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Anxiety and its Associated Factors among Bumiputera Students in A Public University During COVID-19 Pandemic

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Abstract

The coronavirus disease 2019 (COVID-19) is still infecting the world population even after mass vaccination programs are being conducted by most countries. Countries in the world have their own measures to curb and control the spread of the virus. Both the COVID-19 pandemic and measures of its control have negatively affected the mental health of the citizens. Among the affected citizens are the university students who are facing great challenges due to both pandemic and their academic lives. This study aimed to investigate anxiety and its associated factors among Bumiputera students in a public university. The online questionnaire was distributed via Google form from 13th August 2021 until 12th September 2021. Descriptive analysis was conducted to determine the anxiety levels among Bumiputera students. Independent-samples t-test or one-way analysis of variance (one-way ANOVA) was conducted to determine which socio-demographic characteristics (academic characteristics, psychosocial characteristics, open and distance learning (ODL) challenges, and COVID-19 related factors) were significantly associated with anxiety. The anxiety levels of Bumiputera students differed significantly by gender, state region of family residence, subject of study, and current semester status. In comparison to students who did not experience the situations, students who experienced unstable internet, an abundance of assignments, delays in submitting assignments due to internet access, shared laptops with family members, computer crash issues during ODL, insufficient computer competency, insufficient preparation for ODL, problems catching up on difficult online courses, difficulty of covering difficult online courses, inconducive environment for ODL, financial difficulties, and family commitment had statistically significant higher anxiety. Worries about COVID-19's impact on future career, barriers to interaction with lecturers, decreased social interaction, and depressive thoughts had a significant effect on anxiety. The findings also revealed statistically

significant differences in anxiety across quarantine experience, close family infected with COVID-19, and sleep problems.
Keywords: COVID-19 Pandemic, Anxiety Level, Bumiputera Students, Public University, Open and Distance Learning.

Introduction

COVID-19 pandemic became an outbreak worldwide after the World Health Organization (WHO) recognized it as such on 12th January 2020. In Malaysia, the first case of COVID-19 was detected on 25th January 2020, which was traced back to three Chinese citizens who previously had close contact with an infected person in Singapore (Bernama, 2020). The first Malaysian with COVID-19 was confirmed on 4th February 2020 when a 41-year old man returned from Singapore and started to develop fever and cough. He was then quarantined at Sungai Buloh Hospital, Selangor ("[Breaking] 3 Coronavirus Cases Confirmed in Johor Baru," 2020). Every country had its own measures to curb the transmission of this infectious fatal disease. To break the transmission by restricting movement and contact, the Malaysian Government imposed the first Movement Control Order (MCO) starting on 18th March 2020 and extended to 3rd May 2020. The MCO imposed stay-at-home orders, banned outdoor activities (including interstate travel), and shut down all businesses except a few designated essential services and the natural resource sectors (Lim, 2020). It was then followed by stages of MCO by phases. In Malaysia, during the data collection period (13th August 2021 – 12th September 2021) and when the report was written in October 2021, there were 4,979 COVID-19 cases on 31st October 2021, including 37 deaths, as reported by the Ministry of Health (MOH) (Ministry of Health Malaysia, 2022). Between 26th August 2021 and 31st October 2021, there was a decreasing trend of daily confirmed COVID-19 cases, as shown in Figure 1. Between these dates, the lowest reported daily COVID-19 cases was 4,782 on 25th October 2021, while the highest was 24,599, reported on 26th August 2021, as shown in Figure 1.

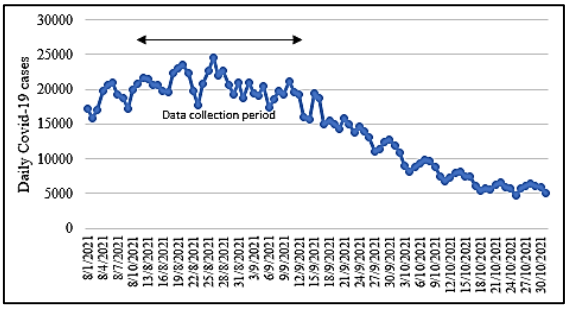

Figure 1: Daily COVID-19 Cases in Malaysia from 1st August–31st October 2021
Source: (Ministry of Health Malaysia, 2022).

In Malaysia, there were three waves of the COVID-19 cases when this research report was written. The first COVID-19 wave lasted from 25th January to 16th February 2020, while the second wave occurred between 27th February 2020 to 30th June 2020. The current third wave began on 8th September 2020, as reported by MOH Malaysia. It did not indicate that the COVID-19 outbreak had ended even though the daily number of COVID-19 cases showed a decreasing trend since 26th August 2021. According to Rampal and Boon Seng (2021), the flattening of the curve does not mean eradication of the disease as the COVID-19 virus is still infecting the people.

The situation also challenged the educational sector worldwide. Educators were forced to shift from classroom mode of learning to an online mode. Many academic institutions had no option but to shift entirely to online teaching and learning (Dhawan, 2020). Limited availability of devices was an obvious obstacle to support online learning. Findings from a survey by the Ministry of Education (MOE) involving close to 900,000 students indicated that 37% of students did not have any appropriate devices (Lim, 2020). Even if a household has a personal computer, many would have to share it with other household members for work or study. Online learning among teachers and students made teaching and learning more challenging during the pandemic due to inadequate equipment, non-conducive learning environments, and lack of familiarity with digital technologies (Hawati et al., 2020). According to Sia and Abbas Adamu (2021), the effect was more severe in East Malaysia due to poor internet connectivity for online learning. During disease outbreaks, unexceptionally COVID-19 pandemic, community anxiety could rise following many deaths, increased media reporting, and an escalating number of new cases (Rubin and Wessely, 2020). With regards to students and lecturers, e-learning obstacles could even increase anxiety to a higher level. It is apparent that students, faculty members, and staff of institutions of higher education (IHEs) cannot escape the psychological and social impacts of the pandemic, and therefore, it is crucial for IHEs to take necessary steps to build resilience and to cope with such damaging consequences of the pandemic (Centers for Disease Control and Prevention (CDC), 2020). A study by Grubic (2020) suggested that there is a necessity for studies investigating the impact of COVID-19 on students' mental health and the need for immediate interventions.

