Psychosocial Factors Associated with Depression and Anxiety During COVID-19 Pandemic Among Outpatients with Depression

ABSTRACT

Objective: Long-term social distancing, isolation, and economic fallout may be significant psychological triggers during pandemic, such as COVID-19, especially for those with underlying psychiatric illness. This study was conducted to address the psychological impact of COVID-19 pandemic among patients with depression based at a teaching hospital in Malaysia.

Methods: This is a cross-sectional online study among patients with depression from University Malaya Medical Centre, using Generalized Anxiety Disorder-7 (GAD-7), Montgomery-Åsberg Depression Rating Scale-Self Assessment (MADRS-S), Insomnia Severity Index (ISI), Multidimensional Scale of Perceived Social Support (MSPSS), Knowledge, Attitudes, and Practices (KAP), and Social Media Addiction during COVID-19 Pandemic (SMACOP).

Results: One hundred seventy-eight patients participated in this study. The mean total of the KAP score is 12.65 (SD = 2.65), with knowledge section (mean = 7.34 [SD = 2.13]), attitudes section (mean = 2.63 [SD = 0.58]), and practices section (mean = 2.69 [SD = 1.00]). They scored moderately on the MADRS-S (mean = 21.03 [SD = 4.62]) and ISI (mean = 20.25 [SD = 4.62]) but had high GAD-7 scores (mean = 16.8 [SD = 6.27]). From the multiple logistic regression analyses, depressive symptoms of greater severity (MADRS-S 18–34) are significantly associated with more severe insomnia (P < .001, adjusted OR = 9.101, 95% CI: 3.613-22.924). Furthermore, the high anxiety level is associated with the younger age group (P = .029, Adjusted OR = 2.274, 95% CI: 1.090-4.746), greater severity of insomnia (P < .001, Adjusted OR = 22.9, 95% CI: 6.145-85.343), and higher risk of COVID-19 related social media addiction (P = .011, adjusted OR = 2.637, 95% CI: 1.253-5.550).

Conclusion: This study demonstrates the high levels of sleep disturbances and anxiety symptoms experienced by outpatients with depression during the COVID-19 pandemic. These are closely linked to the younger age group and at-risk social media addiction related to COVID-19.

Keywords: Depression, anxiety, COVID-19, social media

Introduction

The Coronavirus Disease 2019 (COVID-19) resulted in an epidemic throughout China, leading to a global pandemic since the beginning of 2020. The outbreak was then declared as Public Health Emergency of International Concern by the World Health Organization (WHO) on January 30, 2020. By December 29, 2020, there are 79.9 million confirmed cases and 1.8 million deaths reported globally since the beginning of the pandemic.1

COVID-19 has significantly impacted the well-being at both individual and community levels, which translates into psychological distress, unhelpful coping behaviors, and non-compliance with public health measures.2 These were attributed to the uncertainty of safety and unpredictable consequences, as well as misinformation about COVID-19, particularly...
on social media. A recent study by Ahmad et al. concurrently demonstrated the significant impact of social media on spreading fear and panic related to COVID-19. Vulnerable groups, such as psychiatric patients, are taking the strain during this pandemic, with studies reporting the psychological impact of the COVID-19 lockdown being strongest for people with existing mental health condition.

In Malaysia, the National Health Morbidity Survey published that the prevalence of lifetime depression was 2.3%. However, a systemic analysis performed by the researcher showed that the prevalence ranged from 3.9 to 46%, which might be associated with underreporting and discrepancies between the validity of assessments. As emerged in the increasing numbers of research since the beginning of the pandemic, identifying the sociodemographic factors associated with psychological distress among said population is crucial. A recent meta-analysis has shown that younger age groups, lower socioeconomic status, pre-existing physical or mental health conditions, and longer social media exposure were associated with higher odds of anxiety and depression. Conversely, living together with a partner and higher levels of social support were linked to significantly better mental health well-being. The less fear, anxiety, and depression when a patient was having higher seeking social support during pandemic outbreaks. Higher perceived social support and great coping strategies would improve psychological distress and empowered resilience's and psychological adaptation. The psychological condition of an individual can affect the way they use social media. Given that media access via a smartphone is easy and convenient, and people can rely on their smartphones to relieve stress and tension. Therefore, most people have to stay at home during the pandemic to curb the spread of the infection, so all COVID-19 related information had to be reviewed via social media. Many studies have found a positive link between internet addiction and depression, with higher levels of depression shown by social media addicts. Extensive research on internet addiction was carried out, but there is still a lack of social media addiction to news related to COVID-19. Therefore, the more time used online, exploring news related to COVID-19, there is an association between at-risk social media addiction regarding COVID-19 and heightened anxiety levels among patients with depression. The above factors have potential implications for planning well-targeted and cost-effective interventions to address mental health service needs during COVID-19.

