



# UNCOVER

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Evidence Reviews

What is the impact of COVID-19 mitigation strategies on the mental health of post-secondary school students?

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## Introduction

The COVID-19 pandemic and resulting mitigation measures have had a profound impact on people around the world. Mandated lockdowns and the resulting social isolation may have long-term impacts on mental health and wellbeing. Students are one group likely to be particularly affected, as they have experienced profound disruption to their education, as well as dislocation from normal social networks. The purpose of this review was to assess the impact of COVID-19 mitigation strategies, such as lockdowns and the rapid transition to online learning, on the mental health outcomes of post-secondary school students.

## Methods

This rapid review was guided by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA-2020) protocols statement (Page et al. 2020). We developed a study protocol and registered it on Prospero (CRD42021266889).

## Search methods

We developed a search strategy by combining four search strings, including terms which related to COVID-19, mental health outcomes, post-secondary school students, and COVID-19 mitigations. We identified our initial key search terms from indicator papers derived from our scoping searches.

We searched the following databases: PubMed, CINAHL, Embase, Preview, WHO COVID-19 database, PsycINFO, Medline, ERIC, Scopus, Medrix.

Draft searches were piloted in each database and then finalised. Searches were conducted on 13 – 16 July 2021 by KH, BL and TK.

Finalised search strategies are presented in the Appendix.

## Screening and selection of studies

Following the searches, all identified citations were collated and imported into the bibliographical manager Endnote [version 9] where the first de-duplication of records was conducted. Additional duplicates were identified through the Automated Systematic Search Deduplication Tool (ASySD), both automatically and manually. ASySD suggested a list of potential duplicates, which were screened and de-duplicated manually (KH, BL, LG). The resulting dataset was then imported into the systematic review system Covidence (KH), where a final de-duplication of records was conducted.

Title and abstract screening, followed by full text screening, were performed in Covidence by two independent reviewers (LG, DI, KH, BL, JF, PK, EF), assessed against the inclusion and exclusion criteria outlined in Table 1. Any disagreements were resolved by a third independent reviewer (EM).

### **Data extraction and analysis**

A data extraction form was piloted prior to formal data extraction, conducted in Microsoft Excel. Data were extracted independently by one reviewer for each study (LG, DI, KH, BL, JF, PK, EF, EM). Data extraction was cross-checked by the lead reviewer (LG) and any uncertainties were resolved through discussion between team members.

We extracted data on study characteristics and study findings as follows:

Study characteristics: first author, year published, study design, country, study methods (data collection and recruitment), student population (total number, year of study, course type), demographic characteristics (age, gender, ethnicity), dates for data collection pre or post and during the mitigation, total number of participants at each time point, and COVID-19- mitigations present at each time point.

Study findings: measures of effect at each time point (mental health outcomes and results), secondary measures of effect (mental well-being outcomes and results), prevalence (percentage), effect estimate (mean scores), 95% confidence intervals, p-values.

### **Risk of bias assessment**

Joanna Briggs Institute (JBI) checklists were used to assess the quality of evidence of included studies, depending on their study design. Quality assessments were conducted independently by one reviewer for each study (LG, DI, KH, BL, JF, PK, EF, EM). Any disagreements were resolved through discussion between team members (LG, BL, DI).

### **Data synthesis**

Due to the heterogeneity across studies, data were synthesised narratively. Owing to the time constraints for this rapid review and risk of bias, the highest quality of evidence was prioritised for synthesis. This was defined as any included studies which scored 7 or above (out of a total of 9 questions) in the JBI critical appraisal for quasi-experimental studies.

## **Results**

### **Results of search**

Our search identified 6,499 unique articles. After title and abstract screening, 323 remained. After full text screening, 26 were retained for analysis, of which 17 were judged to be of high quality. Search results are summarised in a PRISMA diagram (**Figure 1**). The 26 studies included in the analysis are described in table 2. One was a preprint [1]; the remainder were published in academic journals.

### **Study designs**

Seven were cross-sectional studies, of which three [2-4] were single cross-sectional surveys. The studies by Bollen and Lawrence asked participants to recall pre-COVID-19 mental health and behaviours and the study by Conrad compared outcomes in two groups identified through the survey as having experienced different COVID-19 mitigations.

Four studies [5-8] were cross-sectional in design but compared outcomes in a group of students surveyed during the COVID-19 period, with similar groups of students surveyed pre-COVID-19.

There were 18 longitudinal studies. Sixteen of these used a pre-post design, surveying the same cohort of students before and after the COVID-19 period, without any other control group [1, 9-25]. Two [9, 22] included an additional control group of similar students surveyed pre-COVID-19.

The design of one study [26] was unclear. Repeat surveys were conducted pre- and during the COVID-19 period; however, it is unclear whether these were independent surveys in different groups of students or a longitudinal design following the same group of students over time.

### **Country of study**

There were five studies each from the USA [3, 4, 13, 18, 22] and China [15-17, 21, 23]; two from Israel [9, 19] and one each from Belgium [2], Canada [14], Croatia [25], Cyprus [24], Germany [6], Greece [7], Japan [5], Kazakhstan [26], Lithuania [10], Netherlands [20], Portugal [1], Switzerland [11], UAE [8], and UK [12].

### **Timing of data collection**

Of the studies based on data from more than one point in time, fifteen compared data from a single pre-COVID-19 survey with data from a single survey conducted during the pandemic period [5-8, 10-14, 16, 18, 20, 24-26]. Three studies [15, 19, 21] compared data at different points during the pandemic, but without a pre-pandemic comparator. Of these three studies, one [15] compared outcomes during high (February 2020), moderate (March 2020) and low (April 2020) levels of lockdown intensity; one [19] compared outcomes at the height of lockdown (March 2020) and the end of lockdown (May 2020); and one [21] compared outcomes at the start of the COVID-19 period when students were still on leave from university (February 2020) with later in the semester when they were studying online from home (March 2020). One study [17] compared pre-COVID-19 outcomes with outcomes at two points during the COVID-19 period: intense lockdown (February/March) and less intense lockdown (May/June 2020). Four studies compared data from a single post-COVID-19 survey with multiple pre-COVID-19 surveys [1, 9, 22, 23].

The majority of surveys conducted during the COVID-19 period were very early in the pandemic (February to May 2020 – see table 1).

Three of the longitudinal studies [1, 14, 23] surveyed their cohort of students at the same time of year, pre- and during COVID-19. Of the studies using data collected from earlier student cohorts as a comparator, five surveyed both groups at approximately the same time of year [5-7, 9, 22].

### **Sample characteristics**

Sample size ranged from 88 to 4006. Eleven studies involved samples of 500 students or more [2, 3, 5, 7, 14-16, 18, 21, 22, 26].

Twenty-three studies provided data on the **percentage of female participants**. This ranged from 21 to 93%. Almost all of the samples were heavily skewed towards female participants. Females made up less than half of the samples in only two studies [5, 11].

Seventeen studies reported the **mean age of respondents**. In eight studies, the mean age was under 20 years [1, 12-14, 16, 17, 20, 26]. In two studies, the mean age was over 25 years [4, 19].

Seventeen studies provided information on **participants' year group**. Six studies focused on first year students, either exclusively [5, 9, 13, 18, 23] or predominantly [25]. Two studies [12, 16] focused on first and second year students. Five studies collected data from a broader range of year groups [7, 19, 20, 24, 26].

In relation to the **subjects studied**, four studies focused on medical students, either exclusively [24-26] or predominantly [15]. Two studies focused on performing arts students [6, 20]. Three other studies focused exclusively on specific study subjects: psychology students [12], engineering and natural science students [11] and social work students [4].

Two studies focused on groups of students with **particular health profiles**: students identified as being socially anxious [9] and those with pre-existing mental health concerns [14].

### **Mitigation measures**

Mitigation measures examined by the studies are listed in **Table 1**. These include a mixture of societal mitigations and context-specific mitigations. Societal mitigations are variously described as lockdown, quarantine, stay at home orders, home confinement, curfew, bans on non-essential movement outside the home, prohibition or restriction of social gatherings, the closure of essential businesses and public spaces and social distancing. Context-specific mitigations are variously described as campus closure, closure of student housing, sending students home, relocation from campus, online learning and home learning. The timing and intensity of these measures differed across space and time.

### **Outcome measures**

The outcome measures investigated by each study are shown in **Table 2**. Seventeen studies investigated anxiety [1, 3-7, 9, 11-19, 21, 26]. Fifteen studies investigated depression or depressive symptoms [1, 3-8, 11-14, 16-18, 22, 23, 26]. Two studies [6, 16] investigated anxiety and depression combined. Four studies investigated other mental disorders, including post-traumatic stress disorder (PTSD) [3, 14]; obsessive compulsive disorder (OCD) [15]; non-suicidal self-injury (NSSI) [14]; borderline personality disorder (BPD) symptoms [14] and disordered eating [10]. One study reported on mental health [24], one on mental health complaints [20] and one on somatic symptoms [10].

We also extracted data on wellbeing measures explored by the studies. Eight studies reported data on health behaviours, including alcohol [2, 4, 5, 10, 12, 14]; physical activity [4, 10, 22]; screen time [4, 10]; health behaviours related to eating and food [10]; media pressure [10] and smartphone addiction [23]. Six reported on loneliness [3, 11, 12, 18, 20], social isolation [14] or social networks [11]. Five reported on stress [11, 14, 17, 20, 22]. Four reported on burnout [24-26] or academic factors [5, 25, 26]. Three studies reported on sleep [10, 12, 20], one on self-reported health [10] and one on overall quality of life [10].

