Medical Students' Mental Health Status and Coping Strategies in Their Quarantine Period During COVID-19 Pandemic in Universiti Putra Malaysia

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ABSTRACT

Movement control order (MCO) was enforced by the Malaysian government on 18th March 2020 due to sudden increase in the cumulative number of COVID-19 cases. University students, including medical students, were among the group of the population which were significantly affected. This study was conducted among medical students in Universiti Putra Malaysia (UPM) to compare the mental health status and coping strategies, between gender and phase of the clinical study related to their quarantine status between 18th March 2020 to 9th June 2020. This was a cross-sectional study involving the undergraduate medical students in UPM in the academic year of 2019/2020 during the MCO. A stratified random sampling method was used; a total of 173 respondents which includes students of Year 1 to Year 5 participated. The study was conducted after five months since the first day of MCO, for one week period of data collection. The mental health status was assessed using Depression, Anxiety and Stress Scale 21-item (DASS-21) questionnaire. Four-point Likert scale was scored to determine the degree of severity. The coping strategies was assessed using Brief-COPE (Coping Orientation to Problems Experienced) in which four-point Likert scale was used as well, and the total marks were grouped into four coping strategies. This study found higher scores of DASS-21 in the non-quarantined group and approach method was considered as a favourable coping strategy in both groups. In the quarantined group, female and clinical students showed higher scores of DASS-21. In the non-quarantined group, clinical students showed a significantly higher score of stress while male students significantly used their humour as coping strategies.

Keywords: Medical student, Mental health, Coping strategies, Quarantine, Pandemic

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INTRODUCTION

Severe acute respiratory coronavirus 2 syndrome (SARS-CoV2), a novel coronavirus that is one of seven coronaviruses known to cause disease in humans, is the cause of COVID-19. It was first recorded in Wuhan, China in December 2019 and has since spread globally. The human coronaviruses causing the "common cold" have not been considered consequential pathogens until the emergence of SARS-CoV and Middle East respiratory coronavirus syndrome (MERS-CoV) from animal reservoirs, triggering global epidemics with unprecedented morbidity and mortality.

The early cases of COVID-19 were related to the live animal market in Wuhan, China, indicating that the virus was initially transmitted to humans from livestock. People-to-people transmission occurs through contact with infected secretions, predominantly large breathing droplets, and by contact with polluted surfaces contaminated by breathing droplets. However, it is unclear whether infection can be acquired by the role of aerosols (small respiratory droplets) in the transmission. About 20% to 30% of infected patients needed mechanical ventilation and 10% died with higher mortality rates in older patients and those with comorbidities (1).

On 25th January 2020, officials in Malaysia reported that a 37-year-old Chinese female tourist from Wuhan who arrived in Malaysia, together with her mother and three friends, was the epicentre of the outbreak, who have travelled from Singapore to Malaysia; they were linked to a 66-year-old man and his son in Singapore who tested positive for the virus. The number of positive cases was initially small until a spike in the number of cases were observed following the four-day Islamic missionary movement cluster which was held at the end of February in Selangor. As a consequence of the sudden rise in the total number of positive cases, a two-week movement control order (MCO) was implemented on 18th March 2020.

University students, including medical students, were among the group of the population significantly affected by the MCO. The shutting down of universities and colleges and the suspension of face-to-face teaching and learning activities, throughout the world, must have negatively impacted the students' psychological and learning behaviours. There will be notable long-term consequences to be expected from the disruption of their routine education. University students constitute a vulnerable age group for developing mental health problem as they undergo the transition to adulthood, and they often experience economic difficulties during their university's life (2–4).

A few studies have shown the major effect on university students, including those in medical schools, of the COVID-19 pandemic and the quarantine implemented (5–7). Depression and anxiety among them were recorded with many felt disheartened and depressed during the quarantine period, perhaps because of the uncomfortable feeling of having to abandon fellow friends or relatives, the restriction on freedom, the fear about the spread of the disease and the sudden changes in their academic environment (8). All of these have essentially contributed to a decline in the overall results of their studies. The degree of depression was higher in graduating final year students than in the other years as they were due to complete their study and the pandemic had caused uncertainty on job security and their future undertakings.

