EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 9
Issue: 12
37-46
Year: 2022

ASSESSMENT OF MENTAL HEALTH AND SUICIDAL BEHAVIOUR DURING THIRD WAVES OF COVID-19 AMONG ADULTS IN MALAYSIA

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Article Received on 24/09/2022 **Article Revised on 15/10/2022** **Article Accepted on 04/11/2022**

ABSTRACT

Background: Globally, during COVID-19 pandemic, the state of mental health was deteriorating and the suicidal behaviour was increasing at an exponential rate. The aim of this research was to determine the prevalence of Malaysian adults who have suicidal behaviour and mental health during third waves of COVID-19 pandemic, 2021. **Methods**: A cross-sectional survey was done using online electronic platforms. Socio-demographic characteristics, level of depression, anxiety and stress (DASS) together with suicidal behaviour were accessed in the questionnaires. **Results**: Among 2485 respondents, almost half of the respondents (49.1%) had high risk for suicidal ideation, whereas 50.9% had low risk of suicidal ideation. Furthermore, 48.8% of the respondents had depression, 22% of them had stress and 46.9% reported for anxiety during COVID-19 pandemic in Malaysia. Age of respondents, education level, occupational status, marital status, and were significantly associated with DASS and suicidal behaviour. **Conclusion**: During pandemic, this study revealed a nearly half population had high risk for suicidal ideation among the Malaysian adults. Future studies should investigate the pandemic's impact on public mental health but also its influence on the mental health of healthcare professionals. Our results may also support the development of resilience trainings.

KEYWORDS: Depression, Anxiety, Stress, Suicidal Behaviour, Third Waves COVID-19 pandemic.

INTRODUCTION

In late 2019-early 2020, the 2019 novel coronavirus disease arose and spread rapidly in China. To minimize the negative psychosocial effects on public mental health, China has been introducing emergency psychological crisis measures, but challenges remain. Interventions in public mental health should be formally incorporated into public health planning and emergency response plans.[1] For months and years to come, the psychological sequelae of the pandemic would undoubtedly continue. Studies suggest that in the general population and among healthcare professionals, the COVID-19 pandemic is associated with pain, anxiety, fear of contagion, depression and insomnia. Psychiatric problems associated with stress, including mood and drug use disorders, are linked to suicidal behavior. Survivors of COVID-19 might also be at high risk of suicide. During and after the pandemic, the COVID-19 crisis could increase suicide rates. The mental health implications, including suicidal tendencies, of the COVID-19 crisis are likely to be present for a long time and peak later than the actual pandemic.[2] However, there is no empirical data that is available in who having risk for commit suicide among Malaysians during pandemic, yet the exact relationship between pandemic and mental health and suicidal behavior remains unknown.

Previous research has shown that suicide deaths can rise during outbreaks of infectious diseases. Suicides increased in the United States during the 1918-20 influenza pandemic, 1 and suicide rates increased in Hong Kong during the extreme acute respiratory syndrome (SARS) epidemic among adults aged 65 years and older.[3] Many strategies had been taken, it is important to reduce stress, anxiety, fears, and depression in the general population to control suicides during the COVID-19 crisis. Traditional and social media campaigns are required to encourage mental health and minimize anxiety. Active outreach is required,

particularly for people with a history of psychiatric problems, survivors of COVID-19 and older adults. Research studies are needed.[2] However, there is no empirical data that is available in who having risk for commit suicide among Malaysians during pandemic, yet the exact relationship between pandemic and mental health and suicidal behavior remains unknown. Also, there is an contradicting study found that there is no negative correlation between suicidal behavior and pandemics which said no absolute or relative increase in the reasons for alleged suicides, including recent unemployment, financial difficulties, relationship breakup or domestic abuse, was reported between February and August 2020 compared to the pre-exposure period.[4] Therefore, assessment of mental health and suicidal behavior during third waves of COVID-19 in among Malaysians should be studied in order to know exact association of pandemic with mental health and suicidal behaviour. This study was able to fill the gap in knowledge and serve as a reference point for other researchers for the development of knowledge-based interventions in the future.

