



Depression, anxiety, and stress among undergraduate health sciences students during COVID-19 pandemic in a low resource setting: a cross-sectional survey from Nepal

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Background: Mental health is an important issue for students during the time of the COVID-19 pandemic and uncertainty. Students suffer from mental health issues due to delayed academic years and prolong stay at home during the lockdown. This study aimed to identify factors associated with depression, anxiety, and stress among undergraduate health sciences students of different medical institutions in Nepal.

Materials and Methods: A web-based cross-sectional survey was conducted among 493 health sciences students between 14 July and 16 August 2020. Depression, anxiety, and stress were measured using the Depression, Anxiety, Stress Scale-21 (DASS-21). Multivariable logistic regression analysis was performed to determine the risk factors of mental health outcomes.

Results: Overall, 50.5, 52.5, and 44.6% of students had symptoms of depression, anxiety, and stress, respectively. Significantly higher odds of experiencing stress symptoms [adjusted odds ratio (AOR): 2.166; 95% CI: 1.075–4.363] were found with the participants whose relatives were infected with COVID-19. Participants with age less than or equal to 21 years among undergraduate health sciences students were significantly associated with higher odds of experiencing symptoms of stress (AOR: 1.626; 95% CI: 1.110–2.383) and anxiety (AOR: 1.6251; 95% CI: 1.110–2.379) in comparison with age above 21. Staying in quarantine was significantly associated with higher odds of experiencing depressive symptoms (AOR: 2.175; 95% CI: 1.142–4.143). Participants who had internet facilities at the residence had less likely to have depressive symptoms than those who are lacking internet services (AOR: 0.420; 95% CI: 0.195–0.905).

Conclusions: Staying in quarantine had higher odds of having depression and students who had internet facilities had lower odds of having depression. While staying in quarantine or isolation, it would be better to provide things to engage like the internet. A focus on improving the mental well-being of health sciences students should be initiated immediately after such a pandemic and lockdown.

Keywords: anxiety, burnout, depression, mental health outcome, psychological distress, stress

Background

SARS-CoV-2-induced COVID-19, which was classified as a worldwide pandemic by the WHO on 11 March 2020, is a viral infection^[1]. The COVID-19 progression trend in Nepal has become a serious challenge to the public health system^[2]. The

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HIGHLIGHTS

- The prevalence of depression, anxiety, and stress was found to be 50.5, 52.5, and 44.6% among undergraduate students during the COVID-19 pandemic.
- Significantly higher odds of experiencing stress symptoms [adjusted odds ratio (AOR): 2.166; 95% CI: 1.075–4.363] were found with the students whose relatives were infected with COVID-19.
- Use of internet facilities during lockdown were significantly less likely to have depressive symptoms (AOR: 0.420; 95% CI: 0.195–0.905) than those who are lacking internet services.

pandemic has brought mental health issues, such as depression, fear, and anxiety with a significant negative impact on public health and health workers^[3,4]. Within academic institutions, students represent a distinct population experiencing a critical developmental period from adolescence to adulthood, which is accompanied by significant stress and challenges^[5]. The unusual experience of home confinement under lockdown, combined with the uncertainties of academic and professional careers can bring various mental health issues such as stress, anxiety, and depression. Health science students showed a significant positive

association of stress with increasing age and academic year^[6,7]. The high prevalence of psychological problems among medical students was most likely due to demographic, academic, financial, fear of failure, social demands, and behavioral factors^[8–11].

Mental health issues primarily depression, anxiety, and stress remained major concerns among public health, paramedic, and medical students in China, India, Bangladesh, and Nepal during and before the pandemic^[12–16]. In the earlier phase of the pandemic experiences of ‘home quarantine’ under lockdown, combined with the uncertainty of academic and professional careers, has a wide-ranging impact on students’ mental health^[16]. There was a high prevalence of depression, anxiety, stress, and insomnia among health science students and health workers of Nepal during the initial phase of the pandemic. The study revealed that 41.9, 37.5, and 33.9% had anxiety, depression, and insomnia symptoms among health workers, and 15.7 and 10.7% had anxiety and depression among health science students^[3,17]. The study conducted in Nepal, Bangladesh, and Egypt during an earlier phase of the first wave shows that socioeconomic standard, living with family, and family or acquaintances isolated or infected with COVID-19, and hours spent on the internet per day were associated with mental health outcomes^[3,9,16–18].

