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# Educational and personal burnout and burnout regarding collaborating with fellow university nursing students during COVID-19 in 2020–2021

**Erla Kolbrun Svavarsdottir RN, PhD, FAAN, Professor[1]** | **Birna Gudrun Flygenring RN, MSc, Assistant Professor[2]** | **Johanna Bernhardsdottir RN, PhD, Assistant Professor[1]** | **Hrund Sch Thorsrteinsson RN, PhD, Department Manager[3]** | **Margret Hronn Svavarsdottir RN, PhD, Associate Professor[4]** | **Gisli Kort Kristofersson RN, PhD, Associate Professor[4]** | **Herdís Sveinsdóttir RN, PhD, Professor[1]**

[1]School of Health Sciences, Faculty of Nursing, University of Iceland and Landspitali University Hospital, Reykjavik, Iceland

[2]School of Health Sciences, Faculty of Nursing, University of Iceland, Reykjavik, Iceland

[3]Landspitali University Hospital and School of Health Sciences, Faculty of Nursing, University of Iceland, Reykjavik, Iceland

[4]Health Sciences, University of Akureyri, Akureyri, Iceland

**Correspondence**
Erla Kolbrun Svavarsdottir, School of Health Sciences, Faculty of Nursing, University of Iceland and Landspitali University Hospital, Eirberg, Eiriksgata 34, IS-101 Reykjavik, Iceland.
Email: eks@hi.is

**Abstract**

**Background:** Knowledge is lacking about the effects of COVID-19 on nursing students' burnout symptoms. Burnout can lead to negative feelings and behaviours towards learning and poor mental health.

**Aims:** To describe and compare nursing/midwifery students' burnout, explore differences and detect predictors at two time points through COVID-19.

**Methods:** Students were offered participation in the spring semesters of 2020 and 2021 (N = 2046), during COVID-19. The response rate was 30–33%. By using reliable and valid instruments, the students' stress and burnout were analysed as well as the students' health and perceived support.

**Results:** Symptoms of academic burnout were higher among 1st and 2nd year BSc students in 2021. On the contrary, 3rd and 4th year students had higher academic and personal burnout than graduate students as well as than 1st and 2nd year students. Regarding academic burnout, 47% of the variability was explained by educational level, support, stress and the interactional effect of stress and support. Collaborational burnout, predicted by the students' educational level and support, explained 7% of the variability in the outcome. Additionally, educational level, and stress, predicted 52% of the variability in personal burnout.

**Conclusion:** Educators or student counsellors need to facilitate effective learning practices and offer academic support, specifically during 3rd and 4th year to boost helpful coping strategies and handle uncertainty and stressors related to crises such as COVID-19.

**KEYWORDS**
burnout, COVID-19, longitudinal study, nursing and midwifery students, stress

# INTRODUCTION

The coronavirus (COVID-19) continues to impact nursing practice [1, 2] and nursing and midwifery education, at undergraduate [3] and graduate levels [4]. Moreover, the pandemic forced university leaders to take strict actions to secure students, their families and patients' health and protect the general population's lives. Therefore, they had to change the educational environment by transitioning overnight to online teaching, which resulted in students experiencing a lack of control over their learning strategies. This increased fear and helplessness regarding the progress of academic studies and clinical education [5, 6], causing high stress levels among nursing students.

In a scoping review, Majrashi and colleagues [5] mapped the relevant evidence and synthesised the findings on stress and coping among nursing students for the duration of COVID-19. The main finding indicated that the pandemic was stressful for them due to online classes and adjusting to the new learning structure affected their psychological health. Furthermore, the students feared getting infected while experiencing anxiety and stress because of the combined workload of clinical education, assignments and other academic work, as well as the new demands distant learning strategies caused. To reduce stress, they used coping strategies such as searching for evidence and staying positive during transferal. Similarly, Rogowska, Kusnierz and Bokszczanin [7] found in a study on 914 Polish university students that they experienced significantly high anxiety levels and stress through COVID-19. The authors pointed out the value of support and guidance or consultations to help them become more competent in managing stress by using constructive coping skills during these unusual circumstances. Notably, research showed that perceived stress among students negatively affects academic burnout [8].

Academic burnout has been referred to as a sequence of destructive emotional expressions like fear, tiredness, symptoms of hopelessness, and low self-confidence caused by a want of curiosity or extreme burden, which may result in destructive state of mind, negative behaviours towards learning [9] and low emotional well-being [10]. Furthermore, being between 18 and 20 years of age and female is also associated with reporting more stressors among nursing students in Turkey at the time of COVID-19 [11].

Although stress and burnout impact nursing education, researchers have also found academic engagement, which concentrates on students' optimistic abilities and their best performing such as energetic mindset, confidence, being innovative, committed, taking pride and having a pleasurable emotional state, could have an impact on academic burnout [12]. In the study by Wang and colleagues on 733 undergraduate nursing students during COVID-19, psychological capital (e.g. self-efficacy, optimism, resilience and hope) reduced academic burnout directly and by improving academic engagement. That is, academic commitment mediated the association among emotional resources and scholarly burnout, indicating the importance of improving university learning activities to reduce burnout among nursing students. Furthermore, in another study conducted in the beginning of COVID-19 [13], self-efficacy influenced nursing student–patient communication through academic burnout. Specifically, academic burnout impacted students' willingness to engage in patient-centred communication. The above findings provide essential guidance for institutions, nursing administrators and university leaders to emphasise factors that buffer or temper academic burnout among nursing students to handle crises like COVID-19.