Due to this continually infectious COVID-19 virus, it is still relevant to study the severity of anxiety among Bumiputera university students, and therefore, the present study was conducted. The main objective of this study was to determine the level of anxiety among Bumiputera university students in Malaysia during the COVID-19 pandemic. The study determined the associated socio-demographic characteristics, academic characteristics, ODL challenges, psychosocial characteristics, and COVID-19-related factors that cause anxiety among students.

Research Questions

The present study hoped to answer the following research questions:

(i) What is the anxiety level of Bumiputera students during the COVID-19 pandemic?

(ii) How does anxiety differ for each (a) socio-demographic characteristic, (b) academic characteristic, (c) ODL challenges, (d) psychosocial characteristic, and (e) COVID-19 related factors?

Scope of the study

The scope of the study was full-time Bumiputera students that were pursuing studies at diploma and bachelor degree levels from different fields of studies in a public university during the academic session of March 2021–August 2021. The students were still undergoing ODL either on campus or at home. However, most of the students were undergoing ODL at their parents' homes.

Significance of the study

The COVID-19 pandemic had triggered mental health crises around the world. The crisis was also unexceptional in Malaysia, particularly anxiety disorder. Therefore, it was significant

and relevant to study factors that contribute to anxiety among Bumiputera students in a public university.

Literature Review

The COVID-19 pandemic had significantly affected the higher education sector in Malaysia for which multiple challenges in teaching and learning were faced by both lecturers and students (Sia and Adamu, 2021). The continuous spread of the pandemic, strict isolation measures and delays in starting schools, colleges, and universities across the country had influenced the mental health of college students in China (Cao et al., 2020). Measures such as lockdowns, strict isolation, social distancing, emergency remote teaching and learning, and uncertainty in commencement of schools, colleges, and universities had significant implications on the students' socio-psychological well-being and anxiety levels, even though such measures primarily reduced the outbreak of COVID-19 in Malaysia (Sundarasen et al., 2020). Cao et al (2020) concluded that 0.9% of 7,143 college students in China experienced severe anxiety, 2.7% had moderate anxiety, and 21.3% had mild anxiety, and identified living in urban areas, family income stability, and living with parents as protective factors against anxiety while having relatives or acquaintances infected with COVID-19 was a risk factor for increasing the anxiety of college students in the country. Using Zung's self-rating anxiety scale (SAS), the study by Sundarasen et al. (2020) concluded that out of the 983 university students in Malaysia, 20.4% experienced minimal to moderate anxiety, 6.6% experienced severe anxiety, and 2.8% experienced the most extreme levels of anxiety. Odriozola-González et al. (2020) found that the anxiety was higher among students compared to that among the general population, whereby 21.34% university students in Spain showed extremely severe anxiety symptoms. Self-reported symptoms of anxiety during pandemic were higher compared to those reported in general before the pandemic (Burkova et al., 2021).

A study from a global perspective of 23 countries showed women had higher levels of anxiety compared to men during COVID-19 outbreak (Burkova et al., 2021). Sundarasen et al (2020 found that factors such as female gender, age below 18 years, age 19 to 25, pre-university level of education, management studies, and staying alone were significantly associated with higher levels of anxiety. It was also concluded that financial constraints, remote online teaching and uncertainty about the future with regard to academics and career as the main stressors of anxiety among university students in Malaysia. Effects on economy, effects on daily life, as well as delays in academic activities, were positively associated with anxiety symptoms while social support was negatively correlated with the level of anxiety (Cao et al., 2020). Other stressors identified were effects of the disease on education and potential jobs (G. Wang et al., 2020), sensational broadcasts and inaccurate news reports (Ayittey et al., 2020), students' place of residence, family income stability (Peng et al., 2012), and reduced social interactions (Xiao et al., 2020). In addition to academic and professional uncertainty, financial insecurity was contributing to the rise of depression and anxiety among university students (Islam et al., 2020).

Anxiety was negatively associated with satisfaction towards online learning (Heckel and Ringeisen, 2019). A study by Saadé et al (2017) reported 30% of students seemed to experience some sort of anxiety with online courses. Son et al (2020) reported that transition to online classes, particularly the concerns about sudden changes in the syllabus, the quality of the classes, technical issues with online applications, and the difficulty of learning online

were some challenges faced by college students in the United States. Due to social distancing and lack of physical interactions with other colleagues, students also worried about their progress in research and class projects, uncertainty about their grades under the online learning environment, reduced motivation to learn, tendency to procrastinate, increased efforts to catch up with online classes and class projects with the lack of in-person support from instructors or teaching assistants, increased volume and difficulty of assignments and difficulty in covering the remainder of coursework. Saadé et al (2015) viewed anxiety in online learning as a feeling of fear from misuse of information technology compromising course performance.

Important reasons for the potential increase in anxiety include the fear of becoming infected with COVID-19, social isolation, changes in daily lives, feeling of loneliness, job losses, financial difficulty, and grief over the death of loved ones (Pietrabissa and Simpson, 2020). A current study by Mertens et al (2020) concluded that health anxiety, regular media use, social media use, and risks for loved ones as four predictors for the fear of COVID-19. Lockdowns or quarantines are necessary as protective measures for physical health (C. Wang et al., 2020). However, it could be detrimental with prolonged impositions of lockdowns or quarantines (Germani et al., 2020).

A study by (Shanmugam et al., 2020.) postulated that improvement of mental health could be achieved with compliance and supervision of medication, strengthening of family support, and reduction in substance-related psychiatric disorders. Strategies such as maintaining a healthy lifestyle and social contacts, acceptance of anxiety and negative emotions, fostering self-efficacy, and information on where to get medical treatment if needed seemed of help to protect from psychological distress, anxiety, and depression (Petzold et al., 2020). Vulnerable groups of individuals such as patients infected with COVID-19, those financially impacted, and those feared of COVID-19 infection were more likely to have higher levels of psychological distress and these individuals should be supported for their mental wellbeing (Moni et al., 2021).

