), but not between T3 and T4 ($p = .910$).

A one-way repeated measures ANOVA was carried out to determine whether generalised anxiety had significantly changed between May 2020 and May 2021, when captured at four time points throughout the pandemic. Findings showed a significant effect, Wilks' Lambda = .95, $F(1, 545) = 9.96, p < .001, \eta_p^2 = .05$. Although [Figure 2](#) illustrates fluctuating levels of anxiety over the course of the COVID-19 pandemic, these findings suggest there is a significant decrease in generalised anxiety scores after 12 months. Post hoc tests revealed that generalised anxiety significantly decreased between T1 and T2 ($p < .001$), significantly increased between T2 and T3 ($p < .001$) and the slight decrease illustrated in [Figure 2](#) between T3 and T4 was not significant

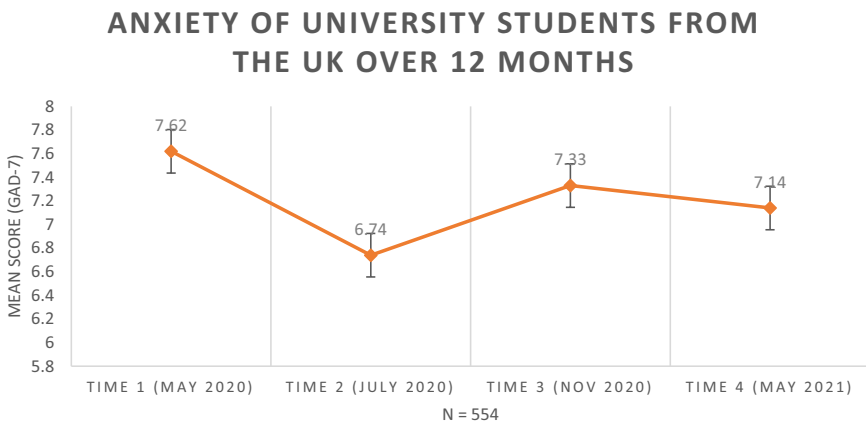


Figure 2. Generalised anxiety of university students in the UK over 12 months

FLOURISHING OF UNIVERSITY STUDENTS FROM THE UK OVER 12 MONTHS

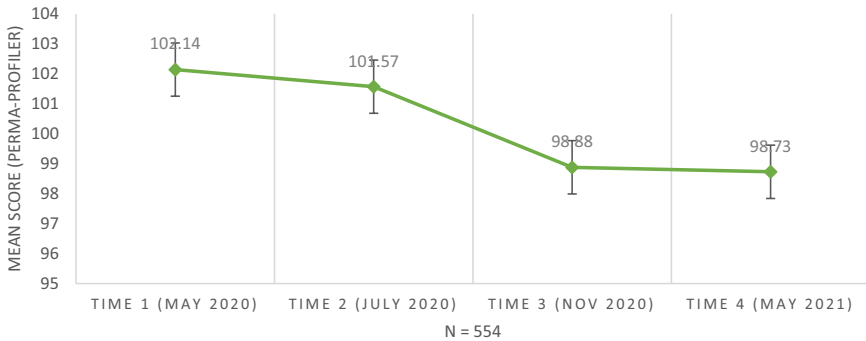


Figure 3. Flourishing of University students in the UK over 12 months

($p=.568$). Nonetheless, generalised anxiety scores for students throughout the pandemic were considerably higher than the pre-pandemic norm of 4.75 (Jordan *et al.*, 2017).

Finally, Figure 3 demonstrates a decline in flourishing scores over 12 months of the COVID-19 pandemic. Overall flourishing levels were considerably lower at all recorded time points than pre-pandemic normative scores of 114.33 (Butler and Kern, 2016). A one-way repeated measures ANOVA was conducted to investigate whether flourishing has significantly changed between May 2020 and May 2021, considering data captured at all four time points. Findings indicated a significant change, Wilks' Lambda = .97, $F(1, 545) = 6.56$, $p < .001$, $\eta_p^2 = .04$. These findings suggest that, overall, flourishing in university students significantly decreased between May 2020 and May 2021. Post hoc tests revealed that the decrease in flourishing between T1 and T2 was not significant ($p=.324$), but flourishing did significantly decrease between T2 and T3 ($p < .001$). The slight decrease in flourishing scores depicted in Figure 3, between T3 and T4 ($p < .001$), was not significant.

Attrition and studied variables

At baseline (T1) there were 1578 responses. At the fourth phase of data collection (T4) after one year, there were 554 responses. Overall attrition after 12 months was 64.9%. A chi-squared test revealed that females were more likely than males to stay in the research, $\chi^2(2, n = 1578) = 13.02$, $p < .001$. According to an independent samples Kruskal–Wallis test, age was not

significantly associated with retention, $H(1) = 3.587, p = .058$. Independent samples t-tests were conducted to determine whether mental health outcomes at baseline (T1) differed for those who dropped out compared to those who were retained. Findings indicated that there were no significant differences at baseline (T1) between participants who stayed for the entirety of the research ($n = 759$) and participants who dropped out ($n = 819$) for psychological distress ($p = .244$), anxiety ($p = .960$), flourishing ($p = .497$), life satisfaction ($p = .164$), worthwhile-ness ($p = .210$), happiness felt yesterday ($p = .097$) or anxiety felt yesterday ($p = .645$). These findings suggesting that those who stayed in the research and those who dropped out were similar in terms of mental well-being at baseline. Therefore, females were more likely to be retained. However, retention was not related to age and there were no differences regarding baseline mental health outcomes.