Nonetheless, no manual has been developed to facilitate adjusting to the pandemic. Therefore, to reduce stress, promote support and reduce burnout among nursing students [14, 15], strategies such as motivation, helpful coping behaviours, being mindful and kindness practice have been recommended [16–18]. According to Polizze and colleagues [18], these strategies are applicable since they can be helpful in making value, tolerating stress, boost community and family support, adopt the notion of interrelation and being determined to reach your goals, during COVID-19.

Nursing education during COVID-19 was complex since students had no in-classroom classes, and pre and postclinical education was often changed without appropriate notice. However, little is known about nursing and midwifery students' learning, perception of stress, levels of burnout or perceived support, and health status, during COVID-19. No study evaluated the gradual effect of COVID-19 on burnout, stress, support and physical and psychological health, among nursing students at the undergraduate and graduate educational levels.

Lazarus and Folkman's [19] framework on demands, cognitive appraisal and coping strategies guided this study. The focus in the framework is on, behaviours and life worries, feelings and on how to manage stress and treat it. Since stress was one of the main predictors of academic and personal burnout among nursing students at the beginning of COVID-19 [8], it is important to study it and nursing students' burnout symptoms over the two years of the pandemic and evaluate the impact of support. In this study, we neither evaluated the nursing students' coping strategies nor their adjustment.

The aim of the research was to describe (a) nursing students' burnout symptoms (personal, academic and burnout related to collaborating with other nursing students), levels of stress, COVID-19 involvement, physical

and psychological health and support, at two time points, that is in spring 2020 and in spring 2021; (b) to explore differences regarding academic and personal burnout and burnout symptoms related to collaborating with other students, levels of stress, support and health throughout aforementioned times; and (c) to identify potential predictors, among nursing and midwifery students during these two times.

## METHODS

### Study design and procedure

Data were collected in 2020 and again in 2021. All nursing and midwifery students ($N = 2046$) in the undergraduate and graduate programmes at the University of Iceland (UI; $n = 1474$) and the University of Akureyri (UNAK; $n = 572$) in spring 2020 (UI; $n = 774$; UNAK; $n = 265$) and 2021 (UI; $n = 699$; UNAK; $n = 307$) were invited to participate. These universities in Iceland offer nursing education. At the UI, in 2020, 774 students (545 BSc students and 229 MSc/PhD students) were invited to participate, and in 2021, 699 students (481 BSc students and 218 MSc/PhD students). At the UNAK, in 2020, 265 students (212 BSc students and 53 MSc students) were invited to participate and in 2021, 307 students (231 BSc students and 76 MSc students). The questionnaires were delivered to the students through their University e-mails. Data gathering was open for 3 weeks at both data collection time points. Reminders were e-mailed about 2 weeks since the survey was opened. The data were collected at the beginning of the pandemic in 2020 and again 1 year later. Data were collected using the electronic RedCap software. In spring 2020, the University of Iceland and the University of Akureyri closed and shifted to electronically teaching. In the spring of 2021, the teaching was still mainly online, since the pandemic was ongoing.

## MEASURES

### Burnout

Burnout was measured by the Copenhagen Burnout Inventory (CBI) [20]. The scale has three subscales: work-related (7 items), client-related (6 items) and personal (6 items). The work-related and the client-related subscales were adapted to the study population and labelled 'academic burnout' and 'burnout related to collaborating with fellow students'. Scores on the three scales ranged from 0 to 100. Higher score indicates

more burnout. For further information about the scoring and interpretation see Sveinsdottir et al., 2021. In this research, $\alpha$ of the CBI scale ranged from 0.79 to 0.93 by the subscales (e.g. education $\alpha = 0.79$–0.91, collaborating with fellow students $\alpha = 0.92$–0.93 and personal $\alpha = 0.88$–0.89).

### Stress

The scale regarding perceived stress (PSS) [21] measured stress. It includes 10 items focusing on exploring thoughts and feelings over the last 30–31 days. Possible responses could be: 0 = never, 1 = almost never, 2 = seldom, 3 = rather often and 4 = very often. The possible scores could be from 0 to 40; higher number indicated more stress. Scores over 13.7 indicated stress [21]. The PSS showed acceptable internal reliability [21, 22]. Along with the PSS, we added three questions that addressed stress related to university studies, insufficient study instructions and communication with teachers. Responses were very little/rather little/rather much/ very much.

### Time and support

Among the questions, three addressed time and support: that is, if the students perceived they had enough time to do their studies, if they perceived they got enough support regarding their studies, and from who/whom they received the support like family/fellow students/partner/ friends/teachers/educational counsellors/others/no need for support (see further information's in Sveinsdottir, et al., [8]).

### Health

Two questions addressed both physical and mental health of the students. Participants had to choose from very good/extremely good/good/moderate/bad.