Research Methodology

Study population

A cross-sectional study was conducted to investigate the level of anxiety among Bumiputera students in a public university in Malaysia during COVID-19 pandemic and the Movement Control Order (MCO) period. The study population was full-time diploma and bachelor degree students from seven different faculties who were pursuing study in three campuses of the university. The participants were sampled from diploma and bachelor degree students who were pursuing studies in semester two and higher in the university during the academic session of March 2021–August 2021.

Sampling technique

Samples were selected using quota sampling. Quota sampling is a non-probabilistic version of stratified sampling (Quota sampling, 2021). Participants were selected from diploma and bachelor degree study levels studying in semester 2 and higher during the academic session of March – August 2021 from each of the seven faculties in the university; Academy of Language Studies (APB), Faculty of Communication and Media Studies (FKPM), Faculty of Business Management (FPP), Faculty of Hotel Management and Tourism (FPHP),

Faculty of Accountancy (FPN), Faculty of Computer Science and Mathematics (FSKM), and Faculty of Arts and Design (FSSR).

Study instrument

The research instrument used in this study was an online questionnaire that included: (1) socio-demographic and academic characteristics such as gender, age, field of study, level of study, current semester status, family residence, family resided state region, previous education background, and previous semester Cumulative Grade Point Average (CGPA), (2) challenges in open and distance learning (ODL), (3) COVID-19 related factors, and (4) Generalized Anxiety Disorder-7 (GAD-7) comprising of seven items to measure anxiety level (Spitzer et al., 2026).

Data Collection

Data was collected from 13 August to 12 September 2021 using online survey via Google Docs Form. The online survey was distributed to students via WhatsApp messages, with two to three reminders. During this period of time, students were still continuing their ODL mostly at their parents' homes.

Data Analysis

Data gathered was analyzed using Statistical Package for Social Sciences (SPSS) Version 26.0. An analysis of descriptive statistics was conducted to illustrate the anxiety level among Bumiputera students. Independent-samples t test and one-way analysis of variance (ANOVA) were used to evaluate the significant differences between socio-demographic characteristics, academic characteristics, ODL challenges, psychosocial characteristics, and COVID-19 related factors against the anxiety level during the COVID-19 pandemic.

Results

Participants' demographic analysis

A total of 811 responses were received for this study. After data cleaning, it was found that only 809 responses were usable for the study. The socio-demographic and academic characteristics of the participants are shown in Table 1.

Table 1
Socio-Demographic and Academic Characteristics of the Participants.

Socio-demographic and academic characteristics	Categories	Frequency	Percent
Gender	Male	191	23.6
	Female	618	76.4
Age	Below 20 years	251	31.0
	20 years and above	558	69.0
Staying with	Alone/With friends	16	2.0
	Family	793	98.0
Family residence	Rural	292	36.1
	Urban	517	63.9
Family monthly income	Less or equal to RM4,850 (B40)	490	60.6
	RM4,851 or equal to RM10,970 (M40)	228	28.2
	RM10,971 or above (T20)	91	11.2

Family residence state region	Northern	101	12.8
	Central	412	52.4
	Southern	200	25.4
	East Coast	55	7.0
	East Malaysia	18	2.3
Field of study	Language studies	76	9.4
	Communication and media studies	160	19.8
	Hotel management	69	8.5
	Business and management studies	195	24.1
	Accounting	102	12.6
	Computer sciences	86	10.6
	Art and design	121	15.0
Level of study	Diploma	596	73.7
	Bachelor degree	213	26.3
Current semester status	Non-graduating	731	90.4
	Graduating	78	9.6
Previous education qualification	Sijil Pelajaran Malaysia (SPM)	576	71.2
	Sijil Tinggi Pelajaran Malaysia (STPM)	53	6.6
	Matriculation/Foundation	47	5.8
	Diploma	133	16.4

Out of 809 respondents, more than three-quarter were females, majority (60.7%) were in the age group of 20–22 years, and almost 98% resided in West Malaysia. In terms of field of study, 24.1% were enrolled in business and management studies, 19.8% in communication and media studies, 15% enrolled in arts and design, 12.6% in accounting, 10.6% in computer sciences, 9.4% in language studies, and 8.6% in hotel management. Almost 74% of the respondents were pursuing their diploma studies and 26.3% were pursuing undergraduate studies. Only 9.6% were graduating students. Before pursuing study in the university, more than 80% students had their pre-university education either at Sijil Pelajaran Malaysia (SPM) (71.2%), Sijil Tinggi Persekolahan Malaysia (STPM) (6.6%), or matriculation/foundation levels (5.8%). At the time of data collection, all students were taking ODL. Most (98%) of the students in this study stayed in their family homes in which majority (63.8%) of them lived in urban areas and from which more than 60% of the students have families of monthly income less or equal to RM4,850 (B40), 28.3% of monthly income between RM4,851 and RM10,970 (M40), and 11.3% of monthly income RM10,971 and above (T20).

Anxiety levels among Bumiputera students in a public university

Students' anxiety levels were measured using Generalized Anxiety Disorder-7 (GAD-7) (Spitzer et al., 2006). GAD-7 used seven items with a 4-point ordinal scale; 0 – not at all, 1 – several days, 2 – more than half the days, 3 – nearly every day. Scores based on students' responses to the seven items in the subscale were summed 0 until 21 to measure the anxiety level as 0 – 4 (none to minimal anxiety), 5 – 9 (mild anxiety), 10 – 14 (moderate anxiety), and 15 – 21 (severe anxiety) (Spitzer et al., 2006.). Internal consistency of the 7 items was high with Cronbach's alpha = 0.916 suggesting very good internal consistency reliability for the scale with the sample used.