In Nepal, although mental health issues remained major concerns among the students in academic performance and achievement, the evidence regarding the mental health status of medical students was not documented well in the time of pandemics. This study aimed to explore depression, anxiety, and stress among undergraduate health science students and the factors associated with it.

Materials and Methods

Study design and data source

A web-based cross-sectional study was carried including students from all seven provinces of Nepal. The survey was conducted from 14 June to 16 August 2020. Health sciences students enrolled in different academic institutions across Nepal were the target population. An online-based platform was used to distribute the e-questionnaire developed in the Google form. University students from health sciences backgrounds were contacted through social media such as Facebook, Twitter, Viber, and Gmail.

Study population

The study population included students pursuing an undergraduate degree as health sciences major. A total of 501 students participated in the study and only eight were considered non-response. All undergraduate students pursuing health sciences subjects were eligible for inclusion. Foreign students and students undertaking other subjects rather than health sciences programs were excluded.

Sampling technique

The snowball sampling technique was used for collecting information. An informed consent form was attached to e-questionnaire, and each participant consented to participate in the survey after reading the consent form. The participants were asked to share the e-questionnaire with their friends using their personal social media platforms. A single response from each

student was ensured via Google Forms setting by choosing ‘Limit to 1 response.’

Of those who participated in the study, 493 responses were considered valid DAS responses on basis of information of sociodemographic, educational factors, and COVID-19 factors which were further analyzed using descriptive and logistic regression.

Data collection

We used a structured questionnaire that was primarily designed with sociodemographic characteristics, academic information, and COVID-19-related factors. The questions were based on Depression, Anxiety, and Stress Scale-21 (DASS-21)^[19]. The DASS-21 was a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. It was a four-point Likert scale where 0 = does not apply to me at all; 1 applies to me to some degree or some of the time; 2 applies to me to a considerable degree or a good part of my life; and 3 applies to me very much, or most of the time. Each number 0, 1, 2, or 3 indicates how much the statement applied to the respondents over the past week^[19].

The depression scale assessed a range of depressive syndromes including dysphoria, hopelessness, and lack of interest/involvement. The higher score indicates a higher level of depression, categorized by scores as normal (0–9 points), mild (10–13), moderate (14–20), and severe (21–27); scores of 28 and above indicate extremely severe depression. The anxiety scale assessed the subjective experience of the anxiety effect, autonomic arousal, skeletal muscle effects, and situational anxiety. Scores were classified as normal (0–7 points), mild (8, 9), moderate (10–14), and severe (15–19), with scores of 20 or more indicating extremely severe anxiety. The stress scale assessed difficulty relaxing, being irritable/overreactive and impatient, and being easily upset/agitated: normal (0–14), mild (15–18), moderate (19–25), and severe (26–33), with scores of 34 or more indicating extremely severe stress^[19,20]. The DASS-21 was a worldly validated tool available in the public domain and the scale demonstrated adequate internal consistency (Cronbach α ranges from 0.76 to 0.90)^[21].

The sociodemographic variables were age, sex, ethnicity, place of residence, living conditions, and family income. Academic-related factors were collected to include university, the academic year of study, faculty, having online classes, and internet facilities. COVID-19-related factors were information on staying in quarantine or isolation, relatives in quarantine or isolation, and relatives infected with COVID-19.

The study has been reported in line with the STROCSS criteria^[22].

Statistical analysis

The collected data was transferred from Google Forms to an Excel format, then for data cleaning and analysis it was exported to SPSS, version-16. The ranked data, derived from the counts of each level of depression, anxiety, and stress were presented as numbers and percentages. The χ^2 test was performed to investigate the association level among variables.

The multivariable logistic regression analysis was used to determine the predictors of stress, anxiety, and depression. We tested for multicollinearity by calculating variance inflation factor

(VIF) scores for each variable in the predictor models. We set the cutoff VIF score of 5 and no variable was found having higher VIF scores greater than 5.