DISCUSSION

University students' mental health in the UK over the COVID-19 pandemic

Psychological distress

The current study found a significant increase in psychological distress scores between May 2020 and May 2021, coinciding with previous research (Browning *et al.*, 2021; Cao *et al.*, 2020; Kannangara *et al.*, 2021). Such that, a longitudinal study that looked at the prevalence of mental health problems in the Great British public found a significant deterioration in mental health, particularly among 18–34 years olds where there was a reported increase in 'psychiatric caseness' (Daly *et al.*, 2020). Also, a 6-week follow-up study using a large sample of university students in the UK revealed a significant rise in psychological distress since the beginning of the COVID-19 pandemic (Kannangara *et al.*, 2021).

Even in May 2020, at the first phase of data collection, psychological distress scores were already considerably above ($M = 13.79$) the mean normative score pre-Covid-19 (Barkham *et al.*, 2013). A rise in psychological distress was to be expected as periods of prolonged isolation are known to have significant psychological effects (Hawryluck *et al.*, 2004). Therefore, increased psychological distress was likely a consequence of the COVID-19 timeline and the events that were taking place at the time leading up to students participating in the research. For instance, on April 16th 2020, lockdown restrictions were extended for a further 3 weeks and on the 5th May 2020, the UK had the second highest daily death toll in the world (Meredith and Browne, 2020). These events would have had an impact on university students' self-reported psychological distress in May 2020. On the other hand, although insignificant according to the pairwise comparisons of a repeated measures ANOVA, a very slight decrease in psychological distress

was starting to become apparent (see [Figure 1](#)) between the end of 2020 (T3) and May 2021 (T4). Students completed the survey at T4 for a final time when the UK was amidst the government's roadmap plan to slowly and indefinitely return to 'normal'. The reality and anticipation of regaining access to indoor and outdoor leisure and entertainment facilities, and the promise of social interaction could have the potential to reduce levels of psychological distress. However, these conclusions cannot be confirmed as the data was captured prematurely in this period of the COVID-19 pandemic and it is unknown how this could have long-term implications for students' psychological distress. Regardless, recent data from the ONS (2021), has shown that since May 2021, students are becoming more socially active and starting to spend more time outside and travel to different areas. This gradual relaxation of isolation restrictions and social distancing measures could begin to contribute towards a slight drop in psychological distress not just for students, but for the entire population. The link between more intense periods of COVID-19 restrictions and poorer mental well-being can be explained by theories on social connectedness. A five dimensional conceptual framework demonstrates the crucial importance of social connection, involvement, closeness and engagement with other people on an individual's physical and mental health (Hare-Duke *et al.*, 2019). Without the ability or possibility for social connection with other people, mental health will inevitably decline.

Flourishing

Findings also suggested that flourishing in university students in the UK significantly decreased between May 2020 and May 2021. Previous research has also indicated a decline in flourishing levels since the COVID-19 outbreak (Kannangara *et al.*, 2021). Also, flourishing levels were much lower in students at all four time points during the pandemic when compared to flourishing scores captured before the pandemic (Butler and Kern, 2016). Findings from a one-way repeated measures ANOVAs revealed that flourishing scores declined between July 2020 (T2) and November 2020 (T3). Students were adjusting to online learning as the academic year of 2020/21 commenced in September 2020, which propelled COVID-19 cases around the country and subsequently meant extended periods of confinement. Not to mention that on the 5th of November 2020, a second lockdown in England was enforced for 4 weeks. It is very probable that the frequent loneliness and social isolation experienced by students was depressing flourishing levels.

Seligman (2011) proposed a theoretical model of happiness (PERMA) that consists of positive emotions, engagement, relationships, meaning and achievement. According to Seligman (2011), these five core elements of flourishing guide people toward a purposeful and meaningful life that offers an individual

fulfilment and happiness. There are many reasons why university students in the UK were unable to ‘flourish’ during the COVID-19 pandemic. University students, along with the rest of the population, were experiencing increased mental illness as a consequence of the fear, anxiety, uncertainty, and health concerns produced by the pandemic. Simply put, the ingredients that contribute towards flourishing are the same ones that have been stripped from people during the COVID-19 pandemic. For example, students have experienced heightened loneliness and social isolation, which we know are linked to lower levels of flourishing (Diener *et al.*, 2010). Likewise, building and maintaining healthy and effective relationships, a fundamental part of flourishing mental health, has been obstructed due to social distancing measures. Ultimately, students have been unable to meet the criteria and demands to achieve flourishing mental health (Kannangara *et al.*, 2021), as students’ ability to experience positive emotions, engagement, relationships, meaning in life and accomplishments have been severely limited, if not withheld entirely, due to the COVID-19 pandemic.