Table 2 displays the frequency distribution of Bumiputera students' anxiety levels in the university. Based on GAD-7 anxiety sum, 197 (24.4%) experienced none to minimal anxiety, 251 (31%) with mild anxiety, 192 (23.7%) experienced moderate anxiety, and 169 (20.9%) with severe anxiety levels. When screening for anxiety disorders, a score of 8 or greater represents a reasonable cut-point for identifying probable cases of generalized anxiety disorder (Spitzer et al., 2006). Using a score of 8 or greater as a reasonable cut-point, it was revealed that 450 (55.6%) students were identified as experiencing generalized anxiety disorder during the COVID-19 pandemic. On averaging the anxiety sum, result revealed that the mean of the overall anxiety score sum was 9.28, indicating mild anxiety level ranged from 0 to 21.

Table 2
Descriptive Statistics of Students' Anxiety Levels.

Anxiety score sum	Anxiety level	Frequency	Percent	Anxiety score mean	Std. deviation (SD)
0 – 4	None to minimal	197	24.4	2.23	1.506
5 – 9	Mild	251	31.0	7.01	1.342
10 – 14	Moderate	192	23.7	11.87	1.410
15 – 21	Severe	169	20.9	17.95	2.191
Total		809	100.0	9.28	5.797

The study also revealed that almost 70% of students did not know or were unsure that the university was providing mental health support services for the students. From 247 (30.5%) students who knew the existence of mental health support services in the university, only 14% of the students sought help from the service. Students who knew and sought help were found to experience lower anxiety level (mean = 8.26, SD = 5.669) in comparison to students who knew but did not seek help (mean = 8.58, SD = 5.661) and students who did not know or not sure (mean = 9.61, SD = 5.835) about the mental health support services provided by the university. These differences were found to be significant ($F(2, 806) = 3.023$, $p < 0.05$). Learning experiences and mental health among students could be affected if students did not seek for any coping strategies (Moni et al., 2021). Therefore, it is an important issue that the university addresses the students' mental health at an earlier stage before it worsens.

Starting from 18th March 2020, the Government of Malaysia via the Ministry of Health had imposed stages of Movement Control Order (MCO) to curb the spread of COVID-19 in the country. Students were asked to respond on which MCO period was the most badly affected and most challenging in their daily life as students. Almost 35% students responded that the total lockdown period from 1st June 2021–28th June 2021 was the most challenging to them while the least affected was during the Conditional Movement Control Order (CMCO) period from 4th May 2020–9th June 2020 as presented in Table 3.

Table 3
Period of MCO that Most Badly Affected the Students' Life.

MCO periods	Duration period	n	%
Movement Control Order (MCO)	18 March – 3 May 2020	193	23.9
Conditional Movement Control Order (CMCO)	4 May – 9 June 2020	61	7.5
Recovery Movement Control Order (RMCO)	10 June 2020 – 31 March 2021	73	9.0
MCO by states	11 January - 31 May 2021	91	11.2
Total lockdown	1 June - 28 June 2021	282	34.9
National Recovery Plan (NRP)	1 June – 31 December 2021	109	13.5

Effect of anxiety with respect to socio-demographic characteristics, academic characteristics, ODL challenges, psychosocial characteristics, and COVID-19 related factors
Difference of anxiety with respect to socio-demographic characteristics

To answer research question 2 (a), independent-samples t test and one-way analysis of variance (ANOVA) were conducted to examine any significance mean difference between anxiety scores across the categories of socio-demographic characteristics, academic characteristics, ODL challenges, psychosocial characteristics, and COVID-19 related factors. Dependent variable was the anxiety scores ranging from 0 until 21.

Table 4 shows the difference of anxiety scores with respect to socio-demographic characteristics (gender, age group, staying arrangement, family residence, family monthly income, and state region of family residence). There were only gender ($t = -3.724$, $p < 0.001$) and state region of family residence ($F(4, 804) = 2.581$, $p < 0.05$) with significant differences for anxiety among Bumiputera students. Female (mean = 9.69, SD = 5.820) students showed significantly higher risk of anxiety than males (mean = 7.96, SD = 5.534). Students staying in East Malaysia (mean = 12.06, SD = 7.100) indicated a significantly higher anxiety than students staying in northern (mean = 8.45, SD = 5.999), central (mean = 9.59, SD = 5.721), southern (mean = 8.63, SD = 5.606), and East Coast (mean = 8.85, SD = 5.417) regions as shown in Table 4. In other words, females and students staying in East Malaysia were more sensitive to anxiety in comparison to males and students staying in other regions of the country.

Moreover, Table 4 shows a higher proportion of females experienced moderate to severe anxiety while a higher proportion of male students experienced minimal to mild anxiety. Higher proportion (38.9%) of students staying in East Malaysia (Sabah, Sarawak, and Labuan) experienced severe anxiety while higher proportion of students staying in East Coast (Kelantan, Terengganu, and Pahang) experienced mild to moderate anxiety, majority (32.7%) staying in the northern region (Perlis, Kedah, Pulau Pinang, and Perak) experienced mild anxiety, and more than 50% of students staying in the central region (Selangor, Kuala Lumpur, Putrajaya, and Negeri Sembilan) experienced minimal anxiety. The possible reason for differences in students' anxiety levels could be due to the imposition of Enhanced Movement Control Order (EMCO) in certain districts of the state regions where strict stay-at-home order was mandatory. Anxiety scores were found not significant across age group, staying arrangement, family residence, and family monthly income.

Table 4
Difference of Anxiety with respect to Socio-Demographic Characteristics.

