Predictors of university nursing students burnout at the time of the COVID-19 pandemic: A cross-sectional study

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ABSTRACT

Background: Little is known about the stress and burnout experienced by undergraduate and graduate nursing students during the COVID-19 pandemic. Academic burnout among nursing students can have an impact on students' learning ability, health, and wellbeing and on the quality of care and intention to leave the profession post-graduation.
Objectives: Evaluate the predictors of nursing students' personal, academic, and collaboration-related burnout during the COVID-19 pandemic.
Design: Cross-sectional two-site study.
Settings: Icelandic universities offering nursing education.
Participants: Graduate and undergraduate nursing students in Iceland ($N = 1044$) were asked to participate in the study, with a response rate of 32.7%.
Methods: An online survey was used to evaluate the students' stress and burnout in spring 2020.
Results: The main findings show that 51% of the variability in the students' personal burnout was explained by their perceived stress, mental health, and perceived support. Furthermore, the students' perceived stress, support, and educational levels predicted 42% of the variability in their academic burnout. Burnout related to collaborating with fellow-students was explained by the nursing students' physical health and by their educational level, explaining 6% of the variability in fellow-students burnout.
Conclusion: University administrators might consider adding academic support facilities into their undergraduate nursing programs and teaching their students healthy coping skills.

1. Introduction

In recent years, burnout among nurses, especially newly graduated nurses, has increasingly been an area of interest for researchers, especially due to its association with clinical performance and newly graduated nurses' intentions to leave the profession. Research shows that burnout among newly graduated nurses may begin to develop during their education. Academic burnout has been found to develop in the early stages of the educational program and increases as the academic year and clinical training progress (Rudman and Gustavsson, 2012;

Valero-Chillerón et al., 2019; Watson et al., 2008).

Clinical training affects burnout in nursing students, with studies showing higher burnout post-clinical training as compared to pre-clinical training (Ayaz-Alkaya et al., 2018). Nursing education has also been found to cause an increase in stress and burnout levels with significant correlation between stress and burnout in nursing students (Watson et al., 2008; da Silva et al., 2014). Furthermore, among masters and doctoral students in nursing the main predictors of burnout have been found to be dissatisfaction with study topic and lower perceptions of social support and leisure opportunities (Caldino et al., 2016).

Burnout has been defined as a state of chronic stress characterized by three dimensions: high levels of emotional exhaustion, feelings of cynicism and depersonalization, and a lack of professional accomplishment (Maslach and Jackson, 1981). Early studies were aimed at employees; however, Schaufeli et al. (2002) extended the concept to encompass students and proposed academic burnout as a combination of emotional exhaustion, cynicism, and academic inefficacy caused by an ongoing failure to manage study pressure effectively. According to Schaufeli et al. (2002), emotional exhaustion is characterized by feelings of exhaustion owing to academic demands; depersonalization, characterized by an attitude of distancing oneself from academic work; and reduced academic effectiveness, which is marked by students' perception of themselves as being incompetent.

In their work, Kristensen et al. (2005) as Schaufeli et al. (2002) found it important to view burnout from perspectives other than that of occupational status. They considered fatigue and exhaustion as the core of burnout and developed the following three concepts related to burnout: personal burnout, defined as the degree of physical and psychological fatigue and exhaustion experienced by the person; work-related burnout, defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to their work; and client-related burnout, defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to their work with clients.

International research on academic burnout among undergraduate nursing students has increased recently. da Silva et al. (2014) found a high prevalence of burnout among nursing students ($N = 570$), especially in the dimension of emotional exhaustion. Similarly, Rudman and Gustavsson (2012) followed 1702 nursing students during their studies and found that academic burnout had increased among them from 29.7% in the first year to 41% one-year post-graduation. Furthermore, nursing students ($N = 240$) that were followed through the second to fourth year of their studies showed that third-year students scored highest on exhaustion, followed by fourth-year students, and depersonalization increased over time spent in the program (Valero-Chillerón et al., 2019). Another study found that of 100 nursing students, 20% experienced burnout, with the main predictors of burnout being attending the second or third year of studies, use of medication, and thinking of dropping out (Vasconcelos et al., 2020). A Brazilian study that focused on academic burnout among graduate students ($N = 129$) found that 11.6% of the students exhibited signs of burnout, with 69.8% of the students scoring high on emotional exhaustion, 27.1% on depersonalization, and 24.8% experiencing low academic effectiveness (Caldino et al., 2016).

Both theoretical and clinical nursing education have been linked to stress and burnout, with stress being a major predictor of academic burnout in students (Sharififar et al., 2020). Sources of stress include academic load, examinations, assignments, and interactions with teachers (Al-Gamal et al., 2018; Alghamdi et al., 2019). Clinical stressors include providing direct patient care, being overburdened with responsibilities, experiencing fear of making mistakes, interacting with nursing staff (Al-Gamal et al., 2018), and the clinical settings themselves (Blomberg et al., 2014).

