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ORIGINAL ARTICLE

Psychological Trauma, Anxiety, and Depression Among University Students During First Phase of COVID-19 Movement Control Order in Malaysia

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Abstract

The authors investigated posttraumatic stress disorder (PTSD), anxiety, and depressive symptoms among university students in Malaysia during the COVID-19 pandemic lockdown in a cross-sectional study involving 375 students. Results showed that 39.5% reported PTSD symptoms, 37.3% anxiety symptoms, and 51.4% depressive symptoms. PTSD is significantly correlated with anxiety and depressive symptoms. Female students reported significantly higher PTSD and depressive symptoms. There was a significant association between race, PTSD, and anxiety symptoms. Participants who stayed at residential college (46.2%) and had underlying health problems (70%) reported having significant anxiety symptoms. A significant association between ethnicity and depressive symptoms and underlying health status was also found. The high rates of PTSD, anxiety, and depressive symptoms call for action for mental health promotion and improving mental health delivery services to higher education students in the wake of COVID-19.

Keywords COVID-19 · Anxiety · Depression · Trauma · MCO

The World Health Organization (WHO) declared COVID-19 a public health emergency of international concern (PHEIC) on 30 January 2020 (World Health Organization, 2020). The Malaysian government took inevitable steps, including imposing its first strict Movement Control Order (MCO) nationwide (Tang et al., 2020). The

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movement regulations significantly affected daily life among Malaysians. University students were no exception.

COVID-19 and Movement Control Order

The COVID-19 MCO affected higher education curriculum delivery. Various challenges were reported (Dill et al., 2020), and the impact on student mental health was evident (Kafka, 2020; Meda et al., 2021). The first MCO was implemented on March 18, 2020 (Immigration Department of Malaysia, 2020). The MCO restricted international and local travel, closed many economic and social sectors, and halted all higher education face-to-face teaching and learning activities (Prime Minister's Office of Malaysia, 2020). Subsequently, classes were conducted online. Many recent studies report that prolonged online class affected the mental health conditions of university students, including suicidal ideation (Balachandran et al., 2020), anxiety (Jehi et al., 2022), stress (Werner et al., 2021), loneliness (Faisal et al., 2021), overall mental health challenges, and well-being (Kafka, 2020; Sahu, 2020). In the Malaysian context, a few studies found that university students experienced psychological stress as a result of prolonged online classes (Azmi et al., 2022; Kumaran et al., 2022; Wong et al., 2023). For example, Azmi et al. (2022) found that online classes were associated with psychological stress and depression. Kumaran et al. (2022) attributed the high prevalence of depression and anxiety among Malaysian university students to drastic changes in online higher education delivery. The objective of this study was to determine the rates of psychological trauma, anxiety, and depressive symptoms among university students. We also attempted to determine if there are sex differences in reporting psychological trauma, anxiety, and depressive symptoms. Establishing the rates of mental health issues faced by university students can provide some perspective on the scope of their psychological struggles during MCO.

Psychological Trauma

Psychological trauma among university students was reported prior to COVID-19. Kratovic et al. (2020) reported that PTSD symptoms were associated with suicidality among 819 university students. Cusack et al. (2019) found that 34.4% of university students ($n = 2310$) met the criteria for probable PTSD as a result of various types of lifetime trauma. Studies on PTSD symptoms during COVID-19 MCO are very limited. Tang et al. (2020) reported 2.7% of students ($n = 2485$) had PTSD symptoms. However, Sun et al. (2021) found a higher rate of PTSD symptoms, in which the majority of participants in China (67.05%, $n = 1912$) reported experiencing COVID-19-related traumatic stress symptoms within the clinical range (mild or higher).

Anxiety Symptoms

MCO during the pandemic may be associated with anxiety among university students. Sun et al. (2021) found anxiety symptoms were clinically elevated among 34.73% of participants. Chang et al. (2020) reported on mental health conditions among Southern Medical University students during COVID-19. They found that 26.6% of students suffered from generalized anxiety disorder (GAD), with incidences of mild, moderate, and severe anxiety at 23.1%, 2.71%, and 0.70%, respectively.