Generalised anxiety

While there was a significant decrease in generalised anxiety scores after 12 months, anxiety scores fluctuated throughout the COVID-19 pandemic. Anxiety scores of university students seemed to correspond to different periods of the COVID-19 pandemic. For example, findings from a repeated measures ANOVA revealed that anxiety levels improved considerably between May 2020 (T1) and July 2020 (T2). Perhaps this was because by June 2020, lockdown was easing slowly across the country which was likely to have a positive impact on university students’ anxiety, even if only temporary, as they were allowed to socialise and felt the exciting anticipation of returning to normal. Findings also demonstrated that anxiety in students appeared to increase again in November 2020 (T3), perhaps in correspondence to the beginning of the academic year 2020/2021, which saw many complications to their education and accommodation, along with a myriad of harsh rules and restrictions. Around this time we saw multiple universities around the UK, including Manchester Metropolitan University and Abertay University, placing their students in isolation within their halls of accommodation, due to outbreaks of COVID-19 on campus. This saw students, often living alone or away from home for the first time, confined to their rooms for 2 weeks. Over the next few months, protests and petitions took place as isolated students shared their frustration and anxiety about their accommodation fees, harsh confinement, employment struggles, lack of academic and mental health contact and support, and unrelenting academic expectations (Blackall and Mistlin, 2021). While a statistical improvement was not illustrated, upon inspection of [Figure 3](#), it seems that anxiety scores were starting to improve again by T4. Throughout March, April and May 2021, the

UK progressed through the steps set out by the Prime Minister to ease lockdown indefinitely, with returned access to hospitality, retail and leisure facilities. These events began to instil a sense of hope and normality in university students which eventually improved their levels of anxiety over time. Ultimately, after 12 months, university students were reporting significantly improved anxiety levels. Anxiety levels were highest in May 2020, at a time when the COVID-19 pandemic was in its early stages with greater levels of fear and uncertainty. As time went on, it is then possible that anxiety levels fell in general as students became more familiar with living during the COVID-19 pandemic and were beginning to adapt to the new normal ways of life. Additionally, recent data from the ONS (2021) that captured data from May 2021, revealed that more and more British students were leaving their accommodation to spend time outdoors, to exercise, for shopping and to socialise. A more social and positive student experience was likely to be contributing towards an improvement in anxiety levels at T4 (May 2021).

Nonetheless, the generalised anxiety scores for students throughout the pandemic were considerably higher than the pre-pandemic norms (Jordan *et al.*, 2017) and so the reduction in scores is not considered to be clinically significant. Further investigation into the prevalence of anxiety levels in university students during the latest stages of the COVID-19 pandemic and beyond is important to help track and manage student mental health.

Practical implications and recommendations for future research

There is clear evidence that the mental health needs of university students in the UK have increased since the outbreak of COVID-19 and throughout much of the pandemic. Traditional forms of support have simply been made inaccessible due to COVID-19 restrictions, and those still active are completely overwhelmed by the sheer number of students seeking help. To counteract this, mental health services must be available online or accessible via social media platforms or mobile phone applications (Visser and Law-van Wyk, 2021). Indeed, the production of effective mental health apps could reduce costs, combat the stigma associated with seeking professional help, can be used in isolation and periods of lockdown and would alleviate the strain on overwhelmed mental health services (Marques *et al.*, 2020). Mental health apps are known to be effective in alleviating mental health problems such as anxiety, stress and depression (Firth *et al.*, 2017; Wright *et al.*, 2019). However, it is important to recognise that these are not an opportunity to substitute more direct mental health support that is empirically supported. Suggestions are also made to provide online peer counselling and support groups, particularly during times of crisis (Visser and Law-van Wyk, 2021). It is also important to consider the disproportionate impacts that some students have faced throughout the COVID-

19 pandemic. Such that, international students, many of whom have moved to a new country to study at university, typically experience greater isolation, loneliness and reduced overall well-being (Burns *et al.*, 2020), further amplified by the COVID-19 pandemic that prevents them from acclimatising to their new environment. University closures also affected the legal status of many international students in their host countries (Schleicher, 2020). Those with family and childcare responsibilities had more difficulties adjusting to learning from home, especially when schools were closed, and disadvantaged students and those without a suitable internet connection or appropriate equipment to study from home faced a disproportionate impact. Further research is needed to inform and shape initiatives for mental health provision within higher education settings, and the possibility for developing efficient virtual solutions, taking the known disproportionate impacts to certain students into account. It is crucial to employ improved support packages for disadvantaged students who are studying remotely, either throughout the pandemic or beyond.

The mental health of students seemed to fluctuate depending on the specific stage of the pandemic. It is imperative that support services are adapted to cater to the rising and unique needs of the student population that are constantly evolving as a consequence of the COVID-19 pandemic. Growing evidence suggests that greater flourishing contributes towards reduced symptomology and improved mental health (Bohlmeijer *et al.*, 2015; Schotanus-Dijkstra *et al.*, 2017). Therefore, flourishing has been identified as a significant protective factor against the incidence of several mental health problems such as anxiety and other mood disorders (Schotanus-Dijkstra *et al.*, 2017). These findings also coincide with recent research that proclaims students mental health during the pandemic is most strongly predicted by their level of hopefulness (Visser and Law-van Wyk, 2021). Broaden-and-build theory (Fredrickson, 2001) states that over time-positive emotions can build a repertoire of resources (i.e., personal, social, intellectual, psychological) that can be accessed in times of need. Further, Fredrickson *et al.* (2003) found that positivity during a crisis, such as a terrorist attack or natural disaster, encourages thriving and provides a buffer against symptoms of depression.

