Anxiety and Depression during COVID-19 Pandemic among Medical Students in Nepal

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ABSTRACT

Background

Medical students' psychological response to societal lockdown during the COVID-19 pandemic has not been studied much.

Objective

To assess levels of anxiety and depression among medical students during initial stages of COVID-19 pandemic in Nepal and relate their distress to relevant variables.

Method

A cross-sectional study with online questionnaire was conducted among medical students at different colleges in Nepal. Hospital Anxiety and Depression Scale (HADS) detected 'anxiety' and 'depression'. The covariates were explored by logistic regression analyses.

Result

A total 416 medical students [mean age: 22.2 (2.1); males 57.7%, females 42.3%] participated. HADS-anxiety scores [mean: 7.1(4.3)] were significantly and positively correlated with HADS-depression [mean: 5.9 (4.1)] (r=0.695; p < 0.001). Point prevalence of total HADS caseness (HADS-T) was 26.7%. Specific HADS-defined caseness were: anxiety (HADS-A) 11.8%, depression (HADS-D) 5.5%, and comorbid anxiety and depression (HADS-cAD) 9.4%. All four types of caseness were significantly more prevalent among students with a history of mental problems (AOR=4.7, 3.2, 2.6, and 3.2 respectively). HADS-T was higher among those with a concurrent physical illness (AOR=2.4). HADS-T, HADS-A and HADS-D scores were higher among the age group > 22 years (AOR= 2.2, 2.5 and 4.4 respectively). HADS-cAD was almost three-times higher among those with a possible COVID-19 exposure (AOR=2.8).

Conclusion

A significant number of medical students in Nepal suffered from high levels of anxiety and depression during the COVID-19 shut-down. The students in the higher (> 22 years) age group, those with past mental disorders, possible COVID-19 exposure, and concurrent physical illness showed elevated levels of anxiety and/or depression.

KEY WORDS

COVID-19, Medical students, Pandemic, Psychological distress, Self-quarantine

INTRODUCTION

Coronavirus disease (COVID-19), spreading worldwide, is now pandemic.[1] Social distancing measures (isolation, quarantine) to limit the disease can have adverse psychosocial consequences.[2-6]

During prior pandemics, psychological problems like depression, anxiety, and post-traumatic stress disorder (PTSD), and emotional responses like anger, irritability, insomnia, have been reported.[7-9]

During the current pandemic, international studies, including those from the neighboring India and China, have shown similar psychological responses.[10-14] Heightened distress among the mentally ill is seen.[15,16] Mounting suicide rates raise public health concern.[17,18] Effects of the pandemic on childhood and adolescents cannot be overlooked.[19]

Nepal Government also imposed an almost 4 months (March-July 2020) nation-wide complete lockdown.[20] The strategy was later changed to partial lockdown or shutdown in affected areas.[20] Few studies indicate psychological consequences of lockdown.[21-24]

Loss of daily routines, less physical activity and social contacts may lead to boredom and frustrations; precipitating psychological distress.[6] Adolescents and youth, especially college students, seem to have been hit hard with their educational institutions closed.[25,26] Medical students are generally confronted with significant academic and career-related stressors.[27,28] Only a few studies have explored the possible psychiatric manifestations among medical students during the COVID-19 pandemic.[29,30]

Hence, we aimed to assess signs of depression and anxiety among the undergraduate medical students in Nepal as possible manifestations of psychological distress during the COVID-19 outbreak. We see this as a starting point for lessening the mental burden now and in the future in relation to similar events.

METHODS

This is an online cross-sectional, quantitative study of undergraduate medical students pursuing Bachelor in Medicine and Bachelor in Surgery (MBBS) courses at different Medical Colleges in Nepal. The study has been approved by the Institutional Review Committee of Kathmandu University School of Medical Sciences (IRC-KUSMS) (Approval number 59/20).

Data collection was done through an online survey using google-forms. It was distributed via online forums and social media at the medical colleges. All respondents were asked to give written informed consent before starting.

The variables below were explored in this study:

1. Participant's demographic status: age (later dichotomized based on the mean value), and gender (male or female).

2. Name of medical college; current year of MBBS study, later dichotomized into the pre-clinical (year 1 and 2) and clinical phase (year 3 and above).

3. Health status: presence of any concurrent physical illnesses (yes or no) at the time of the study; history of a mental disorder (yes or no).