To date, there has been limited published data on the impact of COVID-19 among patients with depression in Malaysia. Given this background, we aim to assess the psychosocial factors associated with depression and anxiety during the COVID-19 pandemic among outpatients with depression. We hypothesize that during the COVID-19 pandemic, there would be psychological-associated factors among depressed patients. With the impact of pandemic, uncertainties would be connected to high levels of anxiety symptoms and sleep disturbances. Furthermore, due to the limitation of social interaction due to the outbreaks, prolonged repetitive exposure to social media is positively associated with social media addiction in relation to COVID-19.

**Methods**

This is a cross-sectional study conducted from mid-April 2020 to June 2020, involving 178 subjects. The target sample size was 156, determined by identifying the smallest acceptable sample size with ±5% margin of error with a 95% CI. As it was unfeasible to conduct a community-based sampling procedure during this period of national lockdown, an online survey using Google forms was deemed most appropriate to collect data in this context.

The Medical Research Ethical Committee of University Malaya Medical Centre approved the study (MREC ID: 202069-8731). Participants who have agreed to participate in the survey voluntarily, as per the agreement, they would press the “I agree” checkbox. They are then instructed to complete the questionnaire, which was self-administered.

Potential subjects who received the diagnosis of depression by the treating doctors were identified from the University Malaya Medical Centre database. Their diagnosis was further confirmed during the phone call interviews by the researcher. A standardized general description of the survey, including objectives and procedure, was given as briefing via phone calls. In this study, 178 patients who fulfilled the inclusion criteria participated in the study; in which the subject age > 18 years old, has been diagnosed with Major Depressive Disorder based on The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by the treating doctor, understood and able to read in Malay or English and consented to enter the study. Subjects experiencing severe psychiatric illness, psychosis, or acute medical illness were excluded.

Seven sets of the instrument were used in this study, along with a sociodemographic questionnaire.

**Study Instruments**

**Montgomery-Åsberg Depression Rating Scale-Self Assessment (MADRS-S):** The MADRS-S is a self-administered diagnostic instrument to assess symptoms variation during treatment for depression. It is used based on the cumulative score to measure the levels of depression, with higher scores representing greater severity of depression. It consists of 9 items, rated on a 0- to 6-point scale, yielding a maximum score of 60. Scores of 9, 18, and 35 are taken as the cut-off scores for mild, moderate, and severe depressive symptoms. It reports Cronbach’s alpha of 0.84 and intra-class correlation coefficient of 0.78.

**General Anxiety Disorder-7 (GAD-7):** This scale used as a screening and severity measuring tool for generalized anxiety disorder. It composed of 7 items, ranging from “0” (not at all) to “3” (nearly every day). The overall score is self-reported between 0 and 21. As for the study purposes, GAD-7 was described as the presence of anxiety signs and symptoms, with a cumulative score of 15 or higher. This cut of point is compatible with the estimation of the prevalence of GAD

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**MAIN POINTS**

- It is suggested that social media and technology can be incorporated into pandemic crisis management.
- Outpatients with depression expressed high levels of sleep disturbances and anxiety symptoms during the COVID-19 pandemic.
- Psychosocial factors that are associated with depression and anxiety among outpatients with depression during the COVID-19 pandemic include those from younger age groups as well as those who are at-risk for COVID-19-related social media addiction.
in primary care settings.20 The Cronbach's alpha for GAD-7 is shown to be 0.89.21

**Insomnia Severity Index (ISI):** ISI is a checklist with a 7-items self-report of insomnia, reviewing its nature, seriousness, and impact.22 The “last month” is the recall duration and the measured parameters are: sleep onset difficulty, sleep regulation, early morning emerging issues, frustration regarding sleep problems, interfering of daytime activities, others perception, and anxiety-induced sleep problems. To grade each parameter (e.g., 0 = no problem; 4 = serious problem), a 5-point Likert scaled is used, giving a cumulative score ranging from 0 to 28. The average score is graded as follows: absence of insomnia (0–7), subthreshold insomnia (8–14), mild insomnia (15–21), and extreme insomnia (22–28). ISI demonstrates excellent internal consistency (Cronbach’s alpha of 0.84) and test–retest reliability (intra-class correlation coefficient of 0.84).23

**Multidimensional Scale of Perceived Social Support (MSPSS):** MSPSS is a short analytical tool aimed at assessing help experiences for patients from 3 sources: colleagues, families, and a significant other. There is a total of 12 items, include 4 items for each subscale. Initial studies on MSPSS showed that high levels of perceived social support were associated with low levels of anxiety and depression.24