The state of higher education has changed drastically since the outbreak of Covid-19. Academic life has been ‘turned upside down’ with the rapid transition to online and blended learning approaches creating many problems for university students around the world (Zarei and Mohammadi, 2022). Indeed, the lack of face-to-face learning was reported to have a major impact on around half of students’ academic performance as well as the quality of their course (Barada *et al.*, 2020). The sudden shift to online learning meant that libraries were closed and most students were now studying in isolation, many without a suitable learning environment (Aristovnik *et al.*, 2020; Barada *et al.*, 2020), leading to a lack of motivation, reduced academic performance and diminished well-being

(Aristovnik *et al.*, 2020; Barada *et al.*, 2020). Further, students have mentioned changes to assessment methods (Schleicher, 2020), changes to the level of academic and peer support, and unsuitable learning environments (Barada *et al.*, 2020). We already know the negative implications that disruption to education can have on the wellbeing of students (Idris *et al.*, 2021; Visser and Law-van Wyk, 2021), and so educational changes are likely to have been a contributing factor in this case. More investigation is needed into how the COVID-19 pandemic has impacted on the education of university students and the role it has played in their mental well-being.

Limitations

As this research used Prolific to recruit participants, this meant that participants were offered financial gain for taking part in the online research which is more recently regarded as common practice (Largent and Fernandez Lynch, 2017). Also, using Prolific makes it possible to review the individual submissions to reject ones that are potentially inadequate or inconsistent. For instance, submissions that are completed 'too quickly'. Data were collected through self-report measures and raises issues surrounding social desirability (Larson, 2019). However, the use of self-report measures remains the most popular form of data collection in psychological research and this study used recognised and standardised measures. Another limitation of this study was the unequal balance of gender in the study sample. Indeed, 72.6% of the sample were female. However, this was expected due to the unequal gender balance apparent in higher education (du Toit *et al.*, 2022; Hillman and Robinson, 2016). While typically, 56.5% of those in higher education in the UK are female (Office for Students, 2022), there are some that demonstrate a greater gender gap including Leeds Arts University (77% female vs. 22% male) and Queen Margaret University (76% female vs. 24% male). Also, females are more likely to participate in online research (Mulder and de Bruijne, 2019). This study had a particularly high attrition rate (64.9%) and this remains a major limitation. While females were more likely to be retained in this longitudinal study, it is important to note that the mental health of students retained in the research was not significantly better or worse than those who dropped out. It is also likely that many students graduated or dropped out of university throughout the course of the study and were no longer eligible to participate. In addition, there are other probable contributing factors toward student mental health during that COVID-19 pandemic that were not accounted for or studied, such as access to and use of mental health support services. The role of educational changes and adapting to online modes of learning is also likely to have contributed towards students' mental health.

Additional concerns might relate to the choice of measures used in this study. We chose to use the GAD-7, alongside the CORE-10. A more natural choice might have been to use the PHQ-9 depression screening scale (Kroenke *et al.*, 2001) with the GAD-7, as one measures anxiety and the other depression, which are the two commonest mental health problems (Layard and Clark, 2014). Similarly, a number of researchers have been critical of the PERMA Profiler (Bartholomaeus *et al.*, 2020; Ryan *et al.*, 2019). An alternative to the PERMA Profiler might be the short 8-item Flourishing Scale (Diener *et al.* (2010).

CONCLUSIONS

The current findings contradict those of Sun *et al.*, (2021) who, through a living systematic review, reported no marked differences in the general mental health, anxiety or depression of university students. Rather, current findings using a large sample of university students in the UK studied over a one-year period, suggests that the mental health of university students has deteriorated over the course of the COVID-19 pandemic and that after 12 months, university students' mental health has worsened generally. It is likely that there are many contributing factors towards university students' mental health throughout Covid-19, including fear, anxiety, loneliness, positivity, social support, psychological support, coping strategies, physical environment, resilience and mind-sets. It is also important to consider the timeline of the COVID-19 pandemic in the UK and how influential different phases of the pandemic were likely to have been on the mental health of students. Specifically, periods in which COVID-19 cases were peaking and during periods of lockdown and intense confinement, were seen to be associated with poorer mental well-being. This was expected as isolation and periods of confinement are linked to worse mental health outcomes (Cacioppo and Cacioppo, 2014). Also, the risk of being infected and knowing someone who is infected with Covid-19, significantly increases levels of psychological impacts (Browning *et al.*, 2021). Conversely, periods of the pandemic that saw the relaxing of rules and restrictions saw a slight improvement. For instance, the significant decrease in anxiety in June and July 2020 when lockdown measures were beginning to relax and social distancing rules were easing after a long period of strict isolation. However, while mental health clearly deteriorated over the COVID-19 pandemic and it appears that mental health fluctuations at different time points are related to different phases of the pandemic, it is not possible to confirm these claims and are simply suggestions. Still, students were considerably worse off than the pre-pandemic norms. In fact, it became apparent that early in the COVID-19 pandemic, in May 2020, the mental health of university students was already suffering.