4. COVID-19 related questions:

a. History of possible COVID-19 exposure (yes or no).

b. Quarantine location: at home with family, or self-quarantine in some other location like student hostels, home of relatives, or rented domicile (home or other).

c. Number of days in self-quarantine, calculated by subtracting the date of initiating the quarantine from the date of the online interview.

d. Adequacy of basic needs: the students' subjective assessment of their situation regarding access to basic needs (food, water, clothing etc.) rated on a scale from 1 to 10; 1 indicated the least and 10, the maximum during the self-quarantine.

Manifestations of anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS).[31] The HADS contains 14 items with seven in each of two subscales: HADS-anxiety and HADS-depression (A1 to A7; D1 to D7). The reliability in terms of internal consistency of the two subscales in this study was indicated by Cronbach alpha, 0.84 and 0.80 respectively for anxiety and depression. Each item addressed the participants' subjective self-report of the preceding week. The item is rated on a four-point scale from 0-3 (3 indicating maximum severity). Each subscale is a sum score with the potential range from 0 to 21. As recommended, we used 11 as the threshold to indicate caseness for anxiety (HADS-A) or depression (HADS-D).[31,32] Participants who scored above the threshold ($\geq$ 11) on both subscales were categorized as cases of comorbid anxiety and depression (HADS-cAD). Those scoring above the threshold only on the HADS-anxiety subscale were considered anxiety cases (HADS-A) while those scoring $\geq$ 11 only on the HADS-depression subscale were considered to be depression cases (HADS-D).[33] All three types of HADS caseness together were considered total HADS cases (HADS-T).

Medical undergraduates (first to fifth year MBBS) willing to take part both in the study and to complete the online questionnaire were included. The prospective participants were contacted via various social media outlets.

Based on a prior study, the required sample size was calculated from the reported prevalence of anxiety (45.3%) and depression (31%) among medical students in Nepal at that time.[28] Using the formula z^2pq/e^2 and allowing for 10% of potential non-responders, the calculated sample size was 414.[34]

Participants: Total 416 participants consented and completed satisfactorily the online survey. Around one-thirds (28.8%) was from Kathmandu University School of Medical Sciences (KUSMS) and around two-fifths (17.3%) from the Institute of Medicine (IOM). Other medical colleges with high frequencies of participants were: Nobel Medical College (8.9%), BP Koirala Institute of Health Sciences (7%), Chitwan Medical College (6.7%), Lumbini Medical College (5.5%), and Nepal Medical College (5%).

Data analysis was done by using SPSS version 25. Responses on the google form were transferred via Excel into SPSS. Descriptive statistic was used for the demographic variables.

The point-prevalence of all the four types of caseness established by HADS (HADS-A, HADS-D, HADS-cAD, and HADS-T) were reported as percentages with 95% confidence intervals (CIs).

Pearson's Correlation was used to explore relationships between the total scores of HADS-anxiety and HADS-depression subscales, and their independent associations with the continuous variables: days in self-quarantine and the adequacy of basic needs.

Logistic regression analysis was used to study the covariates in relation to each of the four types of caseness derived from HADS. The four dependent variables were: HADS-T, HADS-A, HADS-D, and HADS-cAD. The independent variables were age, gender, study phase, history of covid-19 exposure, history of mental disorders, and concurrent physical illnesses. Continuous variables were also entered in the regression equation. Adjusted Odd's ratio (AOR) with 95% CI was calculated. Significance level was considered at $p < 0.05$.

RESULTS

The participants' age ranged from 17 to 30 years; mean age being 22.2 (2.1). This variable was dichotomized into above and below 22 years. Almost three-fifths [57.7% (240)] of them were males. More than three-fifths [64.7% (269)] were in the clinical phase of the study.

Regarding mental health, 76.4% (318) reported never to have had a psychiatric disorder. Among the 23.6 % who reported some psychiatric problems in their past, 13.5% had suffered from anxiety and 8.2% had depression. Below one-tenth [7.5% (31)] had a concurrent physical illness other than COVID-19 at the time of the study.

Regarding COVID-19, 89.7% did not report any exposure that they were aware of. Among the 10.3 % who reported a possible exposure, 6.3% regarded their family members or close relatives as the probable source. In order to maintain self-quarantine, around four-fifths of the participants [78.8% (328)] stayed at home with their families (Table 1).

