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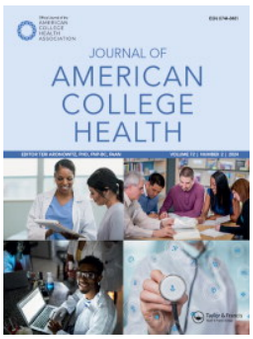

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Student mental health during the COVID-19 pandemic: Are international students more affected?

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ABSTRACT

Background: The psychological well-being of students may be especially affected by the COVID-19 pandemic; international students can lack local support systems and represent a higher risk subgroup. **Methods:** Self-reported depressive symptoms, suicidal ideation, anxiety, post-traumatic stress disorder (PTSD), insomnia, alcohol use, academic stress, and loneliness were examined in two cohorts of university students (March 2020 $n = 207$, March 2021 $n = 142$). We investigated differences i) between 2020 and 2021, ii) between domestic and international students, and ii) whether differences between the two cohorts were moderated by student status. **Results:** More depressive symptoms, academic stress, and loneliness were reported in 2021. International students reported more depressive symptoms, suicidal ideation, anxiety, PTSD, academic stress, and loneliness. The main effect of cohort was not moderated by student status. **Conclusions**: International students had worse mental health outcomes overall, but were not affected more by the COVID-19 pandemic than domestic students.

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Academic stress; anxiety; coronavirus; depression; loneliness; suicidal ideation

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has brought upon a time that for many is filled with anxious uncertainty and themes of loss – whether that be of disruptions in normal daily life and diminished social interactions, loss of income, or health. According to the World Health Organization, as of April 26 2021, more than 146,000,000 COVID-19 cases and 3,000,000 deaths have been reported, of which 1,461,137 cases and 17,049 deaths have been registered in the Netherlands.[1] Recent findings also indicate that the pandemic and its associated effects may impact not only physical, but also mental health: reports of anxiety, stress and loneliness, and the prevalence of substance abuse, post-traumatic stress disorder (PTSD) and depression, have increased during the pandemic, based on studies conducted in the USA,[2] UK,[3,4] Canada,[5,6] Germany,[7] Italy,[8] Spain,[9] Australia,[10] and China.[11–17]. Indeed, some are projecting COVID-19 to result in a "second pandemic" of mental health crises.[18]

Students may be especially affected by the current situation. Even under normal circumstances, students are disproportionately affected by disturbances such as suicidal ideation,[19] depression,[20] insomnia,[21] and stress,[22] compared to the general population. The average self-reported depression point-prevalence among university students is 30%[23,24] – a rate approximately three times that of the general population.[25] Around 10% of students also report current suicidal ideation,[24,26,27] with lifetime prevalence rates among students reaching up to 30%[19] – a rate considerably higher than that of the general population of around 10%.[28] Up to 40% of students also endorse self-reported anxiety,[29] and 10–15% report PTSD symptoms indicative of a partial or full diagnosis.[30] Additionally, up to one-third of U.S. college students engage in drinking behavior qualifying for a diagnosis of alcohol abuse,[31] in comparison to a lifetime prevalence of less than 20% in the general population.[32] Results from the World Mental Health International College Student (WMH-ICS) initiative among 13,984 first-year students also show that the majority feel hesitant about seeking mental health treatment, and that the odds for seeking treatment were further reduced in students who had a recent history (<12-months) of major depression, alcohol abuse, or suicidal thoughts and behaviors.[33] With these pre-crisis levels in mind, how does this population fare in the face of global turmoil?

Limited evidence indicates that students were adapting well in the initial phases of the pandemic. Based on findings from an ecological momentary assessment (EMA) study in March 2020, no changes in mental health outcomes were observed over a 2-week period.[34] In fact, decreases in levels of loneliness were observed from pre- to post-test, although the authors point out that their findings more likely reflect a return to baseline functioning rather than decreases beyond pre-pandemic levels. Conversely, others have reported high rates of mental health symptoms (such as depression, anxiety, and stress) among students during these early stages of the pandemic.[11,35–37] However, it is unclear how much these reports are influenced by COVID-19, and to what

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extent they merely reflect the general high prevalence of mental health complaints among students. Consequently, the effects of the extended pandemic and its associated sequalae on student mental health warrant further research.