University students, especially medical students were particularly vulnerable due to the current academic burden, as their studies may be severely impacted. The mental health of university students has been impacted by the pandemic's continued spread, which has resulted in increased

isolation measures and disrupted their regular academic schedules. Quarantine has caused both male and female medical students to feel emotionally detached from their families, colleagues and friends, according to a report, and has reduced their overall job performance and study time (8). The results also revealed that one-fourth of the medical students who took part in the study experienced depression during the two-week quarantine period. Long-term quarantine as a result of COVID-19 pandemics could exacerbate these medical students' psychological and learning problems (8).

Coping has been defined as a type of adaptation triggered in normal people by particularly demanding situations. Coping is described as an individual's ongoing cognitive and behavioural efforts to deal with demands that are particularly difficult and likely surpass individual resources or capacities. Coping is a three-part process that includes the cause of stress, cognitive appraisal and coping techniques. Humour, religion, avoidance and approach are just a few of the cognitive and behavioural methods that people employ to cope with stress. Psychological approaches have been suggested to minimise the impact of mental health problems of students during the pandemic and quarantine era. Programmes in mental health and education should concentrate on helping to build personal resilience. Healthy diet, proper exercise and sleep, healthy physical, intellectual and educational activities were proposed as part of supplementary mental well-being interventions during the quarantine to mitigate the emotional impact (10). The government should also play a significant role in assisting students to secure employment (11).

This study was conducted to compare the three scales of the mental health status of the undergraduate medical students in Universiti Putra Malaysia (UPM) along with their coping strategies. The comparison was also carried out based on their gender and phase of the clinical study (pre-clinical and clinical phase). The comparison scales were measured between their quarantine status in the residential college, either quarantined (students who were stranded in college residencies) and non-quarantined (those who managed to return home during the MCO period), between 18th March 2020 to 9th June 2020. This study is thought to be the first in Malaysia to deal with the quarantine situation. During this period, the quarantined group of students were not allowed to leave the residential college at all. Their foods were constantly supplied by university management or donated by the lecturers. Their daily requirements such as internet and laundry were also provided, however, the study room and television room were strictly prohibited to avoid mini gathering.

MATERIALS AND METHODS

The research was carried out at the Faculty of Medicine and Health Sciences (FMHS) in UPM Serdang, Selangor. This was a cross-sectional study involving the undergraduate medical school in UPM in 2019/2020 academic year during the MCO. Another criterion for inclusion was that the students be over the age of 18. Meanwhile, students who were unable to create a stable internet connection and were quarantined outside the UPM residential college were excluded. The study was conducted after five months since the first day of MCO. Socio-demographic factors were identified: gender and phase of the clinical study; as well as their quarantine status: quarantined and non-quarantined. In this study, quarantine refers to students who were stranded in the residential college throughout the MCO period and were unable to return home during that time. A stratified random sampling method was used, involving the current 511 medical students of FMHS, UPM which included Year 1 to Year 5. The strata of the required sample size were calculated based on the phase of the clinical study. Year 1 and Year 2 were considered in the pre-clinical

phase, which required a minimum of 45 participants, whereas Year 3, Year 4 and Year 5 were grouped into the clinical phase, which required a minimum of 56 participants.

In this study, Depression, Anxiety and Stress Scale 21-item (DASS-21) questionnaire regarding mental health status which was developed by Lovibond and Lovibond (12), and Brief-COPE (Coping Orientation to Problems Experienced) 28-item questionnaire regarding coping strategies which were developed by Carver (13), were used and they were only available in English. The estimated sample size was calculated using hypothesis testing for two incidences rate with consideration of adjustment of 10% non-response rate (14). This calculation yielded 101 participants as a minimum sample size from Year 1 to Year 5 medical students.