Table 1. Participant information (N=416

Variables	Number (%)
Age (in years)*	
22 years and below	212 (51.0)
Above 22 years	204 (49.0)
Gender	
Male	240 (57.7)
Female	176 (42.3)
Phase of study	
Pre-clinical	147 (35.3)
Clinical	269 (64.7)
History of mental disorder	
No	318 (76.4)
Yes	98 (23.6)
Concurrent physical illness	
No	385 (92.5)
Yes	31 (7.5)
History of possible covid-19 exposure	
No	373 (89.7)
Yes	43 (10.3)
Quarantine location	
At home with family	328 (78.8)
Other locations	88 (21.2)

* mean (SD): 22.2 (2.1)

Almost three-fourths of the participants [73.3% (305)] did not qualify for any psychiatric caseness according to the HADS screening. Among those with caseness, 11.8% had HADS defined anxiety (HADS-A), 5.5% had depression (HADS-D), and 9.4% were suffering from comorbid anxiety and depression (HADS-cAD) (Table 2).

Table 2. Point prevalences of HADS-defined psychiatric caseness (N=416)

Caseness *	Number	% (95% CI)
Anxiety (HADS-A)	49	11.8 (8.8-15.3)
Depression (HADS-D)	23	5.5 (3.5-8.2)
Comorbid anxiety and Depression (HADS-cAD)	39	9.4 (6.7-12.6)
No case	305	73.3 (68.8-77.5)

*Total HADS caseness (HADS-T=HADS-A+HADS-D+HADS-cAD) = 111 (26.7%)

The mean scores of the HADS-anxiety and HADS-depression subscales were respectively 7.1 (SD 4.3) and 5.9 (SD 4.1); the two sub-scales were significantly and positively correlated (r=0.695; p<0.001). The mean number of days in self-quarantine was 59.8, the median was 17 and the mode was 14, and the range went from 0 to 231 days. The self-assessed mean score for the adequacy of basic needs was 8.5 (1.8).

Table 3. Multivariate logistic regression analyses: Exploring associations of independent variables in relation to HADS caseness. Dependent variables: any psychiatric caseness, HADS-A, HADS-D and HADS-cAD.

Caseness	Any HADS caseness, total (n=111)		HADS-A (n=49)			HADS-D (n=23)			HADS-cAD (n=39)		
Variables	n (%)	Multivariate analyses	n (%)	Multivariate analyses		n (%)	Multivariate analyses		n (%)	Multivariate analyses	
		AOR* (95% CI)	p		AOR* (95% CI)	P		AOR* (95% CI)	p		AOR* (95% CI)	p
Age (in years)											
22 and below	49 (44.1)	Reference	-	19 (38.8)	Reference	-	8 (34.8)	reference	-	22 (56.4)	reference	-
> 22 years	62 (55.9)	2.2 (1.1-4.4)	**0.021**	30 (61.2)	2.5 (1.0-6.4)	**0.046**	15 (65.2)	4.4 (1.1-17.7)	0.038	17 (43.6)	0.8 (0.3-1.9)	0.59
Gender											
Male	56 (50.5)	Reference	-	25 (51.0)	Reference	-	14 (60.9)	reference	-	17 (43.6)	reference	-
Female	55 (49.5)	1.6 (0.98-2.7)	0.060	24 (49.0)	1.5 (0.8-2.8)	0.242	9 (39.1)	0.8 (0.3-2.1)	0.686	22 (56.4)	1.7 (0.8-3.7)	0.146
Phase of study											
Pre-clinical	39 (35.1)	Reference	-	16 (32.7)	Reference	-	8 (34.8)	reference	-	15 (38.5)	reference	-
Clinical	72 (64.9)	0.7 (0.3-1.3)	0.254	33 (67.3)	0.6 (0.2-1.6)	0.317	15 (65.2)	0.4 (0.09 - 1.5)	0.160	24 (61.5)	1.1 (0.4-2.9)	0.800
History of possible COVID-19 exposure											
No	94 (84.7)	Reference	-	43 (87.8)	Reference	-	22 (95.7)	reference	-	29 (74.4)	reference	-
Yes	17 (15.3)	1.5 (0.7-3.0)	0.31	6 (12.2)	0.9 (0.3-2.4)	0.839	1 (4.3)	0.4 (0.05 - 3.2)	0.400	10 (25.6)	2.8 (1.2-6.9)	**0.02**
Quarantine location											
At home with family	88 (79.3)	Reference	-	36 (73.5)	Reference	-	20 (87.0)	reference	-	32 (82.1)	reference	-
Other locations	23 (20.7)	0.7 (0.4-1.4)	0.38	13 (26.5)	1.3 (0.6-2.7)	0.533	3 (13.0)	0.4 (0.1-1.8)	0.280	7 (17.9)	0.6 (0.2-1.6)	0.304
History of Mental Disorder											
No	59 (53.2)	Reference	-	26 (53.1)	Reference	-	13 (56.5)	reference	-	20 (51.3)	reference	-
Yes	52 (46.8)	4.7 (2.7-8.0)	**<0.001**	23 (46.9)	3.2 (1.7-6.2)	**<0.001**	10 (43.5)	2.6 (1.0-6.6)	0.041	19 (48.7)	3.2 (1.5-6.7)	**0.002**
Concurrent Physical Illnesses											
No	95 (85.6)	Reference	-	43 (87.8)	Reference	-	19 (82.6)	reference	-	33 (84.6)	reference	-
Yes	16 (14.4)	2.4 (1.1-5.4)	**0.034**	6 (12.2)	1.4 (0.5-3.9)	0.482	4 (17.4)	2.2 (0.6-7.6)	0.197	6 (15.4)	2.2 (0.8-6.2)	0.132