### **Study focus**

The primary focus of seventeen studies was the impact of COVID-19 mitigations on mental health outcomes [2-5, 7-10, 12, 16, 17, 19-21, 24-26]. The remaining nine studies focused primarily on the impact of the pandemic itself on mental health outcomes [1, 6, 11, 13-15, 18, 22, 23].

### **Study quality**

The results of risk of bias assessments are shown in **Tables 3** (cross-sectional studies) and **4** (quasi-experimental studies). Studies which used a repeat cross-sectional design to compare outcomes

between different cohorts of students pre- and post-COVID-19 were assessed as quasi-experimental studies. The three single-survey cross-sectional studies were assessed as high quality using the Joanna Briggs Institute (JBI) tool for cross-sectional studies. Nineteen of the quasi-experimental studies were judged to be of moderate quality using the appropriate JBI tool, with four judged to be of low quality.

A key common limitation of the literature as a whole is that all of the studies were opportunistic: all were either new studies, or rapid adaptations of existing cohort or repeat cross-sectional surveys, established quickly in the context of a rapidly developing pandemic. As such, the timing of data collection, the recruitment of participants and the definition of exposures were sub-optimal. Many of the sample sizes were very small, with low response rates and/or high loss to follow-up. The results were highly skewed in favour of female respondents, which threatens generalisability. Mitigations were imprecisely defined and it is generally not possible to distinguish between the impact of the COVID-19 pandemic and the impact of the COVID-19 mitigation measures. In addition, key limitations in specific study designs were: risk of recall bias in cross-sectional studies; risk of confounding by cohort effects in repeat cross-sectional studies and risk of seasonal bias in longitudinal pre/post studies without additional controls.

Of the three single cross-sectional studies, one [3] compared two groups of students identified through the survey: one group being exposed to the mitigation measures and the other unexposed. The other two cross-sectional studies did not have a comparator group, relying on participants to recall pre-COVID-19 outcomes and behaviours, with a consequent high risk of recall bias [2, 4].

The four repeat cross-sectional studies which compared outcomes in different groups of students, pre- and post-COVID-19 [5-8] are at risk of confounding by unidentified differences between the pre- and post-COVID-19 groups. However, a key strength of three of these studies [5-7] is that they collected data at the same time of year, pre- and post-COVID-19. Seasonal variation in student wellbeing is an important factor, which may confound results if data in the exposure and comparator group are collected at different points in the year. For example, first year students in particular may face high levels of anxiety at the start of the academic year, which naturally declines as they adjust to student life. Conversely, levels of stress and burnout may increase as the academic year progresses and exam time approaches.

There were sixteen longitudinal studies which compared outcomes in the same cohort of students at different time points, without any other control group. Of these, thirteen [10-13, 15-21, 24, 25] did not take seasonal factors into account, typically comparing outcomes in autumn 2019 with spring/summer 2020, and thus being at risk of confounding by seasonal effects.

Only three of these sixteen studies [1, 14, 23] collected pre- and post-COVID-19 data at the same time of year in order to avoid seasonal confounding.

Two longitudinal studies [9, 22] addressed this problem by using an additional cross-sectional control group, surveyed in previous years but at the same time points as the COVID-19 cohort.

### **Analysis of outcomes**

This review reports the association between COVID-19 mitigation measures relating to societal and institutional lockdowns and the switch to online learning and mental health and wellbeing outcomes in college and post-secondary school students globally. Results are presented narratively because the diversity of populations, contexts, study designs and measurement instruments precluded the meta-analysis of results. **Figure 2** is a visual summary of results for all the mental health and wellbeing outcomes reported in this review. Panel A shows data from all 26 studies. Panel B is a

sensitivity analysis of data from the 17 highest quality studies. Results are presented narratively, since the diversity of study designs, measurement instruments and severity levels used to define depression, did not allow the conduct of a meta-analysis.

### **Depression**

**Tables 5 and 6** summarise data on changes in the prevalence of depressive symptoms and mean depression scores in relation to COVID-19. Studies employed a variety of measurement scales and threshold to define prevalence, making meta-analysis challenging.

Eight studies [1, 7, 8, 12, 13, 18, 23, 26] reported data on the prevalence of depression or depressive symptoms pre- and post-COVID-19 (**Table 5**), of which six were judged to be of high quality [1, 12, 13, 18, 23, 26]. Of these six, five found a significant increase in prevalence during the COVID-19 period, compared with pre-COVID-19 [1, 12, 13, 18, 23], with only one reporting a significant decrease [26].

Ten studies [4, 5, 8, 11, 12, 14, 17, 18, 22, 23] reported changes in mean depression scores in relation to COVID-19 (**Table 6**), of which five were judged to be of high quality [12, 14, 18, 22, 23]. Of these five, three [12, 18, 23] found a significant deterioration in depressive symptoms associated with COVID-19 and two [14, 22] found differential effects in different sub-groups. Hamza and colleagues found that Canadian students with pre-existing mental health concerns showed significant improvement in depressive symptoms in May 2020 (mean [SD] 24.29 [13.44]) compared with May 2019 (28.07 [12.29]). In contrast, students without pre-existing mental health concerns showed significant worsening of depressive symptoms over this period (mean [SD] 13.56 [10.91] in May 2020 compared with 8.91 [6.29] in May 2019) [14]. In a US study of undergraduate students, Wilson et al found a significant increase in depression scores in females but not in males for the COVID-19 period compared to the non-COVID-19 period [22]. An additional high quality study [3] compared depression scores in American students mandated to relocate from campus with those not required to relocate. They found no difference in depression scores between the two groups, although students who had to leave behind valuable personal belongings reported more depressive symptoms.

### **Anxiety**

**Tables 7 and 8** summarise data on changes in the prevalence of anxiety and mean anxiety scores in relation to COVID-19. As with the depression analysis, a wide variety of anxiety measurement scales and thresholds were used.

Seven studies [1, 7, 13, 18, 19, 21, 26] reported on changes in the prevalence of anxiety, pre- and post-COVID-19 (**Table 7**), of which four [1, 13, 18, 26] were judged to be of high quality. Of these, two [1, 18] found a significant increase in prevalence. One [26] found a significant decrease in the prevalence of anxiety.

Thirteen studies [1, 3-5, 11-15, 17-19, 21] reported on changes in mean anxiety scores, pre- and post-COVID-19 (table 8), of which five are judged to be of high quality. Of these, two [1, 18] found a significant deterioration in anxiety symptoms; two [12, 13] found no change and one [14] found differential effects in different sub-groups, following the same pattern as they found for depression scores: students with pre-existing mental health concerns showed significant improvement in anxiety symptoms during the pandemic (mean [SD] 8.92 [5.93]) compared with one year prior (10.81 [5.21]), whereas those without pre-existing mental health concerns showed significant deterioration (mean [SD] 4.27 [3.94]) compared with one year prior (3.25 [2.74]).

Two further high quality studies reported higher anxiety scores during intense, compared with less intense, lockdown periods in China [15] and Israel [19]. However, Wang and colleagues found the opposite effect, with significantly higher anxiety scores in Chinese students coinciding with the stabilisation of the COVID-19 situation and the partial relaxation of restrictions [21]. However, this might be attributable to the fact that students were on leave from university during the most intense period, whereas they were studying online from home when restrictions were lifted.

Finally, the high quality study by Conrad and colleagues [3] found significantly higher anxiety symptoms in those forced to relocate from campus compared with those not required to relocate (mean [SD] anxiety score 9.11 [5.62] for those not required to relocate, compared with 10.18 [5.58] for those required to locate,  $p=0.012$ ). This association persisted after controlling for sociodemographic characteristics, pre-existing psychiatric diagnoses, psychological resilience, distress tolerance, COVID-19 transmission rate, and date of survey completion.

### **Other mental health outcomes**

Eleven other measures of mental health outcomes were reported (**Table 9**), by ten studies [3, 5, 6, 9, 10, 14, 15, 20, 24, 26]. Of these, measures reported by eight studies were judged to be of high quality. Bolatov et al found a significant improvement in general mental health during the period when medical students from Kazakhstan were studying online, compared to pre-pandemic when they were being taught traditionally [26]. The authors note that levels of burnout and physical and mental exhaustion also fell during the online learning period. In contrast, a study investigating burnout in medical students in Cyprus [24] found a significant increase in somatic symptoms during the pandemic compared to four months earlier. Four high quality studies report data on five specific mental health conditions. Hamza and colleagues found a significant improvement in post-traumatic stress disorder (PTSD) symptoms during the pandemic compared to before in those with pre-existing mental health conditions, but a significant deterioration in those without pre-existing mental health concerns over the same period [14]. Conrad et al found no difference in PTSD symptoms in students required to relocate from campus, compared to those not required to relocate [3]. In a longitudinal study of Lithuanian students, Baceviciene found no difference in disordered eating during lockdown compared with pre-lockdown [10]. Ji et al found no significant difference in symptoms of obsessive-compulsive disorder (OCD) in Chinese students surveyed whilst on winter break under a high level quarantine (February 2020), whilst taking online courses at home under a moderate level of COVID-19 restrictions (March 2020) and whilst taking online courses at home under a low level of restrictions (April 2020) [15]. Finally, Hamza et al found no difference in non-suicidal self-injury in Canadian students, pre- and post-pandemic; however they observed a deterioration in borderline personality disorder (BPD) symptoms in those without pre-existing mental health conditions (no change in those with pre-existing mental health conditions) [14].