Considering the lasting and wide-spread changes to higher education since the COVID-19 pandemic, it remains as important as ever to support students physically, mentally and academically. We suggest that more needs to be done to protect university students from mental illness and promote mental well-being during the pandemic and beyond, including a re-think of how policies can support this.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in 'figshare' at <https://doi.org/10.6084/m9.figshare.22270969.v1>

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REFERENCES

- Allen, R., Kannangara, C., Vyas, M. and Carson, J. (2022) European university students' mental health during Covid-19: exploring attitudes towards Covid-19 and governmental response, *Current Psychology*, 1–14. [10.1007/s12144-022-02854-0](https://doi.org/10.1007/s12144-022-02854-0).
- Antonovsky, A. (1979). Health, stress and coping: New perspectives on mental and physical well-being. San Francisco: Jossey-Bass.
- Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N. and Umek, L. (2020) Impacts of the COVID-19 pandemic on life of higher education students: a global perspective, *Sustainability*, 12 (20), 8438. [10.3390/su12208438](https://doi.org/10.3390/su12208438).
- Barada, V., Doolan, K., Burić, I., Krolo, K. and Tonković, Ž. (2020). Student life during the COVID-19 pandemic lockdown: Europe-Wide Insights. *University of Zadar*. Available at http://ehea.info/Upload/BFUG_DE_UK_73_11_6_students_Covid_19_survey_results.pdf (Accessed 22 July 2022)
- Barkham, M., Bewick, B., Mullin, T., Gilbody, S., Connell, J., Cahill, J., Mellor-Clark, J., Richards, D., Unsworth, G. and Evans, C. (2013) The CORE-10: a short measure of psychological distress for routine use in the psychological therapies, *Counselling & Psychotherapy Research*, 13 (1), 3–13. [10.1080/14733145.2012.729069](https://doi.org/10.1080/14733145.2012.729069).
- Barkham, M., Broglia, E., Dufour, G., Fudge, M., Knowles, L., Percy, A. and SCORE Consortium. (2019) Towards an evidence-base for student wellbeing and mental health: definitions, developmental transitions and data sets, *Counselling & Psychotherapy Research*, 19 (4), 351–357. [10.1002/capr.12227](https://doi.org/10.1002/capr.12227).

- Bartholomaeus, J. D., Iasiello, M. P., Jarden, A., Burke, K. J. and van Agteren, J. (2020) Evaluating the Psychometric Properties of the PERMA profiler, *Journal of Well-Being Assessment*, 4 (2), 163–180. [10.1007/s41543-020-00031-3](https://doi.org/10.1007/s41543-020-00031-3).
- Blackall, M. and Mistlin, A. (2021, January 11). 'Broken and defeated': uK university students on the impact of Covid rules. The Guardian. Retrieved March 13, 2021, from <https://www.theguardian.com/education/2021/jan/11/broken-and-defeated-uk-university-students-on-the-impact-of-covid-rules>.
- Bohlmeijer, E. T., Lamers, S. M. and Fledderus, M. (2015) Flourishing in people with depressive symptomatology increases with acceptance and commitment therapy. Post-hoc analyses of a randomized controlled trial, *Behaviour Research and Therapy*, 65, 101–106. [10.1016/j.brat.2014.12.014](https://doi.org/10.1016/j.brat.2014.12.014).
- Bonsaksen, T., Chiu, V., Leung, J., Schoultz, M., Thygesen, H., Price, D. and Geirdal, A. Ø. (2022) May Students' mental health, well-being, and loneliness during the COVID-19 pandemic: a cross-national study, *Healthcare*, 10 (6), 996. [10.3390/healthcare10060996](https://doi.org/10.3390/healthcare10060996).
- Browning, M. H., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L. and Alvarez, H. O. (2021) Psychological impacts from COVID-19 among university students: risk factors across seven states in the United States, *PLoS One*, 16 (1), e0245327. [10.1371/journal.pone.0245327](https://doi.org/10.1371/journal.pone.0245327).
- Burns, D., Dagnall, N. and Holt, M. (2020) Assessing the impact of the COVID-19 pandemic on student wellbeing at universities in the United Kingdom: a conceptual analysis, *Frontiers in Education*, 5, 582882. [10.3389/educ.2020.582882](https://doi.org/10.3389/educ.2020.582882).
- Butler, J. and Kern, M. (2016) The PERMA-Profilier: a brief multidimensional measure of flourishing, *International Journal of Wellbeing*, 6 (3), 1–48. [10.5502/ijw.v6i3.526](https://doi.org/10.5502/ijw.v6i3.526).
- Byrne, B. M. (2010) *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming* (New York, Routledge).
- Cacioppo, J. T. and Cacioppo, S. (2014) Social relationships and health: the toxic effects of perceived social isolation, *Social and Personality Psychology Compass*, 8 (2), 58–72. [10.1111/spc3.12087](https://doi.org/10.1111/spc3.12087).
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J. and Zheng, J. (2020) The psychological impact of the COVID-19 epidemic on college students in China, *Psychiatry Research*, 287, 112934. [10.1016/j.psychres.2020.112934](https://doi.org/10.1016/j.psychres.2020.112934).
- Carson, J., Carson, J., Prescott, J., Allen, R. and McHugh, S. (2020) Winter is coming: age and early psychological concomitants of the Covid-19 pandemic in England, *Journal of Public Mental Health*, 24 (3), 163–172. [10.1108/JPMH-06-2020-0062](https://doi.org/10.1108/JPMH-06-2020-0062).
- Chaves, C., Ballesteros-Valdés, R., Madridejos, E. and Charles-Leija, H. (2023) PERMA-Profilier for the Evaluation of well-being: adaptation and validation in a sample of university students and employees in the Mexican educational context, *Applied Research in Quality of Life*, 1–23. [10.1007/s11482-022-10132-1](https://doi.org/10.1007/s11482-022-10132-1).
- Daly, M., Sutin, A. and Robinson, E. (2020) Longitudinal changes in mental health and the COVID-19 pandemic: evidence from the UK household longitudinal study, *Psychological Medicine*, 1–10. Advance online publication. [10.1017/S0033291720004432](https://doi.org/10.1017/S0033291720004432)
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S. and BiswasDiener, R. (2010) New well-being measures: short scales to assess flourishing and positive and negative feelings, *Social Indicators Research*, 97 (2), 143–156. [10.1007/s11205-009-9493-y](https://doi.org/10.1007/s11205-009-9493-y).
- Du Toit, A., Thomson, R. and Page, A. (2022) A systematic review and meta-analysis of longitudinal studies of the antecedents and consequences of wellbeing among university students, *International Journal of Wellbeing*, 12 (2), 163–206. [10.5502/ijw.v12i2.1897](https://doi.org/10.5502/ijw.v12i2.1897).