Previous study has shown that MSPSS has excellent internal consistency among psychiatric outpatients, with Cronbach’s alphas as follow: friends (α = 0.94), family (α = 0.92), and significant other (α = 0.94).25

**Social Media Addiction During COVID-19 Pandemic (SMACOP):** This is a 5-item self-report scale intended to quantify social media addiction in relation to COVID-19 using a 1-month recall period. The scale is adapted from Bergen Social Media Addiction Scale and examines 6 basic symptoms of addiction (salience, conflict, mood modification, withdrawal, tolerance, and relapse). It is scored on a 5-point Likert scale, from “1” (very rarely) to “5” (very often), where a higher total score indicated higher COVID-19-related social media addiction. The cut-off score was set at 13 to classify at-risk social media addiction during COVID-19.

Cronbach’s alpha for the overall SMACOP scale was 0.64, while that of the “Desire” and “Distress” subscales were 0.79 and 0.57, respectively. The concurrent validity of SMACOP was examined by Spearman’s rank correlation coefficient with ISI (0.463); GAD-7 (0.468), and Patient Health Questionnaire-9 (0.383).

**Knowledge, Attitudes, and Practices (KAP) Toward COVID-19 in Malaysia:** This survey has been developed to assess the beliefs and behaviors in relation to COVID-19 among Malaysians.26 It is adapted from a study in China.27 It consists of 18 COVID-19 related questions: 11 items on knowledge (K1-K11), 3 items on attitude (A1-A3), and 4 items on practice (P1-P4). A greater proportion of false statements were included in all 3 sections, which were noted among the public, and misconceptions could intensify substantial COVID-related psychological impact. It has been shown that lower KAP scores, especially in the knowledge section, correlated with higher anxiety levels and greater severity of depressive symptoms.

The KAP exhibits reasonable reliability, with KR-20 (0.50), Rasch item reliability (0.95), and person reliability (0.44). For its construct validity, the dimensionality analysis demonstrated that the KAP is unidimensional, with an Eigenvalue of <2.0 on each contrast. There was a significant correlation between total KAP with GAD-7 (−0.191, P < .05) and PHQ-9 (−0.217, P < .05) as well.26

**Statistical Analysis**
The SPSS v23.0 (IBM Corp., Armonk, NY, USA) software was used for data analysis. Descriptive statistic was used for the subjects’ sociodemographic characteristics, KAP, MADRS, GAD-7, and ISI scoring. The means and standard deviation (SD) were presented for the continuous variables. The frequency and percentage were presented for categorical variables and each item of KAP. For MADRS and GAD-7, the frequency and percentage were also presented for the categories of severity (mild, moderate, and severe). For the ISI, the frequency and percentage were presented for the categories of “no,” “subthreshold,” “moderate,” and “severe” insomnia.

The normality of the outcome measures, namely the MADRS and GAD-7, was tested using the Kolmogorov–Smirnov test. The results showed that GAD, MADRS, and ISI were not normally distributed. As a result, we proceed with non-parametric univariate analysis using the chi-square test. In chi-square analysis, GAD was categorized into high (15 or more) and low (less than 15); MADRS was categorized into mild and moderate; and ISI was categorized into subthreshold (8–14) and moderate to severe (15 and above). All significant variables from the univariate analysis (P value = .05) were included in the multiple logistic regression analysis. All tests were 2-tailed. Alpha value, α = 0.05 was considered as the level of statistical significance. Test of P value was conducted, rated by Omnibus test, to see additional variable it is significant to improve the model, aiming P < .01, the model fitting index was evaluated using Hosmer and Lemeshow test and to test on how good the data fit into the model, aiming >.05, and Nagelkerke R square, to see the percentage of variance explained by the model.

**Results**

In this study, 178 subjects completed the online questionnaire. The mean age of subjects was 31.2 years (SD = 13.9 years). The majority of them (90.4%) were using social media as per the result in Table 1.

The majority (63.5%) of subjects reported moderate depressive symptoms (MADRS-S 8-34), whereas over half (56.7%) of the subjects experienced severe anxiety symptoms (GAD-7 ≥ 15). In total, 80.9% reported moderate to severe insomnia symptoms (ISI ≥ 15) (36.5 and 44.4%, respectively), as shown in Table 2.

In the survey assessing KAP toward COVID-19, the mean score was 12.65 (SD = 2.65). The frequency and percentage of participants who answered correctly for each item are tabulated in Table 3.