### **Wellbeing outcomes**

**Table 10** shows the results of 41 analyses of wellbeing outcomes, across ten categories: general health and wellbeing, stress, sleep, loneliness and isolation, burnout and academic distress, body image and health behaviours relating to alcohol, food, physical activity and screen time. Twenty-seven wellbeing outcomes were reported by high quality studies, categorised as measures related to: general wellbeing, stress and burnout, loneliness, sleep, health behaviours and body image.

**General wellbeing:** Baceviciene et al found a slight but statistically significant increase in quality of life in Lithuanian female students during lockdown compared to pre-lockdown, but no change in males. They found a deterioration in self-reported health in males but not in females [10].

**Stress and burnout:** The five studies investigating stress and burnout reported conflicting results. Wilson and colleagues found a significant increase in perceived stress for both genders for the



COVID-19 period compared to the non-COVID-19 period. Consistent with their findings in other outcomes, Hamza and colleagues found increasing levels of stress associated with COVID-19 in those without pre-existing mental health problems but falling levels of stress in those with pre-existing mental health problems [14]. Hamza also found a reduction in recent stressful experiences common to normal student life, such as academic pressure, having too many things to do or getting insufficient sleep, during the COVID-19 period compared to before. Three studies reported on burnout. Bolatov and colleagues found a significant decrease in burnout amongst Kazakh students during the period of COVID-19-induced online learning, compared to six months earlier [26]. In a study investigating burnout amongst medical students in Cyprus, Zis et al found no difference in the sample overall [24]. However, they found interesting differences in sub-groups. Year 4 is the year when clinical training begins and burnout among year 4 students was significantly lower during the COVID-19, compared to the pre-COVID-19 period. The authors suggest that this reflects the fact that during the COVID-19 period, 4th year students did not start their clinical training and therefore were not having to deal with the associated stress. In contrast, burnout among year 6 students was significantly higher during the COVID-19, compared to the pre-COVID-19 period, reflecting the fact that these students are just about to start working as junior doctors. The switch to online learning during this crucial clinical training period likely had a negative effect on students' confidence. In contrast, Zulevic et al found no difference in burnout levels pre-and post-COVID-19 (2021) in Croatian medical students [25].

**Loneliness:** Eight studies (including six high quality) investigated loneliness and isolation, either directly or as a factor impacting on other mental health and wellbeing outcomes. In a regression model exploring associations between COVID-19 factors and mental health outcomes, Mehus et al found that the largest effect sizes were for feelings of isolation [18]. Feeling extremely isolated, compared to not isolated at all, was significantly associated with depression and anxiety symptom severity and greater odds of moderate anxiety and depression onset. Fruehwirth et al found that students who reported feeling usually or always socially isolated mid-pandemic, but had not reported social isolation pre-pandemic had a 17.7% increase in depressive symptoms, with effects markedly higher in those with pre-existing depression symptoms [13]. In a comparison of outcomes in students required to relocate from campus and those able to remain on campus, Conrad et al found that those required to relocate reported more COVID-19-related loneliness compared to those not required to relocate and that this association remained after controlling for multiple other factors [3]. Hamza and colleagues found that whilst there was no change in those with pre-existing mental health problems, students without pre-existing mental health problems reported deteriorating social isolation and loneliness, and deteriorating mental health [14]. Yang et al found that boredom, emotional loneliness and social loneliness were positively associated with depressive symptoms during COVID-19, although quarantine and lockdown were not significantly associated with depressive symptoms [23]. Finally, only one study [12] found no evidence that students experienced increased loneliness during the pandemic.

**Sleep:** Two high quality studies investigated sleep outcomes. In a UK study, Evans et al found no change in sleep quality in autumn 2019 compared with April/May 2020, under lockdown conditions [12]. Baceviciene found mixed results for sleep duration: whilst women reported sleeping significantly longer during the COVID-19 period, compared to pre-COVID-19, there was no change in men [10].

**Health behaviours:** The high quality studies reported three outcomes related to alcohol consumption, three related to food behaviours and diet, two on screen time and two on physical activity.

In a UK-based study, Evans and colleagues found a significant reduction in alcohol consumption during lockdown compared with pre-lockdown [12]. However Baceviciene and colleagues found no change in binge drinking associated with lockdown [10] and Hamza found no difference in alcohol dependence symptoms [14].

One study reported on eating-related behaviours. Baceviciene et al found a significant decrease in unhealthy eating habits in both men and women; a significant reduction in fast food consumption in men but no change in women; but a significant increase in BMI in women (no change in men) during lockdown compared with pre-lockdown in a cohort of Lithuanian students [10].

Two studies investigated physical activity levels. Baceviciene et al found a significant increase in physical activity levels in men but no change in women [10]. However, Wilson et al found a significant decline in physical activity in both men and women [22].

Two studies investigated outcomes related to screen time. Unsurprisingly, Baceviciene and colleagues found a significant increase in hours spent online [10]. Yang and colleagues found no increase in smartphone addiction, assessed by the 17-item Mobile Phone Addiction Index Scale, pre- and during lockdown in a cohort of Chinese students [23].

It is important to note that apart from the study by Baceviciene et al, which collected data from Lithuanian students in February 2021, almost a year into the pandemic, all the other high quality studies collected data up to July 2020, when changes in lifestyle behaviours may not have become entrenched. Ten studies collected data up to May 2020; six collected data during June and July 2020.

**Body image:** Finally, Baceviciene and colleagues looked at three measures related to body image. They found that the internalisation of thin/low body fat ideals significantly worsened during lockdown in both genders. Media pressure related to appearance worsened for women but not for men; however appearance evaluation improved slightly but significantly for women (no change in men) [10].

## Discussion

This review found evidence of increased anxiety and depression in students during the COVID-19 period, compared to pre-COVID-19. Five out of nine high quality studies, across a diverse range of diverse student populations and contexts, found a significant deterioration in depressive symptoms compared to the pre-COVID-19 period, with only one study reporting a significant improvement over the same period. Five out of ten high quality studies found a significant deterioration in anxiety symptoms during COVID-19, with only one reporting a significant improvement. These findings are in line with two surveys run in the UK in November 2020. A survey of undergraduate students by the Higher Education Policy Institute (HEPI) found that 58% of respondents reported that their mental health had deteriorated because of the pandemic, compared to 14% who reported an improvement [27]. The Coronavirus Student Survey phase 3, conducted by the National Union of Students, found that 52% of respondents reported a deterioration in their mental health during the COVID-19 period, compared to 8% who reported an improvement [28]. The UCL COVID-19 Social Study found, however, that these declines were not unique to students, but broadly similar to the general population of 18 to 29 year olds [29].

Limitations in study design mean that it is not possible to determine with any degree of certainty the extent to which the observed findings are attributable to COVID-19 itself or to COVID-19 mitigation strategies. Nevertheless, we did find evidence that lockdown and the rapid transition to online

learning have impacted on students' feelings of loneliness, stress and burnout and that this may to some extent explain the observed increases in anxiety and depression in some students.

The evidence we found relating to the impact of COVID-19 mitigations on stress and burnout was mixed. Whilst there is some evidence of increasing stress during the lockdown period, there is also evidence consistent with lockdown reducing or eliminating some of the stressors associated with student life in normal times, such as academic and social pressure and being short of time. The investigation of burnout amongst medical students by Zis et al illustrates that the impact of online learning on student wellbeing may be differentially experienced, depending on individual and/or cohort circumstances [24]. For some groups of students, online learning and enforced social isolation might reduce academic and social pressures; whereas for others, particularly those who perceive that they are missing out on the development of key skills, it may increase stress. The Canadian study by Hamza and colleagues compared a range of mental health outcomes in students with and without pre-existing mental health problems. They reported a consistent pattern across outcomes: whilst those with pre-existing mental health problems experienced either no change or an improvement in their mental health in May 2020 compared with twelve months earlier, those without pre-existing mental health problems experienced a significant deterioration across a range of mental health outcomes and reported worsening social isolation and loneliness. The authors hypothesise that students who may be most adversely impacted by social distancing and most at risk of psychological distress are those who are unaccustomed to isolation and being alone [14].

The importance of loneliness as a risk factor is echoed by several studies. Mehus et al found that a feeling of extreme isolation was the most consistent predictor of the incidence and severity of depression during the pandemic [18]. Fruehwirth et al found that students who reported feeling socially isolated during the pandemic, but had not reported such feelings pre-pandemic, experienced a marked increase in depressive symptoms [13]. Yang et al found that boredom, emotional loneliness and social loneliness were positively associated with depressive symptoms during COVID-19 [23]. These findings are in line with findings from a UK survey conducted in late 2020 [30]. This found that the proportion of students feeling lonely daily or weekly and not feeling part of the university community had increased substantially between May 2019 and October 2020. This was particularly the case for students living in university halls. These findings are not, however, consistent across all studies: the UK-based study by Evans and colleagues did not find increased levels of loneliness compared to the pre-lockdown period. Respondents reported good adaptation to COVID-19 restrictions. The authors did, however, detect high levels of COVID-19-related worry, both for participants themselves and for their relatives. They hypothesise that it might be this, rather than the social restrictions related to lockdown, that contribute to the higher rates of depression that they observed during lockdown compared with pre-lockdown [12]. This study serves to illustrate the challenges of trying to separate the impacts of COVID-19 and the impacts of COVID-19 mitigations on mental health outcomes.