- Elmer, T., Mephram, K. and Stadtfeld, C. (2020) Students under lockdown: comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland, *PLoS One*, 15 (7), e0236337. [10.1371/journal.pone.0236337](https://doi.org/10.1371/journal.pone.0236337).
- Farnell, T., Skledar Matijevic, A. and Šćukanec Schmidt, N. (2021). *The impact of COVID-19 on Higher Education: A review of emerging evidence. Analytical report.* European Commission. Available from: EU Bookshop.
- Firth, J., Torous, J., Nicholas, J., Carney, R., Prapat, A., Rosenbaum, S. and Sarris, J. (2017) The efficacy of smartphone-based mental health interventions for depressive symptoms: a meta-analysis of randomized controlled trials, *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 16 (3), 287–298. [10.1002/wps.20472](https://doi.org/10.1002/wps.20472).
- Fredrickson, B. L. (2001) The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions, *The American Psychologist*, 56 (3), 218–226. [10.1037/0003-066X.56.3.218](https://doi.org/10.1037/0003-066X.56.3.218).
- Fredrickson, B. L., Tugade, M. M., Waugh, C. E. and Larkin, G. R. (2003) What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001, *Journal of Personality & Social Psychology*, 84 (2), 365–376. [10.1037/0022-3514.84.2.365](https://doi.org/10.1037/0022-3514.84.2.365).
- George, D. and Mallery, M. (2010) *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 Update 10a* (Boston, Pearson).
- Glowacz, F., & Schmits, E. (2020). Psychological distress during the COVID-19 lockdown: The young adults most at risk. *Psychiatry research*, 293, 113486.
- Hair, J., Black, W. C., Babin, B. J. and Anderson, R. E. (2010) *Multivariate Data Analysis 7th* (Upper Saddle River, New Jersey, Pearson Educational International).
- Händel, M., Stephan, M., Gläser-Zikuda, M., Kopp, B., Bedenlier, S. and Ziegler, A. (2020 July 22) Digital readiness and its effects on higher education students' socio-emotional perceptions in the context of the COVID-19 pandemic, *Journal of Research on Technology in Education*, 54 (2), 267–280. [10.1080/15391523.2020.1846147](https://doi.org/10.1080/15391523.2020.1846147).
- Hare-Duke, L., Dening, T., de Oliveira, D., Milner, K. and Slade, M. (2019) Conceptual framework for social connectedness in mental disorders: systematic review and narrative synthesis, *Journal of Affective Disorders*, 245, 188–199. [10.1016/j.jad.2018.10.359](https://doi.org/10.1016/j.jad.2018.10.359).
- Hawryluck, L., Gold, W. L., Robinson, S., Pogorski, S., Galea, S. and Styra, R. (2004) SARS control and psychological effects of quarantine, Toronto, Canada, *Emerging Infectious Diseases*, 10 (7), 1206–1212. [10.3201/eid1007.030703](https://doi.org/10.3201/eid1007.030703).
- Hillman, N. and Robinson, N. (2016) *Boys to Men: The Underachievement of Young Men in Higher Education-And How to Start Tackling It?* (Oxford, Higher Education Policy Institute).
- Holm-Hadulla, R. M. and Koutsoukou-Argraki, A. (2015) Mental health of students in a globalized world: prevalence of complaints and disorders, methods and effectivity of counseling, structure of mental health services for students, *Mental Health & Prevention*, 3 (1–2), 1–4. [10.1016/j.mhp.2015.04.003](https://doi.org/10.1016/j.mhp.2015.04.003).
- Hubble, S. and Bolton, P. (2020) House of Commons Library: Briefing Paper Number Number 8893, 17 April: House of Commons Library.
- Huppert, F. and Whittington, J. (2003) Evidence for the independence of positive and negative well-being: implications for quality of life assessment, *British Journal of Health Psychology*, 8 (1), 107–122. [10.1348/135910703762879246](https://doi.org/10.1348/135910703762879246).
- Idris, F., Zulkippli, I. N., Abdul-Mumin, K. H., Ahmad, S. R., Mitha, S., Rahman, H. A. and Naing, L. (2021) Academic experiences, physical and mental health impact of