Further research on burnout among nursing students remains vital as this condition may negatively affect academic performance, influencing the quality of care and exposing patients to care-related risks and adverse events (Galbraith and Brown, 2011). Nursing education during the COVID-19 pandemic has met significant challenges that have influenced students. Social distancing and isolation requirements may have resulted in changes in clinical placements, students being unable to attend classes face to face, and students needing to adjust their learning style. In a study by Wang et al. (2021), 39.2% of nursing students in China, were found to rapport certain degree of academic burnout. Interestingly however, students who reported they were effectively engaged in their academic work, were found to rapport reduced academic burnout. Further, the students' positive psychological resources,

were also found to directly reduce their academic burnout. That is, burnout was reduced by improving the nursing student's engagement in their academic work.

Little is yet known about how the COVID-19 pandemic may have affected undergraduate and graduate nursing students' learning, stress, and burnout levels. Nonetheless, studies are already emerging that show its effect on mental health (Reverté-Villarroya et al., 2021; Kalkan Uğurlu et al., 2020) and its relation to difficulty concentrating and learning (Lovrić et al., 2020) as well as on the importance of academic engagement and its impact to reduce burnout (Wang et al., 2021).

The theoretical framework that guided the study was the Lazarus and Folkman (1984) theory on stress, cognitive appraisal, and coping. In this theory, the focus is on behavioral issues, and concerns with the life course, emotions, stress management and treatment. Stressors like academic studying, coping and adaptation represents both an individual psychological and physiological human responses. According to Lazarus and Folkman, even though stress or strains are viewed to be inevitable aspect of the human condition, it is the coping that makes the big difference in adaptational outcome. In psychological stress and the coping process, the emphasis began to shift somewhat from stress per se to coping. Nevertheless, since stress has been found to be a major predictor of academic burnout in students (Sharififar et al., 2020), it is important to study stress and burnout at the time of the COVID-19 pandemic among academic nursing students, and to explore how support from families, friends, fellow students, and teachers might contribute to their coping. However, in our study, we did not evaluate the students coping outcomes nor its contribution to adaptation.

The aim of this study is a) to describe personal burnout, academic burnout, and burnout in relation to collaborating with fellow students, stress, experiences during the COVID-19 pandemic, health, support, and background; b) to explore relationships between the three types of burnout and stress, experiences during the COVID-19 pandemic, health, support, and background; and c) to detect predictors of personal burnout, academic burnout, and burnout in relation to collaborating with fellow students among undergraduate and graduate nursing students during the COVID-19 pandemic.

2. Methods

2.1. Design, study population, and procedure

This was an online cross-sectional two-site study. All graduate and undergraduate nursing students ($N = 1044$) attending the University of Iceland (UI; $n = 774$) and the University of Akureyri (UNAK; $n = 265$), the only universities in Iceland offering nursing education, were invited to participate. At the UI, 545 undergraduate and 229 graduate students were offered participation and at the UNAK, 212 undergraduate and 53 graduate students. Data was collected late spring 2020 using RedCap software (REDCap, n.d.). The students received the questionnaires via their university e-mail. The survey was open for 21 days, and reminders were sent seven and 14 days after it was opened.

The data collection took place following the first wave of the COVID-19 pandemic in Iceland. The first case of COVID-19 was diagnosed in the country on February 27, 2020. In March and April, all the universities in Iceland closed their campus facilities and transitioned to online teaching for those programs not already conducted online. The universities were gradually starting to reopen their campus facilities at the time of the data collection.

2.2. Measures

Burnout was measured using the Copenhagen Burnout Inventory (CBI; Kristensen et al., 2005). The CBI includes three subscales: personal (six items), work-related (seven items), and client-related (six items). The personal scale was generic, while the other two were adjusted to the population (in this case, students) and labelled "academic burnout" and

"burnout related to fellow students." The scores on each scale range from 0 to 100, with higher scores indicating more burnout.

Responses to the seven questions were: to a very low degree = 0, to a low degree = 25, somewhat = 50, to a high degree = 75 and to a very high degree = 100. The responses for 12 questions were never/almost never = 0, seldom = 25, sometimes = 50, often = 75 and always = 100.

Scores of 0–49 were judged as low, 50–74 as moderate, 75–99 as high, and 100 as severe burnout. CBI was translated from English to Icelandic and then back translated to English (Svavarsdóttir and Hjörleifsdóttir, 2020. The relevant subscales have shown high internal reliability (Svavarsdóttir and Hjörleifsdóttir, 2020; Kristensen et al., 2005; Creedy et al., 2017). In the current study, Cronbach α of the CBI subscales were acceptable (personal α = 0.88, education α = 0.79, and related to fellow-students α = 0.92).