The impact of online learning on mental health outcomes is explored by several studies. Fruehwirth found that experiencing difficulties with online learning was associated with higher rates of moderate to severe depression. A 1 SD increase in online learning challenges was associated with a 7% increase in moderate/severe depression symptoms and this effect was three times higher in those with pre-existing depression symptoms [13]. Three of the lower quality studies found similar effects. In a multivariate regression model, Lawrence et al found an association between greater difficulty transitioning to online instruction and increased depression, which approached statistical significance ( $p = .08$ ) [4]. Sazakli found a higher odds of depression in students encountering difficulties with the online education system [7]. Horita et al found that levels of academic distress were significantly higher in 2020 than in 2019 ( $p < 0.001$ ) but found no evidence that this impacted on

depression scores. The authors hypothesise that the observed increase in academic distress might be reflective of the need to adapt to an unfamiliar online learning environment [5]. In contrast, however, Bolatov et al found that students' satisfaction with their academic performance was higher during lockdown when all teaching was online, compared with pre-COVID-19, when traditional teaching methods were in place. They suggest that this may help explain the significant and substantial decrease in the prevalence of depressive symptoms during the COVID-19 period that they observed [26].

The findings on a range of health behaviours are inconclusive, with no evidence of an increase in problematic alcohol consumption, eating problems or reductions in physical activity. However, it is important to note that most of the data were collected early in the pandemic. Of the 26 studies included in this review, 13 collected COVID-19 data in spring 2020, and of the remainder, all but one collected data in summer 2020. The only study to collect data later in the pandemic was the study by Baceviciene et al [10]. It is not surprising that habits relating to eating, alcohol consumption and physical activity had not changed significantly early in the pandemic; however, this is much less likely to be the case a year and a half into COVID-19, when many have had to endure lengthy and repeated lockdowns. It is important to assess eating, alcohol, physical activity and screen time behaviours across this longer time period and to monitor whether adverse changes improve with the relaxing of COVID-19 restrictions or prove more intractable.

This study has a number of strengths. We identified studies on the basis of a priori definitions of mental health outcomes. We conducted double-blind article screening and quality assessment and used only high quality studies in our synthesis of results. The review provides good evidence of deterioration of mental health and anxiety in post-secondary school students and has enabled us to identify gaps in the literature and methodological limitations that need to be addressed by future studies aiming to inform education recovery from a mental health stance as we come out of the pandemic.

This review has several limitations. Because of time pressures, we limited our primary search to mental health, as opposed to wider wellbeing, outcomes. The wellbeing outcomes we report here were those presented by the included studies; however, this is an incomplete assessment and we recommend a further review focused on key wellbeing items, such as loneliness, stress and burnout, sleep and health behaviours. Identified studies were heavily skewed towards female respondents, which limits generalisability to male students. On the basis of the evidence available, it is difficult to separate out the impact of COVID-19 mitigations from the impact of COVID-19 itself, because all the studies except one [3] relied on pre-COVID-19 controls. In included studies, mitigation measures were imprecisely defined and described, typically combining a range of societal and institutional measures in place simultaneously, including lockdowns and online learning arrangements, so it is challenging to identify the impact of particular measures. Studies were drawn from a wide range of diverse countries and educational cultures, so the results may not be applicable to the UK context. Many of the included studies do not consider wider risk factors for mental health, such as socioeconomic status, living conditions or external/social support; hence we were unable to identify specific groups in which mental health may have particularly deteriorated. Differences in the intensity and timing of the pandemic across different countries also present a challenge. Finally, most of the evidence was collected in the early months of the pandemic, thus not addressing the impacts of longer term and repeated lockdowns on student wellbeing outcomes.

The results of this review have implications for universities and for those with responsibility for student welfare. Firstly, institutions must recognise the impact of the pandemic on the level and intensity of depression and anxiety and ensure that robust systems are in place to identify and

support students who may be struggling. Secondly, institutions must also be alert to the fact that certain groups of students, such as those suffering from social anxiety or those with pre-existing mental health problems, may have experienced lockdown as a positive escape from the stressors of normal student life. Those responsible for student welfare must be alert to the potential for these students to experience difficulties during the transition back to campus-based learning and again, robust systems should be put in place to ensure early identification and appropriate support. Thirdly, as the study of medical students by Zis et al illustrates [24], the impact of lockdown and online teaching is not evenly distributed across year groups or study subjects. Those who have missed out on crucial practical skills may experience more severe impacts on wellbeing than those where the transition to online learning was relatively straightforward. It is incumbent on institutions to audit the concerns of students across faculties and year groups, in order to identify and if possible, ameliorate any adverse impacts. Fourthly, This review has identified the real world impacts of the four harms of COVID and consequently investigating the impact of lockdowns on alcohol consumption, eating behaviours, physical activity and screen time in student populations is paramount. Finally, student welfare and mental health is crucially important and it is key that both student welfare services and public services are adequately resourced to enable them to support students as we move into a phase of COVID-19 recovery..

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## Appendix: Search strategy

### Pubmed search - complete

Date: 13/07/21

Search	Query	Filters	Results
6	#1 AND #2 AND #3 AND #4	from 2020 - 2021	1,862
5	#1 AND #2 AND #3 AND #4		1,894
4	((online OR "blended" OR "hybrid" OR mix OR "technology-mediated" OR "web-enhanced" OR mixed) AND ("class" OR "classe" OR "classes")) OR ( "internet"[MeSH Terms] OR "personal protective equipment"[MeSH Terms] OR "quarantine"[MeSH Terms] OR "masks"[MeSH Terms] OR "physical distancing"[MeSH Terms] OR "travel"[MeSH Terms] OR "Communicable Disease Control"[MeSH Terms]) OR ("online lecture*" OR internet OR virtual* OR "distance education" OR "distance learning" OR "online education" OR "remote teaching" OR "remote learning" OR "mobile learning" OR "e-learning" OR "asynchronous learning" OR "synchronous learning") OR ("personal protective equipment" OR "face covering" OR "ppe" OR "facial covering" OR "mask*" OR "N95" ) OR ("contact trac*" OR "symptom tracking" OR "track and trace") OR ("social distanc*" OR "social isolation" OR physical distanc*) OR ("lockdown" OR "quarantine*" OR "isolat*" OR "health screening" OR "health test" OR "health testing and services" OR confinement* OR "stay at home" ) OR ("travel restrictions"[All Fields] OR (((("external*" [All Fields] OR "externally"[All Fields] OR "internal*" [All Fields]) AND ("border*" [All Fields]) OR ("international*" [All Fields] OR "oversea*" [All Fields] OR "abroad*" [All Fields] OR "domestic*" [All Fields] OR "travel*" [All Fields])) AND ("clos*" [All Fields] OR "closure*" [All Fields] OR "ban" [All Fields] OR "restrict*" [All Fields] OR "restriction*" [All Fields]))) OR ("school closing" [All Fields] OR (("colleg*" [All Fields] OR "post-secondary" [All Fields] OR "post-secondary" [All Fields] OR "vocational school" [All Fields] OR "technical school" [All Fields] OR "campus" [All Fields] OR "campus s" [All Fields] OR "universit*" [All Fields] OR "dormitor*" [All Fields] OR "residence*" [All Fields] OR "sororit*" [All Fields] OR "fraternit*" [All Fields]) AND ("clos*" [All Fields] OR "restric*" [All Fields] OR "restiction*" [All Fields])) ) OR (mitigat* OR ventilat* OR "infection preven*" OR "infection control" OR "test" OR "testing" OR "lateral flow" OR "hand wash*" OR sanitiz* OR sanitis* OR clean* OR "hand hygiene")		6,024,250
3	(mental disorders [Mesh] OR mental health [Mesh] OR stress, psychological [Mesh] OR anxiety [Mesh] OR Depressive Disorder [Mesh] OR depression [Mesh] OR psychological distress [Mesh] OR loneliness [Mesh] OR behavior, addictive [Mesh] OR Behavioral Symptoms [Mesh]) OR ("mental disorder*" OR "mental health" OR anxi* OR stress* OR depress* OR loneli* OR trauma* OR psycho* OR		4,908,184



	psychiatr* OR "mental wellbeing" OR OR "mental well-being" OR "mental well being")	
<b>2</b>	"universities"[MeSH Terms] OR "students"[MeSH Terms] OR "college*" [Text Word] OR "post secondary" [Text Word] OR "post-secondary" [Text Word] OR "tertiary education" [Text Word] OR "tertiary-education" [Text Word] OR "Advanced education" [Text Word] OR "higher education" [Text Word] OR "higher-education" [Text Word] OR "further education" [Text Word] OR "further-education" [Text Word] OR "vocational school" [Text Word] OR "technical school" [Text Word] OR "campus*" [Text Word] OR "universit*" [Text Word] OR "dormitor*" [Text Word] OR "residence*" [Text Word] OR "sororit*" [Text Word] OR "fraternit*" [Text Word] OR "graduate student*" [Text Word] OR "undergraduate*" [Text Word] OR "academic student*" [Text Word] OR "postgraduate*" [Text Word] OR "academic degree*" [Text Word] OR "college program*" [Text Word] OR "masters student*" [Text Word] OR "PhD student*" [Text Word]	770,726
<b>1</b>	"coronavirus"[MeSH Major Topic] OR "Betacoronavirus"[MeSH Major Topic] OR "coronavirus infections"[MeSH Major Topic] OR "covid 19"[MeSH Major Topic] OR "sars cov 2"[MeSH Major Topic] OR "Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019	175,987

