Original Research Article

The Psychological Impact of Coronavirus on University Students and its Socio-Economic Determinants in Malaysia

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Muhammad Irfan, PhD[1], Faizah Shahudin, PhD[1], Vincent J. Hooper, PhD[1], Waqar Akram, PhD[2], and Rosmaiza B. Abdul Ghani, PhD[3]

Abstract

The objective of this article is to examine the impact of coronavirus disease 2019 (COVID-19) upon university students' anxiety level and to find the factors associated with the anxiety level in Malaysia. We collected data from 958 students from 16 different universities using an originally designed questionnaire. The Generalized Anxiety Disorder Scale 7-item (GAD-7) was used to estimate the anxiety. Then we applied the ordered logit model to calculate the odds ratios (OR) and factors associated with the anxiety level. We find that 12.3% of students were normal, whereas 30.5% were experiencing mild anxiety, 31.1% moderate anxiety, and 26.1% severe anxiety. Surprisingly, only 37.2% of students were aware of mental health support that was provided by their universities. However, age above 20 years (OR = 1.30), ethnicity Chinese (OR = 1.72), having any other disease (OR = 2.0), decreased family income (OR = 1.71), more time spent on watching COVID-19-related news (OR = 1.52), and infected relative or friends (OR = 1.62) were risk factors for anxiety among students. We conclude that the government of Malaysia should monitor the mental health of the universities' students more closely and universities should open online mental health support clinics to avoid the adverse impacts of anxiety.

Keywords

anxiety, students, risk factors, protective factors, socio-economic status

What Do We Already Know About this Topic?

COVID-19 has an impact on the mental health of the students.

How Does Your Research Contribute to the Field?

We explored the socio-economic and demographic factors that are risk factors for anxiety in Malaysia.

What are Your Research's Implications Toward Theory, Practice, or Policy?

Possibly the authorities in Malaysia can better manage the anxiety level among students after reading our research paper.

Introduction

Coronavirus Disease 2019 (COVID-19) continues to devastate almost every country in the world. As of November 18, 2021, total deaths have reached 5.1 million and total infections 255.7 million[1]. The impact of the virus is different in various countries mainly because of the environment, herd

[1]School of Economics and Management, Xiamen University Malaysia, Malaysia
[2]Department of Business Administration, Sukkur Institute of Business Administration, Sukkur, Pakistan
[3]Department of Economics, MARA University of Technology, Shah Alam, Malaysia

Corresponding Author:
Muhammad Irfan, School of Economics and Management, Xiamen University Malaysia, Jalan Sunsuria, Bandar Sunsuria, Sepang, Selangor 43900, Malaysia.
Email: irfaneconomist786@gmail.com

immunity, health system, government strategies, and public response. To avoid the distressing impact of the COVID-19, every country has adopted numerous health, fiscal, and public policies. So far, Malaysia has made tremendous progress in controlling the impact of COVID-19 in comparison to the European and North American countries. As a result of the better policies and public responses, as of November 18, 2021, Malaysia has a total 2.56 million confirmed cases out of which 2.5 million recovered and 29,837 died[2].

The first case of COVID-19 in Malaysia was confirmed on January 24, 2020,[1] but the cases continued to rise steadily until the end of February 2020. After the 14th of March, the sudden rise in the COVID-19 cases were noted which was believed to be associated with a religious gathering in Kuala Lumpur (Capital city of Malaysia).[2] Approximately, 16,000 people attended that gathering, eventually leading to a rise in the total cases that were observed during the next two months. The government of Malaysia immediately implemented the Movement Control Order (MCO) commencing from March 18, 2020 to control the spread of the virus,[3] which was subsequently relaxed in August 2020 and again implemented in September 2020 (and continues until further notice). During the period of the MCO gatherings at all places were prohibited including religious services and universities. This was the time when almost all the universities in Malaysia shifted their mode of teaching from physical to virtual.

The sudden change in the mode of teaching due to the potential risk of death caused by COVID-19, isolation and lockdown have increased the anxiety level and created extreme stress to the general public[4,5] and students alike.[6,7] The abnormal stress and depression among students not only affect their performance but also are associated with heightened self-injury and suicidal attempts.[8] Therefore, it is immensely important to monitor the mental health of the students and assess the risks coupled with preventive factors of the anxiety and associated mental health issues. We select Malaysia as a case country because of the better possibility of the data collection. Secondly, to date, most of the studies have explored the impact of COVID-19 on students in China, paramedical staff, patients, and even on the general public,[9-12] but the university students in Malaysia are overlooked. However, the psychological impact of COVID-19 can vary from country to country because of different cultural norms, changing public behavior patterns, differing countries' economic and political frameworks, and current rules and regulations set by the governments to curb COVID-19. Therefore, examining the psychological impact of COVID-19 on Malaysian university students is essential and worthwhile.