Stress was measured using the Perceived Stress Scale (PSS; Cohen et al., 1983), which asks for 10 responses that explore feelings and thoughts experienced during the last month. Responses were: never = 0, almost never = 1, seldom = 2, rather often = 3, and very often = 4. Scores range from 0 to 40, with higher scores indicating more stress and scores above 13.7 indicating the presence of stress (Cohen and Williamson, 1988). The PSS has shown good internal reliability (Svavarsdóttir and Hjörleifsdóttir, 2020; Cohen and Williamson, 1988).

Six questions on stress and support related to university studies (see questions and responses in Table 2) were added to the questionnaire (Bernharðsdóttir, 2014). Seven questions addressed experiences during COVID-19, and two questions addressed health (Table 2). Background questions focused on age, gender, marital status, parenting status, type and year of study, type of work and work-percentage and whether the students had considered changing or quitting their nursing education (Table 1).

2.3. Ethical considerations

The study design and procedure were approved by the deans of the faculty of nursing at both universities and by the National Bioethics Committee (approval number: 20–099) as required by law. Participants received a letter explaining the methodology and the questionnaires and indicating that answering the questionnaire as well as each item was optional and that they could withdraw from the study at any time. The letter also included information on responsible parties and on contact persons should the participants have any questions, concerns, or comments regarding the study.

2.4. Data analysis

Statistical analysis was carried out using the Statistical Package for the Social Sciences 24.0 (SPSS Inc., Chicago, IL, USA). All categorical variables were treated as dichotomous and are mostly presented as such. Descriptive data is presented in mean values, with standard deviations, and percentages. Relationships between outcome variables and predictor variables are presented using, as appropriate, Pearson correlations, independent *t*-tests, and one-way repeated-measures ANOVA, followed by Tukey's multiple pairwise comparison. If 80% or more responses to the PSS were present, mean scores were used to create the total scale score. For the CBI, if more than 50% of the responses were present, mean scores were used to create the scale score (Kristensen et al., 2005).

Stepwise multiple regression models were employed to calculate significant predictors of the mean score of personal burnout, academic burnout, and burnout related to fellow-students. Background variables like age, gender, place of study and variables related to physical health, mental health, perceived support, level of education, year in nursing program, and parental and employment status, were correlated with the burnout outcome variables. All variables that were significantly correlated with the outcome burnout variables were entered into the stepwise regression models. The educational variable is an ordinal variable with three levels (backward comparison). The first comparison compares the

Table 1
Nursing student demographics and mean scores on the Perceived Stress Scale and the three subscales of the Copenhagen Burnout Scale: personal burnout, academic burnout, and burnout related to collaborating with fellow students (N = 339).

Background	*n* (%)	*M* (SD) range
Age in years (N = 317)		30.3 (8.4)
		19–60
Gender (N = 333)		
	320	
Female	(96.1)	
Male	12 (3.6)	
Other	1 (0.3)	
Marital status (N = 334)		
	249	
Married/in a relationship	(74.5)	
Single/divorced	85 (25.5)	
Parent (N = 335)		
	158	
Yes	(47.2)	
	177	
No	(52.8)	
Attending (N = 334)		
	217	
University of Iceland	(65.0)	
	117	
University of Akureyri	(35.0)	
Studies (N = 330)		
	256	
Undergraduate	(77.8)	
Graduate	74 (22.4)	
Year of study in undergraduate studies (N = 253)		
First year	69 (27.3)	
Second year	56 (22.1)	
Third year	55 (21.7)	
Fourth year	73 (28.9)	
Are you working during your studies? (N = 339)		
	278	
Yes	(82.0)	
No	61 (18.0)	
How often have you considered changing your education or quitting your nursing education?		
Very often/often	41 (12.8)	
Rather often	47 (14.7)	
	232	
Seldom/never	(72.5)	
Perceived stress scale (N = 338)*		17.7 (6.7) 1–37
		46.6 (19.3)
Personal burnout (N = 337)**		0–100
		45.7 (21.7)
Academic burnout (N = 337)		0–96.4
Burnout related to collaborating with fellow students (N = 335)		28.0 (21.9) 0–95

n varies due to missing data
* Possible range 0–40.
** Possible range for the burnout scales 0–100.

mean for level two (third- and fourth-year undergraduate students) with the mean of level one (first- and second-year undergraduate students). The second comparison is for level three (graduate students) and level two (third- and fourth-year undergraduate students). All dichotomous variables were coded as dummy variables (e.g., 0 or 1).