A limitation of this study was that the survey was not multilingual. The online survey that was used in this research was in English. Therefore, there is possibility of bias because population whose spoken and written language was not English could not participate in the online survey. Besides that, the survey that was conducted online was a limitation of the study. This is because those underprivileged population who have no access to internet or luxury of owning a device could not participate in this study. In addition, the study was over-represented by of people between age 18-24, females, student and those who were from urban residence. Thus, there are limitation to the representativeness of the study. Lastly, the survey was done only in Malaysia and couldn't access worldwide. This is said so as we don't have the chance to assess mental health and suicidal behaviour of people worldwide this Covid-19 pandemic does not only affect Malaysia but it gives a huge impact for most of the country so it is suggested in future to conduct a study on mental health that has the chance to access the worldwide population.

METHODOLOGY

Research design

This is a cross-sectional study to assess depression, anxiety, and stress and suicidal behaviour during third waves of COVID-19 among adult population in Malaysia. The online survey was chosen for this study since population-based survey was not feasible under the current critical condition.[5] A google form questionnaire was designed and participants' consent were obtained.[5] The link of questionnaire was shared via many platforms specifically social medias such as Twitter and Instagram. The inclusion criteria for this study were adult aged 18 years and above. Thus, there were no exclusion criteria other than non-willingness to answer the survey.[6]

Sample size determination

The sample size (n) was calculated by using Rao soft sample size calculator.[4] Sample size calculated with the estimation at a 95% significance level and a 5% margin of error, population proportion is 50% and population size is 21.28 million residents of Malaysian adults, the representative sample size is at least 385 participants. Therefore, a minimum sample size of 385 participants required for the overall study. Data was obtained through primary data from the distributed google form.

Data collection and instruments

The data were collected by using validated online questionnaires. The questionnaire consisted of five sections. The first section was sociodemographic characteristics consisted of age, gender, place of residents, race, education level, occupation, marital status, and family income. Second section was assessment of depression questionnaire consisted of 7 items and each question had a possible response of 0(Did not apply to me at all), 1(Applied to me to some degree, or some of the time), 2 (Applied to me to a considerable degree or a good part of time), 3 (Applied to me very much or most of the time). The total score ranged from 0–42, the sum of the 7 question will multiply by 2 with an overall greater score indicates the individual has higher depression level. The range of depression score is as follows, normal (0-9) mild[10-12], moderate[13-20], severe[21-27], extremely severe.[28-42]

The third section was assessment of anxiety section also consisted of 7 items and the response of each item was indicated on a 0(Did not apply to me at all), 1(Applied to me to some degree, or some of the time), 2 (Applied to me to a considerable degree or a good part of time), 3 (Applied to me very much or most of the time). The total score ranged from 0–42, the total score was calculated by summating the 7 questions and multiply the total by 2, with an overall greater score indicating high anxiety level. The anxiety score range is as follows normal (0-6), mild (7-9), moderate[10-14], severe[15-19], extremely severe.[20-42]

The fourth section was assessment of stress which included 7 items of question and each item was answered 0(Did not apply to me at all), 1(Applied to me to some degree, or some of the time), 2 (Applied to me to a considerable degree or a good part of time), 3 (Applied to me very much or most of the time). The total score ranged from 0–42, the total score was calculated by summating the 7 questions and multiply the total by 2, with an overall greater score indicating high stress level. The anxiety score range is as follow normal (0-10), mild (11-18), moderate (19-26), severe (27-34), extremely severe.[35-42]

The last section was the SBQR question. The participants could choose more than one option. This screening measure employs four questions that assess different elements of suicidality, including lifetime suicide

ideation and attempts (question 1); frequency of suicide ideation over the last 12 months (question 2); the threat of suicidal behaviour (question 3); and self-reported likelihood of suicidal behaviour (question 4). These items are coded and summed to create a possible range from 3 to 18. You circled one answer for each question. Each answer you circled has a number beside it, such as 1, or 2, or 2a or 2b etc. To add up your total score, simply add up the 4 numbers beside your answers. For adults in the general population with a score of 7 or greater are considered at risk of suicide.