The relationship between PTSD, anxiety, and depressive symptoms during the pandemic was strongly established among the general population (Liu et al., 2020) and health care workers (Tan et al., 2020). In the USA, Liu et al. (2020) found that 31.8% of the adult population reported symptoms of PTSD, 43.3% reported depressive symptoms, and 45.4% reported high anxiety scores. In Singapore, Tan et al. (2020) found that 14.5% of health care workers were positive for anxiety, 8.9% for depression, 6.6% for stress, and 7.7% for PTSD.

Depressive Symptoms

Prior to COVID-19, the prevalence of depressive symptoms among university students in Malaysia was high, with 15.5% of university students experiencing depressive symptoms (Ghazali et al., 2022). Findings from the MCO period are mixed. A larger study involving 7887 university students by Debowska et al. (2020) found that a higher percentage of students reported having higher depression, anxiety, stress, and suicidality during the COVID-19 pandemic in Poland. Similarly, Sun et al. (2021) found that 46.55% of students reported having depressive symptoms. However, lower prevalence in China was reported by Tang et al. (2020). They found that 9% of students under home quarantine reported having depressive symptoms.

Sex Differences

Sex differences in psychological trauma, depressive, and anxiety symptoms during the pandemic were reported. Wang et al., (2020a, 2020b) suggested that psychological impact from the pandemic was greater for females, and females experienced higher levels of anxiety. Wang et al. (2021) found that anxiety risk among females was 3.01 times that of males. Chang et al. (2020) found that female participants had higher symptoms of depression in comparison with their male counterparts ($n = 3881$). Liu et al. (2020) found that 7% of participants in Wuhan, China, experienced PTSD during the COVID-19 outbreak, of whom women were predominantly affected.

We anticipated that symptoms of mental disorders may be increased during the pandemic among university students, particularly during the MCO on and

off campus. Of the many studies reporting the prevalence of depression, anxiety, stress, and suicidality during MCO (Debowska et al., 2020; Jehi et al., 2022), only one study reported on psychological trauma among university medical students in Malaysia (Rahman et al., 2021). While anxiety and depression were documented widely during MCO, psychological trauma has not been reported in relation to the MCO experience among university students.

Method

Participants and Sample Size

A total of 319 university students voluntarily participated in this study, of whom 77.4% were female and 22.6% were male. They were recruited from nine different faculties. The majority of the participants were 19 to 23 years old (93.7%) while the rest were 24 to 28 years old (6.3%). The ethnic background was 42.3% Malay, 24.8% Indigenous Sarawak, 12.5% Indigenous Sabah, 9.7% Chinese, and 1.3% Indian. The remaining 9.4% were of other ethnicities. Any undergraduate full-time university full-time regardless of age and years of study and who can comprehend the English language were included in this study. Postgraduate, preuniversity, and part-time students, and those who could not comprehend English were excluded from this study.

The sample size was calculated using Epi Info (version 7) based on the prevalence of 17.7% (Low & Binns, 2014), public university student population size of 584,576 (Ministry of Higher Education Malaysia, 2022), worst acceptable result of 5%, and confidence level of 99%, giving a minimum required sample size of 386. The Universiti Malaysia Sarawak (UNIMAS) student population was estimated at 13,956 in 2021 (Times Higher Education, 2022); thus, 319 participants is an acceptable number.

Measures

Sociodemographic Questionnaire

The sociodemographic questionnaire required participants to answer questions related to their sex, age, ethnicity, religion, faculty (school or department), residency (staying home with family, on campus, or at a rental home outside campus), and health problem (yes or no answer).

PTSD Symptoms

PTSD symptoms were assessed using the PTSD Checklist for DSM-5 (PCL-5) (Weathers et al., 2013). PCL-5 consists of 20 questions relating to a list of lifetime traumatic events. Each question is given a score on a scale of 0–4 (0 = "not at all," 1 = "a little bit," 2 = "moderately," 3 = "quite a bit," 4 = "extremely") to indicate how much they have been bothered by that problem in the past month. Scores consist of a

total symptom severity score (from 0 to 80). Persons with scores greater than 33 are interpreted as having significant PTSD symptoms. Ghazali and Chen (2018) have established the validity and reliability of PCL-5 among Malaysian adolescents with a recommended cut-off score of 33. In the current study, Cronbach's alpha for PCL was $\alpha = 0.97$.