### COVID-19

Experiences and situations related to COVID-19 were covered by six questions. Three asked about how satisfied or unsatisfied the participant was with how the university faculty handled COVID-19 regarding theoretical studies, clinical studies and examinations. Response possibilities were as follows: significantly satisfied/rather satisfied/neither or/rather unsatisfied/significantly unsatisfied. Three

questions addressed infections: Have you been infected by COVID-19 or needed to be isolated or quarantined due to COVID-19? Has a close friend or a relative been infected? Response was either yes or no.

## Background

The background information is listed in Tables 1 and 2.

## ETHICAL CONSIDERATION

The research was approved by the deans at both Universities. It was also approved, as required by law, by the National Bioethics Committee (approval number: 20–099). At both times, the participants received an email with information about the study and the students were informed that participation was voluntary. Furthermore, they were also informed that they could withdraw from the study at any time and were given information about whom to contact if they had any concerns, comments or questions.

## DATA ANALYSIS

The Statistical Package for Social Sciences 24.0 (SPSS Inc., Chicago, IL, USA) was used to conduct the statistical analysis. Data were analysed through descriptive analyses. Furthermore, *independent t-test*s and chi-square tests were used to test differences between groups (e.g. undergraduate and graduate nursing students). However, Fisher's exact test was used when the criteria for chi-square test were not fulfilled. Two-way ANOVA was used to test mean group difference in personal, academic and collaborational burnout by educational level (1st–2nd year, 3rd–4th year, graduate students); and by the year that the data were collected (2020/2021). Linear regression analysis was conducted to predict academic burnout, burnout related to collaborating with fellow students, and personal burnout. All independent variables which were correlated with the outcome variable were entered simultaneously to the linear regression models. Education is an ordinal variable, which was defined with three levels (backward comparison). First comparison was between mean of Level 2 (3rd and 4th year BSc students) and Level 1 (1st and 2nd year BSc students). Second comparison was between level three (MSc/PhD students) and level two (3rd and 4th year BSc students). Dichotomous variables were coded as 0 or 1 that is dummy coded. The perceived stress variable, a continuous variable, was entered directly into the models.

## RESULTS

## Background

In 2020, the response rate was 32.7% ($N = 339$) and 29.7% ($N = 299$) in 2021. The age was on average 30.0 (SD = 8.6) years; 30.3 (SD = 8.4) in 2020, and 29.6 (SD = 8.7) years in 2021. Detailed descriptive findings are shown in Tables 1 and 2.

Majority of the students were females. Most of them were in the BSc programme, were in a relationship and perceived their mental and physical health to be good. Generally, they received good support with their studies, significantly more in 2020 with family showing the most support. Their stress increased significantly between 2020 and 2021. Moreover, they experienced more stress due to academic studies in 2021 and insufficient study instructions in 2020. Additionally, they reported less time for academic studies in 2021. Finally, they were significantly less satisfied with how the faculty handled the COVID-19 situation in 2021 regarding academic studies and examinations.

## Burnout

As shown in Table 2, the average score on personal burnout for all students was 47.7 (SD = 20.2), with the score being significantly higher in 2021 ($M = 50.1$) than in 2020 ($M = 45.6$). For academic burnout, the score was 47.6 (SD = 21.5), significantly higher in 2021 ($M = 49.7$) as compared to 2020 ($M = 45.7$).

When analysing burnout based on study year, the 1st and 2nd year students showed significantly lower scores for academic burnout in 2020 (see Table 3). Furthermore, when analysing burnout between study years at both times and for all students, we found that for academic burnout there was a significant difference in scores between 1st and 3rd year, 1st and 4th year, 2nd and 3rd year, and 2nd and 4th year. Moreover, for burnout related to fellow students there were significant differences in scores between 1st and 4th year (see Table 3), with burnout scores higher during senior years.

## Burnout mean differences among nursing students by time and educational levels

The results from the two-way ANOVA analysis regarding academic burnout during COVID-19 showed a significant main effect of time (2020 vs. 2021) with overall higher mean scores in 2021 ($F = 6.5$; $p < 0.05$; Figure 1). Furthermore, post hoc analyses showed 3rd and 4th year BSc students reported higher academic burnout compared with 1st and 2nd year as well as graduate students ($F = 45.6$;

**TABLE 1** Nursing student background, health, stress and coping for all participants ($N=638$) in 2020 ($N=339$) and in 2021 ($N=299$) and significant differences between 2020 and 2021.