Validity and Reliability

The exploratory and confirmatory factor analysis supported an assumed one-dimensional structure of the questionnaire, with satisfactory internal consistency, evaluated by Cronbach's alpha, equal to 0.83.[7] DASS21 questionnaire has Cronbach's alpha values which were 0.998, 0.990, and 0.994, respectively, for depression, anxiety, and stress domains, which was comparable to other studies and indicated a strong internal consistency and good construct validity. Factor and varimax analysis revealed items to be well suited to their respective domains and overall Cronbach's alpha of DASS21 questions was 0.8.[8]

Data Analysis

The data captured in the online google form were examined for errors then cleaned and exported into SPSS version 25.0. Data were analysed using SPSS statistical software. Descriptive statistics were used to summarize the respondent's socio-demographic. Chi-square test was used to analyse the significance of the association between sociodemographic characteristics and respondents in the groups (depression, anxiety, stress, and suicidal ideation group). Those variables that appeared to have a P-value of < 0.05 are considered significant in the bivariate analysis to identify associations between participants' background and mental health. The Cramer's V value was also analysed by which, those with value of more than 7 are considered to have strong association between the tested variables.

RESULTS

Table 1: Sociodemographic characteristics of the repondents (N=2485)

Variables	Categories	Frequency (n=2485)	Percent (%)
Age in category	Young Adult	2438	98.1
	Middle Age	43	1.7
	Elderly	4	0.2
Gender	Male	388	15.6
	Female	2097	84.4
Place of residents	Rural area	841	33.8
	Urban area	1644	66.2
Race	Chinese	24	1.0
	Indian	25	1.0
	Malay	2302	92.6
	Others	134	5.4
Education Level	No formal education	6	0.2
	Primary /Secondary school	207	8.3
	Post-Secondary education (Pre-University: Matriculation /A-level, Diploma, etc)	1019	41.0
	Tertiary Education	1253	50.4
Occupational Status	Full-time	724	29.1
	Part-time	88	3.5
	Student	1408	56.7
	Unemployed/Homemaker	265	10.7
Marital Status	Divorced	14	0.6
	Married	204	8.2
	Others (Engaged,etc)	60	2.4
	Single	2201	88.6
	Widowed	6	0.2
Family Income	Between RM 4,850 to RM 10,959	775	31.2
	Less than RM 4,849	1408	56.7
	More than RM 10,960	302	12.2

Table 2: Levels of suicidal behavior among participants (N=2485)

Categories of Suicidal behavior	Frequency (n=2485)	Percent (%)
Low risk for Suicidal Ideation	1264	50.9
High Risk for Suicidal Ideation	1221	49.1

Table 3: Levels of Depression, Anxiety and Stress among participants (N=2485)

Categories of DASS-21	Frequency (n)	Percent(%)
Depression		
Normal	1273	51.2
Mild Depression	438	17.6
Moderate Depression	665	26.8
Severe Depression	109	4.4
Anxiety		
Normal	1070	43.1
Mild Anxiety	278	11.2
Moderate Anxiety	628	25.3
Severe Anxiety	413	16.6
Extremely Severe Anxiety	96	3.9
Stress		
Normal	1936	77.9
Mild Stress	359	14.4
Moderate Stress	190	7.6

Table 4: Association between Socio-demographic characteristics and anxiety, stress, depression and suicidal behavior among participants using Chi-square test (N=2485)