3. Results

3.1. Descriptive findings

Response rate was 32.7% (N = 339). Detailed descriptive findings of the participants are shown in Tables 1 and 2. These indicate that the average participant was a 30-year-old female undergraduate student at the UI, was in a relationship, employed and attending school, and rarely considered changing or quitting her education. Her theoretical studies were progressing well, and she was able to organize her studies. She

Table 2
Nursing students' experiences during the COVID-19 pandemic, health, stress, and support ($N = 339$).

Variables	n (valid %)
Experiences during COVID-19	
During COVID-19:	
How did your theoretical studies progress? ($N = 338$)	
Badly/very badly	34 (10.1)
Moderately	116 (34.3)
Well/very well	188 (55.6)
Were you able to organize your studies? ($N = 339$)	
Badly/very badly	67 (19.8)
Moderately	132 (38.9)
Well/very well	140 (41.3)
How did you like the online learning? ($N = 280$)	
Badly/very badly	18 (6.4)
Moderately	67 (23.9)
Well/very well	195 (69.7)
Did the decision to close the university buildings during COVID-19 have an impact on your studying? ($N = 339$)	
Yes	127 (37.5)
No	212 (62.5)
Have you been infected by COVID-19? ($N = 336$)	
Yes	4 (1.2)
No	332 (98.8)
Have you needed to be in quarantine because of COVID-19? ($N = 336$)	
Yes	44 (13.1)
No	292 (86.9)
Has a relative/friend of yours been infected by COVID-19? ($N = 335$)	
Yes	67 (20.0)
No	268 (80.0)
Health	
How do you evaluate your physical health? ($N = 337$)	
Very good/extremely good	154 (44.8)
Good	128 (38.0)
Moderate/bad	58 (17.2)
How do you evaluate your mental health? ($N = 337$)	
Very good/extremely good	106 (31.5)
Good	142 (42.1)
Moderate/bad	89 (26.4)
Stress and support	
How much stress do you experience	
related to your studies? ($N = 337$)	
Very little/rather little	84 (24.9)
Rather much/very much	253 (75.1)
related to communication with your teachers? ($N = 337$)	
Very little/rather little	250 (74.2)
Rather much/very much	87 (25.8)
related to lack of study instructions? ($N = 337$)	
Very little/rather little	193 (57.3)
Rather much/very much	144 (42.8)
Do you have enough time to pursue your studies? ($N = 337$)	
Never/seldom	102 (30.3)
Sometimes	235 (69.7)
Often/always	
Do you receive enough support related to your studies? ($N = 336$)	
Yes	277 (82.4)
No	59 (17.6)
Who, if anyone, supports you? (mark as needed) ($N = 336$)	
Family	225 (75.9)
Fellow students	220 (65.5)
Partner	218 (64.9)
Friends	205 (61.0)
Teachers	97 (28.9)
Educational counselors	14 (4.2)
Others	16 (4.8)
Are not in need of support	13 (3.9)

n varies due to missing data.

liked online learning, and the closing of the university buildings had not affected her studies. She experienced stress related to her studies and received support related to them, mostly from her family. She evaluated her mental and physical health as good and was not infected by COVID-19.

The mean score on the personal burnout scale was 46.6 ($SD = 19.3$), on the academic burnout scale 45.7 ($SD = 21.7$), and on the burnout scale related to collaborating with fellow students 28.0 ($SD = 21.9$). Fig. 1 shows the percentage of students experiencing low, moderate, and high burnout. The mean score on the PSS was 17.7 ($SD = 6.7$), with 91 students scoring at or below 13.7 (26.8%) and 247 students (72.9%) above 13.7.

3.2. Relationships between burnout and stress, support, and background

Personal burnout was found to be positively correlated with academic burnout ($r = 0.617$, $p < 0.001$) and with burnout regarding collaborating with fellow-students ($r = 0.222$, $p < 0.001$). Academic burnout was also positively correlated with burnout regarding collaborating with fellow-students ($r = 0.343$, $p < 0.001$). In addition, the PSS score was positively correlated with personal burnout ($r = 0.665$, $p < 0.001$), academic burnout ($r = 0.415$, $p < 0.001$), and burnout regarding collaborating with fellow-students ($r = 0.196$, $p < 0.001$). (These correlations are not shown in the tables.) Students who reported that they had not received enough support related to their studies ($n = 59$) reported significantly higher personal burnout ($p < 0.001$) and academic burnout ($p < 0.001$). Furthermore, those who had more often considered changing or quitting their nursing education scored higher on academic burnout ($p < 0.001$) and personal burnout ($p < 0.001$) (Table 3).