For subject recruitment, stratified random sampling was performed, with two parameters stratified: gender and phase of the clinical study. The students' names were stratified based on their gender (female and male) and clinical study phase (pre-clinical and clinical phases). Those who volunteered to participate were requested to sign a written consent form that was embedded together with the online questionnaire. Students who answered the questionnaire were considered willing to participate in the study. The survey was distributed via WhatsApp of the respective batch's leader. Since there was an initial sample inadequacy from the fifth year, they were approached individually until the targeted sample size was achieved. The survey was available in English and consisted of five sections: the first section was a briefing about this study, the second section recorded the participant's consent, the third section captured the participant's information, the fourth section required the participant to complete the DASS-21 self-report questionnaire, and the fifth section required the participant to complete the Brief-COPE self-report questionnaire.

The DASS is a quantitative measure of distress along the three axes of depression, anxiety and stress. Four-point Likert scale was introduced: 0 (Did not apply to me at all), 1 (Applied to me to some degree, or some of the time), 2 (Applied to me to a considerable degree or a good part of time) and 3 (Applied to me very much or most of the time). The DASS-21 scores were multiplied by two to determine the degree of severity, either normal, mild, moderate, severe and extremely severe. All of the items in DASS (depression, anxiety and stress) were scored to determine the level of severity (12).

In Brief-COPE, the scale determines the participant's primary different coping strategies: either humour, religion, avoidant, or approach (13). The Brief-COPE scale was created to assess how well people cope with stressful life events. Four-point Likert scale was introduced: 1 (I have not been doing this at all), 2 (A little bit), 3 (A medium amount) and 4 (I have been doing this a lot). The scales were measured based on 28 items of question and the total marks were grouped subsequently onto the four coping strategies. However, no level of severity was required. For depression, anxiety and stress, respectively, the Cronbach alpha for DASS-21 reliability were 0.94, 0.90 and 0.87 (15) whereas the reliability coefficient for Brief-COPE was more than 0.7, suggesting acceptable internal consistency (16).

The collected data were analysed using SPSS version 25. Descriptive analysis of mean, median, mode and variance, standard deviation, and range were calculated for the socio-demographic characteristics. Kolmogorov-Smirnov test is used for $n \geq 50$. Since all the factors: $p < 0.05$, hence the data is not normally distributed. The Mann-Whitney U test, a non-parametric test, was used to assess the median differences in each status score in the comparison of the quarantined and non-quarantined classes.

The Research Ethics Committee of UPM granted the ethical approval to perform this study (reference no. JKEUPM 2020-256).

RESULTS

A total number of 511 students were contacted and screened for their eligibility. Out of this number, only 177 students consented to participate. A total number of 173 students then completed the questionnaires (97.7% response rate). However, the required minimum sample size is achieved. Most of the participants were female, 76.9% ($n = 133$), whereas male participants accounted for 23.1% ($n = 40$). This discrepancy was expected due to the current number of female students are double the number of male students. Out of 173 participants, 65.3% ($n = 113$) were in the pre-clinical phase while 34.7% ($n = 60$) were in their clinical phase. The majority were non-quarantined during the MCO, at 86.7% ($n = 150$). Table 1 demonstrated the distribution of socio-demographic data. Since the students were able to leave campus before the MCO was introduced, there were fewer quarantined students observed.

Generally, both quarantined and the non-quarantined group did not show any statistically significant difference for DASS-21 scores ($p = 0.103, 0.393, 0.439$) as well as Brief-COPE scores ($p = 0.406, 0.683, 0.400, 0.752$). Surprisingly, participants in the non-quarantined group showed higher scores of depression, anxiety and stress as compared to the quarantined group; however, the scores only represented mild depression, mild anxiety and normal stress level as shown in Table 2(a). There were no significant differences between the quarantined and non-quarantined group with regard to their coping strategy during MCO ($p = 0.752$) of which the approach method was the primary coping strategy, as shown in Table 2(b).