Meanwhile, the mental health of international students during the pandemic has been discussed.[37,38] Many international students are living away from their families and extended social circles, and may be more affected by social isolation measures than domestic students. Concern over the health of family members residing in harder-hit areas, travel restrictions, and stress over the completion of one's studies can also disproportionately affect international students. Consequently, the mental health of international students amidst the pandemic may warrant increased attention.

The aim of the present study was to assess mental health outcomes (depressive symptoms, suicidal ideation, anxiety, PTSD, alcohol (ab)use, insomnia, loneliness and academic stress) during the COVID-19 pandemic in two cohorts of university students with self-reported stress and/or mood problems (March 2020 and March 2021). We compared mental health outcomes (i) between a cohort of students assessed in March 2020 (ie, the early "acute" stage of the COVID-19 pandemic) and another cohort examined 12 months later (March 2021 ie, the "chronic" stage of the pandemic). We further examined differences, (ii) between domestic (Dutch) and international students, and (iii) whether potential differences between the two cohorts were moderated by student status. We hypothesized that mental health problems would be heightened (i) in the 2021 cohort, and (ii) among international students, and that (iii) differences between the two cohorts would be more pronounced among international students, due to increased strain from the pandemic and its associated consequences.

Finally, we explored potential predictors of mental health outcomes in the 2021 cohort, including iv) fear about the pandemic, and v) coping with the pandemic, and their differential associations in domestic vs. international students. We hypothesized that mental health problems would be more severe among those with more fear and less coping with the pandemic, and that international students would experience more fear and less coping than domestic students.

Methods

Ethics

The study received institutional ethical approval from the Leiden University Psychology Research Ethics Committee (CEP nr. 2145/2874).

Procedure

Data were collected from two cohorts of students (2020, 2021) with self-reported stress and/or mood problems as part of an online survey study on stress and mental health (incl. suicidal ideation) among Leiden University students in the Netherlands. Data collection in both years was performed by undergraduate psychology students, and participants were recruited through flyers placed in university buildings, and through posts on social media.

Participants were provided with a link to the online survey platform (Qualtrics.com) where they could fill in the questionnaire at their own time. Completing the survey took around 30 min. As compensation, participants could either opt to enter a raffle where monetary prices (2 × 40€, 6 × 20€) could be won, or receive two research credits counting toward their undergraduate study requirements.

The data collection for the 2020 cohort, from March 7th to March 31th, coincided with the emergence of the corona crisis in The Netherlands. The first case of COVID-19 in the Netherlands was confirmed on February 27th, and when data collection for the 2020 cohort started on March 7th the number of cases in the Netherlands had risen to 82, with one confirmed death. On March 12th, the Dutch government implemented measures intended to slow down the spread of the virus, including guidelines to work from home and a ban on gatherings of 100 or more people. On March 15th, these measures were expanded to include the closing of all schools and universities, cafes and restaurants. By the end of the data collection on March 31st the number of coronavirus cases in the Netherlands had exceed 12,000, with 1,039 deaths.[39]

At the time of the 2021 data collection period, between March 4th and April 1st, the Netherlands was in partial lockdown with higher education institutions closed for in-person teaching, cafes and restaurants closed for dining on location, and other venues (such as gyms and museums) fully closed. A 9 pm curfew was in place, with further guidelines to limit contact to max. 1 person outside of one's household per day. With test mandates restricting oversees travel, wearing a mask was required in all indoor spaces. By April 4th 2021, 4.5 million people in the Netherlands (with a population of 17.2 million people) had received their first dose of the COVID-19 vaccine.[40,41]

Materials

Depressive symptoms were assessed with the Beck Depression Inventory (BDI-I).[42] The BDI is a 21-item measure of current depressive symptoms. Total scores range from 0 to 63, with scores 0–9 reflecting none-to-minimal depressive symptoms, 10–18 mild-to-moderate, 19–29 moderate-to-severe, and 30–63 severe depressive symptoms.[43] The BDI exhibits good reliability in both psychiatric (mean Cronbach's alpha = .86) and non-psychiatric samples (mean Cronbach's alpha = .81).[43]

Suicidal ideation was measured with the Beck Scale for Suicide Ideation (BSSI).[44] The BSSI consists of 21 items assessing current (ie, past week) suicidal ideation. Total scores range from 0 to 42, with higher scores reflecting more severe suicidal ideation. The BSSI exhibits excellent reliability in both inpatient and outpatient samples (Cronbach's alphas > .90).[44]