Undergraduate students ($n = 250$) reported significantly higher academic burnout ($p < 0.05$) and burnout regarding collaborating with fellow-students ($p < 0.05$) compared to graduate students ($n = 79$) (Table 3). When the level of education was further analyzed based on year of study, third- and fourth-year undergraduate students ($n = 126$; $M = 56.85$) were found to have reported significantly higher academic burnout compared to the first- and second-year students ($n = 123$; $M = 39.62$), as well as compared to the graduate students at both universities ($n = 81$; $M = 38.39$) ($p < 0.001$) (Table 4). The third- and fourth-year students ($n = 126$; $M = 33.53$) also reported significantly higher burnout related to collaborating with their fellow-students than the first- and second-year students ($n = 123$; $M = 26.63$), as well as compared to the graduate students ($n = 79$; $M = 22.01$) ($p < 0.001$) (Table 4).

3.3. Relationships between burnout and health and experiences regarding COVID-19

Students who reported bad/very bad physical health ($n = 35$) reported significantly higher personal burnout ($p < 0.001$), academic burnout ($p < 0.001$) and burnout regarding collaboration with fellow-students ($p < 0.001$) than their counterparts. Similarly, students who reported bad/very bad mental health ($n = 58$) reported significantly higher personal burnout ($p < 0.01$) and academic burnout ($p < 0.05$) (Table 3). During the first wave of the Covid-19 pandemic, students who reported their studies to progress moderately well to very badly ($n =$
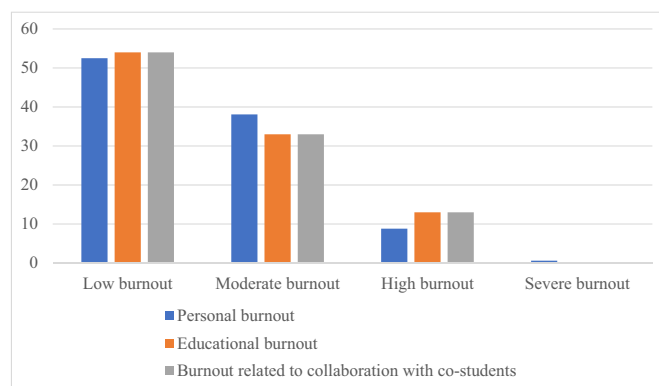

Fig. 1. Percentage of students ($N = 339$) experiencing low, moderate, high, and severe personal burnout, academic burnout, and burnout related to collaborating with fellow students.

Table 3
Independent *t*-tests on mean differences in physical and mental health, perceived support, educational level (graduate vs. undergraduate), and variables addressing COVID-19 (*N* = 336).

Variables	M (sd) *t* (*df*)
How do you evaluate your physical health?	
Personal burnout (*n* = 335)	−6.956 (333.00)***
Extremely good/very good/good (*n* = 300)	43.3 (18.5)
Very bad/bad (*n* = 35)	65.8 (15.0)
Academicburnout (*n* = 335)	−3.624 (333.00)***
Extremely good/very good/good (*n* = 300)	44.4 (21.5)
Very bad/bad (*n* = 35)	58.2 (20.1)
Burnout relating to fellow students (*N* = 333)	−3.818 (331.00)***
Extremely good/very good/good (*n* = 238)	26.5 (21.6)
Very bad/bad (*n* = 35)	41.2 (21.0)
How do you evaluate your mental health?	
Personal burnout (*N* = 335)	−5.001 (333)**
Extremely good/very good/good (*n* = 277)	43.3 (19.0)
Very bad/bad (*n* = 58)	56.8 (17.1)
Academic burnout (*N* = 335)	−2.986 (333)*
Extremely good/very good/good (*n* = 277)	44.2 (21.6)
Very bad/bad (*n* = 58)	53.4 (20.8)
Do you receive enough support related to your studies?	
Personal burnout (*N* = 336)	−4.032 (334.00)***
Enough support with studies (*n* = 277)	43.7 (18.6)
Not enough support with studies (*n* = 59)	54.6 (20.7)
Academic burnout (*N* = 336)	−7.121 (334.00)***
Enough support with studies (*n* = 277)	42.1 (20.3)
Not enough support with studies (*n* = 59)	62.8 (20.4)
Graduate vs. undergraduate students	
Academic burnout (*N* = 331)	−3.468 (329.00)*
Graduate (*n* = 81)	38.4 (22.2)
Undergraduate (*n* = 250)	47.9 (21.2)
Burnout relating to fellow students (*N* = 329)	−2.777 (327.00)*
Graduate (*n* = 79)	22.0 (24.2)
Undergraduate (*n* = 250)	29.9 (21.1)
During COVID-19, how did your theoretical studies progress?	
Personal burnout (*N* = 336)	−4.308 (334)**
Very well/well (*n* = 186)	41.7 (19.5)
Moderately/very bad/bad (*n* = 150)	50.6 (18.1)
Academic burnout (*N* = 336)	−3.266 (334)**
Very well/well (*n* = 186)	42.4 (21.1)
Moderately/very bad/bad (*n* = 150)	50.0 (21.8)
During COVID-19, how did you like the online learning?	
Personal burnout (*N* = 279)	−2.203 (277)***
Very well/well (*n* = 194)	44 (18.8)
Moderately/very bad/bad (*n* = 85)	49.4 (19.1)
Academic burnout (*N* = 279)	−3.386 (277)*
Very well/well (*n* = 194)	42.7 (22)
Moderately/very bad/bad (*n* = 85)	52.1 (20.4)
During COVID-19, were you able to organize your studies?	
Personal burnout (*N* = 337)	−3.367 (335)**
Very well/well (*n* = 139)	41.4 (18.0)
Moderately/very bad/bad (*n* = 198)	48.5 (19.7)
Academic burnout (*N* = 337)	−2.677 (335)*
Very well/well (*n* = 139)	42.0 (20.3)
Moderately/very bad/bad (*n* = 198)	48.4 (22.3)