| Background | All $N=638$ $n$ (%) | 2020 $N=339$ $n$ (%) | 2021 $N=299$ $n$ (%) |
|---|---|---|---|
| Gender | | | |
| Female | 602 (94.4) | 320 (94.4) | 282 (94.3) |
| Male | 22 (3.4) | 12 (3.5) | 10 (3.3) |
| Other | 2 (0.3) | 1 (0.3) | 1 (0.3) |
| Marital status | | | |
| Married/in a relationship | 473 (74.1) | 249 (73.5) | 224 (74.9) |
| Single/divorced | 158 (24.8) | 85 (25.1) | 73 (24.4) |
| Parent | | | |
| Yes | 281 (44.0) | 158 (46.6) | 123 (41.1) |
| No | 351 (55.0) | 177 (52.2) | 174 (58.2) |
| Are you pregnant? | | | |
| Yes | 33 (5.2) | | |
| No | 600 (94.0) | | |
| Studies | | | |
| Undergraduate | 474 (74.3) | 256 (75.5) | 218 (72.9) |
| Graduate | 158 (24.8) | 82 (24.2) | 76 (25.4) |
| Year of study in undergraduate studies | | | |
| First year | 131 (20.5) | 69 (20.4) | 62 (20.7) |
| Second year | 107 (16.8) | 56 (16.5) | 51 (17.1) |
| Third year | 103 (16.1) | 55 (16.2) | 48 (16.1) |
| Fourth year | 124 (19.4) | 73 (21.5) | 51 (17.1) |
| Health | | | |
| How do you evaluate your general health? | | | |
| Very good/extremely good | 299 (46.8) | 161 (46.5) | 138 (46.2) |
| Good | 256 (40.1) | 141 (41.6) | 115 (38.5) |
| Moderate/bad | 79 (12.3) | 35 (10.3) | 44 (14.7) |
| How do you evaluate your physical health? | | | |
| Very good/extremely good | 282 (44.2) | 151 (44.6) | 131 (43.9) |
| Good | 237 (37.1) | 128 (37.8) | 109 (36.5) |
| Moderate/bad | 115 (18.0) | 58 (17.1) | 57 (19.0) |
| How do you evaluate your mental health? | | | |
| Very good/extremely good | 197 (30.9) | 106 (31.3) | 91 (30.4) |
| Good | 243 (38.1) | 142 (41.9) | 101 (33.8) |
| Moderate/bad | 194 (30.4) | 89 (26.2) | 105 (35.2) |
| Stress and support | | | |
| Received enough support related to academic studies** | | | |
| Yes | 491 (77.0) | 277 (81.7) | 214 (71.6) |
| No | 140 (21.9) | 59 (17.4) | 81 (27.1) |
| Who, if anyone, supports you? (mark as needed) | | | |
| Family | 478 (74.9) | 255 (75.2) | 223 (74.6) |
| Fellow students | 403 (63.2) | 220 (64.9) | 183 (61.2) |
| Partner | 408 (63.9) | 218 (64.3) | 190 (63.5) |
| Friends | 373 (58.5) | 205 (60.5) | 168 (56.2) |

(Continues)

**TABLE 1** (Continued)

| Background | All $N=638$ $n$ (%) | 2020 $N=339$ $n$ (%) | 2021 $N=299$ $n$ (%) |
|---|---|---|---|
| Teachers | 177 (27.7) | 97 (28.6) | 80 (26.0.8) |
| Educational counsellors | 20 (3.1) | 14 (4.1) | 6 (2.0) |
| Others | 39 (6.1) | 16 (4.7) | 23 /7.7) |
| Are not in need of support | 27 (4.2) | 13 (3.8) | 14 (4.7) |
| Infection | | | |
| Been infected by COVID-19 and required to be isolated?* | | | |
| Yes | 15 (2.4) | 4 (1.2) | 11 (3.7) |
| No | 618 (96.9) | 332 (97.9) | 286 (95.7) |
| Been in quarantine due to COVID-19*** | | | |
| Yes | 140 (21.9) | 44 (13.0) | 96 (32.1) |
| No | 493 (77.3) | 292 (86.1) | 201 (67.2) |
| Has a close friend or relative that has been infected by COVID-19?*** | | | |
| Yes | 182 (28.5) | 67 (19.8) | 115 (38.5) |
| No | 450 (70.5) | 268 (79.1) | 182 (60.9) |

*Note: n* varies due to missing data.

*$p<0.05$; **$p<0.01$; ***$p\leq0.001$. Significant differences between 2020 and 2021 by chi-square test and by Fisher's exact test when appropriate.

$p<0.001$; Figure 1). Similarly, for personal burnout during COVID-19, a significant main effect was regarding time (2020 vs. 2021) with overall higher mean scores in 2021 ($F=7.4$; $p<0.01$; Figure 1). Moreover, post hoc analyses of educational levels showed 3rd and 4th year BSc students reported significantly higher personal burnout compared with graduate students ($F=4.57$; $p<0.05$; Figure 1). Regarding collaborating with other students, the main effect was found only by the educational level, whereas post hoc analyses showed 3rd and 4th year BSc students reported significantly higher collaborational burnout compared with 1st and 2nd year as well as graduate students. Furthermore, 1st and 2nd year BSc students reported significantly higher collaborational burnout compared with graduate students ($F=15.5$; $p<0.001$; Figure 1).