The model with the lowest Akaike Information Criterion (AIC) value was selected as the best-fitted model. The likelihood ratio test and Hosmer-Lemeshow tests were for the goodness of fit of the model. The Cox and Snell, and Nagelkerke pseudo- R^2 represented the proportion of variance in the outcome variable explained by the variables in the model^[11].

Ethical approval

All participants were provided with information concerning the research purpose, confidentiality of information, and the right to revoke participation without prior justification. The digital consent for participation in the study was made compulsory and access was denied if participants didn't provide their consent. Approval for this study was obtained from the institutional review Board of Nepal Health Research Council (NHRC- 479/2020) also the study was registered in the research registry with Unique Identifying Number (UIN): researchregistry8707.

Results

A total of 493 (63.5% female and 36.5% male) undergraduate health science students from four universities of Nepal took part in this study. Age ranged from 18 to 32, with a mean age of 21.82 (SD = 1.87). About 43.4% of students fall into the age group of 18–21. Almost one third (65.7%) of the participants were Brahmin/Chettri. Nearly half (46.7%) percentage of the respondents belongs to Bagmati province. Of the total participants 80.9% were living with their family, nearly half of the participants had a family income in between 20 000 and 50 000. Among total 40.2% were studying Bachelor in Public health followed by Bachelor in Medicine and Bachelor in Surgery (MBBS), 59.4% of the participants were from Tribhuvan University and 36.3% were participants were studying in final year or interns. The majority of the participants (93.3%) had an internet facility in their place of residence and 86.8% of the students had online classes. The proportion of students who were staying in quarantine or isolation was 14 and 9.5% of their relative were infected with COVID-19 and nearly one fifth (19.7%) of their relatives were staying in quarantine or isolation (Table 1).

Prevalence of depression, anxiety, and stress among undergraduate medical and health science students

The scores obtained for each of the three DASS-21 subscales were summed up and multiplied by 2. Sum scores varied from 0 to 126 and ranged from 0 to 42 for each subscale. The study found that the overall prevalence of stress was 44.6% (mild = 13%, moderate = 16.2%, severe = 6.5%, and extremely severe = 8.9%). The overall prevalence of anxiety was 52.5% (mild = 13.8%, moderate = 18.5%, severe = 10.3%, and extremely severe = 9.9%). The overall prevalence of depression was 50.5% (mild = 17.2%, moderate = 19.5%, severe = 9.7%, and extremely severe = 4.1%). The percentage distribution of depression, anxiety, and stress are presented in Table 2.

Table 1

Demographic, academic, and COVID-19-related information (N = 493)

Variables	Category	n (%)
Age (years)	< 21	214 (43.4)
	> 21	279 (56.6)
Sex	Male	180 (36.5)
	Female	313 (63.5)
Ethnicity	Brahmin/Chettri	324 (65.7)
	Janajati	20.1
	Madhesi	11.4
	Others	2.8
Province	Koshi	32 (6.5)
	Madhesh	52 (10.5)
	Bagmati	230 (46.7)
	Gandaki	54 (11)
	Lumbini	82 (16.6)
	Karnali	5 (1.0)
Living condition	Sudurpashchim	38 (7.7)
	With family	399 (80.9)
Family income per month (in Nepalese rupees)	Without family	94 (19.1)
	≤ 20 000	124 (25.2)
	20 000–50 000	245 (49.7)
Faculty	> 50 000	124 (25)
	MBBS	134 (27.2)
	Bachelor of Public Health	198 (40.2)
University/institution	Nursing	82 (16.6)
	Others	79 (16.0)
	Tribhuvan	293 (59.4)
	Kathmandu	79 (16.0)
	Purbanchal	61 (12.4)
Education system	Pokhara	36 (7.3)
	Others	23 (4.7)
Academic year	Annually	387 (78.5)
	Semester	106 (21.5)
Internet facility	First	70 (14.2)
	Second	119 (24.1)
	Third	125 (25.4)
	Fourth or interns	179 (36.3)
Online classes	Yes	460 (93.3)
	No	33 (6.7)
Duration of online classes (h)	Yes	428 (86.8)
	No	65 (13.2)
Staying in quarantine or isolation	≤ 2	282 (56.4)
	≥ 2	149 (30.6)
Relatives infected with COVID-19	Yes	69 (14.0)
	No	424 (86.0)
Relatives quarantine or isolation	Yes	47 (9.5)
	No	446 (90.5)
Relatives quarantine or isolation	Yes	97 (19.7)
	No	396 (80.3)