n varies due to missing data.
* *p* < 0.05.
** *p* < 0.01.
*** *p* ≤ 0.001.

150) reported significantly higher personal burnout (*p* < 0.001) and academic burnout (*p* < 0.01). Similarly, the students who were moderately/badly/very badly able to organize their studies at the time of Covid-19 (*n* = 198), reported significantly higher personal burnout (*p* < 0.01) and academic burnout (*p* < 0.05). Additionally, the students who reported that they liked the online learning moderately/badly/very badly (*n* = 85), reported significantly higher personal burnout (*p* < 0.001) and academic burnout (*p* < 0.05) (Table 3).

Table 4
One-way ANOVA on mean differences in academic burnout and burnout related to collaborating with fellow students (*N* = 336) among university nursing students based on whether they are first- or second-year nursing students, third- or fourth-year nursing students, or graduate students.

Outcome	*n*	Mean	*SD*	*F*-value	*p*-value	Post hoc
Academic burnout (*N* = 330)						
1st and 2nd year undergraduate students [a]	123	39.62	18.37			
3rd and 4th year undergraduate students [b]	126	56.85	21.07			
Graduate students [c]	81	38.39	19.35	30.411	0.000	b > a, b > c
Burnout related to collaborating with fellow students (*N* = 328)						
1st and 2nd year undergraduate students [a]	123	26.63	20.65			
3rd and 4th year undergraduate students [b]	126	33.53	20.90			
Graduate students [c]	79	22.01	24.15	7.381	0.001	b > a, b > c

n varies due to missing data.
a = mean level for 1st and 2nd year undergraduate students.
b = mean level for 3rd and 4th year undergraduate students.
c = mean level for graduate nursing students.

3.4. Predictors of personal burnout, academic burnout, and burnout related to collaborating with fellow-students

The mean score on the PSS and variables having significant relationships with at least one of the three burnout scales was entered into the stepwise regression analysis. This step was followed by dummy coding (identified in parentheses) on the following variables: physical health and mental health (extremely good/very good/good = 1; bad/very bad = 0), support (enough support with studies = 1; not enough support with studies = 0), education, progression of theoretical studies, liking online learning, and ability to organize studies during the COVID-19 pandemic (very well/well = 1; moderately/bad/very bad = 0). The level of education variable was coded using backward difference coding in the stepwise regression. In this coding system, the mean of the dependent variable for one level of the categorical variable is compared to the mean of the dependent variable for the prior adjacent level of the categorical variable (Table 5).

Only the independent variables that significantly predicted the outcome of personal burnout, academic burnout, and burnout related to fellow students are reported in Table 5. Approximately 51% of the variability in the students' personal burnout was explained by the PSS, mental health, and perceived support (*F* = 92.76; *p* < 0.001) (see Table 5). Additionally, the PSS, support, and educational level (that is, third- and fourth-year students over first- and second-year students, and third- and fourth-year students over graduate-level students) predicted 42% of the variability in academic burnout (*F* = 39.03; *p* < 0.001) (Table 5). Burnout related to collaborating with fellow-students was explained by the nursing students' physical health and educational level (third- and fourth-year students over first- and second-year students, and third- and fourth-year students over graduate-level students), explaining 6% of the variability in the outcome (*F* = 6.85; *p* < 0.001) (Table 5).

4. Discussion

It is important as emphasized by Lazarus and Folkman (1984), to detect early symptoms of stress and burnout among nursing students to reduce its adverse effects and understand how we can best support them. During times of crisis such as the COVID-19 pandemic, we need our

Table 5
Stepwise regression analysis of predictors of the subscales of the Copenhagen Burnout Scale among nursing students.