Socio-demographic characteristics	Categories	Total		Anxiety level								Anxiety score		t or F	Sig
				Minimal		Mild		Moderate		Severe					
		n	%	n	%	n	%	n	%	n	%	Mean	SD		
Gender	Male	191	23.6	56	29.3	77	40.3	31	16.2	27	14.1	7.96	5.534	-3.724***	0.000
	Female	618	76.4	141	22.8	174	28.2	161	26.1	142	23.0	9.69	5.820		
Age group	18 – 19 years	251	31.0	71	28.3	74	29.5	62	24.7	44	17.5	8.82	5.597	1.201	0.301
	20 – 22 years	491	60.7	108	22.0	155	31.6	121	24.6	107	21.8	9.52	5.818		
	23 years and above	67	8.3	18	26.9	22	32.8	9	13.4	18	26.9	9.25	6.345		
Staying arrangement	Alone/Friends	16	2.0	3	18.8	4	25.0	6	37.5	3	18.8	10.63	5.749	0.935	0.350
	Parents/Family	793	98.0	194	24.5	247	31.1	186	23.5	166	20.9	9.26	5.798		
Family residence	Rural	292	36.1	80	27.4	92	31.5	60	20.5	60	20.5	8.89	5.932	-1.436	0.151
	Urban	517	63.9	117	22.6	159	30.8	132	25.5	109	21.1	9.50	5.714		
Family monthly income	Less or equal to RM4850 (B40)	490	60.6	121	24.7	151	30.8	120	24.5	98	20.0	9.19	5.798	0.166	0.847
	RM4851 or equal to RM10970 (M40)	228	28.2	55	24.1	72	31.6	50	21.9	51	22.4	9.45	5.882		
	RM10971 or above (T20)	91	11.2	21	23.1	28	30.8	22	24.2	20	22.0	9.37	5.625		
State region of family residence	Northern	101	12.8	33	32.7	28	27.7	20	19.8	20	19.8	8.45	5.999	2.581*	0.036
	Central	412	52.4	94	22.8	126	30.6	98	23.8	94	22.8	9.59	5.721		
	Southern	200	25.4	54	27.0	64	32.0	50	25.0	32	16.0	8.63	5.606		
	East Coast	55	7.0	11	20.0	21	38.2	14	25.5	9	16.4	8.85	5.417		
	East Malaysia	18	2.3	3	16.7	5	27.8	3	16.7	7	38.9	12.06	7.100		

**Significant at 0.05 level* ****Significant at 0.001 level*

Difference of anxiety with respect to academic characteristics

For research question 2 (b), scores from GAD-7 were also summed up ranging from 0 to 21. Independent-samples t test or one-way ANOVA were again conducted to examine the significance of anxiety score sum across academic characteristics tested. Academic characteristics tested were field of study, level of study, current semester status, and previous education background. Table 5 shows the difference of anxiety based on the academic characteristics of the students. Using bivariate analysis, field of study ($F(6, 802) = 6.118$, $p < 0.001$) and current semester status ($t = -1.76$, $p < 0.10$) showed significant differences in anxiety among Bumiputera students.

There were statistically significant differences in anxiety scores across field of study ($F(6, 802) = 6.118$, $p < 0.001$). Post hoc multiple comparison using the Tukey HSD test indicated that the anxiety scores mean for students pursuing language studies (mean = 10.88, SD = 6.015) and communication and media studies (mean = 10.80, SD = 5.463) were significantly different from anxiety scores of business management studies (mean = 8.13, SD = 5.725), accounting

(mean = 7.90, SD = 5.555), and arts and design (mean = 8.40, SD = 5.464) students. Students enrolling in language studies were most affected by anxiety, followed by communication and media studies students and hotel management students, while the least affected were students enrolled in accounting. Graduating students (mean = 10.38, SD = 5.590) had statistically significant higher anxiety (t = -1.768, p < 0.10) than non-graduating students (mean = 9.17, SD = 5.810). Table 5 shows higher proportion of graduating students experienced moderate to severe anxiety compared to non-graduating students. No significant anxiety mean score differences were observed for level of study and previous education background. This suggested diploma and bachelor degree students as well as students with pre-university and university previous education backgrounds experienced approximately equal anxiety levels.

Table 5
Difference of Anxiety with respect to Academic Characteristics.

Academic characteristics	Categories	Total		Anxiety level								Anxiety score		t or F	Sig
				Minimal		Mild		Moderate		Severe		Mean	SD		
		n	%	n	%	n	%	n	%	n	%				
Field of study	Language studies	76	9.4	13	17.1	21	27.6	20	26.3	22	28.9	10.88	6.015	6.118***[b]	0.000
	Communication and media studies	160	19.8	21	13.1	54	33.8	42	26.3	43	26.9	10.80	5.463		
	Business management studies (BM)	195	24.1	63	32.3	59	30.3	42	21.5	31	15.9	8.13	5.725		
	Hotel management (HM)	69	8.5	17	24.6	20	29.0	9	13.0	23	33.3	10.20	6.475		
	Accounting (AC)	102	12.6	33	32.4	34	33.3	18	17.6	17	16.7	7.90	5.555		
	Computer science (CS)	86	10.6	16	18.6	24	27.9	28	32.6	18	20.9	9.79	5.527		
	Arts and design (AD)	121	15.0	34	28.1	39	32.2	33	27.3	15	12.4	8.40	5.464		
Level of study	Diploma	596	73.7	147	24.7	183	30.7	147	24.7	119	20.0	9.21	5.694	-0.560	0.575
	Degree	213	26.3	50	23.5	68	31.9	45	21.1	50	23.5	9.47	6.087		
Current semester status	Non-graduating	731	90.4	183	25.0	229	31.3	171	23.4	148	20.2	9.17	5.810	-1.768[+]	0.077
	Graduating	78	9.6	14	17.9	22	28.2	21	26.9	21	26.9	10.38	5.590		
Previous education background	SPM	576	71.2	145	25.2	175	30.4	143	24.8	113	19.6	9.16	5.674	0.654	0.581
	STPM	53	6.6	11	20.8	21	39.6	8	15.1	13	24.5	9.49	5.793		
	Matriculation/ Foundation	47	5.8	4	8.5	19	40.4	15	31.9	9	19.1	10.36	4.945		
	Diploma	133	16.4	37	27.8	36	27.1	26	19.5	34	25.6	9.35	6.576		

[+]Significant at 0.1 level ****Significant at 0.001 level*

Difference of anxiety with respect to open and distance learning (ODL) challenges

For research question 2 (c), scores from GAD-7 were also summed up that ranged from 0 to 21. Independent-samples t test was conducted to examine the significance of anxiety score sum across ODL challenges tested. ODL challenges tested for the study were unstable internet, overload of assignments, staying online for more hours, share laptops with family members, computer crash during ODL, insufficient computer/internet competency, insufficient preparation for ODL, problems to catch up with difficult online courses, difficulty

of covering online courses, and non-conducive environment for ODL. Table 6 presents the effect of anxiety with respect to challenges in ODL.