Table 2

Prevalence of depression, anxiety, and stress (DAS) (N = 493)

DAS level	n (%)		
	Depression	Anxiety	Stress
Normal	244 (49.5)	234 (47.7)	273 (55.4)
Mild	85 (17.2)	68 (13.8)	64 (13.0)
Moderate	96 (19.5)	91 (18.5)	80 (16.2)
Severe	48 (9.7)	51 (10.3)	32 (6.5)
Extremely severe	20 (4.1)	49 (9.9)	44 (8.9)

Table 3
Association of depression, anxiety, and stress with independent variables

Variables	Category (N)	Depression [n (%)]	No depression [n (%)]	P	Anxiety [n (%)]	No anxiety [n (%)]	P	Stress [n (%)]	No stress [n (%)]	P
Age (years)	≤ 21 (214)	115 (53.7)	99 (46.3)	0.21	142 (66.4)	72 (33.6)	0.03*	63 (29.4)	151 (70.6)	0.14
	< 21 (279)	134 (38)	145 (52)		159 (57)	120 (43)		66 (23.7)	213 (76.3)	
Sex	Male (180)	90 (50)	90 (50)	0.86	105 (58.3)	75 (41.7)	0.34	50 (27.8)	130 (72.2)	0.53
	Female (313)	159 (50.8)	154 (49.2)		196 (62.6)	117 (37.4)		79 (25.2)	234 (74.8)	
Ethnicity	Brahmin/Chettri	155 (52.2)	169 (52.2)	0.11	130 (40.1)	194 (59.9)	0.80	77 (23.8)	247 (76.2)	0.080
	Janajati	54 (45.5)	45 (54.5)		37 (37.4)	62 (62.6)		25 (25.3)	74 (74.7)	
	Madhesi	35 (37.5)	21 (62.5)		19 (33.9)	37 (66.1)		21 (37.5)	35 (62.5)	
	Others	5 (64.3)	9 (35.7)		6 (42.9)	8 (57.1)		6 (42.9)	8 (57.1)	
Province	1 (32)	16 (50)	16 (50)	0.49	21 (65.6)	11 (34.4)	0.07	6 (18.8)	26 (81.2)	0.514
	2 (52)	32 (61.5)	20 (38.5)		41 (78.8)	11 (21.2)		19 (36.5)	33 (63.5)	
	Bagmati (230)	120 (52.2)	110 (47.8)		138 (60)	92 (40)		63 (27.4)	167 (72.6)	
	Gandaki (54)	31 (57.4)	23 (42.6)		33 (61.1)	21 (38.9)		12 (22.2)	42 (77.8)	
	Lumbini (82)	37 (45.2)	45 (54.8)		45 (54.9)	37 (45.1)		17 (20.7)	65 (79.3)	
	Karnali (5)	3 (60)	2 (20)		4 (80)	1 (20)		2 (40)	3 (60)	
	Sudurpashchim (38)	18 (47.4)	20 (52.6)		19 (50)	19 (50)		10 (26.3)	28 (73.7)	
Living with	With family (399)	196 (49.1)	203 (50.9)	0.21	239 (59.9)	160 (40.1)	0.27	100 (25.1)	299 (74.9)	0.25
	Without family (94)	53 (56.4)	41 (43.6)		62 (66)	29 (30.9)		29 (30.9)	65 (69.1)	
Family income/month	Up to 20 000 (124)	66 (53.2)	58 (46.8)	0.67	88 (71)	36 (29)	0.01	45 (36.3)	79 (63.7)	0.01*