Steps and variables	Models		
	B	β^a	t
Personal burnout ($N = 268$)			
(Constant)	11.550		
Perceived stress	1.769	0.641	14.475***
Mental health	8.140	0.161	3.709***
Support	5.975	0.119	2.707**
R^2	0.512		
Adj. R^2	0.507		
F	92.764***		
Academic burnout ($N = 268$)			
(Constant)	21.174		
Perceived stress	1.161	0.364	7.485***
Support	14.263	0.245	5.039***
Educational level (3rd/4th year over 1st /2nd year undergraduate)	17.791	0.396	7.445***
(Graduate level over 3rd/4th year undergraduate)	−17.482	−0.331	−6.301***
Mental health	5.876	0.100	2.121*
R^2	0.426		
Adj. R^2	0.415		
F	39.033***		
Burnout related to collaborating with fellow students ($N = 267$)			
(Constant)	27.444		
Physical health	14.139	0.199	3.349**
Educational level (3rd/4th year over 1st /2nd year undergraduate)	8.386	0.187	2.817**
(Graduate level over 3rd/4th year undergraduate)	−7.858	−0.148	−2.231*
R^2	0.072		
Adj. R^2	0.062		
F	6.852***		

n varies due to missing data; a = standard coefficients.

  * $p < 0.05$.
  ** $p < 0.01$.
  *** $p < 0.001$.

students to perform and function at their best. The objective of our study was to evaluate the predictors of nursing students' personal, academic, and collaboration-related burnout during the COVID-19 pandemic.

Notable findings are that most of the students participating in the study reported that their studies were progressing well, that they had enough time for their studies, that they were able to organize them, that they liked online learning, and that they were receiving enough support. These results indicate that most of our students are handling their nursing education effectively despite the COVID-19 pandemic. Similarly, a majority of students described their mental and physical health as good and did not experience significant levels of stress. This outcome contrasts with other studies showing that perceived stress among nursing students increased during the pandemic to a moderate level and that fourth-year students had the maximum mean perceived stress score (Sheroun et al., 2020; Aslan and Pekince, 2020). This contrast may be explained by the fact that the Icelandic students were able to engage in the clinical part of their studies despite the pandemic and were therefore able to continue their programs mostly uninterrupted, whereas students in other countries could not. Other researchers have shown that students have been highly vulnerable to mental health issues during the pandemic and that mental health problems have increased (Lee, 2020).

The finding that several students experienced stress due to a lack of study instructions emphasizes the importance of faculty members being aware of the need for students to receive additional support in their studies in times of crisis and to apply a variety of effective teaching methods (e.g., discussion groups, group assignments, case studies, simulations, social media) in their teaching. The stress students experience due to lack of teaching quality can easily be managed by faculty

members and administrators at universities with relatively little cost and effort. These findings from our study are new and in harmony with findings from Wang et al. (2021) who found nursing students academic engagement reduced their academic burnout. These authors emphasized the importance of improving academic engagement by effective increase educational practices such as co-operative learning, creative and challenging work, rich teaching experience, active learning, or social relationships, and by increasing effective interaction between students.

On average, the students in this study experienced a low degree of personal and academic burnout, though the mean score was close to moderate. Burnout related to collaborating with fellow students was low. Further analysis of the data indicates, however, that over 40% of the students experienced moderate or severe burnout. An additional finding is that students who reported worse physical and mental health, lower levels of support related to their studies, and worse progress in their theoretical studies were less likely to like online learning and less able to organize their studies. They also reported significantly higher scores on personal and academic burnout; in all instances, their burnout was moderate compared to low. This should be taken seriously due to the adverse impact of academic burnout on students' learning ability and performance.

Galbraith and Brown (2011) and Rudman and Gustavsson (2012) found that academic burnout influences students' overall health and wellbeing and could have consequences on a person's health at graduation as well as after they enter the nursing profession. Rudman and Gustavsson (2012) also reported that early development of burnout in nursing students may affect the quality of their care, as higher disengagement, and exhaustion levels at the end of a nursing education predict decreased skill mastery, decreased emphasis on evidence-based clinical practice, and higher turnover intentions one year after graduating. Therefore, educators and nursing leaders need to be sensitive to, and aware of, the impact that academic burnout can have on students and find ways to ameliorate its impact on student performance. In the research literature on burnout, females generally score higher (as we found in our study) regarding academic burnout (Purvanova and Muros, 2010). Nursing is a female-dominated profession and based on these findings it is imperative that nursing faculties take action to sufficiently support their students from the first year of their studies.