Results have been imported into Covidence on 9/07/21

## Medline search - complete

13/07/20

1	exp coronavirus/	83969
2	exp coronavirus infections/	102425
3	exp covid 19/	91845
4	exp sars cov 2/	71419
5	("Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019).mp.	173382
<b>6</b>	<b>1 or 2 or 3 or 4 or 5</b>	<b>178486</b>
7	exp mental disorders/	1302447
8	exp mental health/	45003
9	exp stress, psychological/	139840
10	exp anxiety/	93651
11	exp Depressive Disorder/	113605
12	exp depression/	129973
13	exp psychological distress/	4572
14	exp loneliness/	4483
15	exp behavior, addictive/	11184
16	exp behavioral symptoms/	393672
17	("mental disorder*" or "mental health" or anxi* or stress* or depress* or loneli* or trauma* or psycho* or psychiatr* or wellbeing or well-being or well being).mp.	3742945
<b>18</b>	<b>7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17</b>	<b>4270430</b>
19	exp internet/	86068
20	exp personal protective equipment/	34028
21	exp quarantine/	4943
22	exp masks/	10969
23	exp physical distancing/	1404

24	exp travel/	29127
25	exp communicable disease control/	368768
26	((online or blended or hybrid or mix or technology-mediated or web-enhanced or mixed) and class*) or "online lecture*" or internet or "virtual learning*" or virtual* or "distance education" or "distance learning" or "online education" or "remote teaching" or "remote learning" or "mobile learning" or e-learning or "asynchronous learning" or "synchronous learning").mp.	331105
27	("personal protective equipment" or "facial mask*" or "face covering" or ppe or "facial covering" or mask* or N95 or ("contact trac*" or "symptom tracking" or "track and trace" or "test and protect") or ("social distanc*" or "social isolation" or "physical distanc*" or lockdown or quarantine* or isolat* or "health screening" or "health test" or ("health testing" and services) or confinement*)).mp.	2263727
28	("stay at home" or "travel restriction" or "travel restrictions" or ((external* or external or externally or externals) and border*) or (internal and border*) or international* or oversea* or abroad* or domestic* or (travel* and (clos* or closure* or ban or restrict* or restriction*))).mp.	569379
29	("school closing" or ((colleg* or "post secondary" or "post-secondary" or "vocational school" or "technical school" or campus* or (universit* or dormitor* or residence* or sororit* or fraternit*)) and (close* or closure* or restric* or restiction*))).mp.	31041
30	(mitigat* or ventilat* or infection preven* or "infection control" or testing or test or "lateral flow" or "hand wash*" or sanitiz* or sanitis* or clean* or "hand hygiene").mp.	2641245
<b>31</b>	<b>19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30</b>	<b>5681071</b>
32	exp Universities/	44570
33	exp Students/	140652
34	(college* or post-secondary or "post secondary" or tertiary-education or "tertiary education" or higher-education or "higher education" or further-education or "further education" or "vocational school" or "technical school" or (campus* or universit* or dormitor* or residence* or sororit* or fraternit*) or ("Graduate student*" or Undergraduate* or "Undergraduate student*" or "Academic student*" or "Postgraduate student*" or "Academic degree*" or "College program*" or "Masters student*" or "Advanced education")).mp.	676478
<b>35</b>	<b>32 or 33 or 34</b>	<b>755448</b>
<b>35</b>	<b>6 and 18 and 31 and 35</b>	<b>1745</b>

## ERIC - complete

Date: 13/07/21

1	exp coronavirus/	6678
2	exp coronavirus diseases/	6678
3	exp COVID-19/	2481
4	("Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019).af.	2762
<b>5</b>	<b>1 or 2 or 3 or 4</b>	<b>6951</b>
6	exp mental disorders/	36191
7	exp mental health/	13124
8	exp anxiety/	16618
9	exp anxiety disorders/	2671
10	exp depression/	10871
11	exp psychological patterns/	62804
12	exp behavior/	418485
13	exp behavior patterns/	18672
14	exp individual development/	145182
15	exp student development/	9423
16	exp psychological patterns/	62804
17	("mental disorder*" or "mental health" or anxi* or stress* or depress* or loneli* or trauma* or psycho* or psychiatr*).mp.	234617
<b>18</b>	<b>6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17</b>	<b>682776</b>
19	exp internet/	22236
20	exp travel/	1735
21	exp communicable diseases/	6678
22	exp disease control/	2022
23	((online or blended or hybrid or mix or technology-mediated or web-enhanced or mixed) and class*) or "online lecture*" or internet or "virtual learning*" or virtual* or "distance education" or "distance learning" or "online education" or "remote teaching" or "remote	89662

	learning" or "mobile learning" or e-learning or "asynchronous learning" or "synchronous learning").af.	
24	("personal protective equipment" or "facial mask*" or "face covering" or ppe or "facial covering" or mask* or N95 or ("contact trac*" or "symptom tracking" or "track and trace" or "test and protect") or ("social distanc*" or "social isolation" or "physical distanc*" or lockdown or quarantine* or isolat* or "health screening" or "health test" or ("health testing" and services) or confinement*)).af.	24087
25	(quarantine or "stay at home" or "travel restriction" or "travel restrictions" or ((external* or external or externally or externals) and border*) or (internal and border*) or international* or oversea* or abroad* or domestic* or (travel* and (clos* or closure* or ban or restrict* or restriction*))).af.	175779
26	("school closing" or ((colleg* or "post secondary" or post-secondary or "vocational school" or "technical school" or campus* or (universit* or dormitor* or residence* or sororit* or fraternit*)) and (close* or closure* or restric* or restiction*))).af.	206684
27	(mitigat* or ventilat* or infection preven* or "infection control" or testing or test or "lateral flow" or "hand wash*" or sanitiz* or sanitis* or clean* or "hand hygiene").af.	207293
28	<b>19 or 20 or 21 or 22 or 23 or 24 or 24 or 25 or 26 or 27</b>	<b>465292</b>
29	exp colleges/	106284
30	exp universities/	33657
31	exp Students/me	366551
32	(college* or post-secondary or "post secondary" or tertiary-education or "tertiary education" or higher-education or "higher education" or further-education or "further education" or "vocational school" or "technical school" or (campus or universit* or dormitor* or residence* or sororit* or fraternit*) or ("Graduate stud*" or Undergraduate* or "Undergraduate stud*" or "Academic stud*" or "Postgraduate stud*" or "Academic degree*" or "College program*" or "Masters student*" or "Advanced education")).af.	714621
<b>33</b>	<b>29 or 30 or 31 or 32</b>	<b>839383</b>

34	5 and 18 and 28 and 33	1596
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## SCOPUS - complete

Date: 14/07/21

1	TITLE-ABS-KEY ("Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019)	211,972
2	TITLE-ABS-KEY ( "mental disorder*" OR "mental health" OR ansi* OR stress* OR depress* OR loneli* OR trauma* OR psycho* OR psychiatr* OR "personality disorder*" OR "substance related disorder*" OR "paraphilic disorder*" or "factitious disorder*" OR "neuro* disorder*" OR "obsessive compulsive disorder*" OR "adjustment disorder*" or "sleep or suicide*" or catatoni* OR "eating disorder*" OR "elimination disorder*" or "distress" or "mental well-being" OR "mental wellbeing" OR "mental well being")	7,100,155
3	TITLE-ABS-KEY ("online class*" or "blended class*" or "blended learning" or "hybrid class*" or "mix* class*" or "technology mediated class*" or "web enhanced class*" or "online lecture*" or internet or "virtual learning*" or virtual* or "distance education" or "distance learning" or "online education" or "remote teaching" or "remote learning" or "mobile learning" or "e learning" or elearning or "asynchronous learning" or "synchronous learning" or "personal protective equipment" or "facial mask*" or "face covering" or ppe or "facial covering" or mask* or N95 or "contact trac*" or "symptom tracking" or "track and trace" or "test and protect" or "social distanc*" or "social isolation" or "physical distanc*" or lockdown or quarantine* or isolat* or "health screening" or "health test" or "health testing services" or confinement* or "disease control" or quarantine or "stay at home" or "travel restriction" or "travel restrictions" or "external* border*" or "internal border*" or international* or oversea* or abroad* or domestic* or "travel* ban" or "travel* restrict*" or "travel* clos*" or "school closing" or ((colleg* or "post secondary" or "vocational school" or "technical school" or campus or campuses or universit* or dormitor* or residence* or sororit* or fraternit*) and (close* or closure* or restric*)) or mitigat* or ventilat* or "infection preven*" or "infection control" or testing or test or "lateral flow" or "hand wash*" or sanitiz* or sanitis* or clean* or "hand hygiene")	15,032,954
4	TITLE-ABS-KEY (college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further education" OR "vocational school" OR "technical school" OR campus OR dormitor* OR residence* OR sororit* OR fraternit* OR undergraduate* OR "Postgraduate*" OR "Academic degree*" OR "College program*" OR "Advanced education")	3,183,268
5	<b>#1 and #2 and #3 and #4</b>	<b>3,022</b>

## ProQuest Dissertations & Theses Global - complete

14/07/21

Set#	Searched for	Databases	Results
S1	noft(exp coronavirus/) OR noft(exp coronavirus infections/) OR noft(exp covid 19/) OR noft(exp sars cov 2/) OR noft(("Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019))	ProQuest Dissertations & Theses Global	2411
S2	noft((exp mental disorders/) OR (exp mental health/) OR (exp stress, psychological/) OR (exp anxiety/) OR (exp Depressive Disorder/) OR (exp depression/) OR (exp psychological distress/) OR (exp loneliness/) OR (exp behavior, addictive/) OR (exp behavioral symptoms/) OR (("mental disorder" OR "mental disorders") or "mental health" or anxi* or stress* or depress* or loneli* or trauma* or psycho* or psychiatr* or wellbeing or "well being"))	ProQuest Dissertations & Theses Global	719297
S3	noft((exp internet/) or (exp personal protective equipment/) or (exp quarantine/) or (exp masks/) or (exp physical distancing/) or (exp travel/) or (exp communicable disease control/))	ProQuest Dissertations & Theses Global	19
S4	noft(("online class" OR "online classes" OR "online classified" OR "online classifieds" OR "online classroom") or "blended	ProQuest Dissertations & Theses Global	501285 0