Anxiety Symptoms

Anxiety symptoms were measured using the Zung self-rating anxiety scale (Zung, 1971). This instrument is available for public use and covers DSM-5 anxiety disorder symptoms. This scale consists of 20 questions scored on a scale of 1–4 (1 = "none or a little of the time," 2 = "some of the time," 3 = "a good part of the time," and 4 = "most of the time"). Total scores range from 20 to 80. A score of 20 to 44 is interpreted as "the normal range," a score of 45–59 is interpreted as "mild to moderate anxiety levels," a score of 60–74 is interpreted as "marked to severe anxiety levels," and a score between 75 and 80 is interpreted as "extreme anxiety levels." In the most recent study, a cut-off score of 39 was recommended to identify the presence of anxiety disorders (Dunstan & Scott, 2020). In the current study, Cronbach's alpha for this instrument was $\alpha = 0.88$.

Depressive Symptoms

Depressive symptoms were measured by Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001). PHQ-9 consists of 10 questions related to DSM-5 depressive symptoms in the duration of the past 2 weeks. Participants must choose on a scale of 0–3 (0 = "not at all," 1 = "several days," 2 = "more than half the days," 3 = "nearly every day") for questions 1 to 9. Using a cut-off point of ≥ 10, the PHQ-9 has a sensitivity of 88% and a specificity of 88% for the detection of major depression (Kroenke et al., 2001). The construct validity of PHQ-9 was established with PCL-5 (Ghazali & Chen, 2018). In the current study, Cronbach's alpha for PHQ-9 was $\alpha = 0.92$.

Procedure

Data collection was done from 1 to 23 May 2020. The participants were briefed regarding research objective, issues related to confidentiality, and participant rights. Questionnaires were distributed once the consent form was signed. This study was approved by the Faculty of Medicine and Health Sciences UNIMAS Ethics Committee.

Analysis

Descriptive analysis was performed for sociodemographic characteristics of the students, prevalence of PTSD, anxiety, and depressive symptoms. A chi-square test was conducted to select significant independent variables for comparison in addition

to the association between sociodemographic characteristics, PTSD, anxiety, and depressive symptoms. A regression analysis was conducted to examine if any variable serves as a significant predictor for psychological trauma or PTSD, anxiety, and depressive symptoms.

Results

Demographic Characteristics and Descriptive Data

Of the 375 students who received the questionnaire, only 319 (75%) responded. The majority of the students were females (77.4%) and Malays (42.3%) and had no health problems (90.6%). The remaining sociodemographic characteristics are shown in Table 1; 39.5% ($n=126$) reported having PTSD symptoms when using PCL-5 ≥ 33 cut-off score; 37.3% ($n=119$) reported having anxiety symptoms when using ≥ 39 Zung's Anxiety Scale cut-off score; 51.4% ($n=164$) reported having depressive symptoms when using >9 PHQ-9 cut-off score.

PTSD was strongly and significantly correlated with depressive symptoms, $r=0.868$, $n=319$, $p<0.001$. Similarly, PTSD was also strongly and significantly correlated with anxiety symptoms, $r=0.740$, $n=319$, $p<0.001$. A chi-square test of independence was performed to examine the association between sex and PTSD symptoms. The association between these variables was significant, χ^2 (1, $N=319$) $=4.15$ $p<0.05$. Female students (42.5%) were more likely to report PTSD symptoms compared to male students (29.2%). There was a significant association between ethnicity and PTSD symptoms ($\chi^2=19.45$, $p<0.001$). Indigenous Sarawak (46.8%) reported the most PTSD symptoms, followed by Malays (45.9%), Indigenous Sabah (35%), others (33.3%), Indians (25%), and Chinese (6.5%). Similarly, there was a significant association between student health status and PTSD symptoms ($\chi^2=10.23$, $p<0.001$). Those with underlying physical health problems reported having more PTSD symptoms (66.7%).