## Predictors of academic, personal and collaborational burnout

Based on results from our prior study [8], the literature review and the theoretical framework used as a guide, we added the following variables (that had significant relationship with one at least, of the three burnout subscales), simultaneously to the linear regression analyses: (a) time (*dummy coding;* year 2020 = 0; and the year 2021 = 1); support (*dummy coding*; enough support = 1; not enough support = 0). Educational level was coded such that the mean of the dependent variable for one level of the categorical variable was compared with that for the former adjacent level of the categorical variable (using backward difference

coding; Table 4). The score on PSS (*continuous variable*) was also entered into the linear regression analysis. About 47% of the variability in the students′ academic burnout was explained by support, educational level (i.e. 3rd and 4th year students over 1st and 2nd year students, and 3rd and 4th year students over graduate level students), score on PSS and the interactional effect of stress and support. That is, as stress increased, there was a less beneficial impact of educational support on academic burnout ($F=89.78$; $p<0.001$; Table 4). The independent variables and the interactional effect that predicted the outcome of academic burnout are reported in Table 4. Collaborational burnout was predicted by the students′ support and their educational level (3rd and 4th year over 1st and 2nd year students, and 3rd and 4th year over graduate level students), explaining 7% of the variance in the outcome variable ($F=10.11$; $p<0.001$; Table 4). Moreover, educational level (3rd and 4th year over 1st and 2nd year students, and 3rd and 4th year over graduate level students), and the score on PSS predicted 52% of the variance in personal burnout ($F=132.46$; $p<0.001$; Table 4). The variables that predicted the outcome of burnout related to collaborating with fellow students and personal burnout are reported in Table 4.

## DISCUSSION

COVID-19 has, over the last 3 years, affected nursing and midwifery theoretical and clinical education. Our finding of the overall increase in academic and personal burnout during the pandemic among all students

**TABLE 2** Mean score for all participants and significant changes by t-test in the burnout scales, variables measuring stress and satisfaction with the actions of the nursing faculty related to COVID-19 between spring 2020 and spring 2021.

| Variables[a] | All students<br>n M (SD) | Spring semester 2020<br>n M (SD) | Spring semester 2021<br>n M (SD) | t (df) |
|---|---|---|---|---|
| Personal burnout** | | 337 45.6 (19.3) | 298 50.1 (21.0) | −2.810(633) |
| Academic burnout* | | 337 45.7 (21.7) | 298 49.7 (21.1) | −2.320 (633) |
| Burnout related to collaborating with fellow students | | 335 38.0 (21.9) | 292 26.7 (23.8) | |
| Perceived stress scale*** | 624 18.8 (7.4) | 332 17.7 (6.9) | 292 20.1 (7.8) | −3.987 (622) |
| Stress experienced due to academic studies* | 634 3.0 (0.7) | 337 2.9 (0.7) | 297 3.0 (0.7) | −2.064 (632) |
| Stress related to insufficient study instructions** | 634 2.5 (0.8) | 337 3.5 (0.8) | 297 2.6 (0.9) | −2.925 (632) |
| Stress related to communication with your teacher | 634 2.1 (0.8) | 337 2.2 (8.1) | 297 2.1 (0.8) | ns |
| Enough time for academic studies** | 634 3.0 (1.1) | 337 3.1 (1.1) | 297 2.9 (1.1) | 2.755 (632) |
| Satisfaction with how the nursing faculty addressed the COVID-19 situation regarding academic studies?** | 627 3.8 (1.0) | 335 3.9 (0.9) | 292 3.7 (1.0) | 3.002 (625) |
| Satisfaction with how the nursing faculty addressed the COVID-19 situation regarding clinical studies? | 584 3.8 (0.9) | 304 3.8 (0.9) | 280 3.8 (0.9) | ns |
| Satisfaction with how the nursing faculty addressed the COVID-19 situation regarding examination?*** | 616 3.5 (1.2) | 334 3.9 (1.1) | 282 3.3 (1.2) | 7.454 (566.695) |

*Note*: Scores for the burnout scales range from 0 to 100, higher scores, more burnout; range of scores for the Perceived Stress Scale 0–40, higher score, more stress; responses for the three questions addressing stress ranged from 1 (very little) to 4 (very much) and the question on time for academic studies ranged from 1 (almost never) to 5 (almost always) and responses for the three satisfaction questions ranges from 1 (very dissatisfied) to 5 (very satisfied).

Abbreviation: ns = not significant.

[a]Significant differences between 2020 and 2021 by t-test.

*$p < 0.05$; **$p < 0.01$; ***$p \leq 0.001$.

in 2021 compared with that in 2020, is new and has not been previously reported. As the pandemic progressed, the students experienced higher academic and personal burnout. Worries regarding being the carrier of the virus to their patients or family members, as well as swift to online learning may have contributed to an increase in stress and consequently burnout. Further evaluation of educational level's impact found that 3rd and 4th year nursing students experienced higher personal and academic burnout when compared to graduate students. Moreover, 3rd and 4th year BSc students reported higher academic burnout when compared to 1st and 2nd year BSc students. This finding stresses the emotional pressure that our senior BSc students are experiencing when integrating theoretical knowledge into clinical practice but in our curriculum, clinical practices mainly take place in the 3rd and 4th year of our BSc nursing programme. Furthermore, this finding emphasises the long-term effect of COVID-19 on BSc students' emotional health levels. These findings and those from the review by Majrashi

and colleagues [5] are however crucial in handling the uncertainty that follows crises such as COVID-19 and stresses the importance of teaching nursing students new methods to handle challenges related to such a crisis. Regarding this, university educators might need to create a well-structured learning environment for students to enhance learning outcomes and decrease the impact of uncertainty, anxiety and stress on learning.