	<p>class* or "blended learning" or ("hybrid class" OR "hybrid classes") or "mix* class*" or "technology mediated class*" or "web enhanced class*" or ("online lecture" OR "online lectures") or internet or ("virtual learning") or virtual* or "distance education" or "distance learning" or "online education" or "remote teaching" or "remote learning" or "mobile learning" or e learning or elearning or "asynchronous learning" or "synchronous learning" or "personal protective equipment" or ("facial mask" OR "facial masks") or "face covering" or ppe or "facial covering" or mask* or N95 or "dental mask*" or ("contact tracing") or "symptom tracking" or "track and trace" or "test and protect" or ("social distance") or "social isolation" or ("physical distance") or lockdown or quarantine* or isolat* or "health screening" or "health test" or "health testing services" or confinement* or "disease control" or quarantine or "stay at home" or "travel restriction" or "travel restrictions" or "external* border*" or ("internal border" OR "internal borders") or international* or oversea* or abroad* or domestic* or "travel* ban" or "travel* restrict*" or "travel* clos*" or "school closing" or colleg* or "post secondary" or "vocational school" or "technical school" or ((campus* or universit* or dormitor* or residence* or sororit* or fraternit*) and (close* or closure* or restric*)) or mitigat* or ventilat* or ("infection prevention") or "infection control" or testing or test or "lateral flow" or ("hand wash" OR "hand washed" OR "hand</p>		
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	washing") or sanitiz* or sanitis* or clean* or "hand hygiene")		
S5	ti((college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further education" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR ("graduate student" OR "graduate students" OR "graduate studies" OR "graduate study") OR Undergraduate* OR ("undergraduate student" OR "undergraduate students") OR ("academic student" OR "academic students") OR ("postgraduate student" OR "postgraduate students") OR ("academic degree" OR "academic degrees") OR ("college program" OR "college programme" OR "college programmes" OR "college programs") OR ("masters student" OR "masters students") OR "Advanced education")) OR ab((college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further education" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR ("graduate student" OR "graduate students" OR "graduate studies" OR "graduate study") OR Undergraduate* OR ("undergraduate student" OR "undergraduate students") OR ("academic student" OR "academic students") OR ("postgraduate student" OR "postgraduate students") OR ("academic degree" OR	ProQuest Dissertations & Theses Global	522809

	"academic degrees") OR ("college program" OR "college programme" OR "college programmes" OR "college programs") OR ("masters student" OR "masters students") OR "Advanced education"))		
S6	S3 OR S4	ProQuest Dissertations & Theses Global These databases are searched for part of your query.	501285 0
S7	S1 AND S2 AND S5 AND S6	ProQuest Dissertations & Theses Global These databases are searched for part of your query.	167

## Proquest COVID - complete

14/07/21

Set#	Searched for	Databases	Results
S1	noft(exp coronavirus/) OR noft(exp coronavirus infections/) OR noft(exp covid 19/) OR noft(exp sars cov 2/) OR noft(("Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019))	Coronavirus Research Database	80171
S2	noft((exp mental disorders/) OR (exp mental health/) OR (exp stress, psychological/) OR (exp anxiety/) OR (exp Depressive Disorder/) OR (exp depression/) OR (exp psychological distress/) OR (exp loneliness/) OR (exp behavior, addictive/) OR (exp behavioral symptoms/) OR ("mental disorder" OR "mental disorders") or "mental health" or anxi* or stress* or depress* or loneli*	Coronavirus Research Database	11742

	or trauma* or psycho* or psychiatr* or wellbeing or "well being"))		
S3	noft((exp internet/) or (exp personal protective equipment/) or (exp quarantine/) or (exp masks/) or (exp physical distancing/) or (exp travel/) or (exp communicable disease control/))	Coronavirus Research Database	2
S4	noft(("online class" OR "online classes" OR "online classified" OR "online classifieds" OR "online classroom") or "blended class*" or "blended learning" or ("hybrid class" OR "hybrid classes") or "mix* class*" or "technology mediated class*" or "web enhanced class*" or ("online lecture" OR "online lectures") or internet or ("virtual learning") or virtual* or "distance education" or "distance learning" or "online education" or "remote teaching" or "remote learning" or "mobile learning" or e learning or elearning or "asynchronous learning" or "synchronous learning" or "personal protective equipment" or ("facial mask" OR "facial masks") or "face covering" or ppe or "facial covering" or mask* or N95 or "dental mask*" or ("contact tracing") or "symptom tracking" or "track and trace" or "test and protect" or ("social distance") or "social isolation" or ("physical distance") or lockdown or quarantine* or isolat* or "health screening" or "health test" or "health testing services" or confinement* or "disease control" or quarantine or "stay at home" or "travel restriction" or "travel restrictions" or "external* border*" or ("internal border" OR "internal borders") or international* or oversea* or	Coronavirus Research Database	50759

	<p>abroad* or domestic* or "travel* ban" or "travel* restrict*" or "travel* clos*" or "school closing" or colleg* or "post secondary" or "vocational school" or "technical school" or ((campus* or universit* or dormitor* or residence* or sororit* or fraternit*) and (close* or closure* or restric*)) or mitigat* or ventilat* or ("infection prevention") or "infection control" or testing or test or "lateral flow" or ("hand wash" OR "hand washed" OR "hand washing") or sanitiz* or sanitis* or clean* or "hand hygiene")</p>		
S5	<p>ti((college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further education" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR ("graduate student" OR "graduate students" OR "graduate studies" OR "graduate study") OR Undergraduate* OR ("undergraduate student" OR "undergraduate students") OR ("academic student" OR "academic students") OR ("postgraduate student" OR "postgraduate students") OR ("academic degree" OR "academic degrees") OR ("college program" OR "college programme" OR "college programmes" OR "college programs") OR ("masters student" OR "masters students") OR "Advanced education")) OR ab((college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further</p>	Coronavirus Research Database	9233

	education" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR ("graduate student" OR "graduate students" OR "graduate studies" OR "graduate study") OR Undergraduate* OR ("undergraduate student" OR "undergraduate students") OR ("academic student" OR "academic students") OR ("postgraduate student" OR "postgraduate students") OR ("academic degree" OR "academic degrees") OR ("college program" OR "college programme" OR "college programmes" OR "college programs") OR ("masters student" OR "masters students") OR "Advanced education"))		
S6	S3 OR S4	Coronavirus Research Database These databases are searched for part of your query.	50759
S7	S1 AND S2 AND S5 AND S6	Coronavirus Research Database These databases are searched for part of your query.	1136
S8	(S1 and S2 and S5 and S6) AND yr(2020-2021)	Coronavirus Research Database These databases are searched for part of your query.	1133

## Proquest Public Health - issue due to “sanatis”

Date: 09/07/21

1	noft(exp coronavirus/) OR noft(exp coronavirus infections/) OR noft(exp covid 19/) OR noft(exp sars cov 2/) AND noft(("Wuhan seafood market pneumonia virus" or 2019nCoV or Betacoronavirus* or "Corona Virus*" or Coronavirus* or Coronovirus* or CoV or CoV2 or COVID or COVID19* or COVID-19* or COVID-2019* or HCoV-19 or nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or "SARS CoV 2" or SARS-CoV-2019))	45,003
2	noft((exp mental disorders/) OR (exp mental health/) OR (exp stress, psychological/) OR (exp anxiety/) OR (exp Depressive Disorder/) OR (exp depression/) OR (exp psychological distress/) OR (exp loneliness/) OR	690,816

	(exp behavior, addictive/) OR (exp behavioral symptoms/) OR (exp sleep wake disorders/) OR ("mental disorder*" or "mental health" or anxi* or stress* or depress* or loneli* or trauma* or psycho* or psychiatr*))	
	noft ((exp internet/) or (exp personal protective equipment/) or (exp quarantine/) or (exp masks/) or (exp physical distancing/) or (exp travel/) or (exp communicable disease control/))	20
3	noft ("online class*" or "blended class*" or "blended learning" or "hybrid class*" or "mix* class*" or "technology mediated class*" or "web enhanced class*" or "online lecture*" or internet or "virtual learning*" or virtual* or "distance education" or "distance learning" or "online education" or "remote teaching" or "remote learning" or "mobile learning" or e learning or elearning or "asynchronous learning" or "synchronous learning" or "personal protective equipment" or "facial mask*" or "face covering" or ppe or "facial covering" or mask* or N95 or "dental mask*" or "contact trac*" or "symptom tracking" or "track and trace" or "test and protect" or "social distanc*" or "social isolation" or "physical distanc*" or lockdown or quarantine* or isolat* or "health screening" or "health test" or "health testing services" or confinement* or "disease control" or quarantine or "stay at home" or "travel restriction" or "travel restrictions" or "external* border*" or "internal border*" or international* or oversea* or abroad* or domestic* or "travel* ban" or "travel* restrict*" or "travel* clos*" or "school closing" or colleg* or "post secondary" or "vocational school" or "technical school" or ((campus or campuses or universit* or dormitor* or residence* or sororit* or fraternit*) and (close* or closure* or restric* or mitigat* or ventilat* or "infection preven*" or "infection control" or testing or test or "lateral flow" or "hand wash*" or sanitiz* or sanatis* or clean* or "hand hygiene"))	1,244,410
4	ti((college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further education" OR "vocational school" OR "technical school" OR campus OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR "Graduate stud*" OR Undergraduate* OR "Undergraduate stud*" OR "Academic stud*" OR "Postgraduate stud*" OR "Academic degree*" OR "College program*" OR "Masters student*" OR "Advanced education")) OR ab((college* OR universit* OR student* OR "post secondary" OR "tertiary education" OR "higher education" OR "further education" OR "vocational school" OR "technical school" OR campus OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR "Graduate stud*" OR Undergraduate* OR "Undergraduate stud*" OR "Academic stud*" OR "Postgraduate stud*" OR "Academic degree*" OR "College program*" OR "Masters student*" OR "Advanced education"))	450,283
5	<b>S1 and S2 and S3 and S4</b>	<b>564</b>