For instance,[4,5,13,14] focused on the general public and medical staff but ignored college and university students. However, only a few studies have attempted to estimate the impact of COVID-19 on the mental health of students. Such as, in China,[6,7] Cao et al. examined the psychological impact of the COVID-19 on college students. Using cluster sampling, they collected data from 7143 students from Changzhi Medical College China. Using GAD-7, they found that 21.3% of respondents were experiencing mild, 2.7% moderate, and .9% severe anxiety. Furthermore, they applied the ordered logit model and explored that living in urban areas, living with parents, having a steady family income were protective factors against anxiety. Our study uses the same methods for measuring the anxiety factors associated with this mental health issue. However, our study covers around 16 universities, which may produce more generalizable and comprehensive estimates, because of the heterogeneity amongst the sample.

Moreover,[15] Kaparounaki et al. examined the impact of COVID-19 on the mental health of university students in Greece. They collected the data from 1000 university students and found that 42.5% of the total sample population had anxiety and 74.3% depression. Using similar data, in Greece,[8] Patsali et al. found that depression was present in 12.43% and severe distress was present in 13.46% of the sample population. Of concern, they noticed a 2.59% increase in suicidal thoughts. Similarly, in Bangladesh,[16] Dhar et al. investigated the psychological impact of COVID-19 on university students. Using GAD-7 and ordered logistic regression, they found among 15,543 students, 44.59% were suffering from severe anxiety, whereas, 48.41% were moderately, and 3.82% were mildly suffering from anxiety. In addition, they found worries about the economic situation, influence of COVID-19 on daily life, academic delays, and lower social support were risk factors for anxiety.

We could only find one study by Sundarasen[17] that was conducted in Malaysia in a similar vein. Their study was the closest to us in terms of our research objectives. However, they used Zung's self-rating anxiety scale (SAS) to estimate the anxiety level. Quite surprisingly, they found only 8% of students were experiencing mild to moderate and moderate to severe anxiety, which is substantially different from the findings of other studies, hence this requires further investigation. The basic reason for an extremely low number could be using Zung's SAS. The anxiety scale has been criticized by earlier studies such as[18-20] for producing unreliable results. Thus, instead of collecting data from only one or two universities, our study covers a more comprehensive base of 16 universities and applies advanced methods[6,7,16] to estimate the anxiety among students. Our study also provides plausible estimates for Malaysian students' anxiety for the first time. Furthermore, we examine the impact of COVID-19 on ethnicity (specifically Chinese) as it is lacking in the literature.

Methods

Study Design

Growing worldwide usage of the internet has encouraged many researchers to collect data online to achieve their research objectives. However, online surveying or data collection has several limitations and potentially affects generalizability because of low participation and non-response bias.[21] In our case, it was impossible for us to collect the data physically

because of COVID-19 and resulting lockdown events, travel restrictions, and social distancing measures. We further made less wordy questions and reduced the length of the questionnaire to avoid non-response bias as this method can sufficiently improve the participation rate especially in psychological studies.[22] Therefore, due to the prevailing pandemic situation, we had no other choice to proceed with online data collection.

Therefore, we created a Google form which consists of 45 questions (including GAD-7) for collecting data and sent the link through email, WhatsApp, Zoom, Microsoft Teams, Google Meetings, WeChat, and other social media platforms. We used simple English language and collected demographic, social, and economic information from the respondents such as living area, age, gender, education, current semester, number of friends, family income, and so on. However, the question related to anxiety was taken from GAD-7. In almost all the questions, we gave possible categorical choices for easiness and clarity of our respondents and subsequent encoding. For instance, when we asked in which area do you currently live, we gave options (a) urban, (b) rural, and (c) peri-urban; similarly, what is your age (a) below 20 years and (b) above 20 years; and what is your ethnicity (a) Malay, (b) Chinese, (c) Indian, (d) Bangladeshi, and (e) others (we merged c, d, and e in our data analysis because of low responses). Likewise, binary response options (yes or no) were given for internet access, playing sports, living with parents, having any other disease, and infected with the virus. The details of the variables along with categories can be seen in Table 1.

In total, 958 students from 16 different universities participated in the survey (we dropped 4 respondents because of incomplete data provision). The respondents were requested to provide their consent to use their information for research purposes only. The participation was voluntary and respondents had the option to exit the survey at any point. Data were collected in June and July 2020 when the mode of teaching in most of the

Table 1. List of the Variables.