Variables	Depression				Anxiety				Stress			p-value		
	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	Normal n(%)	Mild n(%)	Moderate n(%)	Depression	Anxiety	Stress
Age														
Young adults	1234 (50.7)	435 (17.8)	661 (27.1)	107 (4.4)	1034 (42.4)	274 (11.2)	625 (25.6)		1892 (77.6)	35.8 (14.7)	188 (7.7)			
Middle adults	35 (81.4)	2 (4.7)	4 (0.6)	2 (4.7)	33 (76.7)	4 (9.3)	2 (4.7)		40 (93.0)	1 (2.3)	2 (4.7)	0.005	0.002	0.116
Older adults	3 (75.0)	1 (25.0)	0 (0.0)	0 (0.0)	3 (75.0)	0 (0.0)	1 (25.0)		4 (100.0)	0 (0.0)	0 (0.0)			
Gender														
Male	236 (60.8)	60 (15.5)	80 (20.6)		204 (52.6)	42 (10.8)	88 (22.7)	43 (11.1)	319 (82.2)	47 (12.1)	22 (5.7)			
Female	1037 (49.5)	378 (18.0)	585 (27.9)		866 (41.3)	236 (11.3)	540 (25.8)	370 (17.6)	1617 (77.1)	312 (14.9)	168 (8.0)	0.001	0.000	0.075
Place of residence														
Rural	445 (52.9)	156 (18.5)			363 (43.2)	81 (9.6)	215 (25.6)		668 (79.4)	122 (14.5)	51 (6.1)			
Urban	828 (50.4)	282 (17.2)			707 (43.0)	197 (12.0)	413 (25.1)		1268 (77.1)	237 (14.4)	139 (8.5)	0.284	0.319	0.103
Race														
Chinese	13 (54.2)	4 (16.7)	5 (20.8)		14 (58.3)	4 (16.7)	4 (16.7)	1 (4.2)	21 (87.5)	2 (8.3)	1 (4.2)			
Indians	17 (68.0)	2 (8.0)	5 (20.0)		15 (60.0)	3 (12.0)	4 (16.0)	3 (12.0)	21 (84.0)	3 (12.0)	1 (4.0)			
Malay	1172 (50.9)	408 (17.7)	623 (27.1)		983 (42.7)	262 (11.4)	576 (25.0)	392 (17.0)	1786 (77.6)	338 (14.7)	178 (7.7)	0.813	0.193	0.834
Others	71 (53.0)	24 (17.9)	32 (23.9)		58 (43.3)	9 (6.7)	44 (32.8)	17 (12.7)	108 (80.6)	16 (11.9)	10 (7.5)			
Education level														
No formal education	2 (33.3)	1 (16.7)												
Primary/ Secondary	90 (43.5)	35 (16.9)			0 (0.0)	2 (33.3)			3 (50.0)	3 (50.0)				
	514													

Post-secondary (pre-university, matriculation/A-level/diploma, etc)	(50.4) 667 (53.2)	194 (19.0) 208 (16.6)			68 (32.9) 424 (41.6)	24 (11.6) 101 (9.9)			147 (71.0) 793 (77.8)	43 (20.8) 154 (15.1)		0.089	0.000	0.008
Tertiary (Degree, Master, PhD)					578 (46.1)	151 (12.1)			993 (79.2)	159 (12.7)				
Occupational status														
Full-time	409 (56.5)				366 (50.6)	76 (10.5)			580 (80.1)	90 (12.4)				
Part-time	39 (44.3)				35 (39.8)	11 (12.5)			64 (72.7)	14 (15.9)				
Student	712 (50.6)				551 (39.1)	164 (11.6)			1101 (78.2)	207 (14.7)		0.011	0.003	0.108
Unemployed/homemaker	113 (42.6)				118 (44.5)	27 (10.2)			191 (72.1)	48 (18.1)				
Marital status														
Divorced	11 (78.6)	1 (7.1)			9 (64.3)	0 (0.0)			13 (92.9)	1 (7.1)				
Married	145 (71.1)	26 (12.7)			134 (65.7)	19 (9.3)			177 (86.8)	11 (5.4)				
Others (Engaged)	22 (36.7)	13 (21.7)			18 (30.0)	6 (10.0)			45 (75.0)	8 (13.3)				
Single	1091 (49.6)	397 (18.0)			904 (41.1)	253 (11.5)			1695 (77.0)	339 (15.4)		0.000	0.000	0.009
Widowed	4 (66.7)	1 (16.7)			5 (83.3)	0 (0.0)			6 (100.0)	0 (0.0)				
Family income B40 (Less than RM 4849) M40 (RM-4850-10959) T20 (More than RM 10960)	700 (49.7) 407 (52.5) 166 55.0)	264 (18.8) 125 (16.1) 49 (16.2)			582 (41.3) 337 (43.5) 151 (50.0)	155 (11.0) 88 (11.4) 35 (11.6)			1083 (76.9) 614 (79.2) 239 (79.1)	214 (15.2) 104 (13.4) 41 (13.6)		0.361	0.223	0.749