Notably, academic burnout symptoms increased significantly from 2020 to 2021 among 1st and 2nd year students but not the senior students. A possible explanation is that academia is new to junior students and they are novice to the complicated healthcare system, a system that became full of confusing twists and turns between the two times and the academic environment, which may have added to their stress level and consequent burnout. Moreover, nursing students in Iceland are selected into the nursing programme based on a competitive examination after the first semester, meaning that junior students did not have the opportunity to become acquainted and

**TABLE 3** Independent *t*-tests on mean differences in personal burnout, academic burnout and burnout related to fellow students between each BS study year in 2020 and in 2021 during the COVID-19 pandemic and One-way ANOVA in differences by BS study year among all participants in spring 2020 and 2021.

| Variables | All participants | Spring semester 2020 | Spring semester 2021 | t (df) | All participants | Spring semester 2020 | Spring semester 2021 |
|---|---|---|---|---|---|---|---|
| | n M (SD) | n M (SD) | n M (SD) | | F (df, within groups) = F | F (df, within groups) = F | F (df, within groups) = F |
| **Personal burnout** | | | | | | | |
| 1st year of study in BS programme | 131 46.8 (19.9) | 69 44.8 (18.4) | 62 49.1 (21.5) | | | | |
| 2nd year of study in BS programme | 107 48.0 (20.9) | 56 45.0 (21.6) | 51 51.3 (19.7) | | | | |
| 3rd year of study in BS programme | 103 49.6 (19.6) | 55 46.6 (18.0) | 48 53.1 (21.0) | | | | |
| 4th year of study in BS programme | 123 51.2 (18.8) | 72 49.2 (18.8) | 51 53.8 (18.6) | | | | |
| Graduate studies | 157 44.5 (20.7) | 81 43.1 (19.7) | 76 45.9 (21.6) | | | | |
| **Academic burnout[a]** | | | | | $F_{(3,460)} = 25.420$ | $F_{(3,248)} = 19.239$ | $F_{(3,208)} = 7.910$ |
| 1st year of study in BS programme* | 131 40.3 (19.7) | 69 35.6 (18.2) | 62 44.3 (20.7) | −2.291 (129) | | | |
| 2nd year of study in BS programme* | 107 46.6 (19.6) | 56 43.0 (20.8) | 51 50.5 (17.5) | −2.011 (105) | | | |
| 3rd year of study in BS programme | 103 55.9 (18.9) | 55 54.8 (19.4) | 48 57.1 (18.4) | | | | |
| 4th year of study in BS programme | 123 59.6 (19.1) | 72 58.8 (18.9) | 51 60.6 (19.5) | | | | |
| Graduate studies | 157 39.9 (22.3) | 81 38.4 (22.2) | 76 41.5 (22.5) | | | | |
| **Burnout related to collaboration with fellow students[b]** | | | | | $F_{(3,459)} = 6.465$ | $F_{(3,248)} = 3.265$ | $F_{(3,207)} = 4.076$ |
| 1st year of study in BS programme | 130 24.2 (22.4) | 69 25.4 (21.7) | 61 44.4 (20.7) | | | | |
| 2nd year of study in BS programme | 107 31.4 (22.5) | 56 28.6 (19.2) | 51 34.4 (25.5) | | | | |
| 3rd year of study in BS programme | 103 28.5 (20.3) | 55 30.4 (19.5) | 48 26.4 (21.1) | | | | |
| 4th year of study in BS programme | 123 36.0 (21.8) | 72 36.1 (21.6) | 51 35.9 (22.2) | | | | |
| Graduate studies | 151 19.3 (23.3) | 79 22.0 (24.2) | 72 16.4 (22.2) | | | | |

[a] $p \leq 0.001$ for all students in 2020 and 2021. Post hoc Tuckey test showed that for Academic burnout there were significant difference in scores between 1st year and 3rd year; between 1st year and 4th year, between 2nd year and 3rd year and between 2nd year and 4th year.

[b] $p \leq 0.01$ for all students in 2020 and 2021. Post hoc Tuckey test showed that for Burnout related to fellow students there was a significant difference in score between 1st year and 4th year.