	No Anxiety	Mild Anxiety	Moderate Anxiety	Severe Anxiety
Anxiety Level (Dependent Variable)	118 (12.3%)	292 (30.5%)	298 (31.1%)	250 (26.1%)
Gender	Male 279 (29.1%)	Female 679 (70.9%)		
Age	Below 20 667 (69.6%)	Above 20 291 (30.4%)		
Ethnicity	Chinese 305 (31.8%)	Malay 603 (62.9%)	Others 50 (5.2%)	
Living area	Rural 286 (29.9%)	Urban 672 (70.1%)		
Internet access	Yes 917 (95.7%)	No 41 (4.3%)		
Current semester	Mean 2.93	SD 1.61	Min 1	Max 8
Playing sports	Yes 655 (68.4%)	No 303 (31.6%)		
Number of close friends	Mean 7.4	SD 5.7	Min 1	Max 28
Living with parents	Yes 901 (94.1%)	No 57 (5.9%)		
Persons living in 1 home	Mean 5.2	SD 1.88	Min 1	Max 13
Personal expenses monthly (RM)	Below 1000 794 (82.9%)	Above 1000 164 (17.1%)		
Family income decreased	Yes 496 (51.8%)	No 462 (48.2%)		
Any other disease	Yes 156 (16.3%)	No 802 (83.7%)		
COVID news time spent more than 30 minutes	Yes 677 (70.7%)	No 281 (29.3%)		
COVID infect any relative or friend	Yes 83 (8.7%)	No 875 (91.3%)		
University provides mental health support	No 105 (10.9%)	Not sure 497 (51.9%)	Yes 356 (37.2%)	

Authors' calculations, SD, standard deviation; RM, Malaysian Ringgit.

universities was entirely virtual learning and total number of COVID cases in Malaysia were 8976 (as of July 31, 2020).

Variables

The dependent variable "Anxiety Level" was constructed using GAD-7 questionnaire. It is gleaned from the practical self-reporting questionnaire which consisted of 7 items such as feeling nervous, not able to stop worrying, worrying to much about different things, trouble relaxing, being restless, being easily annoyed, and feeling afraid.[23] The GAD-7 is widely used in the literature and its validity has been tested in numerous studies such as.[24-26] They also tested the reliability of the GAD-7 and found a high Cronbach's alpha internal consistency score, for instance,[23] found Cronbach's α = .92,[24] α = .89,[25] α = .69, and[26] α = .88. It implies that the reliability of GAD-7 is adequate.

Depending upon the response of the students, 4 categories of anxiety were created such as 1 means no anxiety, 2 = mild anxiety, 3 = moderate anxiety, and 4 = severe anxiety. Hence, the variable has an order from 1 to 4, where 1 means no anxiety and 4 means severe anxiety. After estimating the anxiety level among students, we applied ordered logit model to examine the impact of various socio-economic and demographic variables. The list of our variables of interest along with frequencies and percentages is given in the Table 1.

Statistical Model

The ordered logit model is suitable when the proportional odds assumption satisfies and the coefficients are usually estimated by using the maximum likelihood method. The model has been used in recent studies by Cao et al.,[7,16,17] to estimate the odds ratios. In our case, we had an ordinal dependent variable "Anxiety level" and our objective was to predict the odds ratios. The odds ratios represent the constant effect of an independent variable on the likelihood that one outcome (from dependent variable) will occur.

We had 4 levels of our dependent variable such as no anxiety, mild anxiety, moderate anxiety, and severe anxiety. The model can be characterized as follows -equation (1)

$$y^* = \sum_i^k \beta_k x_{ki} + \varepsilon_i = z_i + \varepsilon_i \quad (1)$$

where y^* is our unobserved dependent variable and x_{ki} represents the list of independent variables, ε_i is the error term, and β_k shows the coefficients which we have estimated. The model estimates m-1 odds ratios, since our dependent variable is of a mutually exclusive categorical nature which means if a person belongs to a one category (say no anxiety), the same person would not be in another category (say severe anxiety). Moreover, one category considers as a reference category to compare the estimates. As a result we assume 0 odds ratio for that reference category or simply we exclude the intercept and it gives us m-1 odds ratios.[27]

Results and Discussion

Table 1 shows the frequencies of anxiety levels among students. Surprisingly, almost 57% of our sampled students were experiencing moderate or severe anxiety during COVID-19, whereas almost 62% of the students did not know whether their institutions were providing mental health support. Perhaps, universities might not have anticipated the sudden surge in anxiety levels, however, this might have serious repercussions on learning experiences.

