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ARTICLE

Depression, Anxiety, and Behavioural Changes during the COVID-19 Pandemic among Medical and Nursing Students

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ABSTRACT

During the COVID-19 pandemic, medical and nursing students are faced with various challenges such as the need to attend online classes and juggling clinical postings under the new norm. This study aimed to assess the association between depression, anxiety, and behavioural changes among medical and nursing students during the COVID-19 pandemic. An online self-administered questionnaire was distributed between March 2021 and July 2021 to 292 undergraduates medical and nursing students in a higher education institute on the East Coast of Malaysia. The questionnaires consisted of four parts: sociodemographic data, the Generalised Anxiety Disorder-7, the Patient Health Questionnaire-9, and questions related to behaviours during the COVID-19 pandemic. This study found that 23.6% and 33.6% of the students experienced anxiety and depression respectively, possibly caused by the COVID-19 pandemic. Anxiety was associated with a high level of behavioural changes during the pandemic with a total of 87% of the students showing behavioural changes. Therapeutic interventions such as online counselling and consultation should be implemented by the university to reduce the prevalence of depression and anxiety resulting from the COVID-19 pandemic among medical and nursing students.

KEYWORDS

Nursing students; medical students; depression; anxiety; behavioural changes; pandemic; COVID-19

1 Introduction

COVID-19 pandemic is one of the most severe public health crises in the history of mankind. Since its onset in December 2019, it has spread to the entire population in the world. As of 21st October 2021, more than 240 million confirmed cases of COVID-19 with more than 4 million deaths worldwide have been reported [1]. The Ministry of Health Malaysia [2] reported that a total of 2.48 million cases of COVID-19 and more than 28,000 deaths up to 3rd November 2021. Various control strategies were put in place to contain the spread of COVID-19, including the Movement Control Order (MCO), mass vaccination programme, and a set of standards of precautions (SOP) that included physical distancing for at least 1–3 meters from other individual, use of alcohol-based sanitiser, and regular handwashing [1,3].

As a newly emerging and highly contagious infection, COVID-19 has produced heavy workloads for healthcare workers, resulting in adverse emotional impacts. Working in hospitals during the outbreak, dealing with critical patients for a long period of time, and longer hours of working shifts have all resulted in emotional distress and burnout among healthcare practitioners [4–6]. Similarly, undergraduate medical and nursing students who were amid their clinical postings during the pandemic were also vulnerable to negative impacts such as higher levels of mental health disorders due to their close contact with the patients [7].

Studies in the literature have shown that medical and nursing students were emotionally affected during the COVID-19 pandemic. This was evidenced by an increase in the prevalence of depression and anxiety among medical and nursing students during the pandemic as reported in several studies [7–9]. A cross-sectional study in Pakistan reported that 48.1% and 48.6% of medical students experienced depressive and anxiety symptoms during the COVID-19 pandemic [8]. Another cross-sectional study among 244 nursing students in Hong Kong showed that 12.2% and 5.8% of nursing students experienced moderate and severe anxiety during the COVID-19 outbreak [9]. In addition, Saraswathi et al. [7] conducted a prospective longitudinal study among 217 undergraduate medical students in Chennai, India from December 2019 to June 2020 to assess the mental health of the students. The findings indicated a significant increase in the prevalence of anxiety (21.2% to 33.2%) and stress (20.7% to 24.9%) during the COVID-19 pandemic.

Correspondingly, a study by Soltan et al. [10] found that medical students who had a higher risk of exposure to the COVID-19 virus were more likely to apply preventive behaviours accordingly. Annamma et al. [11] also reported on the behavioural changes among nursing students in Malaysia during the COVID-19 pandemic whereby they practised hand hygiene more frequently and expressed their woes about having to attend clinical posting during the pandemic. Huang et al. [4] suggested that emotions are linked to motivational properties that inspire certain behaviours. For example, when an individual is fearful of something, they will have the desire to protect themselves from the incident. Likewise, when an individual feels uncomfortable with certain things, they will try to avoid them.