*$p < 0.05$

**FIGURE 1** Two-way ANOVA analyses on mean differences in academic and personal burnout and in burnout regarding collaborating with fellow students during COVID-19, among nursing students by time and by educational level (1–2 BSN; 3–4 BSN; and graduate students; $N=617$).
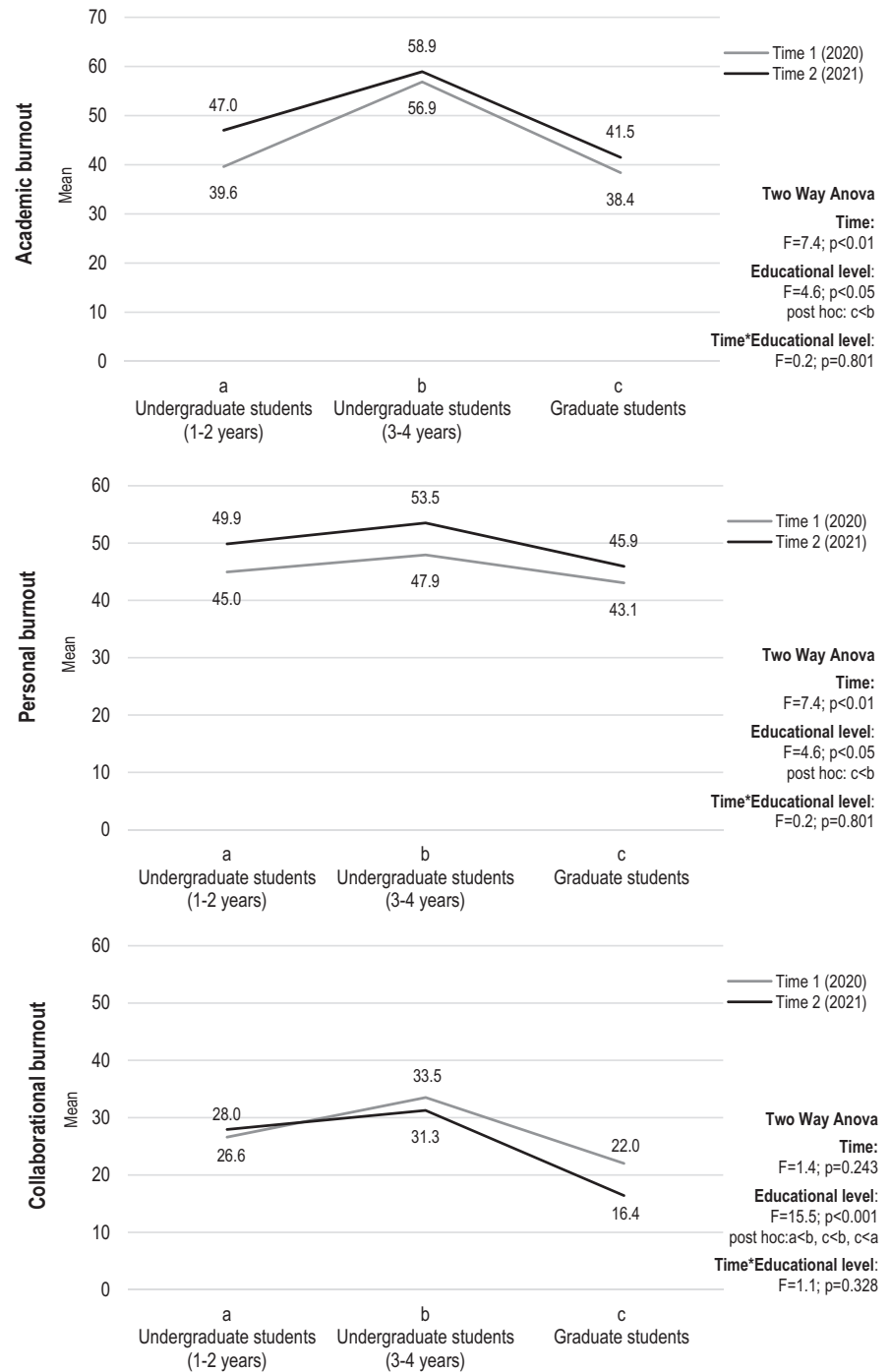


receive co-support with each other during this year since they rarely met.

The main finding from the linear regression analysis indicated that about half of the variability in academic burnout was explained by the nursing students' educational support and educational level, scores of PSS and the interaction between support and stress. As they experienced higher stress, they found the educational support to be of less benefit. In other words, the educational support from family, friends, co-students and teachers benefitted the students with low-to-moderate stress but

not those with high stress. The students experiencing the latter might need other support sources (e.g. professional and or further educational support by teachers, assistant teachers or educational counsellors). These findings are consistent with Wang et al. [12], who found that improving academic engagement was beneficial in reducing academic burnout.

Moreover, in the regression analyses, seven per cent of the variability in burnout regarding collaborating with fellow nursing students was explained by educational support and educational level. Furthermore, over

**TABLE 4** Linear regression analyses of predictors of main and interactional effects of academic burnout, burnout regarding collaborating with fellow students and personal burnout among nursing students in spring semester of 2020 and 2021 during the COVID-19 pandemic ($N = 602$).