These ODL challenges were measured using a 5-point Likert scale (1 – Strongly disagree, 2 – Disagree, 3 – Moderately agree, 4 – Agree, 5 – Strongly agree). With these 11 items for ODL challenges, Cronbach's Alpha was 0.853 which indicated the scales were good and acceptable. For easy analysis, 5-point Likert scale was recoded to a dichotomous scale (0 – No (Strongly disagree and disagree), 1 – Yes (Moderately agree, agree, and strongly agree)).

Table 6
Effect of Anxiety with Respect to Challenges in ODL.

Challenges in ODL	Categories	Total		Anxiety level								Anxiety score		t value	Sig
				Minimal		Mild		Moderate		Severe		Mean	SD		
		n	%	n	%	n	%	n	%	n	%				
Unstable internet	No	211	26.1	73	34.6	63	29.9	39	18.5	36	17.1	7.98	5.974	-3.827***	0.000
	Yes	598	73.9	124	20.7	188	31.4	153	25.6	133	22.2	9.74	5.668		
Overload of assignments	No	44	5.4	28	63.6	12	27.3	2	4.5	2	4.5	4.18	4.541	-7.543***	0.000
	Yes	765	94.6	169	22.1	239	31.2	190	24.8	167	21.8	9.58	5.727		
Delay in assignment submission due to internet access	No	84	10.4	31	15.7	28	11.2	13	6.8	12	7.1	7.27	5.675	-3.377***	0.001
	Yes	725	89.6	166	84.3	223	88.8	179	93.2	157	92.9	9.52	5.770		
Stay online for more hours	No	19	2.3	10	52.6	3	15.8	3	15.8	3	15.8	7.47	6.744	-1.378	0.169
	Yes	790	97.7	187	23.7	248	31.4	189	23.9	166	21.0	9.33	5.770		
Share laptops with family members	No	532	65.8	153	28.8	164	30.8	121	22.7	94	17.7	8.67	5.750	-4.244***	0.000
	Yes	277	34.2	44	15.9	87	31.4	71	25.6	75	27.1	10.47	5.712		
Computer crash during ODL	No	173	21.4	71	41.0	51	29.5	31	17.9	20	11.6	7.02	5.602	-5.919***	0.000
	Yes	636	78.6	126	19.8	200	31.4	161	25.3	149	23.4	9.90	5.700		
Insufficient computer/internet competency	No	229	28.3	71	31.0	76	33.2	51	22.3	31	13.5	7.95	5.481	-4.158***	0.000
	Yes	580	71.7	126	21.7	175	30.2	141	24.3	138	23.8	9.81	5.838		
Insufficient preparation for ODL	No	85	10.5	38	44.7	20	23.5	14	16.5	13	15.3	6.92	5.977	-4.014***	0.000
	Yes	724	89.5	159	22.0	231	31.9	178	24.6	156	21.5	9.56	5.716		
Problems to catch up online courses	No	134	16.6	63	47.0	35	26.1	24	17.9	12	9.0	6.37	5.164	-7.022***	0.000
	Yes	675	83.4	134	19.9	216	32.0	168	24.9	157	23.3	9.86	5.744		
Difficulty of covering difficult online courses	No	53	6.6	33	62.3	12	22.6	5	9.4	3	5.7	4.81	4.645	-7.127***	0.000
	Yes	756	93.4	164	21.7	239	31.6	187	24.7	166	22.0	9.60	5.743		
Non-conducive environment for ODL	No	254	31.4	88	34.6	81	31.9	48	18.9	37	14.6	7.71	5.656	-5.299***	0.000
	Yes	555	68.6	109	19.6	170	30.6	144	25.9	132	23.8	10.00	5.723		
Financial difficulties	No	473	58.5	133	67.5	152	60.6	103	53.6	85	50.3	8.65	5.705	-3.733***	0.000
	Yes	336	41.5	64	32.5	99	39.4	89	46.4	84	49.7	10.18	5.816		
Family commitment	No	639	79.0	166	84.3	198	78.9	150	78.1	125	74.0	9.01	5.773	-2.583**	0.010
	Yes	170	21.0	31	15.7	53	21.1	42	21.9	44	26.0	10.30	5.790		

****Significant at 0.001 level*

Results in Table 6 revealed that there were statistically significant higher anxiety level if students experienced unstable internet in their place of stay ($t = -3.827$, $p < 0.001$), overload of assignments ($t = -7.543$, $p < 0.001$), delay in assignment submission due to internet access ($t = -3.377$, $p < 0.001$), share laptops with family members ($t = -4.244$, $p < 0.001$), computer crash during ODL ($t = 5.919$, $p < 0.001$), insufficient computer/internet competency ($t = -4.158$, $p < 0.001$), insufficient preparation for ODL ($t = -4.014$, $p < 0.001$), problems to catch up with

online courses (t = -7.022, p < 0.001), difficulty of covering difficult online courses (t = -7.127, p < 0.001), non-conducive environment for ODL (t = -5.299, p < 0.001), financial difficulties (t = -3.733, p < 001), and family commitment (t = -2.583, p < 0.01) in comparison to those not experiencing these situations. The results suggest students who experienced challenges in ODL had higher chances of developing anxiety.