- COVID-19 pandemic on students and lecturers in health care education, *BMC Medical Education*, 21 (1), 1–13. [10.1186/s12909-021-02968-2](https://doi.org/10.1186/s12909-021-02968-2).
- Jordan, P., Shedden-Mora, M. C., Löwe, B. and van Wouwe, J. P. (2017) Psychometric analysis of the Generalized Anxiety Disorder scale (GAD-7) in primary care using modern item response theory, *PLoS One*, 12 (8), e0182162–one.0182162. [10.1371/journal.pone.0182162](https://doi.org/10.1371/journal.pone.0182162).
- Kannangara, C., Allen, R., Vyas, M. and Carson, J. (2021) Every cloud has a silver lining: short-term psychological effects of Covid-19 on British university students, *British Journal of Educational Studies*, 71 (1), 1–22. [10.1080/00071005.2021.2009763](https://doi.org/10.1080/00071005.2021.2009763).
- Keyes, C. L. (2005) Mental illness and/or mental health? Investigating axioms of the complete state model of health, *Journal of Consulting & Clinical Psychology*, 73 (3), 539. [10.1037/0022-006X.73.3.539](https://doi.org/10.1037/0022-006X.73.3.539).
- Keyes, C. L. M. (2002) The mental health continuum: from languishing to flourishing in life, *Journal of Health & Social Behavior*, 43 (2), 207. [10.2307/3090197](https://doi.org/10.2307/3090197).
- Kohls, E., Baldofski, S., Moeller, R., Klemm, S. L. and Rummel-Kluge, C. (2021) Mental health, social and emotional well-being, and perceived burdens of university students during COVID-19 pandemic lockdown in Germany, *Frontiers in Psychiatry*, 12, 643957. [10.3389/fpsy.2021.643957](https://doi.org/10.3389/fpsy.2021.643957).
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine*, 16(9), 606–613.
- Largent, E. A. and Fernandez Lynch, H. (2017) Paying research participants: regulatory uncertainty, conceptual confusion, and a path forward, *Yale Journal of Health Policy, Law, and Ethics*, 17 (1), 61–141.
- Larson, R. B. (2019) Controlling social desirability bias, *International Journal of Market Research*, 61 (5), 534–547. [10.1177/1470785318805305](https://doi.org/10.1177/1470785318805305).
- Layard, R. and Clark, D. (2014) *Thrive: The Power of Evidence Based Psychological Therapies* (London, Allen Lane).
- Margraf, J., Zhang, X. C., Lavallee, K. L. and Schneider, S. (2020) Longitudinal prediction of positive and negative mental health in Germany, Russia, and China, *PLoS One*, 15 (6), e0234997. [10.1371/journal.pone.0234997](https://doi.org/10.1371/journal.pone.0234997).
- Marques, L., Bartuska, A. D., Cohen, J. N. and Youn, S. J. (2020) Three steps to flatten the mental health need curve amid the COVID-19 pandemic, *Depression & Anxiety*, 37 (5), 405–406. <https://doi.org/10.1002/da.23031>.
- Meredith, S. and Browne, R. (2020, May 5). *UK coronavirus death toll surpasses Italy to become the highest in Europe*. CNBC. Available at <https://www.cnbc.com/2020/05/05/coronavirus-uk-death-toll-becomes-the-highest-in-europe.html> (Accessed 9 November 2021)
- Mulder, J. and de Bruijne, M. (2019) Willingness of online respondents to participate in alternative modes of data collection, *Survey Practice*, 12 (1), 8356. [10.29115/SP-2019-0001](https://doi.org/10.29115/SP-2019-0001).
- Neves, J. and Hillman, N. (2019) *Student Academic Experience Survey 2019*. Oxford, United Kingdom, Higher Education Policy Institute (HEPI). ISBN 978-1-908240-50-7.
- Office for National Statistics (2020, December 21). Coronavirus and the impact on students in higher education in England: september to December 2020. <https://www.ons.gov.uk/peoplepopulationandcommunity/educationandchildcare/articles/coronavirusandtheimpactonstudentsinhighereducationinenglandseptembertodecember2020/2020-12-21>