| Variables | B | ß | | t-Value | p-Value |
|---|---|---|---|---|---|
| | | Models | | | |
| Academic burnout ($N = 602$) | | | | | |
| (Constant) | | 39.095 | | 9.267 | 0.000 |
| Wave | | 0.282 | 1.321 | 0.214 | 0.831 |
| Support | | −22.743 | −0.434 | −4.887 | 0.000 |
| Educational level | | | | | |
| (3rd/4th year over 1st/2nd year undergraduate) | | 14.448 | 0.322 | 9.593 | 0.000 |
| (graduate level over 3rd and 4th year undergraduate) | | −15.092 | −0.301 | −8.928 | 0.000 |
| Perceived stress | | 1.016 | 0.348 | 5.799 | 0.000 |
| Stress x support | | 0.479 | 0.210 | 2.353 | 0.019 |
| $R^2$ | 0.475 | | | | |
| Adj. $R^2$ | 0.469 | | | | |
| F | 89.782*** | | | | |
| Burnout regarding collaborating with fellow students ($N = 595$) | | | | | |
| (Constant) | | 24.648 | | 6.953 | 0.000 |
| Wave | | −3.240 | −0.070 | −1.749 | 0.081 |
| Support | | −5.270 | −0.095 | −2.297 | 0.022 |
| Educational level | | | | | |
| (3rd/4th year over 1st/2nd year undergraduate) | | 5.160 | 0.109 | 2.452 | 0.014 |
| (graduate level over 3rd and 4th year undergraduate) | | −11.498 | −0.215 | −4.819 | 0.000 |
| Perceived stress | | 0.399 | 0.130 | 3.086 | 0.002 |
| $R^2$ | 0.079 | | | | |
| Adj. $R^2$ | 0.071 | | | | |
| F | 10.107*** | | | | |
| Personal burnout ($N = 602$) | | | | | |
| (Constant) | | 13.603 | | 6.106 | 0.000 |
| Wave | | −0.229 | −0.006 | −0.197 | 0.844 |
| Support | | −2.278 | −0.047 | −1.583 | 0.114 |
| Educational level | | | | | |
| (3rd/4th year over 1st/2nd year undergraduate) | | 3.442 | 0.083 | 2.598 | 0.010 |
| (graduate level over 3rd and 4th year undergraduate) | | −2.113 | −0.045 | −1.421 | 0.156 |
| Perceived stress | | 1.916 | 0.707 | 23.623 | 0.000 |
| $R^2$ | 0.526 | | | | |
| Adj. $R^2$ | 0.522 | | | | |
| F | 132.463*** | | | | |

***Linear regression analyses of predictors of main and interactional effects of academic burnout, burnout regarding collaborating with fellow students and personal burnout among nursing students in 2020 and 2021.

half of the nursing students' personal burnout variability was explained by stress and by educational level. These findings are consistent with those by Rogowska and colleagues [7] that university students in Poland experience high anxiety and stress during COVID-19. Therefore, these results and those by Rogowska et al.

(7) emphasise the need for university leaders to build distress tolerance among students. Also, to gradually increase social support and offer helpful strategies to assist undergraduate nursing students in the 3rd and 4th year in theoretical and clinical course work more effectively during a crisis such as COVID-19.

The students were less satisfied with how the nursing faculty addressed the COVID-19 situation regarding academic studies and examinations in 2021 compared to 2020. They also experienced increased stress related to communication with teachers, academic studies and insufficient study instructions. These findings and others underscore the importance of safeguarding nursing students' mental well-being during COVID-19 and address how essential it is to facilitate helpful approaches such as using effective coping, practising mindfulness and kindness during crises such as COVID-19 [18]. This emphasis is also consistent with Lazarus and Folkman [19] regarding the value of supporting emotionally stressed nursing students and smoothening the process of coping effectively with the stressors.

Our study has limitations. Generally, the participants were few and the response rate was relatively low at data collection time points. One explanation could be that data were collected towards the end of the spring semester from May to June 2020 and from March to May 2021. At this time of the year, most of the students were either taking final examinations or finishing their courses by handing in their course papers or their thesis. Low response rate could therefore be explained because of the stress of the students. For that reason, generalisability is limited. Self-reported instruments were also used in our data collection and questions were used that were not based on reliable and valid instruments, for example, questions regarding support; but that can cause a bias when interpreting the data.

## CONCLUSION

Based on these study's findings, stress level and academic and personal burnout increased from 2020 to 2021 among our students. Although the time did not predict the outcome in the regression analyses, students´ support, stress and educational level predicted the nursing students' burnout symptoms. These findings are essential as they highlight the need for university educators to take appropriate actions to minimise the impact of stress and burnout symptoms, specifically, among 3rd and 4th year students, to increase their academic performance and outcomes. University administrators need to emphasise technical support for students and teachers and facilitate and smoothen the

process of completely transitioning to online teaching and learning. Furthermore, offering appropriate professional and social support and encouraging helpful coping strategies might benefit nursing students in the long run. However, further research is needed on the role of support, coping and adaptation among nursing students experiencing environmental stress and burnout due to a crisis such as COVID-19.

## CONFLICT OF INTEREST STATEMENT
The authors have nothing to declare regarding this study (e.g. financial interests or personal relationships) that could have had an impact on the presentation of the manuscript.

## DATA AVAILABILITY STATEMENT
Research data are not shared.

## ETHICAL APPROVAL
The research was approved by the deans at both Universities. It was also approved, as required by law, by the National Bioethics Committee (approval number: 20–099). Participants received at both times, a letter where the study was explained and the students were informed that it was optional to them to answer the questions. Furthermore, they were also informed that they could withdraw from the study at any time and were given information regarding a contact person who they could contact if they had any concerns, comments or questions.

## ORCID
*Erla Kolbrun Svavarsdottir* https://orcid.org/0000-0003-1284-1088
*Herdís Sveinsdóttir* https://orcid.org/0000-0002-1766-3543

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