Table 1: Socio-demographic data (gender, phase of the clinical study and quarantine status)

Gender	Frequency (n)	Percentage (%)
Male	40	23.1
Female	133	76.9
Total	**173**	**100.0**

Year	Phase of the clinical study		Percentage (%)
	Pre-clinical phase (n)	Clinical phase (n)	
Year 1	46	–	65.3
Year 2	67	–	
Year 3	–	24	
Year 4	–	20	34.7
Year 5	–	16	
Total	**113**	**60**	**100.0**

Quarantine status	Frequency (n)	Percentage (%)
Quarantined	23 (Male = 4, Pre-clinical = 19)	13.3
Non-quarantined	150	86.7
Total	**173**	**100.0**

Table 2: Mann-Whitney U test for comparison between quarantine status for (a) DASS-21 and (b) Brief-COPE

(a) DASS-21

	Quarantine status	Mean rank	Level of severity	p-value
Depression	Quarantined	6.61	Normal	0.103
	Non-quarantined	10.39	Mild	
Anxiety	Quarantined	7.39	Normal	0.393
	Non-quarantined	9.16	Mild	
Stress	Quarantined	9.91	Normal	0.439
	Non-quarantined	11.64	Normal	

(b) Brief-COPE

	Quarantine status	Mean rank	p-value
Humour	Quarantined	3.43	0.406
	Non-quarantined	3.90	
Religion	Quarantined	6.13	0.683
	Non-quarantined	5.91	
Avoidant	Quarantined	20.39	0.400
	Non-quarantined	21.59	
Approach	Quarantined	31.83	0.752
	Non-quarantined	31.68	

In the quarantined group (Table 3), the female students showed higher scores of depression, anxiety and stress as compared to the male students. However, they were not statistically significant (p = 0.837, 0.128 and 0.101). Between these three axes, only female anxiety was not in the normal score, shown as mild manifestation, as shown in Table 3(a[i]). Both male and female students in the quarantined group showed approach method as their favourite coping strategies during MCO, however insignificant between both genders (p = 0.371), as shown in Table 3(a[ii]).

A further comparison was carried out between pre-clinical and clinical medical students in the quarantined group. Clinical students showed higher scores of depression, anxiety and stress manifest as moderate, moderate and mild, respectively. All pre-clinical students had normal scores of depression, anxiety and stress. However, no statistical difference was found between these two groups (p = 0.139, 0.202, 0.251), as shown in Table 3(b[i]). Similarly, the majority of both groups showed the approach method as their primary coping strategy even though it was not significant (p = 0.208), as shown in Table 3(b[ii]).

Table 3: Mann-Whitney test for comparison between (a) gender and (b) phase of the clinical study for (i) DASS-21 and (ii) Brief-COPE in the quarantined group

(a[i]) DASS-21

	Gender	Mean rank	Level of severity	*p*-value
Depression	Male	5.00	Normal	0.837
	Female	6.95	Normal	
Anxiety	Male	3.00	Normal	0.128
	Female	8.32	Mild	
Stress	Male	5.00	Normal	0.101
	Female	10.95	Normal	

(a[ii]) Brief-COPE

	Gender	Mean rank	*p*-value
Humour	Male	4.25	0.104
	Female	3.26	
Religion	Male	6.00	0.772
	Female	6.16	
Avoidant	Male	20.50	0.745
	Female	20.37	
Approach	Male	35.25	0.371
	Female	31.11	

(b[i]) DASS-21

	Phase of the clinical study	Mean rank	Level of severity	*p*-value
Depression	Pre-clinical	4.95	Normal	0.139
	Clinical	14.50	Moderate	
Anxiety	Pre-clinical	6.00	Normal	0.202
	Clinical	14.00	Moderate	
Stress	Pre-clinical	8.32	Normal	0.251
	Clinical	17.50	Mild	

(b[ii]) Brief-COPE

	Phase of the clinical study	Mean rank	p-value
Humour	Pre-clinical	3.32	0.392
	Clinical	4.00	
Religion	Pre-clinical	6.32	0.384
	Clinical	5.25	
Avoidant	Pre-clinical	19.89	0.542
	Clinical	22.75	
Approach	Pre-clinical	30.79	0.208
	Clinical	36.75	

As for the non-quarantined group (Table 4), female students showed higher depression and stress scores as compared to the male students. However, only mild depression is shown. Male students had a slightly higher score for the anxiety level, which was at a mild level, as compared to the female students. However, none of the differences was significant (p = 0.291, 0.914, 0.356), as shown in Table 4(a[i]). As in their coping strategies, male students showed a significant increase in humour as compared to female students (p = 0.011). Other coping strategies were insignificant (p = 0.828, 0.954, 0.574). Similar to the previous results, the approach method was found to be their primary coping strategy, as shown in Table 4(a[ii]).