Anxiety symptoms were measured with the Beck Anxiety Index (BAI), consisting of 21 items.[45] Total scores range from 0 to 63, with scores 0–7 reflecting minimal anxiety, 8–15 mild, 16–25 moderate, and 26–63 severe anxiety.[46] The

BAI has shown excellent reliability in outpatient samples (Cronbach's alpha = .92).[45]

Post-traumatic stress disorder (PTSD) symptoms were measured with the PTSD Checklist for DSM-V (PCL-5).[47] The PCL-5 is a 20-item measure of DSM-V PTSD symptoms, with total scores ranging from 0 to 80. Scores above 33 are indicative of probable PTSD.[48] The PCL-5 has shown excellent internal consistency among trauma-exposed college students (Cronbach's alphas ≥ .94).[47]

Alcohol (ab)use was measured with the Alcohol Use Disorders Inventory test (AUDIT).[49] The AUDIT consists of 10 items assessing the amount, frequency, and consequences of the respondent's alcohol use. Total scores for the AUDIT range from 0 to 40, with scores of 15 and above indicating probable alcohol dependence. The AUDIT exhibits good internal consistency (mean Cronbach's alpha = .80).[50]

Insomnia symptoms were measured with the Insomnia Severity Index (ISI).[51] The ISI consists of 7 items concerning the severity and impact of sleep disturbance in the past week. Total scores range from 0 to 28, with scores 0–7 indicating no (clinically significant) insomnia, 8–14 indicating subthreshold, 15–21 indicating moderate, and 22–28 indicating severe clinically significant insomnia. Internal consistency of the ISI among insomnia patients is acceptable/good (Cronbach's alphas ≥ .74).[51]

Academic stress was measured with the Law Student Perceived Stress Scale (LSPSS).[52] The LSPSS consists of 16 items assessing the impact of academic demands, career pressures, and study/life imbalance. Total scores range from 16 to 80, with higher scores reflecting more severe academic stress. The LSPSS has good internal consistency in student samples (Cronbach's alpha 2020 = .86).[52]

Loneliness was measured with the De Jong-Gierveld Loneliness Scale (DJGLS).[53] The DJGLS consists of 11 items assessing subjective loneliness rated on a 5-point scale. Total scores range from 0 to 11, with scores 0–2 reflecting no loneliness, 3–8 moderate loneliness, and 9–11 severe loneliness. Internal consistency of the DJGLS is good/excellent (Cronbach's alpha .80–.90).[53]

Fear of COVID-19 was measured based on the Fear of Covid-19 Scale (FVC-19S).[54] The original scale consists of seven items relating to anxiety regarding COVID-19, rated on a 5-point Likert-scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). The validity of the scale in the general population was recently supported.[53] For the present study, three additional items were included in the scale relating to the long-term consequences of the pandemic: "I am afraid of losing a loved one because of COVID-19", "I am afraid of the long-term financial consequences of the pandemic (ie, not finding a job)", and "A loved one contracted COVID-19 and now I am more worried than before". Total scores on the adapted scale range from 10 to 50, with higher scores reflecting greater fear about COVID-19. Initial evaluation of the psychometric properties of the FVC-19S indicated good internal consistency (Cronbach's alpha = .82).[54]

Coping with COVID-19 was measured with the Pandemic Coping Scale (PCS),[55] consisting of 13 items rated on a 4-point scale from 0 (I have not been doing this at all) to 4 (I have been doing this a lot). The psychometric properties of the scale have been recently evaluated.[54] Example items include "I have been paying attention to maintain my daily routine" and "I have been spending a good time with loved ones, friends, or my pet." Initial evaluation of the psychometric properties of the PCS indicated good internal consistency (Cronbach's alpha = .83).[55]

Covariates Age, study phase (undergraduate vs. graduate student), and student status (Dutch vs. international) were assessed.

Statistical analysis

The data were analyzed with IBM SPSS Statistics 26.0 (SPSS Inc.). One-way MANOVAs were used to assess for the effect of (i) year of assessment (2020 vs. 2021), and (ii) student status (Dutch vs. international) on reports of depressive symptoms, suicidal ideation, anxiety, PTSD, alcohol (ab)use, insomnia, loneliness, and academic stress. Two-way MANOVA was used to examine the interaction of year of assessment and student status. Linear regression analyses were used to test whether iii) fear about the pandemic, and iv) coping with the pandemic were associated with mental health outcomes in the 2021 cohort, and *t*-tests were used to assess for differences between Dutch vs. international students on fear and coping with the pandemic. As the 2020 cohort had a younger age distribution and consisted of less undergraduate students in comparison to the 2021 cohort (Table 1), we corrected for age and study phase in all analyses. Bonferroni correction was applied to adjust for multiple testing and significance was determined at $\alpha = 0.05/8 = 0.006$.