## Ovid-PsychINFO - complete

Date: 15/07/21

1	exp coronavirus/	2922
2	(Wuhan seafood market pneumonia virus or 2019 nCoV or Betacoronavirus* or Corona Virus or Coronavirus* or Coronavirus* or CoV or CoV2 or COVID or COVID19* or COVID-19 or COVID-2019 or HCoV-19 or nCoV or 2019nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV or SARS-CoV-2 or SARS CoV 2 or SARS-CoV-2019 or coronarus infection or SARS coronavirus or Severe acute respiratory syndrome coronavirus 2).mp.	7319
3	exp college students/ or exp college athletes/ or exp community college students/ or exp education students/ or exp junior college students/ or exp nursing students/ or exp college graduates/ or exp graduate students/ or exp postgraduate students/ or exp reentry students/	101635
4	(post-secondary or post secondary or tertiary-education or tertiary education or higher-education or higher education or further-education or further education or vocational school or technical school or campus or universit* or dormitor* or residence* or sororit* or fraternit* or Graduate stud* or Undergraduate* or Undergraduate stud* or Academic stud* or Postgraduate stud* or Academic degree* or College program* or Masters student* or Advanced education or Universities or university student).mp.	343147
5	exp mental health/ or exp mental disease/ or exp stress, psychological/ or exp Depression/ or exp distress syndrome/ or exp loneliness/ or exp behavior disorder/ or exp sleep disorder/ or exp mental disorders/ or exp Anxiety Disorders/ or exp Anxiety/ or exp "Depression (Emotion)"/ or exp Distress/ or Loneliness/ or exp Sleep Wakeproq Disorders/ or exp Behavior Disorders/ or exp Psychological Stress/ or exp "Stress and Coping Measures"/ or exp "Stress and Trauma Related Disorders"/	1068754
6	(mental health or wellbeing or well-being or psychological distress or mental disorders or (psychological trauma or (stress disorders, post traumatic or (stress and disorders and post traumatic))) or post-traumatic stress disorders or ptsd or sleep disorders or (psychotic disorders or (psychotic and disorders) or psychotic disorders or psychosis) or personality disorders or (lonelier or loneliness or loneliness)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	581288
7	exp e-learning/ or exp protective equipment/ or exp masks/ or exp quarantine/ or exp social distancing/ or exp social distance/ or exp social isolation/ or exp infection control/ or exp communicable disease control/ or exp public health service/ or exp Electronic Learning/ or exp Personal Protective Equipment/ or exp Quarantine/ or exp Physical Distancing/ or exp public health services/	16739
8	((online or blended or hybrid or mix or technology-mediated or web-enhanced or mixed) and (class or classe* or classes)) or travel or Communicable Disease Control or (online lecture* or internet or virtual* or distance education or distance learning or online education or remote teaching or remote learning or mobile learning or e-learning or asynchronous learning or synchronous learning) or (personal protective equipment or face covering or ppe or facial covering or mask* or N95) or ((contact trac* or symptom tracking or track) and trace) or (social distanc* or social isolation or physical distanc*) or (((lockdown or quarantine* or isolat* or health screening or health test or health testing) and services) or confinement* or stay at home) or (travel restrictions or (((external* or externally or internal*) and border*) or (international* or oversea* or abroad* or domestic* or travel*)) and (clos* or closure* or ban or restrict* or restriction*)) or	949458



	(school closing or ((colleg* or post-secondary or post-secondary or vocational school or technical school or campus or universit* or dormitor* or residence* or sororit* or fraternit*) and (clos* or restric* or restriction*))) or (mitigat* or ventilat* or infection preven* or infection control or test or testing or lateral flow or hand wash* or sanitiz* or sanitis* or clean* or hand hygiene)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	
9	1 or 2	7537
10	3 or 4	381005
11	5 or 6	1306144
12	7 or 8	954539
13	9 and 10 and 11 and 12	160
14	<b>Limit 13 to yr = "2020-2021"</b>	<b>157</b>

## Ovid- EMBASE

Date: 15/07/21

1	exp Coronavirinae/ or exp Coronavirus infection/ or exp coronavirus disease 2019/	160350
2	exp SARS coronavirus/ or exp "SARS-CoV-2 (clinical isolate Wuhan/Hu-1/2019)"/ or exp Severe acute respiratory syndrome coronavirus 2/	41288
3	(Wuhan seafood market pneumonia virus or 2019 nCoV or Betacoronavirus * or Corona Virus or Coronavirus * or Coronavirus * or CoV or CoV2 or COVID or COVID19 * or COVID-19 or COVID-2019 or HCoV-19 or nCoV or 2019nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV-19 or SARS-CoV-2 or SARS CoV 2 or SARS-CoV-2019) .mp.	153145
4	exp Universities/ or exp college student/ or exp university/ or exp college/	234954
5	(universities or students or college* or post secondary or post-secondary or tertiary education or tertiary-education or Advanced education or higher education or higher-education or further education or further-education or vocational school or technical school or campus* or universit* or dormitor* or residence* or sororit* or fraternit* or Graduate stud* or Undergraduate* or Undergraduate stud* or Academic stud* or Postgraduate stud* or Academic degree* or college program* or masters student* or PhD student*).mp	1394288
6	exp mental health/ or exp mental disease/ or exp stress, psychological/ or exp Anxiety/ or exp Anxiety Disorders/ or exp Depression/ or exp distress syndrome/ or exp loneliness/ or exp behavior disorder/ or exp sleep disorder/ or exp psychological well-being/	2679448
7	(mental health or wellbeing or well-being or psychological distress or mental disorders or (psychological trauma or (stress disorders, post traumatic or (stress and disorders and post traumatic))) or post-traumatic stress disorders or ptsd or sleep disorders or (psychotic disorders or (psychotic and disorders) or psychotic disorders or psychosis) or personality disorders or (lonelier or loneliness or loneliness)).mp.	707410

8	exp e-learning/ or exp protective equipment/ or exp masks/ or exp quarantine/ or exp social distancing/ or exp social distance/ or exp social isolation/ or exp infection control/ or exp communicable disease control/ or exp public health service/	312082
9	((online or blended or hybrid or mix or technology-mediated or web-enhanced or mixed) and (class or classe* or classes)) or travel or Communicable Disease Control or (online lecture* or internet or virtual* or distance education or distance learning or online education or remote teaching or remote learning or mobile learning or e-learning or asynchronous learning or synchronous learning) or (personal protective equipment or face covering or ppe or facial covering or mask* or N95) or ((contact trac* or symptom tracking or track) and trace) or (social distanc* or social isolation or physical distanc*) or (((lockdown or quarantine* or isolat* or health screening or health test or health testing) and services) or confinement* or stay at home) or (travel restrictions or (((external* or externally or internal*) and border*) or (international* or oversea* or abroad* or domestic* or travel*)) and (clos* or closure* or ban or restrict* or restriction*))) or (school closing or ((colleg* or post-secondary or post-secondary or vocational school or technical school or campus or universit* or dormitor* or residence* or sororit* or fraternit*) and (clos* or restric* or restiction*))) or (mitigat* or ventilat* or infection preven* or infection control or test or testing or lateral flow or hand wash* or sanitiz* or sanitis* or clean* or hand hygiene)).mp.	5115859
10	1 or 2 or 3	181435
11	4 or 5	1394288
12	6 or 7	2849425
13	8 or 9	5224876
14	10 and 11 and 12 and 13	1261
15	<b>limit 14 to yr="2020 - 2021"</b>	<b>1235</b>

## EBSCO- CINAHL

Date: 16/07/21

1	MH ( "COVID-19" OR "SARS-CoV-2" OR "COVID-19 Pandemic" OR "Coronavirus Infections+" OR "Coronavirus+" ) OR  ( Wuhan seafood market pneumonia virus or 2019 nCoV or Betacoronavirus * or Corona Virus or Coronavirus * or Coronavirus * or CoV or CoV2 or COVID or COVID19 * or COVID-19 or COVID-2019 or HCoV-19 or nCoV or 2019nCoV or SARS2 or SARSCoV or SARS-CoV or 2019-nCoV or SARS-CoV-2 or SARS CoV 2 or SARS-CoV-2019 )	63936
2	MH(mental health or mental illness or mental disorder or psychiatric illness mental wellbeing or psychological wellbeing or emotional wellbeing or well being OR (stress and anxiety OR anxiety disorders or anxiety or generalized anxiety disorder OR depression or depressive disorder or depressive symptoms or major depressive disorder OR loneliness or lonely OR behavioral health OR sleep disorders OR (adaptation, psychological) OR suicidal ideation) OR	345540