Table 5: Association between Socio-demographic characteristics and suicidal behavior among participants using Chi-square test (N=2485)

Variables	Suicidal Behaviour		Chi-square (df)	p-value
	Low n(%)	High n(%)		
Age				
Young adults	1229 (50.4)	1209 (49.6)		
Middle adults	32 (74.4)	11 (25.6)	10.68(2)	0.005
Older adults	3 (75.0)	1 (25.0)		
Gender				
Male	244 (62.9)	144 (37.1)	26.59(1)	0.000
Female	1020 (48.6)	1077 (51.4)		
Place of residence				
Rural	431 (51.2)	410 (48.8)	0.08(1)	0.785
Urban	833 (50.7)	811 (49.3)		
Race				
Chinese	9 (37.5)	15 (62.5)		
Indians	17 (68.0)	8 (32.0)		
Malay	1179 (51.2)	1123 (48.8)	7.27(3)	0.064
Others	59 (44.0)	75 (56.0)		
Education level				
No formal education	1 (16.7)			
Primary/Secondary	72 (34.8)			
Post-secondary (pre-university, matriculation/A-level/diploma, etc)	490 (48.1)		40.32(3)	0.000
ertiary (Degree, Master, PhD)	701 (55.9)			
Occupational status				
Full-time	423 (58.4)			
Part-time	40 (45.5)		23.83(3)	0.000
Student	678 (48.2)			
Unemployed/homemaker	123 (46.4)			
Marital status				
Divorced	9 (64.3)	5 (35.7)		
Married	145 (71.1)	59 (28.9)		
Others (Engaged)	15 (25.0)	45 (75.0)		
Single	1090 (49.5)	1111 (50.5)	54.54(4)	0.000
Widowed	5 (83.3)	1 (16.7)		
Family income				
B40 (Less than RM 4849)	703 (49.9)		1.19(2)	0.551
M40 (RM-4850-10959)	402 (51.9)			
T20 (More than RM 10960)	159 (52.6)			

Table 1 shows the summary statistics of the sociodemographic profile of 2485 participants. We received responses from respondents who are in the range of 18 to 35 years old with the most common age of 22 years old. Among the 2485 respondents, only 388 (15.6%) were male, and the rest 2097 (84.4%) were female. 1644(66.2%) of them lives in urban area. 2302 (92.6%) of them were Malay, 25(1.0%) were Indians, 24(1.0%) were Chinese, and 134(5.4%) comes from other races. Regarding their educational background, 1253(50.4%) completed tertiary education and only 6(0.2%) had no formal education. For the occupational background, 724(29.1%) were full-time employees, 88(3.5%) with part time, and a majority of 1408(56.7%) are still students.

Table 2 shows people who at risk of suicidal ideation. As a result we can see out of 2485 participants, 1221(49.1%) has high risk for suicidal ideation which is nearly 50% .