	20 000–50 000 (245)	119 (46.6)	126 (51.4)		148 (60.4)	97 (39.6)		54 (22)	191 (78)	
	> 50 000 (124)	64 (51.6)	60 (48.4)		65 (52.4)	59 (47.6)		30 (24.2)	94 (75.8)	
Faculty	MBBS (134)	64 (47.8)	70 (52.2)	0.05*	73 (54.5)	61 (45.5)	0.90	33 (24.6)	101 (75.4)	0.63
	Bachelor of Public Health (198)	109 (55.1)	89 (44.9)		135 (68.2)	63 (31.8)		60 (30.3)	138 (69.7)	
	Nursing (82)	40 (48.8)	42 (51.2)		47 (57.3)	35 (42.7)		16 (19.5)	66 (80.5)	
	Others (79)	36 (45.6)	43 (54.4)		46 (58.2)	33 (41.8)		20 (25.3)	59 (74.7)	
Academic year	First (70)	34 (48.6)	36 (51.4)	0.602	46 (65.7)	24 (34.3)	0.223	33 (24.6)	101 (75.4)	0.634
	Second (119)	62 (52.1)	57 (47.9)		78 (65.5)	41 (34.5)		60 (30.3)	138 (69.7)	
	Third (125)	57 (45.6)	68 (54.4)		70 (56)	55 (44)		16 (19.5)	66 (80.5)	
Education system	Fourth or Intern (179)	96 (53.6)	83 (46.4)		107 (59.8)	72 (40.2)		20 (25.3)	59 (74.7)	
	Annually (387)	198 (52.2)	189 (48.8)	0.58	235 (60.7)	152 (39.3)	0.82	97 (25.1)	290 (74.9)	0.31
Internet facility at residence	Semester (106)	51 (48.1)	55 (22.5)		66 (62.3)	40 (37.7)		32 (30.2)	74 (69.8)	
	Yes (460)	227 (49.3)	233 (50.7)	0.05*	283 (61.5)	177 (38.5)	0.42	119 (25.9)	341 (74.1)	0.57
Having online classes	No (33)	22 (66.7)	11 (33.3)		18 (54.5)	15 (45.5)		10 (30.3)	23 (69.7)	
	Yes (428)	219 (51.2)	209 (48.8)	0.45	260 (60.7)	168 (39.3)	0.72	114 (26.6)	314 (73.4)	0.54
Staying in quarantine or isolation	No (65)	30 (46.2)	35 (53.8)		41 (63.1)	24 (36.9)		15 (23.1)	50 (76.9)	
	Yes (69)	45 (65.2)	24 (34.8)	0.009*	47 (68.1)	22 (31.9)	0.19	26 (37.7)	43 (62.3)	0.01*
Relatives in quarantine or isolation	No (424)	204 (48.1)	220 (51.9)		254 (59.9)	170 (40.1)		103 (24.3)	321 (75.7)	
	Yes (97)	56 (57.7)	41 (42.3)	0.11	67 (69.1)	30 (30.9)	0.07	35 (36.1)	62 (63.9)	0.01*
Relatives infected with COVID-19	No (396)	193 (48.7)	203 (51.3)		234 (59.1)	162 (40.9)		94 (23.7)	302 (76.3)	
	Yes (47)	27 (57.4)	20 (42.6)	0.31	35 (74.5)	12 (25.5)	0.04*	18 (38.3)	29 (61.7)	0.04*
	No (446)	222 (49.8)	224 (50.2)		2669 (59.6)	180 (40.4)		111 (24.9)	335 (75.1)	