Results

Sample characteristics

Between 2020 and 2021, 374 individuals participated in the study, of whom 349 successfully completed the assessment (ie, filled in the complete survey) (2020 $n = 207$, 2021 $n = 142$). Non-completers (2020 $n = 12$, 2021 = 13) all filled in ≤ 50% of the survey. They did not differ from completers in gender ($p = .25$), age ($p = .23$) or student status (Dutch vs. international) ($p = .06$). Sample characteristics and differences between the 2020 and 2021 cohorts are presented in Table 1.

Data screening

Data visualization indicated appropriate normality for the dependent variables; only the BSSI showed deviations from normality (skewness and kurtosis ≥ 2), which was not considered problematic due to the large sample size.[56] While ANOVA is robust to violations of homogeneity of variance given equal group sizes (as in our analyses of student status), we examined homogeneity between the 2020 and 2021 cohorts due to unequal groups: homogeneity was met for all variables (variance ratios (VRs) < 1.5), with the BDI showing a slight deviation (VR = 1.57). No multicollinearity was observed (Pearson *rs* ≤ .49). Mahalanobis distance identified nine participants as potential multivariate outliers. Manual

Table 1. Sociodemographic characteristics of the sample ($N = 349$).

	2020 ($n = 207$)	**2021** ($n = 142$)	F-test/χ^2-test	p-value
Gender, Female (n, %)	169 (82%)	113 (80%)	0.27	.874
Age, Years (m, sd)	20.3 (2.19) $_a$	21.1 (5.61) $_b$	11.8	**.001**
Undergraduate student (n, %)	202 (98%) $_a$	131 (92%) $_b$	5.47	**.019**
Study program (n, %)			26.5	**<.001**
Social & Behavioral Sciences	185 (89%) $_a$	98 (69%) $_b$		
Humanities	13 (6%) $_a$	36 (25%) $_b$		
Biology & Medicine	5 (2%) $_a$	5 (4%) $_a$		
Other	4 (2%) $_a$	3 (2%) $_a$		
International student (n, %)	81 (39%) $_a$	88 (62%) $_b$	17.6	**<.001**
Region of origin (n, %)			2.75	.601
Europe	73 (90%)	81 (92%)		
Asia	5 (6%)	2 (2%)		
South America	1 (1%)	2 (2%)		
North America	2 (2%)	2 (2%)		
Africa	–	1 (1%)		

Note: Subscript letters indicate groups that significantly differ from each other. Full list of countries of origin of international students: Austria, Belgium, Bolivia, Brazil, Bulgaria, Canada, Colombia, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Great Britain, Hungary, India, Indonesia, Ireland, Israel, Italy, Lithuania, Luxembourg, Malta, Namibia, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Sint Maarten, Slovakia, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, United States.

Table 2. Multivariate analysis of variance of year of assessment on student mental health outcomes.

	2020 ($n = 207$)	2021 ($n = 142$)		
	M (SD)	M (SD)	F-test	p-value
BDI	9.67 (8.15)	15.0 (10.2)	24.2	**<.001**
BSSI	1.75 (4.54)	2.70 (5.32)	2.02	.156
BAI	13.5 (10.2)	16.9 (12.9)	7.43	.007
PCL-5	18.3 (15.7)	22.7 (17.5)	3.67	.056
AUDIT	17.9 (5.69)	16.5 (5.20)	5.36	.021
ISI	8.81 (5.28)	9.62 (5.51)	0.52	.471
LSPSS	49.9 (9.80)	54.0 (10.2)	11.3	**.001**
DJGLS	3.62 (3.40)	5.30 (3.40)	13.8	**<.001**

Note: BDI = Beck Depression Inventory; BSSI = Beck Scale for Suicide Ideation; BAI = Beck Anxiety Index; PCL-5 = Post-traumatic stress disorder checklist for DSM-5; AUDIT = Alcohol Use Disorders Inventory Test; ISI = Insomnia Severity Index; LSPSS = Law Student Perceived Stress Scale; DJGLS = De Jong-Gierveld Loneliness Scale. The model is corrected for age and study phase. Significant effects based on Bonferroni adjusted α = .006 are presented in bold.

checks confirmed all recorded values were within expected ranges, and the outliers were retained in the analyses.