In Malaysia, while a study reported that 36.4% of health sciences students had depressive symptoms before the pandemic [12], no available data could show whether the prevalence of depression and anxiety increased among medical and nursing students during the COVID-19 pandemic. Behavioural changes can be one of the important responses to the pandemic, especially when they are required to attend clinical postings. However, there is no evidence on whether such behavioural changes are associated with the depression and anxiety experienced by the students. It is vital to further explore these changes to gain an in-depth understanding of the behavioural changes specific to the COVID-19 pandemic so that better management can be put in place in the future [13]. In short, this study aimed to assess the association between depression, anxiety, and behavioural changes among medical and nursing students during the COVID-19 pandemic.

2 Methods

The study was conducted using a quantitative cross-sectional design. Data were collected online between March and July 2021 among 292 medical and nursing students who were conveniently sampled from a higher education institute on the East Coast of Malaysia. To determine the sample size of this study, OpenEpi (single proportion formula) was used. After the calculation with an anticipated frequency of anxiety (77%), 5% confidence limits, and 95% confidence level, the required sample size for this study was 163. To address potential non-response, the sample size was inflated by 100% to 326 [14]. The inclusion criteria were undergraduate medical and nursing students involved in clinical postings during the COVID-19 pandemic. The exclusion criteria were students who were on leave during data collection and those with known psychiatric problems.

The self-administered online questionnaire consisted of four parts. Part A captured the sociodemographic data of participants, i.e., age, gender, kulliyyah (faculty), current year of study, weeks of the required clinical posting, and history of mental illness. Part B consisted of the Generalised Anxiety Disorder-7 (GAD-7) questionnaire to determine the levels of anxiety [15] that was made up of seven items. The scores from each item ranged from 0 to 3, giving a total score ranging between 0 and 21. The level of anxiety was further dichotomised with a cut-off point of 10, based on the optimal level of sensitivity and specificity for the GAD-7 reported in a study. Therefore, participants who scored 10 and above in the GAD-7 were classified as having moderate to severe anxiety. The validity and reliability of GAD-7 were confirmed by Spitzer et al. [15] with a Cronbach alpha's value of ($\alpha = 0.92$).

Part C aimed to assess the depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9) [16]. PHQ-9 consists of nine items on a scale of 0 to 3 with a total score ranging between 0 and 27. In this present study, the level of depression was categorised into two groups with a cut-off point of $\geq$10. Those with a total score of 9 and below were categorised as having normal or mild depression while those with scores of 10 and above were classified as having moderate to severe depression [16]. The validity and reliability of PHQ-9 have been confirmed with a Cronbach alpha's value of 0.89 and it was found to be effective to measure the level of depression in a diverse population [17].

Part D consisted of questions related to the behaviours during the COVID-19 pandemic as adopted from a previous study [18]. Using a Likert scale, this questionnaire measured COVID-19 awareness, personal protective measures, mental health status, and behavioural changes. The total score was obtained by summing up the scores for each question, with 1 mark for 'yes' and 0 marks for 'no'. Those who scored 75% and above were classified as having a high performance of behavioural changes [19]. The validity and reliability of these questions were confirmed with a good Cronbach alpha's value of 0.78 [19].

Prior to the data collection, ethical approval was obtained from the IIUM Research Committee (IREC 2021-KON/61). The list of potential participants with their names, email, and contact numbers were obtained from the respective kulliyyah (faculty). The participant information sheet, informed consent, and questionnaire were distributed via Google form through email or WhatsApp. All potential participants were assured that the information provided would be fully confidential and used solely for academic purposes. They were informed of their right to refuse participation or withdraw at any time. They could contact the researcher for any inquiry via email or WhatsApp. Upon completing the questionnaire, the form was submitted and returned to the researchers via Google Form. Data were analysed using Statistical Package for Social Science (SPSS) Version 26.0. Descriptive statistical tests were used to measure the frequency and percentage of variables and the Chi-square test was used to assess the association between depression, anxiety, and behavioural changes. A p-value of less than 0.05 was considered statistically significant.

3 Results

Out of the 326 respondents, 292 of them completed the survey, giving rise to an 89.6% response rate. According to Nulty [20], the acceptable response rate for a cross-sectional survey should be at least 60%. The findings showed that 76.3% (n = 225) of them were females. The participants' aged between 20 and 25 years old. A total of 65.4% (n = 190) were Year 4 students, 24.7% (n = 72) were in Year 3, 8.6% (n = 25) in Year 2, and 1.7% (n = 5) in Year 1. The mean weeks of posting they needed to complete during the COVID-19 pandemic was 21.8. Table 1 shows the sociodemographic characteristics of the participants.