Further investigation in the clinical study group showed that clinical students scored significantly more on the stress axis as

Table 4: Mann-Whitney U test for comparison between (a) gender and (b) phase of the clinical study for (i) DASS-21 and (ii) Brief-COPE in the non-quarantined group

(a[i]) DASS-21

	Gender	Median	Level of severity	p-value
Depression	Male	9.06	Normal	0.291
	Female	10.81	Mild	
Anxiety	Male	9.22	Mild	0.914
	Female	9.14	Mild	
Stress	Male	10.56	Normal	0.356
	Female	11.98	Normal	

(a[ii]) Brief-COPE

	Gender	Median	*p*-value
Humour	Male	4.56	*0.011
	Female	3.69	
Religion	Male	5.83	0.828
	Female	5.94	
Avoidant	Male	21.56	0.954
	Female	21.61	
Approach	Male	32.17	0.574
	Female	31.53	

Note: *p-value < 0.05 at 95% confidence interval.

(b[i]) DASS-21

	Phase of the clinical study	Median	Level of severity	*p*-value
Depression	Pre-clinical	9.26	Normal	0.057
	Clinical	12.29	Mild	
Anxiety	Pre-clinical	8.55	Mild	0.222
	Clinical	10.18	Mild	
Stress	Pre-clinical	10.36	Normal	*0.028
	Clinical	13.79	Normal	

Note: *p-value < 0.05 at 95% confidence interval.

(b[ii]) Brief-COPE

	Phase of the clinical study	Median	*p*-value
Humour	Pre-clinical	3.83	0.354
	Clinical	4.02	
Religion	Pre-clinical	6.02	0.184
	Clinical	5.73	
Avoidant	Pre-clinical	21.68	0.978
	Clinical	21.45	
Approach	Pre-clinical	32.06	0.451
	Clinical	31.04	

compared to the pre-clinical students in the non-quarantined group (p = 0.028), however, both scores were still considered as normal stress level. Clinical students showed mild depression and mild anxiety as compared to the normal depression score and mild anxiety score of the pre-clinical students, but the difference was insignificant (p = 0.057, 0.222), as shown in Table 4(b[i]). The approach method was used as the primary coping strategy, but no significant difference was found between pre-clinical and clinical students (p = 0.451), as shown in Table 4(b[ii]).

DISCUSSION

Despite the increased trend shown in DASS-21 items in the non-quarantined group as opposed to the quarantined group, there was no substantial difference between these two groups in terms of depression level, anxiety and stress scores. The increased trend findings were similar in a high-quality study in which quarantined people exhibited fewer levels of mental health symptoms especially post-traumatic stress disorder (PTSD) during the outbreak than non-quarantined people (17). Unlike those who are quarantined, non-quarantined students might suffer severe psychosocial consequences because they were unable to revise and discuss their study with their colleagues. Furthermore, a recent study indicated that mental illness was more strongly linked to trait anxiety in non-quarantine conditions (18).

Brief-COPE is designed to assess effective and ineffective methods to cope with stressful life events using different subscales of humour, religion, avoidant and approach (19). In our study, there were no significant differences among quarantined vs. non-quarantined group for all four subscales to cope with COVID-19. The avoidance coping mechanism recorded in one study was an unsuccessful way to get through COVID-19 and increased the chances of depression, anxiety and stress (20).

Another study showed that COVID-19 related anxiety enticed the presence of alcohol or drug abuse, suicidal thought and a sense of hopelessness as coping strategies (21). A religious coping strategy is another method to significantly alleviate depression, anxiety and stress, where a person can find comfort, motivation and management of the emotional challenges (20).