There was a significant association between ethnicity and anxiety symptoms ($\chi^2=14.18$, $p<0.01$). Malays (45.2%) exhibited more anxiety symptoms as compared to other ethnic groups. This was followed by Indigenous Sabah (37.5%), Indigenous Sarawak (36.7%), others (33.3%), Indians (25%), and Chinese (9.7%). Similarly, a significant association was found between residency and anxiety symptoms ($\chi^2=9.35$, $p<0.01$), and underlying health problems ($\chi^2=15.14$, $p<0.001$). Those who stayed at a residential college (46.2%) and had underlying health problems (70%) reported having more anxiety symptoms.

There was a significant association between sex and depressive symptoms, with female students showing a significantly higher percentage of depressive symptoms ($\chi^2=7.20$, $p<0.01$). Similarly, a significant association between ethnicity and depressive symptoms was found, with Indigenous Sarawak showing a significantly higher percentage of depressive symptoms than other ethnic groups ($\chi^2=11.68$, $p<0.05$). Those who had underlying health problems reported having significant depressive symptoms ($\chi^2=6.37$, $p<0.05$).

Table 1 Sociodemographic characteristics of the participants ($N=319$)

Sociodemographic characteristics	*n*	%
Gender		
Male	72	22.6
Female	247	77.4
Age		
19–23 years old	299	93.7
24–28 years old	20	6.3
Religion		
Islam	183	57.4
Christian	116	36.4
Buddhist	17	5.3
Hinduism	3	0.9
Race		
Malay	135	42.3
Bumiputera Sarawak	79	24.8
Bumiputera Sabah	40	12.5
Chinese	31	9.7
Indian	4	1.3
Others	30	9.4
Faculty		
Faculty of Resources Science & Technology	54	16.9
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Faculty of Cognitive Sciences & Human Resources	51	16.0
Faculty of Engineering	49	15.4
Faculty of Computer Science & Information Technology	32	10.0
Faculty of Social Sciences & Humanities	29	9.1
Faculty of Language & Communication	26	8.2
Faculty of Applied & Creative Arts	22	6.9
Faculty of Built Environment	2	0.6
Residency		
Residential college	145	45.5
Stay at home	142	44.5
Non-college resident	32	10.0
Underlying health problems		
Yes	30	9.4
No	289	90.6

Regression Analysis

A regression analysis examining the relationship between PTSD symptoms, sociodemographic data, and other psychological symptoms was conducted. The model accounted for a significant amount of variance in PTSD scores ($R^2=0.05$, $F(6,$

304) = 2.42, $p < 0.05$) with only health problems a significant predictor for the model, $t = 3.14$, $p < 0.01$. The significance of the model increased when other psychological problems such as anxiety and depressive scores were included ($R^2 = 0.59$, $F(8, 302) = 54.42$, $p < 0.001$). Total anxiety and depressive scores were significant predictors for PTSD symptoms, $t = 11.247.16$, $p < 0.001$ and $t = 4.83\ 3.96$, $p < 0.001$ respectively.

Similarly, the model accounted for a significant amount of variance in anxiety scores ($R^2 = 0.08$, $F(6, 304) = 4.28$, $p < 0.001$) with only health problems a significant predictor for the model, $t = 3.71$, $p < 0.001$. The significance of the model increased when other psychological problems, i.e., depressive and trauma scores were included ($R^2 = 0.53$, $F(8, 302) = 41.96$, $p < 0.001$). Total depressive symptoms and trauma scores were significant predictors for anxiety symptoms, $t = 7.48$, $p < 0.001$ and $t = 4.83$, $p < 0.001$ respectively.

The model accounted for a significant amount of variance in depressive symptoms scores ($R^2 = 0.06$, $F(68, 30418) = 3.47$, $p < 0.001$) with health problems and residency as the significant predictors, $t = 3.51$, $p < 0.001$ and $t = 2.25$, $p < 0.05$ respectively. The significance of the model increased when other psychological issues, i.e., anxiety and trauma scores were included ($R^2 = 0.64$, $F(8, 302) = 65.65$, $p < 0.001$). Total anxiety and trauma scores were significant predictors for PTSD symptoms, $t = 7.048$, $p < 0.001$ and $t = 11.247$, $p < 0.001$ respectively.