*Significant at $P < 0.05$, χ^2 test.

Association of depression, anxiety, and stress with independent variables

A significant association was found between respondents who were in quarantine or isolation and relatives of respondents who were in quarantine or isolation and depression at 95% CI ($P < 0.05$).

Significant association was found between the age, family income, internet facility at residence, relatives who were in quarantine or isolation, and relatives infected with COVID-19 with anxiety at 95% CI ($P < 0.05$). The remaining independent variables such as living conditions, family income, online classes,

and respondents who were in quarantine or isolation were not significantly associated with anxiety at 95% CI ($P > 0.05$).

A significant relation was found between respondents' age, family income, respondents who were in quarantine or isolation, and relatives of respondents who were in quarantine or family relatives infected with COVID-19 with stress ($P < 0.05$) (Table 3).

Factors associated with depression, anxiety, and stress among undergraduate health science students

Staying in quarantine or isolation among undergraduate health sciences students during COVID-19.

Table 4
Factors associated with depression among undergraduate health sciences students during COVID-19 pandemic

Variable	Category	Depression [n (%)]	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Sex	Male	90 (50)	0.969 (0.671–1.398)	0.937 (0.640–1.371)
	Female	159 (50.8)	1	1
Internet facility	Yes	227 (49.3)	0.487 (0.231–1.028)	0.420 (0.195–0.905)*
	No	22 (66.7)	1	1
Staying in quarantine or isolation	Yes	45 (65.2)	2.022 (1.189–3.438)*	2.175 (1.142–4.143)*
	No	204 (48.1)	1	1
Relatives in isolation or quarantine	Yes	56 (57.7)	1.437 (0.917–2.250)	0.935 (0.514–1.700)
	No	193 (48.7)	1	1
Relatives infected with COVID-19	Yes	227 (49.3)	1.362 (0.742–2.5)	1.445 (0.726–2.874)
	No	22 (66.7)	1	1

*Significant at $P < 0.05$.

Pandemic was significantly associated with higher odds of experiencing symptoms of depression (AOR: 2.175; 95% CI: 1.142–4.143438), internet facility (AOR: 0.420; 95% CI: 0.195–0.905) (Table 4).

Adjusted (95% CI) sex, internet facility, staying in quarantine or isolation, Relative isolation or quarantine, relative infected with COVID-19 with each other.

Participants with age lower than 21 years among undergraduate health sciences students were significantly associated with higher odds of experiencing symptoms of anxiety (AOR: 1.625; 95% CI: 1.110–2.379), and also with family income up to 20,000 is significantly associated with higher odds of anxiety (AOR: 2.4787; 95% CI: 1.443–4.255) (Table 5).

Adjusted (95% CI) age, sex, family income, relative in quarantine or isolation relative infected with COVID-19 with each other.

Participants whose relatives were infected with COVID-19 data was significantly associated with higher odds of experiencing symptoms of stress (AOR: 2.1; 95% CI: 1.075–4.363), and participants age less than or equal to 21 had 1.6 time more stressed in compare to those who were (AOR: 1.626; 95% CI: 1.110–2.383) (Table 6).

Adjusted (95% CI) age, ethnicity, living condition, education system, and relative infected with COVID-19 with each other.

Discussion

In this study, the prevalence of depression, anxiety, and stress was 50.5, 52.5, and 44.6%, respectively which was higher than

studies conducted in Germany^[23], China^[24], and India^[25]. However, the prevalence of stress was lower compared to studies conducted in Jordan^[26] and Egypt^[27]. The result of the present study was higher than the study conducted among medical students during the nonpandemic period, that is, stress (27%) anxiety (41.1%), and depression (29.9%), respectively in Nepal^[28]. This might be because during the pandemic there are multiple factors such as financial insecurity, fear of the virus, countless deaths, isolation, inadequate food supply, etc. associated with the surge of mental distress. However, the study conducted among undergraduate students from various streams showed depression (38.2%), anxiety (46.9%), and (24.1%)^[29]. The study population might contribute to variation in fact medical students have hectic study schedules and class load than other streams. This may be the reason for the higher prevalence of stress, anxiety, and depression among undergraduate medical students compared to other academic streams of education.

The prevalence of mental health problems may be particularly high because of uncertainty in examinations, classes, reopening of the university, and strict isolation^[30]. The study suggested that there was a significant association between anxiety and the age of the respondents. These results corroborate with findings of similar other studies conducted in Australia^[31] as well as stress was significantly associated with age in a study conducted at the time of COVID-19 in Bangladesh^[32] which is similar to this study conducted on Malaysian students^[33], but is inconsistent with other studies which show older students to have lower anxiety level because of better time management and less physical and psychological reactions to academic stress^[34,35]. This study

Table 5
Factors associated with anxiety among health sciences students during COVID-19 pandemic

Variables	Category	Anxiety [n (%)]	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age (years)	≤ 21	142 (66.4)	1.488 (1.029–2.154)*	1.625 (1.110–2.379)*
	> 21	159 (57)	1	1
Sex	Male	105 (58.3)	0.836 (0.575–1.215)	0.807 (0.547–1.192)
	Female	196 (62.6)	1	1
Family income/month	Up to 20 000	88 (71)	2.219 (1.314–3.747)*	2.478 (1.443–4.255)*
	20 000–50 000	148 (60.40)	1.385 (0.896–2.141)	1.417 (0.911–2.206)
	> 50 000	65 (52.4)	1	1
Relative in isolation or quarantine	Yes	67 (69.1)	0.647 (0.402–1.040)	1.309 (0.778–2.205)
	No	234 (59.1)	1	1
Relatives infected with COVID-19	Yes	35 (74.5)	1.974 (0.998–3.905)	1.884 (0.894–3.970)
	No	266 (59.6)	1	1

*Significant at $P < 0.05$.