Our study has a similar mild anxiety outcome in the quarantined group to a previous study using a cluster sampling technique conducted during the COVID-19 epidemic in China on 7,143 college students from Changzhi medical college (22). In February 2019, a systematic cross-sectional analysis was conducted on a total of 69 studies comprising 40,348 medical students that examined the prevalence of anxiety among medical students (23). In a previous report, the global prevalence rate of anxiety among medical students was high at 33.8%, even without the influence of the COVID-19 pandemic (24). The most prevalent anxiety among medical students was from the Middle East and Asia (23).

Our study showed that the quarantined clinical group had a high DASS-21 score compared to the pre-clinical group where depression and anxiety were moderate, and stress was mild. An article published in Albania found that quarantine policies had a major effect not only on university students but also on family members on the level of depression (5). Students who thought COVID-19 could cause health issues were more likely to have a high depression score using the Patient Health Questionnaire (PHQ-9) (25).

In the non-quarantined group, female students showed higher scores of depression and stress as compared to male students. This finding was similar to the pandemic study in Spain which showed women and young adults are the majority that suffers from psychological impact (26). At home, female students have always been distracted by all the social media which worry them. They feel difficulty concentrating in study

hence making them stressed out and depressive (27). Furthermore, in the Asian community, most of the house chores were more likely to be performed by the female and they are susceptible to depressive symptoms even with minor triggers (28).

Clinical medical students were more depressed, anxious and stressed as compared to pre-clinical medical students in the non-quarantined group. The reasons were believed that the clinical students were limited in meeting patients physically to hone their clinical skill, distracted with house chores, concerned about the final examination and worried about not becoming a competent doctor. They might also be afraid of inadequate university's information about lockdown status and felt bored (10). Furthermore, a previous study found that students with home-quarantine were prone to have sleep deprivation, leading to depressive symptoms (29).

In the non-quarantined group, both genders, pre-clinical and clinical students were similarly using the approach method as their primary coping strategy to overcome their problems (30). They always have their internet connection to express their feelings and emotional supports as their communication tools. Even though humour is the least coping strategy, our study demonstrated a higher significance of humour in male students. A previous study proved that this type of coping strategy was seen more in male which probably eases them in facing minor threatening situation (31). Male students were also using humour as a social skill in self-enhancing their personality (32).

LIMITATION

Since the study was only conducted among medical students at UPM, the collected data does not represent all medical students in Malaysia. Besides, the different number of students in quarantined and non-quarantined groups might cause a bias to the study. Non-quarantined students, on the other hand, might be confronted with different atmospheres at home, where some may live in more relaxed and conducive environments, while others struggle with all kinds of distractions and problems. Each clinical lecturer has their teaching hours, and due to their busy schedules, some of them may not be able to hold online classes. As a result, some students received sufficient instruction while others received only minimal instruction, putting their skills at risk. These discrepancies can influence the study's results.

FUTURE DIRECTION

There are a variety of mechanisms for supporting medical students' mental well-being and coping strategies. Counselling and support groups consisting of peers and batchmates via online medium, mentor-mentee/buddy programme between lecturer and students, physical activities such as exercise, play sport, jog or brisk walk and meditation are among them. Talking among classmates can help to relieve some of the stress, agitation and anxiety that has built up. These small support groups will act as mini-counselling session, allowing them to see that they are not alone in dealing with similar issues. In the case of a mentor/buddy programme between lecturers and students, a word of encouragement or sharing of knowledge from someone older and wiser could be beneficial. Exercising, playing sports, jogging, or taking a fast stroll are all known to release endorphins, which can make the brain feel happy. Additionally, meditation or religious exercises can be used as a coping mechanism to help medical students improve their mental health.

CONCLUSION

In conclusion, this study found higher rates of depression, anxiety and stress in the non-quarantined group compared to the quarantined group, especially in the level of stress. However, their coping strategies

remain incomparable. Furthermore, female and clinical students manifest higher mental health problem in the quarantined group.

Even though the clinical students showed significantly higher stress score as compared to the pre-clinical students, it was ranged in the higher normal stress level. The approach method was considered as a primary coping strategy in both quarantined and non-quarantined group. However, male students showed significantly higher humour as their coping strategy in the non-quarantined group.

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ETHICAL APPROVAL

The Research Ethics Committee of UPM granted the ethical approval to perform this study (Reference no. JKEUPM 2020-256).

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