Table 3 shows the proportion of stress, anxiety, depression and suicidal ideation in the study population among all 2485 participants. In term of stress, the highest number of participants voted for normal score (77.9%) followed by mild (14.4%) and moderate level (7.6%). About one third of respondents scored normal anxiety level (43.1%), then moderate score (25.3%), mild at (11.2%), next severe state at (16.6%) and lastly (3.9%) for extremely severe category. For the depression scores, more than half of the respondents stated their depression in normal level (51.2%) followed by moderate (26.8%), mild at (17.6%) and the least category; severe at (4.4%).

Table 4 show the association of socio-demographic characteristic with anxiety, stress, depression and suicidal ideation. It illustrates positive correlation of stress, depression and suicidal ideation with marital status, occupational status, educational level and gender ($p<0.05$) whereas negative relation with family income, race and place of residence. Meanwhile anxiety had significant association not just with marital status, occupational status educational level and gender but also with family income while had no significance association with race and place of residence.

The association of all socio-demographic characteristic with anxiety, stress, depression and suicidal ideation has weak correlation as the Cramer's V value below 0.3

Table 5 shows the association of socio-demographic characteristics with depression, anxiety, stress and suicidal ideation among 2485 respondents. It depicts positive correlation of depression, anxiety, and stress (DASS) together suicidal ideation with female in terms of gender with proportion of (42.7%), (49.5%), (19.3%) and (43.3%) respectively. According to age group, young adults reported higher number for depression (48.4%), anxiety (56.5%), stress (22.0%) and also suicidal ideation (48.7%) compared to other group age. Looking in to place of residents, people living in urban area having greater proportion of depression (32.8%), anxiety (37.7%) and stress (15.1%) also suicidal ideation (32.6%)

Among races, Malay is highly associated with depression (45.5%), anxiety (53.1%) and stress (20.8%) also suicidal ideation (45.2%) in our survey. In terms of education level, people in tertiary education have higher complain of depression (23.6%), anxiety (27.2%), stress (10.5%) with suicidal ideation (22.2%) during this pandemic. According to occupational status, students have higher number of depression (28.0%), anxiety (34.5%), stress (12.3%) and suicidal ideation (29.3%) compared to the others. People who are single tend to have higher number of depression (44.7%), anxiety (52.2%), stress (20.4%) and suicidal ideation (44.7%). Looking into family income, those who are getting less than RM 4849 reported higher number of depression (28.5%), anxiety (33.2%) and stress (13.1%) and also suicidal ideation (28.4%).

DISCUSSION

We conducted a study on the assessment of mental health and suicidal behaviors during third waves of covid-19 among adults in Malaysia. This study found that the prevalence of suicidal ideation during the Covid-19 pandemic among Malaysian adults was 49.1% and it was significantly associated with gender, marital status, occupational status, educational level. This could be due to loneliness as social isolation is essential during pandemic and financial instability as most of population loss their job.[7] Our next significant finding would be status of relationship. Single individuals tend to develop higher risk of suicidal ideation, depression, anxiety, and stress. This could be due to poor social support they receive as living and being alone during the pandemic can be very challenging. This number is alarmingly high as the prevalence of suicidal ideation prior to the pandemic as reported by a systematic review in 2014 was between 8.8 to 10 %.[3] Although this number was higher than most studies done recently on suicidal ideation during the pandemic. Our study indicated that third waves of COVID-19 has positive association with suicidal ideation.

However, in recent study of COVID-19 Social Study done in United Kingdom, 17.8% had self-harm or suicidal thoughts and it was higher among women, Black, Asian and minority ethnic (BAME) groups and among respondents with socioeconomic difficulties, unemployment, disability, chronic physical illnesses, mental health problems and having COVID-19 diagnosis.[8] In the United Sates, the percentage of respondents who reported having seriously considered suicide in the 30 days before completing the survey was 10.7% and it was significantly higher among the young adults aged 18–24 years.[1] Therefore, suicidal ideation if not detected or prevented may lead to attempts and suicide. It is even more imperative to detect it during the pandemic as some countries have reported rising cases of suicide and suicide attempts.[9]