Table 6
Factors associated with stress among undergraduate health sciences students during COVID-19 pandemic

Variable	Category	Stress	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age (years)	≤21	63 (29.4)	1.346 (0.900–2.015)	1.626 (1.110–2.383)*
	>21	66 (23.7)	1	1
Ethnicity	Brahmin/Chettri	77 (23.8)	0.520 (0.121–2.224)	2.939 (0.661–13.081)
	Janajati	25 (25.3)	0.563 (0.125–2.252)	3.502 (0.754–16.267)
	Madeshi	21 (37.5)	1.00 (0.216–4.61)	4.236 (0.882–20.335)
	Dalit	3 (50)	1.66 (0.195–14.26)	9.732 (0.714–132.631)
	Others	3 (37.5)	1	1
Living condition	With family	100 (25.1)	0.750 (0.428–1.227)	0.736 (0.448–1.208)
	Without family	29 (30.9)	1	1
Education system	Annual	97 (25.1)	0.773 (0.481–1.243)	0.974 (0.620–1.531)
	Semester	32 (30.2)	1	1
Relatives infected with COVID-19	Yes	18 (38.3)	1.873 (1.002–3.503)*	2.166 (1.075–4.363)*
	No	111 (24.9)	1	1

*Significant at $P < 0.05$.

further shows the association of family income with anxiety which supports the prior findings that students' family income and living with parents were protective factors against anxiety^[15]. Due to heightened psychological and financial pressure, as well as the family income's importance in helping the family deal with the range of obstacles brought on by the pandemic, the anxiety experienced by students during the COVID-19 virus outbreak was also a significant factor^[15].

This study also signifies the association of family income with stress because of the sudden sense of joblessness and financial insecurity put on the backs of university students, an unpleasant situation affecting their socioeconomic and mental well-being^[16]. The level of stress was higher to those whose relative were infected with COVID-19. The result was comparable to the study conducted in Italy which also shows a positive correlation with relatives infected with COVID-19 and higher level with stress^[18].

The study shows the depression was significantly associated with respondents who are living in quarantine or isolation. The finding of this study coincides the study conducted in China which shows the post-traumatic stress disorder and depression among the students who stay in home quarantine^[36]. Students' life is never sedentary but due to the COVID-19 virus, it is compulsory to be isolated from college and social life. Due to the long duration of social isolation students who are living in isolation or quarantine have high levels of depressive symptoms.

Limitations of the study

Although the study was conducted using a validated questionnaire and provides sufficient useful information about the depression, anxiety, and stress status of health sciences students, it does have limitations. First, the study was conducted using a Google form, and because of that some students might have missed and were not interested in using social media. Second, the snowball sampling technique was used to recruit respondents due to the COVID-19 outbreak and social distancing measures. This method might not be represent other faculties than health sciences. Lastly, this study design cannot demonstrate casualty between the variables.

Conclusions

A considerable proportion of Nepali health sciences students were suffering from psychological distress like depression, anxiety, and stress in the first phase of the pandemic. Special attention and necessary psychological intervention should be provided to the students by the government and university. Parents should be supported by offering a pandemic response to create a friendly and supportive family atmosphere for university students without putting pressure on their future academic and working careers. Staying in quarantine or isolation had higher odds of having depression and students who have internet facility had lower odds of having depression. So, while staying in quarantine or isolation, it would be better to provide engagement tools such as the internet and this study also suggested the importance of mental health promotion interventions among university students due to constants academic loads and examinations.

Ethical approval

This study was approved by the Institutional Review Board of Nepal Health Research Council (NHRC) with reference number (479/2020).

Consent

The consent was taken. Digital consent was made compulsory during the data collection.

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The authors declare that they have no financial conflict of interest with regard to the content of this report.

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