	(mental health or wellbeing or well-being or psychological distress or mental disorders or (psychological trauma or (stress disorders, post traumatic or (stress and disorders and post traumatic))) or post-traumatic stress disorders or ptsd or sleep disorders or (psychotic disorders or (psychotic and disorders) or psychotic disorders or psychosis) or personality disorders or (lonelier or loneliness or loneliness))	
3	MH ( "Students, College" OR "Students, Undergraduate" OR "Colleges and Universities" OR "Student, postgraduate" ) OR  (universities or students or college* or post secondary or post-secondary or tertiary education or tertiary-education or Advanced education or higher education or higher-education or further education or further-education or vocational school or technical school or campus* or universit* or dormitor* or residence* or sororit* or fraternit* or Graduate stud* or Undergraduate* or Undergraduate stud* or Academic stud* or Postgraduate stud* or Academic degree* or college program* or masters student* or PhD student)	481074
4	MH ( protective personal equipment OR masks OR "Mass Gathering" OR "social distancing" or "quarantine" or "isolation or border control or border protection or "Handwashing+" or "Sanitation+" or "Hygiene" or "Online Education" OR social distancing OR communicable disease control ) OR  (((online or blended or hybrid or mix or technology-mediated or web-enhanced or mixed) and (class or classe* or classes)) or travel or Communicable Disease Control (online lecture* or internet or virtual* or distance education or distance learning or online education or remote teaching or remote learning or mobile learning or e-learning or asynchronous learning or synchronous learning) or (personal protective equipment or face covering or ppe or facial covering or mask* or N95) or ((contact trac* or symptom tracking or track) and trace) or (social distanc* or social isolation or physical distanc*) or (((lockdown or quarantine* or isolat* or health screening or health test or health testing) and services) or confinement* or stay at home) or (travel restrictions or (((external* or externally or internal*) and border*) or (international* or oversea* or abroad* or domestic* or travel*)) and (clos* or closure* or ban or restrict* or restriction*)) or (school closing or ((colleg* or post-secondary or post-secondary or vocational school or technical school or campus or universit* or dormitor* or residence* or sororit* or fraternit*) and (clos* or restric* or restiction*)) or (mitigat* or ventilat* or infection preven* or infection control or test or testing or lateral flow or hand wash* or sanitiz* or sanitis* or clean* or hand hygiene))	1382005
5	S1 AND S2 AND S3 AND S4  <b>Limiters</b> - Publication Year: 2020-2021	417

\* All search options: Expanders - Apply equivalent subjects, Search modes - Boolean/Phrase

## WHO COVID-19 Database - complete

Date: 14/07/21

Population block	college* OR "post-secondary" OR "post secondary" OR "tertiary-education" OR "tertiary education" OR "higher-education" OR "higher education" OR "further education" OR "further-education" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR "graduate student*" OR undergraduate* OR "academic student*" OR "postgraduate*" OR "post-graduate*" OR "academic degree*" OR "masters student*" OR "advanced education"tw:(college* OR "post-secondary" OR "post secondary" OR "tertiary-education" OR "tertiary education" OR "higher-education" OR "higher education" OR "further education" OR "further-education" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit* OR student* OR undergraduate* OR postgraduate* OR post-graduate* OR "academic degree" OR "advanced education") OR mj:(universities OR students)
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Mitigation block	tw:(mj:(internet OR "personal protective equipment" OR "quarantine" OR "masks" OR "physical distancing" OR travel OR "Communicable Disease Control") OR tw:((online OR blended OR hybrid OR mix OR "technology-mediated" OR "web-enhanced" OR mixed) AND ("class" OR "classe" OR "classes") OR "online lecture" OR "online lectures" OR internet OR "virtual learning" OR virtual* OR "distance education" OR "distance learning" OR "online education" OR "remote teaching" OR "remote learning" OR "mobile learning" OR "e-learning" OR "asynchronous learning" OR "synchronous learning" OR "personal protective equipment" OR "facial masks" OR "face covering" OR "ppe" OR "facial covering" OR "mask" OR "masks" OR "N95" OR "contact tracing" OR "symptom tracking" OR "track and trace" OR "test and protect" OR "social distance" OR "social distancing" OR "social isolation" OR "physical distance" OR "physical distancing" OR lockdown OR quarantine* OR isolat* OR "health screening" OR "health test" OR "health testing and services" OR confinement* OR "stay at home" OR ("travel restrictions" OR (((external* OR "externally" OR internal*) AND (border*)) OR (international* OR oversea* OR abroad* OR domestic* OR travel*)) AND (clos* OR closure* OR "ban" OR restrict*)) OR "school closing" OR ((colleg* OR "post secondary" OR "post-secondary" OR "vocational school" OR "technical school" OR campus* OR universit* OR dormitor* OR residence* OR sororit* OR fraternit*) AND (close* OR closure* OR restric*)) OR mitigat* OR ventilat* OR "infection prevention" OR "infection control" OR "test" OR "testing" OR "lateral flow" OR "hand washing" OR sanitiz* OR sanitis* OR clean* OR "hand hygiene"))
Mental health block	tw:("mental disorder" OR "mental disorders" OR "mental health" OR anx* OR stress* OR depress* OR loneli* OR trauma* OR psycho* OR psychiatr*) OR mj:("Mental Disorders" OR "mental health" OR "stress, psychological" OR anxiety OR "Depressive Disorder" OR "psychological distress" OR "Loneliness" OR "behavior, addictive" OR "Behavioral Symptoms")"mental health" OR "mental disorder" OR anx* OR depress* OR lonli* OR trauma* or psycho* OR phsychiatr*
Date filter	2020, 2021
TOTAL PAPERS IDENTIFIED	<b>2088</b>

Medrxiv 1

Date: 15/07/21

Mental health	[Mm]ental [Dd]isorder [Mm]ental [Hh]ealth \\b[Aa]nxi \\b[Ss]tres \\b[Dd]epress \\b[Ll]oneli \\b[Tt]rauma \\b[Pp]sycho [Pp]sychiatr [Pp]ersonality [Dd]isorder [Ss]ubstance.{0,10}[Dd]isorder [Pp]araphilic [Dd]isorder [Ff]actitious [Dd]isorder [Nn]eruo.{0,4}[Dd]isorder [Oo]bsessive compulsive [Dd]isorder [Aa]djustment [Dd]isorder \\b[Ss]leep [Ss]uicide [Cc]atatoni [Ee]ating [Dd]isorder [Ee]limination [Dd]isorder //b[Dd]istress [Mm]ental [Ww]ell(?.)being	
Mitigations	([Oo]nline   [Bb]lended   [Hh]ybrid   [Mm]ix   [Tt]echnology.mediated   [Ww]eb.enhanced).{0,8}[Cc]lass [Oo]nline lecture [li]nternet [Vv]irtual learning [Vv]irtual [Dd]istance education [Dd]istance learning	

<p>[Oo]nline education</p> <p>[Rr]emote teaching</p> <p>[Rr]emote learning</p> <p>[Mm]obile learning</p> <p>[Ee](.?)learning</p> <p>(a?)synchronous learning</p> <p>[Pp]ersonal.[Pp]rotective.[Ee]quipment</p> <p>\\bPPE</p> <p>[Ff]ac.{0,5}covering</p> <p>\\bmask</p> <p>\\bN95</p> <p>contact trac</p> <p>symptom tracking</p> <p>[Tt]rack and [Tt]race</p> <p>[Tt]est and [Pp]rotect</p> <p>[Ss]ocial [Dd]istanc</p> <p>[Ss]ocial isolation</p> <p>[Pp]hysical [Dd]istanc</p> <p>[Ll]ockdown</p> <p>[Qq]uarantine</p> <p>\\bisolat</p> <p>[Hh]ealth screening</p> <p>[Hh]ealth test</p> <p>[Hh]ealth testing services</p> <p>[Cc]onfinement</p> <p>[Dd]isease [Cc]ontrol</p> <p>[Qq]uarantine</p> <p>[Ss]tay at [Hh]ome</p> <p>[Tt]avel restriction</p> <p>[Ee]xternal [Bb]order</p> <p>[Ii]nternal [Bb]order</p>	
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	<p>[li]nternational   [Oo]versea   [Aa]broad   [Dd]omestic.{0,5}([tT]ravel?)(ban  clos restrict)</p> <p>colleg post.secondary vocational school technical school campus universit dormitor residence sororit fraternit.{0,10}\\ b[Cc]lose \\b[Cc]losure \\b[Rr]estrict</p> <p>[Mm]itigat</p> <p>[Vv]entilat</p> <p>[li]nfection preven</p> <p>[li]nfection control</p> <p>\\b[Tt]esting</p> <p>\\b[Tt]est</p> <p>[Ll]ateral [Ff]low</p> <p>[Hh]and [Ww]ash</p> <p>\\b[Ss]anitiz</p> <p>\\b[Ss]anitis</p> <p>[Cc]lean</p> <p>[Hh]and [Hh]ygiene</p>	
COVID	<p>2019nCoV</p> <p>[bB]etacoronavirus</p> <p>[Cc]orona [Vv]irus</p> <p>[Cc]oronavirus</p> <p>[Cc]oronovirus</p> <p>\\bCoV\\b</p> <p>\\bCoV2\\b</p> <p>COVID</p> <p>HCoV-19</p> <p>\\bnCoV\\b</p> <p>SARS CoV 2</p> <p>SARS2</p> <p>SARSCoV</p> <p>SARS-CoV</p>	



Higher education	\\b[Cc]ollege [Uu]niversit [Ss]tudent [Pp]ost.secondary [Tt]ertiary education [Hh]igher education [Ff]urther education [Vv]ocational school [Tt]echnical school \\bcampus [Dd]ormitor [Rr]esidence [Ss]pororit [Ff]raternit [Uu]nder(?.)graduate [pP]ost(?.)graduate [Aa]cademic degree [Cc]ollege program [Aa]dvanced education	
<b>TOTAL RESULTS</b>	<b>73</b>	