Furthermore, third- and fourth-year undergraduate students reported higher scores than graduate students on academic burnout and burnout related to their fellow-students. Third- and fourth-year undergraduate students also reported higher academic burnout and burnout related to collaborating with their fellow-students than the first- and second-year undergraduate students. This finding is informative and should draw the attention of nursing educators, administrators, and faculty members to the need to evaluate the theoretical and clinical setting within which students are educated so they can respond in an effective way. These outcomes are supported in the literature and in harmony with the work of Rudman and Gustavsson (2012), who reported that academic burnout increases about 10% from the first year of the studies until one year post-nursing education. Similarly, Valero-Chillerón et al. (2019) found that third-year students show the highest levels of exhaustion, followed by fourth-year students. The results from this Icelandic study and findings from the international community stress the importance of offering appropriate support, both educational and theoretical. Perhaps placing special emphasis on how to apply knowledge in practice among nursing students when they are attending the theoretical and clinical courses at their educational institutions and their training at healthcare institutions will go some way toward helping them navigate past stress.

Our regression analysis showed that stress as measured by the PSS, lack of support, and students' perceived mental health explained 50.7% of the variance in scores on personal burnout; these variables and educational level explained 41.5% of the variance in academic burnout. This finding supports previous research suggesting that stress is a major predictor of burnout (Sharififar et al., 2020). Further, these findings are

in harmony with Lazarus and Folkman theory (1984) on the importance of offering appropriate support to nursing students when experiencing stress related to their feelings and thoughts regarding their theoretical and clinical studying, and to deal effectively with the source of stress and stressors that the students are experiencing. Sources of stress include academic load, interaction with teachers, clinical stressors, and clinical settings, as described in the introduction (Al-Gamal et al., 2018; Alghamdi et al., 2019; Blomberg et al., 2014). Stress has also been correlated with worse mental health, indicating a need for university-based preventive services to deal with stress and mental health distress (Beiter et al., 2015).

It is important to address these findings by observing the workload of students closely and developing methods to manage the distribution of workload such as through regular meetings each semester among the supervisory faculty. In times of crisis such as the COVID-19 it is important for teachers and educational organizers to detect early symptoms of stress and burnout among nursing students particularly undergraduate students to reduce its adverse effects on academic performance. This can be done by providing support from academic teachers and clinical instructors by interviewing students, giving clear course descriptions and study instructions. Additionally, it could be of benefit for students to teach them relaxation techniques, stress management as well as how to use their support system effectively. A successful collaboration between academia and clinical practice is fundamental for the effective clinical training of students and should be a major aim in all clinical teaching and learning organizations.

The model for burnout related to collaborating with fellow students was not strong, but worse physical health and educational level explained 6.2% of the variance. The authors of the CBI (Kristensen et al., 2005) mentioned in their theoretical work that they distinguished between working with clients, customers, and colleagues but asserted that a specific questionnaire for work with colleagues needs to be developed. Campos et al. (2013) adapted the CBI for students in Portugal and Brazil. We decided not to use this version since we had access to a validated and translated Icelandic version of the CBI. It may be that this part of the CBI needs to be developed further for use among colleagues. On the other hand, 65.5% of the participants mentioned fellow students as a source of support. It might be that the variables in our study do not accurately capture the factors that might influence burnout related to fellow students.

The study had limitations. One limitation of our study is few participants and low response rate (only 32.7%); but due to COVID-19 with the Universities being locked down, we were unable to introduce face-to-face the study to the students. Also, few students in general are watching out for their e-mails from the Faculty of Nursing after they have finished their classes in the spring semester and started their summer jobs; but the data collection took place in May–June 2020. Therefore, due to the rather small sample size, generalizability needs to be limited. Secondly, the data was collected by self-reported scales and by questions not representing a valid and a reliable instrument (e.g., the support questions), which may lead to bias in the interpretation. Thirdly, we only evaluated the stress and the support components of Lazarus and Folkman theory (1984) but not the coping appraisals nor the adaptation. Further studies are therefore needed, focusing on support, coping and adaptation as well as on stress and burnout among nursing students at the time of a pandemic like the COVID-19 pandemic.

5. Conclusion

Burnout assessment was initially evaluated in the context of work-related stress, especially among those working with and for other people. In this study, which was conducted during the first wave of the COVID-19 pandemic, Icelandic nursing students were found to report a higher degree of burnout within the moderate category than individuals in the general Danish population, which should raise concerns among nursing educators and prompt them to take timely and decisive action to

prevent further negative consequences of these alarming levels of burnout. One of those actions might be teaching and encouraging students to use positive coping styles such as relaxation and cognitive reappraisal techniques to relieve stress (and thereby burnout) to increase academic performance and quality of care. Nevertheless, the students on average experienced low personal and academic burnout, even though the score was close to moderate.

Author contributions

Declaration of competing interest

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.

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