*adjusted for age, gender, phase of study, possible covid-19 exposure history, quarantine, History of Mental Disorder, presence of any physical illnesses, days of self-quarantine, and subjective adequacy of basic needs; AOR: Adjusted odds ratio; CI: confidence interval

HADS-anxiety was significantly and positively correlated with the days in self-quarantine (r=0.137; p=0.005) and negatively correlated with adequacy of basic needs (r=-0.106; p=0.031). HADS-depression was negatively correlated with the adequacy of basic needs (r=-0.168; p=0.001).

In the multivariate logistic regression analyses, HADS-T caseness was significantly more frequent among the participants above 22 years (AOR=2.2; p=0.021), among those with a history mental disorder (AOR=4.7; p<0.001), and among those with a concurrent physical illnesses (AOR=2.4; p=0.034) at the time of the study.

Regarding the specific caseness, HADS-A was significantly more frequent among participants above 22 years (AOR=2.5; p= 0.046) and those with a history of mental disorder (AOR=3.2; p<0.001). HADS-D caseness was also more frequent among those with age > 22 years (AOR=4.4; p=0.038) and those with a history of mental disorder (AOR=2.6; p=0.041). HADS-cAD was more frequent among those with a possible history of COVID-19 exposure (AOR=2.8; p=0.02), and those with a history of mental disorder (AOR=3.2; p=0.002) (Table 3).

DISCUSSION

This online survey indicates that almost one-third of the medical students in Nepal are mentally affected by COVID-19 as a stressor in their daily lives. This applies even to those with no experience of exposure to COVID-19. As a stressor, the virus represents a major unseen threat to life and to the health of the students, their families, friends, and community.

During the pandemic outbreak, the students' levels of anxiety and depression go up. Around one-tenth score above the thresholds for comorbid anxiety and depression; and this group of students reported a high degree of possible COVID-19 exposure. The potential contact with the virus leads to the highest reported distress in this population. The finding underscores the "dose-response" link between stressor exposure and the distress levels. Moreover, it is publicly well known that those who die from COVID-19 often have an additional diagnosis.[35] In our study, those with a concurrent physical illness have higher occurrence of the comorbid HADS caseness.

Regarding caseness for anxiety only, more than 10% score above the threshold, and 5.5% do so for depression only. The frequency of anxiety cases is twice that of the depressive ones. In the stress paradigm when faced with threats, arousal, sympathetic activation of the fight-flight mode is the expected response, which is closely related to anxiety.[36] The high correlation between anxiety and depression among the students is in line with findings of a high co-occurrence of the two related to PTSD.[37]

In their short lives, 13.5% of the Nepalese medical students had anxiety-related mental problems in the past, and 8.2% had depression. In terms of point prevalence at the outbreak of the pandemic by means of HADS, 11.8% showed caseness of anxiety and 5.5% displayed caseness for depression. When looking at the figures from these two sources – past and now – the first figures reflect the numbers from an extended time period while the other is a momentary measure. Fear of infection among students may be one probable explanation for the high point prevalence found.[6]

The Nepali government enforced social-distancing in addition to the shutdown and later a complete or partial lockdown in areas to combat the spread of the virus.[20] Schools, colleges and universities have been closed since March 2020, and most people including students are staying at home in self-quarantine. These restrictions may have been more stressful among the medical students in the higher classes, i.e., those in higher age bracket (> 22 years) displayed more anxiety and depression than their younger fellow students. The students in the higher classes who usually have regular clinical postings may have been more worried of less clinical exposure as a result of their home-quarantine status. With higher age and maturity, they may have recognized more fully what the COVID-19 pandemic may entail. In addition, sedentary habits due to prolonged lockdown may have contributed to psychological distress.[25]