Table 1: Sociodemographic characteristics of the participants

Variables		Frequency (n)	Percentage (%)	Mean
Gender	Male	67	22.7	
	Female	225	76.3	
Age	18–20	2	0.7	
	21–23	197	67.5	
	24–25	90	30.8	
	25 and above	3	1.0	
Faculty	Nursing	174	59.6	
	Medicine	118	40.4	
Year of study	Year 1	5	1.7	
	Year 2	25	8.6	
	Year 3	72	24.7	
	Year 4	190	65.1	
Weeks of clinical posting				21.8

The anxiety level was categorised into two groups. Those who scored 10 and above for the GAD-7 were classified as having moderate to severe anxiety. A quarter of them (n = 69, 23.6%) showed moderate or severe symptoms of anxiety while the remaining (n = 223, 76.4%) had no symptoms. Similarly, the depression level was divided into two groups, whereby those who scored 10 and above was classified as having moderate to severe depression. By using the cut-off score of 10 for the PHQ-9, 33.6% (n = 98) students were identified to have moderate to severe depression symptoms while 66.4% (n = 194) of students had normal or mild symptoms of depression (Table 2). For the behavioural changes, it was classified as low performance and high performance. The result showed that 87.0% (n = 254) of the students displayed high performance of preventive behaviours while the remaining 13.0% (n = 38) showed low performance of preventive behaviours during the COVID-19 pandemic.

Table 2: Level of anxiety, depression, and behavioural changes

	Level	Frequency (n)	Percentage (%)
Anxiety	Normal	223	76.4
	Moderate/Severe	69	23.6
Depression	Normal	194	66.4
	Moderate/Severe	98	33.6
Behavioural change	Low performance	38	13.0
	High performance	254	87.0

Using the Pearson Chi-Square test, a significant difference was detected between the level of anxiety and behavioural changes ($p = 0.014$) The participants with high anxiety levels during the COVID-19 pandemic applied more preventive behaviours to avoid being infected by the COVID-19 virus. Gender was found to be associated with and behavioural changes ($p = 0.029$) with female students engaged with higher preventive behaviours than their male counterparts. However, there was no significant association between the level of depression and behavioural changes ($p = 0.928$). Table 3 shows the association between demographic information, anxiety, depression, and behavioural changes.

Table 3: Association between demographic information, anxiety, depression, and behavioural changes

	Level	Behavioural changes		*p*-value
		Low performance	High performance	
Gender	Male	14 (4.8%)	53 (18.2%)	*0.029
	Female	24 (8.2%)	201 (68.8%)	
Age	18–20	0 (0.0%)	2 (0.7%)	0.623
	21–23	27 (9.3%)	170 (58.2%)	
	24–25	10 (3.4%)	80 (27.4%)	
	25 and above	1 (0.3%)	2 (0.7%)	
Year of study	Year 1	0 (0.0%)	5 (1.7%)	0.560
	Year 2	5 (1.7%)	20 (6.9%)	
	Year 3	8 (2.7%)	64 (21.9%)	
	Year 4	25 (8.6%)	165 (56.5%)	
Week of clinical posting	1–20	14 (4.9%)	130 (44.5%)	0.072
	21–40	23 (7.9%)	99 (33.9%)	
	41–60	1 (0.3%)	24 (8.2%)	
	61 and above	0 (0.0%)	1 (0.3%)	
Anxiety	Normal	23 (7.9%)	200 (68.5%)	*0.014
	Moderate/Severe	15 (5.1%)	54 (18.5%)	
Depression	Normal	25(8.6%)	169 (57.9%)	0.928
	Moderate/Severe	13 (4.5%)	85 (29.1%)	

Notes: *Pearson Chi-Square, *p*-value = 0.05.