The results of the ordered logit model are presented in Table 2. We have only emphasized the significant results where *P*-value was less than .05. We found that, having internet access helps to reduce anxiety amongst students, the odds of being at a higher level of anxiety decreases (OR = .45, 95% CI = .25 to .80) if students have internet access. Perhaps, the students can have more entertainment options at home which may lead to reduce anxiety. Internet access not only make people have more time for home entertainment but it can also encourage people to access telemedicine through mobile devices and consult psychiatrics.[28] Second, due to the lockdown or MCO, outdoor sports and other activities were banned; hence, in this situation, having internet access could be a significant factor to control anxiety level. Most importantly, students during the MCO period were taking online classes; therefore, having an internet connection helps them to concentrate on the study rather on COVID-19. These factors have the potential to eventually reduce anxiety among students.

Undoubtedly, COVID-19 has affected economic activities adversely and resulting lockdown has reduced personal income significantly. This might have a severe impact on the welfare and the anxiety level of individuals. We found that the odds of being at the higher level of anxiety increase by 1.7 times (95% CI = 1.34 to 2.17) if students' family income diminishes because of the coronavirus, our estimates for family income are align with.[6,7] Astonishingly, almost 52% of the students reported that their family income has reduced because of the low economic activities and lockdown which was the result of COVID-19.

Furthermore, having any other disease may increase the level of anxiety among students. Our study found that the odds of being at the higher level of anxiety increase by 2.0 times (95% CI = 1.44 to 2.79) if students have any other pre-existing disease. Perhaps pre-existing diseases have a cumulative effect on fear and lead to a higher level of anxiety. Likewise, spending more than 30 minutes weekly on watching the coronavirus related news significantly increases the anxiety level among students (OR = 1.51, 95% CI = 1.2 to 1.97). Perhaps, during the time of data collection the news relating to the availability of the COVID-19 vaccine or medicine was not available. Eventually, watching the news about the spread of the virus, new restrictions, and COVID-19's devastation would have mounted the psychological pressure on students, potentially increasing anxiety. Additionally, having an infected friend or relative significantly increases the anxiety level

Table 2. Results of Ordered Logit Model.

Factor	OR	Std. Error	t Value	*P*-Values	CI 95%	
					Lower	Upper
Gender (male)	.798*	.137	−1.653	.098	.610	1.043
Age above 20 years	1.297*	.153	1.694	.090	.960	1.752
Ethnicity Chinese	1.719*	.300	1.805	.071	.953	3.097
Ethnicity Malay	1.215	.287	.678	.498	.691	2.133
Ethnicity others (reference)						
Area urban	.831	.132	−1.406	.160	.641	1.076
Internet access (yes)	.446***	.300	−2.686	.007	.245	.799
Current semester	.970	.042	−.713	.476	.894	1.054
Playing sports (yes)	1.053	.132	.390	.697	.812	1.365
Number of close friends (log)	.972	.077	−.366	.715	.837	1.130
Living with parents yes	.668	.276	−1.458	.145	.388	1.148
Persons living in one home	1.042	.033	1.247	.212	.977	1.112
Expenses above 1000 RM (yes)	1.252	.159	1.410	.159	.916	1.713
Family income decreased (yes)	1.706***	.123	4.342	.000	1.341	2.173
Any other diseases (yes)	2.001***	.168	4.135	.000	1.442	2.785
COVID news time spent more than 30 m	1.515***	.133	3.131	.002	1.169	1.966
COVID infect any relative or friends	1.624**	.219	2.217	.027	1.059	2.499
Residual deviance	2467.97					
Akaike information criterion (AIC)	2505.97					
Observations	958					

Note: authors' calculations, OR, odd ratios; CI, confidence intervals, and *P < .1; **P < .05; ***P < .01.

among students. We found that the odds of being at the higher level of anxiety increases by 1.62 times (95% CI = 1.06 to 2.46) if students' friends or relatives were infected by COVID-19, our results match with Cao et al.[6,7] The infected person has to go for hospitalization (in severe cases), home quarantine, or self-isolation instantly and immediate stop physically seeing the infected relative or friends that can affect the students' mental health. Moreover, if a close relative or friend gets infected it is natural that a person would think s/he might also get infected and this could increase the psychological pressure.