Discussion

This is a cross-sectional study surveying symptoms of PTSD in relation to anxiety and depressive symptoms among university students during the COVID-19 MCO. We also surveyed whether PTSD, anxiety, and depressive symptoms are associated with other sociodemographic factors.

PTSD Symptoms

We found that 39.5% of students have PTSD symptoms. Previous studies have shown a dramatic range in prevalence of PTSD symptoms, from 2.9% (Tang et al., 2020) to 67% (Sun et al., 2020). Our study falls squarely in the middle of that range. One notable difference is that Sun et al. (2021) used different instruments. They used the Impact of Event Scale (IES) which only measures two DSM-5 PTSD symptoms (intrusion and avoidance) and omits the two other symptoms (negative alteration cognition and hyperarousal). This might contribute to the elevated PTSD prevalence in their study. Meanwhile, Tang et al. (2020) used the PTSD Check List–Civilian Version (PCL-C) consisting of 17 items. They used a significantly higher cut-off score of 38 in defining positive PTSD symptoms in comparison with our cut-off score of 33. Tang et al. (2020) also surveyed only home-quarantine students while the current study surveyed students who stayed at home as well as in college and other types of residencies such as a rental home. Perhaps this explains why their findings were so much lower in comparison with

the current study. Staying at home with the support of family members may have made it easier to manage an individual's psychological health (Lai & Ma, 2016).

Although facing an infectious disease does not qualify as DSM-5 Criterion A (exposure to a life-threatening event; APA, 2013) PTSD diagnosis, a few studies have shown that the COVID-19 experience can be traumatizing for some populations (Bridgland et al., 2021; Sun et al., 2021) and we suggest that university students are not an exception. Zhang et al. (2020) postulate that death anxiety had a significant predictive effect on PTSD symptoms in their study. Meanwhile, Bridgland et al. (2021) suggested that three significant risk factors had significantly predicted PTSD symptoms in their study: financial stress due to COVID-19, perceived COVID-19 threat, and societal stigma. Financial stress has been reported to be highly prevalent among Malaysian university students (Bahar et al., 2021). Meanwhile, COVID-19-related self-stigma was strongly associated with PTSD among the community who had recovered from COVID-19 infection (Mahmoudi et al., 2021).

Anxiety Symptoms

Results showed that anxiety is high (37.3%) which is consistent with the previous studies (Liu et al., 2020; Sun et al., 2021). Although the prevalence is lower than PTSD and depression symptoms, anxiety symptoms are higher than a previous study conducted before COVID-19 among Malaysian university students, where the prevalence of anxiety was 29% (Mohamad et al., 2021). Although Sun et al. (2021), Chang et al. (2020), and Mohamad et al. (2020) used the GAD-7 scale to measure predominantly generalized anxiety disorder symptoms, we surveyed symptoms of anxiety using Zung's scale without specifying anxiety disorder categories.

Anxiety disorders were often the most prevalent disorders reported in comparison with other psychological disorders prior to COVID-19 (e.g., Baxter et al., 2013). However, in this study, anxiety symptoms are lower. In addition, GAD is only a type of anxiety disorder; findings that report a higher prevalence of GAD among university students might indicate emerging mental health concerns among university students. Abdullah (2020) indicated that there is a rising prevalence in students seeking counselling during the MCO period. These included cases of anxiety due to multiple factors, including living in isolation, not being able to see family, worrying about the well-being of family members, and concern about the effect of the MCO on study plans. Perhaps surveying anxiety disorders along with several subscales such as GAD, social anxiety, agoraphobia, and other subtypes of anxiety disorders in a single study would be more useful to understand the different prevalence of anxiety disorders during the pandemic. We do not rule out the possibility that GAD could be significantly more prevalent in comparison with other types of anxiety disorders. Different disorders warrant different treatments (Abbing et al., 2018; Dindo et al., 2017).