The prevalence of stress, anxiety and depression among the respondents were 22.1%, 56.9% and 48.8% respectively which significantly associated with gender, occupational status, marital status and educational level. Which may be caused by the burden of paying for debts, disparities between different level of socioeconomic status, the pressure and overloads of working from home, and the pressure of having to provide for the family.[10] According to Banerjee et al.[11] The pandemic has increased the risk of isolation, fear, stigma, abuse and economic fallout, and therefore, increasing the risk of psychiatric disorders, chronic trauma and stress, which eventually increase suicidality and suicidal behavior. Among 1593 respondent, one study reported that the prevalence of anxiety and depression was 8.3% and 14.6%, respectively using the self-rating anxiety scale (SAS) and the self-rating depression scale (SDS).[12] Other cross sectional studies, using different assessment tools and methodologies between them, found that the prevalence of depression and anxiety range between 19.2% – 43.7% and 23.8 – 45.1% respectively.[13]

To date, there was one longitudinal study that was done comparing mental health status of the general population at the beginning of the pandemic and four weeks later.[14] The study reported that the respondents had moderate-to-severe stress, anxiety, and depression at the beginning at 8.1%, 28.8%, and 16.5%, respectively, which did not change significantly at the end of the study.[15] The co-occurrence of the Covid-19 pandemic and rising mental health issues such as depression, anxiety and suicidal

ideation serve as a double threat. As the consequences of both issues are dire it is important to create awareness on mental health problems among the general population by primary prevention methods, promoting resilience and better coping strategies as well as, identifying and providing access to mental health professionals/facilities in those who are vulnerable. Periodic assessment of mental health, substance use, and suicidal ideation should evaluate the prevalence of psychological distress over time. Addressing mental health disparities and preparing support systems to mitigate mental health consequences as the pandemic evolves will continue to be needed urgently. Future studies should identify drivers of adverse mental and behavioral health during the COVID-19 pandemic and whether factors such as social isolation, absence of school structure, unemployment and other financial worries, and various forms of violence (e.g., physical, emotional, mental, or sexual abuse) serve as additional stressors.[16]

CONCLUSION

As a conclusion, this study can increase the social awareness of the importance of mental health and how it affects certain people especially during the pandemic. According to our data, based on the answers given by the respondents, 1212 have high risk of depression, 1165 are stressed, and 1165 are reported for anxiety. By consuming this data alone, we were able to highlight one of the most important objectives in our research, which is to measure the negative emotional states of a population.

In addition, several recommendations are needed for future references in this study. For example, a larger sample size in the population would provide more accurate mean values, identify outliers that could skew the data compared to a smaller sample and provide a smaller margin of error. Thus, provides a more promising outcome. Next, usage of more than a single platform to spread questionnaires. Due to strict lockdowns, we were unable to physically spread the questionnaires in person. Thus limits our reach for surveys.

DECLARATIONS

Ethics approval and consent to participate

All the participants were provided with informed consent before commencement of the survey. The ethical approval was acquired from the Human Research Ethic Committee, Centre of Research and Development, Asia metropolitan University (No. AMU/MREC/FOM/NF/03/2021), which is in accordance with the Declaration of Helsinki. Participants undergone informed consent prior to enrolment of the study.

Consent for publication

All authors involved in this study agreed to proceed for publication.

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to confidentiality; however, data is accessible from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

There is no funding provided for this study.

Authors' contributions

TMK, LLW, YMH, MAK, and MNHS devised the project, the main conceptual ideas, and proof outline. TMK, MAK, YMH, MNHS and NMSA collected and analyzed the data. TK,LLW, MAK and NMSA contributed to the interpretation of the results. NMSA and TMK took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis, and manuscript. The author(s) read and approved the final manuscript.

ACKNOWLEDGEMENTS

We would like to extend our heartfelt thanks to the participants of this study. We also would like to thank the Centre of Research and Development, Asia Metropolitan University for approval of our research ethic application.

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