Difference of anxiety with respect to psychosocial characteristics

Psychosocial factors is a shorthand term for the combination of psychological and social factors. Examples of psychosocial factors include social support, loneliness, marriage status, social disruption, bereavement, work environment, social status, and social integration (Upton, 2013). Table 7 shows the effect of anxiety with respect to psychosocial characteristics. Psychosocial characteristics studied were worries about COVID-19 impacts on future career, problems with classmates, barrier of interaction with lecturers, decreased social interaction, and depressive thoughts.

Table 7
Effect of Anxiety with Respect to Psychosocial Characteristics.

Psychosocial characteristics	Categories	Total		Anxiety level								Anxiety score		t value	Sig
				Minimal		Mild		Moderate		Severe		Mean	SD		
		n	%	n	%	n	%	n	%	n	%				
Worry about COVID-19 impacts on future career	No	16	2.0	7	43.8	7	43.8	1	6.2	1	6.2	5.69	5.275	-5.919***	0.000
	Yes	793	98.0	190	24.0	244	30.8	191	24.1	168	21.2	9.36	5.787		
Have problems with classmates	No	783	96.8	192	24.5	242	30.9	185	23.6	164	20.9	9.27	5.808	-0.400	0.689
	Yes	26	3.2	5	19.2	9	34.6	7	26.9	5	19.2	9.73	5.554		
Barrier of interaction with lecturers	No	84	10.4	40	47.6	22	26.2	15	17.9	7	8.3	6.17	4.859	-6.078***	0.000
	Yes	725	89.6	157	21.7	229	31.6	177	24.4	162	22.3	9.64	5.792		
Decreased social interaction	No	94	11.6	50	53.2	26	27.7	8	8.5	10	10.6	5.91	5.737	-6.126***	0.000
	Yes	715	88.4	147	20.6	225	31.5	184	25.7	159	22.2	9.73	5.662		
Depressive thoughts	No	131	16.2	68	51.9	38	29.0	13	9.9	12	9.2	5.66	5.222	-8.549***	0.000
	Yes	678	83.8	129	19.0	213	31.4	179	26.4	157	23.2	9.98	5.643		

****Significant at 0.001 level*

Worry about COVID-19 impacts on future career had a significant effect (t = -5.919, p < 0.001) on anxiety. Higher percentage of students who had responded that they were worried about COVID-19 impacts on their future career experienced moderate (24.1%) and severe (21.2%) anxiety compared to students who did not worry. Barrier of interaction with lecturers (t = -6.078, p < 0.001), decreased social interaction (t = -6.126, p < 0.001), and depressive thoughts (t = -8.549, p < 0.001) also had significant effects on anxiety. From the results in Table 7, it is observed that approximately 21% to 23% of students experienced severe anxiety level when encountering these significant ODL challenges. Students who faced barriers of interaction with lecturers, experienced decreased social interaction, and experienced depressive thoughts were seen to have higher level of anxiety compared to those who did not experience these situations.

Difference of Anxiety with Respect to COVID-19 Related Factors

Independent-samples t test was again performed to investigate for any significant anxiety difference across each COVID-19 related factors. COVID-19 related factors studied were quarantine experience due to close contact with someone positive COVID-19, infected with COVID-19, close family infected with COVID-19, close family died due to COVID-19 infection, and having sleeping problems. Results revealed that there were statistically significant differences of anxiety across quarantine experience ($t = -2.683$, $p < 0.01$), close family infected with COVID-19 ($t = -2.437$, $p < 0.05$), and having sleeping problems ($t = -9.416$, $p < 0.001$). Students who had quarantine experience, students who had close family infected with COVID-19, and students having sleeping problems had higher anxiety level in comparison to students with no such problems. Higher percentage of students whose close family were infected with COVID-19 and students having sleeping problems experienced mild to severe anxiety while students who had quarantine experience had higher proportion in mild and severe anxiety. No significant differences in anxiety were observed for students infected with COVID-19 and students whose close family died due to COVID-19 infection. Table 8 presents the results.

Table 8
Effect of Anxiety with respect to COVID-19 Related Factors.

COVID-19 related factors	Categories	Total		Anxiety level								Anxiety score		t value	Sig
				Minimal		Mild		Moderate		Severe		Mean	SD		
		n	%	n	%	n	%	n	%	n	%				
Quarantine experience	No	640	79.1	171	26.7	189	29.5	154	24.1	126	19.7	9.00	5.808	-2.683**	0.007
	Yes	169	20.9	26	15.4	62	36.7	38	22.5	43	25.4	10.34	5.646		
Infected with COVID-19	No	763	94.3	187	24.5	239	31.3	178	23.3	159	20.8	9.23	5.769	-1.021	0.308
	Yes	46	5.7	10	21.7	12	26.1	14	30.4	10	21.7	10.13	6.249		
Close family infected with COVID-19	No	452	55.9	124	27.4	138	30.5	103	22.8	87	19.2	8.84	5.805	-2.437*	0.015
	Yes	357	44.1	73	20.4	113	31.7	89	24.9	82	23.0	9.84	5.746		
Close family died due to COVID-19 infection	No	691	85.4	174	25.2	209	30.2	165	23.9	143	20.7	9.20	5.818	-1.007	0.314
	Yes	118	14.6	23	19.5	42	35.6	27	22.9	26	22.0	9.78	5.674		
Having sleeping problems	No	76		47	61.8	19	25.0	5	6.6	5	6.6	4.61	4.412	-9.416***	0.000
	Yes	733		150	20.5	232	31.7	187	25.5	164	22.4	9.77	5.709		

**Significant at 0.05 level* ***Significant at 0.01 level* ****Significant at 0.001 level*

Discussion

Various steps such as lockdowns, quarantines, social distancing, isolation, and MCOs were taken by every country to control the spread of COVID-19. The Government measures to control the virus and the fear of being infected with COVID-19 have affected the mental health of many citizens. University students were a vulnerable group significantly associated with greater psychological impact of the pandemic and higher levels of stress, anxiety and depression (Tee et al., 2020). The study identified some protective and risk factors for severe anxiety among Bumiputera students during the COVID-19 pandemic in Malaysia. Mental wellbeing of vulnerable groups of individuals such as students who were infected with COVID-19 should be provided support as they were the group that were more likely to develop severe anxiety levels that might affect their learning experiences and hence their academic performance.