Depressive Symptoms

We also found that 51.4% of participants reported having depressive symptoms. According to the PHQ-9 manual, these students should seek professional help. Sun

et al. (2021) reported a similar prevalence among their students; 46.55% had depressive symptoms during COVID-19. This finding is a lot higher than the study conducted before COVID-19 among Malaysian university students; Nahas et al. (2019) found that 36.4% of 425 had depressive symptoms.

Although different studies used different instruments to measure depression, it has been established that the COVID-19 pandemic resulted in a significantly higher prevalence of depression (e.g., Debowska et al., 2020; Sun et al., 2021). Our data were collected during the first phase of MCO. All students were required to isolate themselves and most movements were restricted. Social isolation and loneliness significantly increased depression among adolescents (Loades et al., 2020) and university students (Hamza et al., 2021). An interesting finding by Hamza et al. (2021) indicated that even students without pre-existing mental health problems were more likely to show declining mental health. They attribute this decline to the increased social isolation during COVID-19, and we speculate that enforcement of the MCO is the most likely proximate cause for the increasing prevalence of depression in this study.

PTSD in Correlation with Anxiety and Depressive Symptoms

This study replicates findings from previous research among the general population as well as university students. PTSD was significantly and strongly correlated with depressive and anxiety symptoms before the pandemic (Kratovic et al., 2020; Liu et al., 2020; Rahman et al., 2021; Sun et al., 2021). The correlation between PTSD, anxiety, and depressive symptoms remained the same during the pandemic. Those who reported PTSD symptoms indicated depressive and anxiety symptoms too. During the initial phase of the pandemic, students faced unclear policies and communication with a multitude of rumors and uncertainties that amplified their psychological distress (Tang et al., 2020).

Fear and anxiety are common emotions in response to a crisis to protect the self from danger. Given the contagious nature of COVID-19, students may have been afraid they would be infected and infect others, further triggering feelings of guilt. The long incubation period and restriction of contact with others to mostly online platforms increased the feeling of loneliness which is believed to be the mediator between MCO and depression (Moeller & Seehuus, 2019). PTSD is highly comorbid with depression and anxiety, showing that the longitudinal mental health changes after the pandemic might be complicated. Therefore, more studies are needed to provide insight and continuously monitor the psychological impact of the pandemic among university students.

PTSD, Sex, and Other Sociodemographic Factors

Our findings indicated that female students had a higher prevalence of PTSD and depressive symptoms than their male counterparts. This is consistent with other studies despite different trauma types (Castillo et al., 2014; King et al., 2013). Males and females respond to trauma experiences differently (Pooley et al., 2018). Females

manifest a more depressive-like phenotype compared to males who show more internalized symptoms (e.g., feeling sad, anhedonia, and loss of interest).

We found that those who had underlying health issues had a higher percentage of PTSD symptoms in comparison with those who did not. This finding is consistent with Zhang et al. (2020), who found that PTSD risk factors were significantly associated with poor health status. An epidemiologic study of a general adult population found that PTSD was associated with poor physical health conditions including cardiovascular, gastrointestinal, and musculoskeletal diseases (Pietrzak et al., 2012). The individual with physical health issues is reported to more frequently re-experience symptoms which is one of the key PTSD symptoms criteria (Berkman et al., 2022).

We also found that certain ethnic groups reported a significantly higher percentage of PTSD and anxiety symptoms. Indigenous Sarawak (46.8%) reported the highest percentage of PTSD symptoms, followed by Malays, Indigenous Sabah, others, Indians, and Chinese (6.5%). This is consistent with our previous study on psychological trauma among university students before the COVID-19 pandemic. Ghazali et al. (2022) investigated 1767 university students and found that certain ethnic groups had a significantly higher percentage of PTSD symptoms compared to others. Those findings showed that the Iban ethnic group (the largest of the Indigenous Sarawak ethnicities) had the highest prevalence of PTSD (13.8%), followed by other ethnic groups (12.4%), Malays (11.5%), Bidayuh (11.0%), and Chinese (4.6%). They also argued that the lower reported prevalence of PTSD might be due to a common cultural trait among ethnic Chinese of being reserved about disclosure of mental health issues due to perceived stigma (Ghazali et al., 2022). This notion has been supported by Stefanovics et al. (2016) that ethnic Chinese are reluctant to share their mental health issues with outsiders. On this understanding, the experience of traumatic events may be substantially underreported among ethnic Chinese Malaysians. A qualitative investigation may be pursued to study traumatic experiences among this population to explore cultural differences surrounding the meaning of psychological trauma.