Reliability estimates (Cronbach's alphas) indicated excellent internal consistency in our sample for the BDI (2020 = .90, 2021 = .91), BAI (2020 = .91, 2021 = .94), PCL-5 (2020 = .94, 2021 = .94), and DJGLS (2020 = .92, 2021 = .91). Reliability was good for the AUDIT (2020 = .87, 2021 = .88), ISI (2020 = .83, 2021 = .86), LSPSS (2020 = .88, 2021 = .87), and FVC-19S (2021 = .85), acceptable/good for the BSSI (2020 = .84, 2021 = .62), and acceptable for the PCS (2021 = .66) (*Note*: The FVC-19S and PCS were only administered in 2021).

Year of assessment (2020 vs. 2021)

There was a significant multivariate main effect of year of assessment (F (8, 338) = 5.53, $p < .001$, Wilks' $\lambda = 0.88$). This was supported by univariate tests: students in the 2021 cohort reported more depressive symptoms, academic stress and loneliness (Table 2). Based on clinical cutoffs, 9% of students in 2020 indicated moderate-to-severe depressive symptoms, compared to 22% in 2021.[43] In 2020, 13% of students reported severe loneliness, in comparison to 24% in 2021.[53] (*Note*: No cutoff scores are provided for the BSSI or LSPSS.) See Table S1 for full categorical presentation of scores.

Student status (Dutch vs. international)

There was a significant multivariate main effect of student status (F (8, 338) = 7.35, $p < .001$, Wilks' $\lambda = 0.85$). In comparison to Dutch students, international students reported more depressive symptoms, suicidal ideation, anxiety, PTSD, academic stress and loneliness (Table 3). Among Dutch students, the prevalence of moderate-to-severe depressive symptoms was 9%, in comparison to 20% among international.[43] 12% of Dutch students met criteria for probable PTSD, in comparison to 30% of international students.[47] 10% of Dutch students and 25% of international students indicated severe loneliness.[53] Severe anxiety was reported by 9% of Dutch students, and 25% of international students.[46] (*Note*: No cutoff scores are provided for the BSSI or LSPSS.) See Table S2 for full categorical presentation of scores.

Interaction of year of assessment and student status

The interaction between year of assessment and student status was not significant (F (8, 336) = 1.68, $p = .102$, Wilks' $\lambda = 0.96$), indicating that the overall increase in symptom presentation in the 2021 cohort was observed among both domestic (Dutch) and international students (Table S3).

Table 3. Multivariate analysis of variance of student status on student mental health outcomes.

	Dutch ($n = 180$)	International ($n = 169$)		
	M (SD)	M (SD)	*F*-test	*P*-value
BDI	9.73 (8.26)	14.1 (10.0)	13.1	**<.001**
BSSI	1.23 (3.54)	3.11 (5.86)	9.43	**.002**
BAI	12.6 (9.77)	17.4 (12.7)	14.6	**<.001**
PCL-5	15.9 (13.9)	24.6 (18.0)	17.2	**<.001**
AUDIT	17.9 (5.93)	16.7 (5.02)	3.95	.048
ISI	8.80 (4.98)	9.50 (5.78)	0.04	.845
LSPSS	49.1 (9.50)	54.2 (10.2)	19.6	**<.001**
DJGLS	3.02 (3.15)	5.67 (3.31)	40.7	**<.001**

Note: BDI = Beck Depression Inventory; BSSI = Beck Scale for Suicide Ideation; BAI = Beck Anxiety Index; PCL-5 = Post-traumatic stress disorder checklist for DSM-5; AUDIT = Alcohol Use Disorders Inventory Test; ISI = Insomnia Severity Index; LSPSS = Law Student Perceived Stress Scale; DJGLS = De Jong-Gierveld Loneliness Scale. The model is corrected for age and study phase. Significant effects based on Bonferroni adjusted α = .006 are presented in bold.