4 Discussions

This study reported that about one-third of the participants experienced moderate to severe depression. Prior to the COVID-19 pandemic, a study conducted in a similar setting indicated that 36.4% of health sciences students had depressive symptoms [12]. Although there was a slight decrease in the prevalence in our study, it should be noted that our sample included only medical and nursing students as compared to Nahas et al. [12] who included participants from five health-related courses. In another study, Vitale et al. (2020) [21] reported a higher prevalence (45.3%) of depression among 285 nursing students in Italy during the COVID-19 pandemic compared to our study. This could be attributed to the challenges faced by medical and nursing students in coping with a new study environment, the uncertainty of examination and graduation dates, concerns about families back home that distracted them from focusing on their

studies, not to mention financial problems and the lower level of clinical experience due to inadequate exposure [18,21,22].

In this study, about one-quarter of the participants reported symptoms of anxiety, much higher than a study conducted by Pandey et al. [23] among medical students in India in which only 9.8% of medical students had moderate to severe symptoms of anxiety during the COVID-19 pandemic. The prevalence in our study was also higher than a previous study conducted before the pandemic by Francis et al. [24] in which 622 medical students in Kuala Lumpur, Malaysia showed only 4.7% prevalence of anxiety. A higher level of anxiety among medical and nursing students during the pandemic could be linked to social isolation, academic challenges, fear of getting infected, and financial problems.

In general, behavioural changes refer to any modification of behaviours that might have happened spontaneously or involuntarily without any intervention or as a result of current conditions [25]. In this study, behavioural changes include the preventive or protective behaviours adopted by the students to avoid being infected by the COVID-19 virus, namely applications of hand hygiene, social distancing, mask-wearing, and cough etiquette. Based on our findings, as high as 87.0% of students displayed a high performance of behaviour changes. These were in line with the high levels of behavioural changes reported in studies from India, China, and Iran [19,23,26]. For instance, Xiao et al. [19] reported a high 90% of medical students applied preventive behaviour including social distancing, hand hygiene, and avoidance of unnecessary outings. Such behavioural changes are a common psychological strategy applied by people in the face of difficult circumstances or unavoidable danger [13]. Likewise, during the COVID-19 pandemic, it is believed that the majority of students modified their behaviours to adapt to the new norm under the pandemic to avoid being infected by the virus. In this study, both male and female students engaged in more protective behaviours to avoid the infection of COVID-19, with female students scoring higher in behavioural changes. Similarly, earlier studies to determine predictors of behavioral change during COVID-19 pandemic have found that there was an association between gender and behavioural changes with female were more likely than men to perform preventive measures [27–29].

Moreover, this study also highlighted a significant association between anxiety and behavioural changes. This is consistent with two previous studies [30,31] that reported a similar strong association between anxiety and behavioural changes, especially in terms of preventive behaviours. Clark et al. [28] suggested that psychological distress such as stress, anxiety, and depression was associated with the high engagement of behavioural changes during the pandemic. According to Sochańska [32], the COVID-19 pandemic led to the emergence of rapid, unexpected, often radical changes in diverse areas of social life, subsequently resulting in various alterations in the regular systemic regulations, habits, customs, and meanings that the public is familiar with. In many instances, simple daily routines such as interaction with other people in regular social situations have become hazardous, in other words, the emergence of social trauma. Social trauma creates a new perception of pre-existing problems that leads to a change in how individuals define their priorities and interpret the phenomena [32]. This paradigm shift is likely the reason why students with anxiety are more likely to modify their behaviours as compared to those without anxiety.

5 Conclusion

This cross-sectional study determined the prevalence of depression and anxiety as well as the level of behavioural changes during the COVID-19 pandemic among medical and nursing students in a higher institution on the East Coast of Malaysia. This study reported that one-third and one-quarter of the medical and nursing students who needed to attend clinical postings during the pandemic reported symptoms of depression and anxiety. A big proportion of them also modified their behaviours during the COVID-19 pandemic. The study findings indicated an association between anxiety and behavioural changes. Thus, it is vital to address the high prevalence of depression and anxiety among this group of

vulnerable populations. The psychological wellbeing of the students during the COVID-19 pandemic warrants close attention from the university. Immediate strategies in the form of therapeutic interventions such as online consultation and counselling can be implemented to prevent such mental issues. Waechter et al. [33] recommended incorporation of variety of wellness activities to promote well-being into the medical curriculum. The findings from this study serve as important baseline data to guide future research. They also provide the much-needed evidence to convince higher learning institutions to acknowledge the importance of the psychological wellbeing of medical and nursing students during the pandemic. To better support our findings, multi-centre studies with a larger sample size are warranted in the future.

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