The present study investigated the anxiety among Bumiputera students in Malaysia. The study found that 44.6% students experienced moderate to severe anxiety levels which was inconsistent with the study by Irfan et al (2021) among Malaysian students who found that almost 57% students experienced moderate to severe anxiety levels. The inconsistent result might be due to the national vaccination program that had started on 24th February 2021 nationwide in Malaysia. During the time of data collection (13th August 2021–12th September 2021) almost 75% of Malaysian citizens of ages 18 years and above had been fully vaccinated and cases of positive COVID-19 were seen to be in a decreasing pattern as shown in Figure 1. A study by Rubin and Wessely (2020) concluded that community anxiety would rise with an escalating number of new COVID-19 cases. Female students were significantly associated with higher anxiety levels which agreed with studies by Sundarasen et al (2020) in Malaysia, Saadé et al (2017) in Vietnam, Irfan et al (2021) also in Malaysia, Browning et al (2020) in the United States, Ghazawy et al (2021) in Egypt, Lopes and Nihei (2021) in Brazil, and many other studies in different countries in the world. Students staying in East Malaysia also showed significantly higher anxiety compared to other regions in Malaysia as reported by Sia and Abbas Adamu (2021) for which many parts of East Malaysia faced internet accessibility issues which can lead to developing anxiety among students as they were undertaking ODL.

In terms of academic characteristics, students pursuing language studies, communication and media studies, and hotel management disagreed with the study by Sundarasen et al. (2020) and graduating students significantly higher anxiety levels. With respect to ODL challenges, sharing laptops, computer crash experience during ODL, insufficient computer competency, insufficient preparation for ODL, problems to catch up the difficult online courses, difficulty of covering difficult online courses, and non-conducive environment for ODL were found to be significantly associated with higher anxiety levels which was agreed with by (Saadé et al., 2015). Students who were dissatisfied towards ODL showed higher anxiety than students who were satisfied with ODL. Worry about COVID-19 impacts on future career, barrier of interaction with lecturers, decreased social interaction, and depressive thoughts were psychosocial characteristics that showed significantly associated with higher anxiety among Bumiputera students. With respect to COVID-19 related factors, quarantine experience which agreed with Tee et al (2020), close family infected with COVID-19 which was in line with Ghazawy et al (2021), facing sleeping problems, and facing financial difficulties were found to be significantly associated with higher levels of anxiety.

The study revealed that only 30.5% of students knew the existence of mental health support services provided by the university. However, only 14% sought help from the service. The study revealed that students who knew and sought help were found to have lower anxiety levels in comparison to students who knew but did not seek help and students who did not know or not sure about the mental health support services provided by the university. Medication, counseling, or therapy, or combination of any of these interventions can be used as a treatment of anxiety. From this finding, it is important for the university to ensure students are aware of the existence of the mental health support services and above all encourage them to seek treatment, therapy, or counseling from the service. The preliminary action by the university is imperative before mental health among students deteriorates which can affect their learning experiences which finally disrupts their academic performances. Mental health support both psychiatric and psychology-based must be provided by the university. The monetary aid from the Government was also needed to make

sure that the mental health support was functioning and simultaneously able to practice regular monitoring of the mental health condition of the students. Results also found students with decreasing academic performance for one to two semesters during COVID-19 pandemic experienced higher level of anxiety compared to those students with increasing or no change in academic performances.

The financial stimulus packages such as Economic Stimulus Package (ESP) provided by Government of Malaysia i.e the PRIHATIN and PEMULIH were unveiled by the Prime Minister on 27th March 2020 and late June 2021, respectively, to help Malaysian citizens and businesses during the COVID-19 pandemic and especially after the enforced lockdowns ((PRIHATIN Economic Stimulus Package, 2020), (Raihan Rahman, 2021)). These financial stimulus packages would at least help B40 families to ease the financial difficulties faced during MCOs which eventually lowered the anxiety level among them.

Conclusion, Recommendation, and Future Research

Almost 76% Bumiputera students in a public university have experienced anxiety due to the stay-at-home order during COVID-19 pandemic and MCO periods along with ODL they had to undertake. Gender, sharing laptops with other family members, problems to catch up with difficult online courses, quarantine experience, and depressive thoughts were some stressors in developing severe anxiety among Bumiputera students during the Covid-19 pandemic. The findings suggested the mental health of university students was significantly affected when facing the pandemic crisis. Help, attention, and support from the community, families, and the universities were needed by the students in facing this emergency period. Pedagogy for efficient and effective online courses were needed to reduce anxieties and enhance performance among students (Saadé et al., 2017). Laptops loan scheme is highly recommended especially for students from B40 family who do not own laptops. It is highly recommended that both the Ministry of Higher Education and universities collaborate to resolve the problem by strengthening the mental health support services in the universities and equipping the public health facilities in the university clinics. Universities should always improve the Learning Management System such that it is more user friendly to lecturers, students, and non-academic staff. Lecturers must improve their online teaching strategy to cater for students who had problems to catch up particularly in difficult topics of the courses. Barrier of interaction between lecturers and students must be improved by providing interactive and collaborative online learning activities. A study by Chandrasiri and Weerakoon (2021) highlighted the requirement of implementing interactive online learning sessions which can be delivered through smartphones. Implementation of online education also requires a change in content delivery, communication, and assessments (Junus et al., 2021). Intervention and supportive programs based on improving self-esteem and self-efficacy should be offered to students over the long term, beyond the current outbreak (Germani et al., 2020). In order to maximize the benefits of online education, it is important to conduct training for both lecturers and students on the application and availability of technology. Through this training they can improve their computer/internet competency and their preparedness for online education. Follow-up research is also called involving a wider range of students of different ethnicities from both public and private universities in the country, with more stressors of anxiety covering more aspects of mental health issues for the post-Covid-19 period.

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