Fear of and coping with COVID-19

In the 2021 cohort, increased fear of COVID-19 was associated with more depressive symptoms ($b = .36$, $t = 2.80$, $p = .006$), anxiety ($b = .82$, $t = 5.31$, $p < .001$), PTSD ($b = .91$, $t = 4.33$, $p < .001$), academic stress ($b = .66$, $t = 5.53$, $p < .001$), and loneliness ($b = .12$, $t = 2.90$, $p = .004$). Less coping with COVID-19 was associated with more depressive symptoms ($b = -.58$, $t = -3.82$, $p < .001$), insomnia ($b = -.37$, $t = -4.70$, $p < .001$), and loneliness ($b = -.16$, $t = -3.26$, $p = .001$). Furthermore, international students (M = 23.9, SD = 6.79) reported more fear than domestic students (M = 20.6, SD = 5.57) ($t = -2.99$, $p = .003$), but did not differ in coping ($t = -0.22$, $p = .825$).

Discussion

The aim of the present study was to assess mental health outcomes in university students with self-reported stress and/or mood problems during the COVID-19 pandemic. Specifically, we explored whether mental health problems would be more pronounced (i) in a cohort of students assessed 12-months into the pandemic (March 2021) in comparison to the previous year (March 2020), (ii) among international students, and (iii) whether potential differences between the cohorts were moderated by students' status (Dutch vs. international). We further explored the associations of fear about COVID-19 and coping with COVID-19 on mental health outcomes in 2021, and their differential associations in Dutch vs. international students.

In line with our hypothesis, we observed more severe mental health complaints in the 2021 cohort: more depressive symptoms, academic stress and loneliness were reported in 2021 in comparison to the previous year. These results follow prior findings indicating that several mental health issues, such as anxiety and depression, are on the rise during the pandemic (see eg, Wang et al[16] and Torales et al[57]). However, studies in student populations are more limited (see Deng et al[37] for a meta-analysis and review). Among 874 Bangladeshi university students, 40% of students reported moderate to severe anxiety and 72% endorsed depressive symptoms; however, the study was conducted in the very early stages of the pandemic (April 2020).[35] Likewise, around 25% of Chinese university students endorsed mild-to-moderate anxiety during the early months of the pandemic.[11] In another study in Chinese university students, 47% showed high or very high distress due to COVID-19, and 39% reported depressive symptoms.[36] Among Indian medical students, reports of anxiety and stress, but not depression, increased during the pandemic.[58] A cross-sectional study in Canadian adults from the community also reported highest rates (38%) of depression among young adults aged 18 and 24 during the pandemic.[6] Another cross-national survey study indicated the age group of 18 to 24 to experience more stress, anxiety and depression than other age groups, and student populations specifically to be impacted by increased depressive symptoms during COVID-19.[59] In the present study, mean scores of depressive and anxiety symptoms reflected mild-to-moderate severity in both the 2020 and 2021 cohorts,[43,46] although it should be noted that our sample was pre-selected based on self-reported stress and/or mood problems. Within this limitation, our findings support the notion of prevalent mental health complaints among students during the pandemic, and that the presentation of many symptoms (such as depression, academic stress and loneliness) has increased in the past year. However, lacking a pre-pandemic control group in our study, alternative explanations cannot be excluded. It is possible that students in early 2020 may have been enjoying some of the positive side-effects of the early pandemic measures, such as the postponement of exams and increased free time. Therefore, potentially lower levels of some complaints (eg, academic stress) in 2020 may also have contributed to our observed differences between the cohorts. Indeed, a previous study in Leiden University students indicated that students were relatively resilient in the early days of the pandemic.[34]

We further observed a pattern of heightened mental health complaints among international students: international students reported more anxiety, PTSD, academic stress and loneliness. There are a number of reasons why international students may experience more mental health problems than domestic students. Moving abroad alone at a relatively young is subject to its unique stressors. While doing so, prospective students leave behind their familiar surroundings and social support systems, which may reduce resilience.[60] Students may also experience social isolation and disconnect while trying to assimilate into a new culture – some may face racial discrimination that may further hinder this process.[38,60,61] Finally, studying abroad may be a bigger financial investment than studying in one's domestic country, which may increase stress and pressures for

success.[37,38] All things considered, international students face challenges domestic students do not. International students have been observed to experience heightened levels of depression, anxiety, and stress,[61,62] and poorer life satisfaction,[63] while being more reluctant to use university counseling services.[60,63] These issues may further be heightened by the ongoing pandemic and social isolation measures, and students may feel anxious over the health and wellbeing of loved ones back home, while themselves navigating a foreign health care system. Indeed, two previous studies found international students' mental health during the pandemic to be significantly related to academic stress, lack of social support, and fear over the health of oneself and close others.[16,64] Our findings add to this existing evidence by demonstrating increased fear of COVID-19 among international students.