Anxiety Symptoms, Sex, and Other Sociodemographic Factors

Malays, Indigenous Sabah, and Indigenous Sarawak ethnic groups reported having a high prevalence of anxiety symptoms. Similarly, Indigenous Sarawak and Malays showed a significantly higher percentage of depressive symptoms, while ethnic Chinese had the lowest anxiety and depressive symptoms. This result is inconsistent with a study on the psychological impact of COVID-19 among university students in Malaysia by Irfan et al. (2021), who reported that Chinese ethnicity was a risk factor for anxiety. Meanwhile, Sundarasen et al. (2020) reported no ethnic differences in anxiety symptoms in a study on the psychological impact of COVID-19 among university students in Malaysia. The reasons for these differences are not well-understood. There is no study to date that describes why the prevalence of anxiety disorders or other mental disorders is varied among the different ethnic groups in Malaysia, particularly among university students. Further investigation should be

conducted to understand the role of culture in association with certain mental disorders. For example, Hwang and Ting (2008) suggested that certain aspects of cultural identity are significantly associated with the expression of certain anxiety disorders. Recognizing these differences might help to approach different ethnic groups with more appropriate and culturally relevant methods to recognize mental disorders and ways to help them.

Depressive Symptoms, Sex, and Other Sociodemographic Factors

Female students were also found to have a higher percentage of depressive symptoms in comparison with their male counterparts. Many previous studies indicated that females reported a significantly higher percentage of depressive symptoms. For example, Kassim et al. (2021) studied a Malaysian population and found that females below 25 years old had significantly higher levels of depression, anxiety, stress, and fear of COVID-19 compared to males. A study on the psychological impact of the COVID-19 pandemic on mental health among medical students in Malaysia reported that female students were more vulnerable to depression and other mental health issues compared to male students in the initial model, although there was no gender difference in the final model of hierarchical multiple linear regression analysis (Rahman et al., 2021). García-Fernández et al. (2021) found that the pandemic has been a significant stressor, with higher levels of fear and isolation affecting women more than men. The current findings support sex differences in stress response systems as suggested by Bangasser and Wicks (2017). Evidence of sex variations in stress response systems supports this sex bias, with females having higher endocrine, affective, and arousal responses to stress in general, as well as being more prone to social isolation (Spagnolo et al., 2020).

Our findings also indicated that students who stayed in residential colleges had a higher prevalence of anxiety compared to those who stayed at home. Living separately from family members and other support systems during lockdown can indeed induce excessive feelings of anxiety and fear among university students. Kalok et al. (2020) found that undergraduates who received family support showed higher mental well-being. Similarly, continuous support from family members especially parents or siblings is significantly associated with a lower prevalence of emotional problems among undergraduate university students even before the pandemic in Malaysia (Mohd Sidik et al., 2003). Cao et al. (2020) studied the psychological impact of the COVID-19 pandemic on university students in China suggested that living with parents is a protective factor against anxiety. The possible psychological impacts of living away from home during the pandemic include worries about family members' health and well-being at home, loneliness, and a sense of isolation compounded by the physical and social distancing required by the MCO. Our results indicated that during the MCO, students who stay in college and are separated from their family members do need more emotional support from the university.

We also found that students who have existing health problems reported a higher prevalence of anxiety symptoms. Similar findings by Hu et al. (2020) showed that people with chronic physical or mental illness were more susceptible

to psychological impact during the pandemic as they feared their symptoms may appear like the symptoms of COVID-19. In other words, fear of COVID-19 could be mediated by their existing medical conditions. In a recent study, Koçak et al. (2021) found that the effect of COVID-19 fear is stronger for those who have an underlying illness and for those whose friends or family became ill or died because of COVID-19. This fear is not without basis; substantial literature has reported the greater risk of COVID-19 complications and fatalities among those who have existing medical problems (e.g., Sanyaolu et al., 2020).