We now discuss the results which were found significant at .1 *P*-value. We found that the odds of being at the higher level of anxiety decreases (OR = .798, 95% CI = .61 to 1.04) if the students were male. In other words, male students were less likely to develop a higher level of anxiety in comparison with female students our finding corroborates with.[11] Perhaps, female students are more sensitive to the COVID-19 situation than males. Furthermore, the odds of being at the higher level anxiety increases by 1.3 times (95% CI = .96 to 1.75) if the students were above 20 years old in comparison to those whose age below 20 years. Possibly older students take the impact of coronavirus more seriously which may lead to an upsurge in anxiety level our findings are similar with.[11] Interestingly, the odds of being at a higher level of anxiety increases by 1.7 times (95% CI = .95 to 3.09) if the students were of Chinese ethnicity in comparison to other ethnicities (Indian, Bengali, Arabian, and Indonesian). Perhaps, Chinese students were more sensitive to the pandemic and overly worried about their own health and their relatives' health who were residing in China amidst the pandemic. Second, because of the strict travel restrictions imposed by governments, it was extremely difficult for the Chinese students to visit their families back in China. These factors could have extensively increased the psychological pressure on them. Unfortunately, we have not found any study outside the China which has examined the relationship between anxiety because of COVID-19 and students' ethnicity.

In addition, as the number of close friends increases, anxiety decreases. However, these results were not significant. Perhaps, future larger sample size studies may explore some more interesting exploratory discoveries that may lead to more definite and significant findings. Second, the data were collected in July 2020, when the curve of the COVID-19 in Malaysia was getting flatter. Perhaps, data collection in some other time periods may produce slightly different results.

Conclusion

The COVID-19 outbreak continues to create chaos in almost every country. In response to controlling the virus, every country has taken various steps such as lockdowns, quarantines, social distancing, isolations, and MCOs. The fear of death due to COVID-19 and government measures to control the spread of the virus have affected the mental health of citizens and students in particular. The psychological impact

of COVID-19 in Malaysian students is a relatively unexplored phenomenon. We explored the anxiety among students in Malaysia and found that around 57% of the students were experiencing moderate to severe anxiety. Surprisingly, only 37% of students were aware of mental health support services which are provided by their institutions. Additionally, gender as male and internet access were a protective factor against anxiety, despite the potential for the internet to increase anxiety through constant worrying news reports. However, age above 20 years, ethnicity as Chinese, decreased family income, a pre-existing disease, spending more than 30 minutes weekly on watching or reading COVID-19-related news, and having an infected family or friends were viewed as the major risk factors for anxiety.

Treatment of anxiety involves various interventions including the medication, counseling, and therapy, the combination of all of these usually being more effective. We suggest higher education institutions should assist universities to open mental health support (both psychiatric- and psychology-based) clinics on every campus, with online access. These services should be provided on both an informal and formal basis as well because those students who are unable to visit the clinic physically can get mental support on call or chat. It is also important to regularly monitor the mental health condition of the students. The financial packages or support can help families to maintain their income which eventually lowers the anxiety level. It can also lead to greater economic productivity in lockdowns. Hence, we suggest the government should also consider providing financial support to the families working from home during lockdowns and higher stringency regimes. Moreover, sports clubs and student societies can also reduce anxiety among students by operating within the context of social distancing. These concerns should be addressed by the Ministries of Education and Quality Control. Our policy suggestions can lower the anxiety among students and can help the policy setters in formulating the adequate policies. Our results are likely to be of interest to education policy setters around the globe as the majority of students around the world have experienced very similar issues during COVID-19 lockdowns as teaching has been online, and so they confront common issues.

Limitations

As noted above, the foremost limitation of our study is concerned with data non-response and low participation bias. Indeed, larger data sets can produce relatively better and generalizable results; however, given the time limits, lockdown, and travel restrictions, it was impossible for us to conduct a larger-scale study. Second, data collection timing can sufficiently affect the anxiety level, for example, if data are collected during the worse period of pandemic, the results would show higher level of anxiety and vice versa. Hence, data collection throughout the year may produce better and more generalizable results; however, owing to the time limits, we collected the data within 1–2 months when Malaysia was experiencing comparatively less COVID-19 cases. Third, our study lacks in producing causal estimates because we did not carry out the clinical trials; nevertheless, carrying an experimental study during the time of travel restriction was not possible. We suggest future research in Malaysia should also focus on clinical and experimental research to go into deeper understanding of psychological impact of COVID-19 on students.

Ethical Statement

We hereby declare that the paper reflects the authors' own research and analysis in a truthful and complete manner. The results are appropriately placed in the context of prior and existing research. In addition, no animal or human were harmed, no blood samples were collected, no clinical trials were carried out, identity of the respondents kept confidential, prior consent from the respondents were taken, the respondents were free to exit the survey at any point, and no financial incentives were offered.

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ORCID iD

Muhammad Irfan https://orcid.org/0000-0002-3876-4941

Notes

1. https://www.worldometers.info/coronavirus/
2. https://www.worldometers.info/coronavirus/

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