Interestingly, while the interaction effect of student status and year of assessment failed to reach significance ($p = .102$), different patterns emerge when observing the scores of Dutch and international students (Table S3). While international students appeared considerably worse off during the early pandemic, their symptom levels remained relatively stable across cohorts. Meanwhile, scores of both depressive symptoms and suicidal ideation *doubled* among Dutch students, coming to par with scores observed among internationals. Contrary to our expectations of worse mental health outcomes for internationals, it therefore appears that international students were rather *less* affected by the prolongation of the pandemic. This may be due to ceiling effects, with international students already presenting at (near) peak levels on psychological complaints prior to the pandemic. This is also in line with findings that, in comparison to clinical groups, those *without* prior clinical complaints showed *more* increases in mental health symptoms during the pandemic, based on a longitudinal study in the Netherlands.[65] Hence, while international students appear more at risk of mental health issue overall, the rate of deterioration among Dutch students is troubling; the well-being of domestic students under prolonged stress should not be discounted.

In line with our findings of an association between fear of COVID-19 and the severity of depressive symptoms, anxiety, PTSD, academic stress and loneliness in the 2021 cohort, similar findings have been reported by others. Among Turkish and Ecuadorian university students, fear of COVID-19 was significantly associated with higher reports of anxiety, depression and stress.[66,67] Notably, fear of COVID-19 in our 2021 cohort was higher than that in the previously reported student samples measured in early 2020 (M range = 14.4–16.88), again signaling a decrease in functioning over time. We further found reduced coping to be associated with more depressive symptoms, insomnia, and loneliness. Resilient coping has been previously associated with reduced anxiety, but not depression, during the pandemic in a multi-national cross-sectional study of adults.[68] Coping also mediated the relationship between stress about COVID-19 and depressive symptoms in a sample of US college students.[69] While Ding et al[68] used a different coping measure, scores in our study were similar to that in the validation study of the PCS (in a non-student sample).[54]

Strengths of the present study include the comparison of cohorts observed over two consecutive years at two distinctly different stages of the pandemic. The study focused on students with self-reported stress and/or mood problems, as one of its aims was to assess for correlates of student suicidal ideation (and due to the low base rate of suicidal ideation). However, this limits generalizability to the greater student population, and only provides insights into this vulnerable subgroup; it has been shown that preexisting mental health issues exacerbate the development and maintenance of mental health complaints during pandemics[70]. Furthermore, while our samples incorporated international students from diverse backgrounds, our samples represent predominantly female undergraduate students in the Netherlands, and have limited generalizability to other (male, graduate student) populations. Finally, while we aimed to keep our recruitment strategy constant from 2020 to 2021, and statistically controlled for significant group differences between the cohorts, it is possible that different (self-)selection biases in 2020 and 2021 may have led to some unknown (and un-controlled for) group differences.

In conclusion, our results add to the emerging literature on increased mental health complaints (including depressive symptoms, academic stress, loneliness) among university students during the COVID-19 pandemic. Further, we observed international students to report worse symptom severity on a number of mental health outcomes (including loneliness) compared to domestic (Dutch) students. Recently, calls have been made for more mental health support for students during the pandemic.[71] We extend on this notion by proposing that the well-being of international students may warrant special attention. The mobility of students has increased greatly in recent years, with up to 5 million international students in 2017 pursuing a degree abroad – a number that is expected to increase by an additional 3 million by 2025.[72] With such rapidly increasing numbers, educational institutes may fail to adapt in time to the changing needs of their student bodies. Meanwhile, students with special circumstances (such as international students) represent at-risk groups.[73] Targeting the issues faced by many internationals early on – such as increasing interactions with domestic students and providing specialized counseling services – may facilitate international students' adaptation, and reduce mental health complaints later on. We therefore call for more attention on the well-being of international students – both during the pandemic, and beyond.

Conflict of interest disclosure

All authors declare that they have no conflicts of interest. The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal requirements, of The Netherlands and received approval from the Leiden University Psychology Research Ethics Committee (CEP nr. 2145/2874).

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