Regression analysis data indicated that the significance of the model increased when anxiety and depressive symptoms were included in the model. This sheds light on the complex dynamics within these psychological issues. Yang et al. (2017) examined the longitudinal relationship between PTSD, anxiety, and depression, indicating the predictive relationship between these variables. Marthoenis et al. (2019) found that individuals with higher depression scores were more likely to experience elevated levels of anxiety and report a history of trauma and PTSD symptoms. Understanding the relationship between PTSD, depression, and anxiety highlights the importance of comprehensive assessment and integrated treatment approaches targeting psychological issues. Longitudinal studies tracking the temporal sequence of these variables can provide valuable insights into the causal pathways and identify mediators or moderators to understand the complex interplay between these psychological constructs.

Limitations of Study

The sample size was limited due to many students having difficulty accessing the internet. This study did not include the source of traumatic events in their life; thus, any attempt to attribute PTSD symptoms to the COVID-19 experience is not feasible. However, we strongly believe that our study provides some preliminary data on psychological trauma in relation to anxiety, depression, and sociodemographic background like ethnicity among our university students despite these two limitations. This study might be the first to correlate PTSD, anxiety, and depression during COVID-19 among Malaysian youth.

Implications for Counselling and Future Directions

There are a few implications for counselling practitioners. Therapeutic resources for mental health services to those who are affected should be made available online and face-to-face. With these options, students are more comfortable to choose different modes of counselling services. Wang et al., (2020a, 2020b) discovered that online service can help reduce self-stigma, stigma by close others, and those who have communication competence issues among university students. Options for face to face as well as online services improve help-seeking behavior and their attitudes towards professional services (El-Hachemet al., 2023). Second, the prevalence of mental health problems is higher following the

prolonged COVID-19 pandemic because of various changes in university students' lives. The increasing prevalence can lead towards overwhelming demand for counselling services on campus.

We recommend more online and face-to-face group counselling be provided as treatment options to the students. A web-based group psychotherapy has been shown to help university students with anxiety and depression (Bantjes et al., 2021). More mental health promotions and programs are recommended not only to the students, but also to parents, guardians, and family members. Ongoing mental health promotion and psychoeducation can be useful to further support students going through various mental health challenges.

Future researchers should focus on two major issues: first, the long-term mental health impact on student mental health including psychological trauma caused exclusively by the COVID-19 experience. Second, qualitative research approaches such as focus groups can address issues related to COVID-19 trauma symptom reduction. This is particularly important to gain an in-depth understanding of their mental health issues that can be used for psychological treatment plan recommendations and options. The need to continuously investigate the mental health situation of our university students qualitatively has been described by David et al.'s (2022) research findings. Although the purpose of the study was to investigate the mental health aspect of the university students, issues related to the other aspect of life emerged, and they felt that the pandemic created uncertainties about their career and education. Qualitative research provides richer knowledge and in-depth information for researchers and practitioners.

Conclusion

The present study indicated that the COVID-19 MCO has impacted the mental health of university students in Malaysia, with a high prevalence of PTSD, anxiety, and depressive symptoms. Female students had a significantly higher prevalence of PTSD and depressive symptoms than male students. Students who reported PTSD symptoms also reported having anxiety and depressive symptoms. We found that PTSD and anxiety symptoms were significantly higher among certain ethnic groups. Students staying in residential colleges who had underlying health problems reported having more anxiety symptoms. A significant association was found between ethnicity and depressive symptoms and their underlying health status. The high prevalence of PTSD, anxiety, and depressive symptoms among university students calls for urgent action from agencies related to the Higher Education Ministry, especially in the departments of student affairs and student services. Treating PTSD symptoms and anxiety or depressive symptoms require a different approach. Overall, this study provides information on mental health promotion and group intervention for the improvement of mental health delivery services to higher education students.

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Declarations

Conflict of Interest The authors declare no competing interests.

Disclaimer This article has not been published elsewhere and has not also been submitted simultaneously for publication elsewhere and there is no conflict of interest.

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