- Office for Students (2022, June 7). *Equality, diversity and student characteristics data. Students at English higher education providers between 2010-11 and 2020-21*. Office for Students.
- ONS. (2021, May 23). *Coronavirus and higher education students: England, 4 to 12 May 2021*. Coronavirus and higher education students - Office for National Statistics. Available at <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandhighereducationstudents/england4to12may2021> (Accessed 31 January 2022)
- Palan, S. and Schitter, C. (2018) Prolific. ac—A subject pool for online experiments, *Journal of Behavioral and Experimental Finance*, 17, 22–27. [10.1016/j.jbef.2017.12.004](https://doi.org/10.1016/j.jbef.2017.12.004).
- Ryan, J., Curtis, R., Olds, T., Edney, S., Vandelonotte, C., Plotnikoff, R. and Maher, C. (2019) Psychometric properties of the PERMA Profiler for measuring wellbeing in Australian adults, *PLoS One*, 14 (12), e0225932. [10.1371/journal.pone.0225932](https://doi.org/10.1371/journal.pone.0225932).
- Schleicher, A. (2020). The impact of COVID-19 on education insights from education at a glance 2020. Available at: <https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance2020.pdf> (Accessed 12 February 2022).
- Schotanus-Dijkstra, M., Ten Have, M., Lamers, S., de Graaf, R. and Bohlmeijer, E. T. (2017) The longitudinal relationship between flourishing mental health and incident mood, anxiety and substance use disorders, *European Journal of Public Health*, 27 (3), 563–568. [10.1093/eurpub/ckw202](https://doi.org/10.1093/eurpub/ckw202).
- Seligman, M. (2011) *Flourish: A Visionary New Understanding of Happiness and Well-Being*. New York, NY: Simon and Schuster.
- Slade, M. (2010) Mental illness and well-being: the central importance of positive psychology and recovery approaches, *BMC Health Services Research*, 10 (1), 1–14. [10.1186/1472-6963-10-26](https://doi.org/10.1186/1472-6963-10-26).
- Spitzer, R. L., Kroenke, K., Williams, J. B. and Löwe, B. (2006) A brief measure for assessing generalized anxiety disorder: the GAD-7, *Archives of Internal Medicine*, 166 (10), 1092–1097. [10.1001/archinte.166.10.1092](https://doi.org/10.1001/archinte.166.10.1092).
- Sun, Y., Wu, Y., Bonardi, O., Krishnan, A., He, C. and Boruff, J. T., Thombs, B. D. (2021) Comparison of mental health symptoms prior to and during COVID-19: evidence from a living systematic review and meta-analysis, *medRxiv*, PPR: PPR338740. [10.1101/2021.05.10.21256920](https://doi.org/10.1101/2021.05.10.21256920).
- Tiirikainen, K., Haravuori, H., Ranta, K., Kaltiala-Heino, R. and Marttunen, M. (2019) Psychometric properties of the 7-item Generalized Anxiety Disorder Scale (GAD-7) in a large representative sample of Finnish adolescents, *Psychiatry Research*, 272, 30–35. [10.1016/j.psychres.2018.12.004](https://doi.org/10.1016/j.psychres.2018.12.004).
- Visser, M. and Law-van Wyk, E. (2021) University students' mental health and emotional wellbeing during the COVID-19 pandemic and ensuing lockdown, *South African Journal of Psychology*, 51 (2), 229–243. [10.1177/00812463211012219](https://doi.org/10.1177/00812463211012219).
- Wammerl, M., Jaunig, J., Mairunteregger, T. and Streit, P. (2019) The German version of the PERMA-Profiler: evidence for construct and convergent validity of the PERMA theory of well-being in German speaking countries, *Journal of Well-Being Assessment*, 3 (2–3), 75–96. [10.1007/s41543-019-00021-0](https://doi.org/10.1007/s41543-019-00021-0).
- Wang, C., Horby, P. W., Hayden, F. G. and Gao, G. F. (2020) A novel coronavirus outbreak of global health concern, *The Lancet*, 395 (10223), 470–473. [10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9).
- Westerhof, G. J. and Keyes, C. L. (2010) Mental illness and mental health: the two continua model across the lifespan, *Journal of Adult Development*, 17 (2), 110–119. [10.1007/s10804-009-9082-y](https://doi.org/10.1007/s10804-009-9082-y).

- Wittchen, H. U., Höfler, M., Gloster, A. T., Craske, M. G. and Beesdo, K. (2011) Options and dilemmas of dimensional measures for DSM-5: which types of measures fare best in predicting course and outcome? In *The Conceptual Evolution of DSM-5* (Washington, American Psychiatric Publishing), 119–143. ISBN 978-1-58562-388-4.
- Wright, K. P., Linton, S. K., Withrow, D., Casiraghi, L., Lanza, S. M., de La Iglesia, H., Vetter, C. and Depner, C. M. (2020) Sleep in university students prior to and during COVID-19 stay-at-home orders, *Current Biology*, 30 (14), R797–798. [10.1016/j.cub.2020.06.022](https://doi.org/10.1016/j.cub.2020.06.022).
- Wright, J. H., Mishkind, M., Eells, T. D. and Chan, S. R. (2019) Computer-assisted cognitive-behavior therapy and mobile apps for depression and anxiety, *Current Psychiatry Reports*, 21 (7), 1–9. [10.1007/s11920-019-1031-2](https://doi.org/10.1007/s11920-019-1031-2).
- Zarei, S. and Mohammadi, S. (2022) Challenges of higher education related to e-learning in developing countries during COVID-19 spread: a review of the perspectives of students, instructors, policymakers, and ICT experts, *Environmental Science & Pollution Research*, 29 (57), 85562–85568. [10.1007/s11356-021-14647-2](https://doi.org/10.1007/s11356-021-14647-2).

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