Few or no classes and insufficient online teaching may have escalated the already high academic stresses of medical students and increased the uncertainty about their academic future.[28] Nepalese medical students tend to enjoy directly supervised teaching-learning rather than self-studies. A prior comparative study of medical students showed that a self-administered or non-authoritarian learning format was culturally less popular among the Nepalese students than in Western countries.[38]

In the binary analysis, the number of days of self-quarantine was positively linked to the levels of anxiety. The perception of their adequacy of basic needs was negatively correlated with both anxiety and depression. These facts are in keeping with findings in a review which underscored that the length of the quarantine and insufficient basic living conditions or facilities, were linked to a negative psychological outcome.[6] However, the days in quarantine and the adequacy of basic needs did not emerge with significance in the multivariate analyses.

However, there were clear links between a history of mental problems and the medical students' current levels of distress. This is in line with a case-control study from the hospital designated for COVID-19 patients in China; it showed higher anxiety and depression scores among psychiatric patients than in healthy controls.[15] Within the stress paradigm, research findings have shown that those with former anxiety and/or depression problems are more PTSD prone when exposed to major stressors.[37,39]

High prevalence of anxiety and depression in general among the adult population in Nepal has been well documented in a nationwide study.[33] The recent global burden of disease (GBD) survey data revealed depression and anxiety to be among the top ten disabling conditions in the world; extrapolated data in South Asia and Nepal also support these findings.[40] Higher degrees of general psychological distress in the form of anxiety and depression have also been reported among medical students in Nepal.[27,28] The current global pandemic has added a sense of threat with surmounting stress.[6,11] The levels of stress have gone up among college students, who during the pandemic were isolated in their homes, perhaps suffering from boredom and frustrations, loneliness due to limited social activities and learning opportunities. In addition comes the escalating academic and career-oriented uncertainties and pressures.[25,26]

An online survey in Nepal among healthcare workers involved in the pandemic revealed high levels of anxiety in almost 40% and depression in the 8% of the participants.[21] These healthcare workers were predominantly younger (mean age 29.5), close in age to the medical students. Another study assessing the psychological impacts of the

lockdown in Nepal showed 25.4% of the participants to have anxiety and 7% reporting depression.[22] The findings of both studies are relevant, as the majority of the participants were doctors, and the participants in our study are the 'future doctors'.

The study has some limitations. Being cross-sectional research, cause-effect relationships cannot be established. The population of medical students is not a representative drawn sample. However, the medical students form a fairly homogeneous group with regard to age and socio-demographic status, and in our study, they come from colleges from several parts of the country. Probably this makes the studied sample not too different from a representative sample. The findings may not easily be generalized to the general population but more likely to other kinds of health workers.

Face-to-face diagnostic interviews would have been preferable for establishing the frequencies of psychiatric disorders. However, that procedure for data collection would not have been advisable during the current pandemic. HADS has clearly demonstrated to be a valid screening instrument, both internationally, and in Nepal.[32,41] In this study, it indicates that the medical students experience an increase in mental burden in the context of the COVID-19 pandemic. The above-mentioned national and international studies also used online surveys; previous research has demonstrated that online surveys function as well as paper-and-pencil surveys.[15,21,22,24,25,42] In addition; online studies are safer for all parties during a pandemic. Also, online surveys are more convenient for the informant as they can choose the time and location for

responding, which is assumed to lower the threshold for participating. Another issue of concern may be the self-rating of the adequacy of basic needs, which is an entirely a subjective expression.

Despite these limitations, we were able to form an understanding about the psychological impact of COVID-19 as a mental stressor in a sample of medical students in Nepal. These students, being a literate group, were easily amenable for an online survey and self-administration of the HADS.[31,32] The findings of this study call for a coordinated health strategy with special emphasis on upholding the mental health of health workers during times of a pandemic. Society is particularly dependent on their work in crisis of this kind.

CONCLUSION

A good number of medical students in Nepal suffer from higher levels of anxiety and depression during this phase of COVID-19 shut-down. The students in the higher (> 22 years) age group, those with more days in self-quarantine, those with inadequate resources for daily living, those with a history of mental health problems or a concurrent physical illness, and a possible COVID-19 exposure history are at higher risk of psychological distress in a pandemic.

ACKNOWLEDGMENTS

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