Almost all of the subjects answered the first 3 items under the knowledge section (K1-K3) correctly, which are the true statements regarding COVID-19. Nonetheless, there was an obvious misunderstanding among subjects regarding widespread COVID-19 misconceptions, such as face mask knowledge and attitude on the usage of face masks during COVID-19 (K10; 26.4%) (A1; 73.6%). Only 27.0% of subjects answered correctly when asked about the origin of COVID-19 (K11), showing that this had not been evidently debunked since the beginning of its outbreak in Malaysia.
It is noteworthy that from the practices section, 65.7% of subjects indicated that they have been using social media to obtain news and updates regarding COVID-19 all the time.

### Table 1. Sociodemographic Characteristics of the Study Subjects (n = 178)

| Sociodemographic variables | n (%) |
|----------------------------|-------|
| Gender                     |       |
| Male                       | 62 (34.8) |
| Female                     | 116 (65.2) |
| Ethnicity                  |       |
| Malay                      | 97 (54.5) |
| Chinese                    | 47 (26.4) |
| Indian                     | 26 (14.6) |
| Others                     | 8 (4.5) |
| Marital status             |       |
| Single                     | 115 (64.5) |
| Married                    | 47 (26.4) |
| Divorced                   | 9 (5.1) |
| Stable partner             | 3 (1.7) |
| Others                     | 4 (2.2) |
| Employment status          |       |
| Working                    | 78 (43.8) |
| Retired                    | 9 (5.1) |
| Not working                | 73 (41.0) |
| Others                     | 18 (10.1) |
| Number of children         |       |
| < 5 children               | 42 (23.6) |
| ≥ 5 children               | 6 (3.4) |
| No children                | 130 (73.0) |
| Education level            |       |
| Primary school             | 4 (2.2) |
| Secondary school           | 35 (19.7) |
| Diploma (pre-university)   | 45 (25.3) |
| Degree (university)        | 84 (47.2) |
| Masters                    | 9 (5.1) |
| PhD                        | 1 (0.6) |
| Partner occupation         |       |
| Government                 | 10 (5.6) |
| Private                    | 23 (12.9) |
| Not working/Retired        | 18 (10.1) |
| Not applicable             | 127 (71.3) |
| Smoking                    |       |
| Yes                        | 35 (19.7) |
| No                         | 143 (80.3) |
| Alcohol intake             |       |
| Yes                        | 39 (21.9) |
| No                         | 139 (78.1) |
| Monthly household income   |       |
| < RM 5000                  | 94 (52.8) |
| RM 5000-RM 10 000          | 54 (30.3) |
| > RM 10 000                | 30 (16.9) |
| Social media usage         |       |
| Yes                        | 161 (90.4) |
| No                         | 17 (9.6) |

### Table 2. GAD-7, MADRS-S, and ISI Scores Among the Study Subjects

| Variables                      | Median (Min–Max) | n (%) |
|--------------------------------|------------------|-------|
| Total GAD-7 score              | 13 (5–17)        |       |
| Category of GAD-7              |                  |       |
| Mild                           | 23 (12.9)        |       |
| Moderate                       | 54 (30.3)        |       |
| Severe                         | 101 (56.7)       |       |
| Total MADRS-S score            | 15 (7–28)        |       |
| Category of MADRS-S            |                  |       |
| Mild                           | 65 (36.5)        |       |
| Moderate                       | 113 (63.5)       |       |
| Total ISI score                | 21 (7–35)        |       |
| Category of ISI                |                  |       |
| No Insomnia                    | 5 (2.8)          |       |
| Subthreshold insomnia          | 29 (16.3)        |       |
| Moderate insomnia              | 65 (36.5)        |       |
| Severe insomnia                | 79 (44.4)        |       |

GAD-7, General Anxiety Disorder-7; MADRS-S, Montgomery-Åsberg Depression Rating Scale-Self Assessment; ISI, Insomnia Severity Index.

Analysis of chi-square was carried out to determine the correlates of depressive symptoms. This specifies that female gender and ISI score were significantly associated with greater depressive symptoms (Table 4). After adjusting for multiple logistic regression analysis, only ISI (P < .001, adjusted OR = 9.101, 95% CI: 3.613-22.924) remained significantly associated with greater depressive symptoms.

As for symptoms of anxiety, chi-square analysis demonstrated that age, ethnicity, social media usage, SMACOP score, and ISI score were significantly correlated (Table 5). After adjusting for multiple logistic regression analysis, younger age group (P = .029, adjusted OR = 2.274, 95% CI: 1.090-4.746), higher SMACOP (P = .011, adjusted OR = 2.637, 95% CI: 1.253-5.550), and ISI scores (P < .001, adjusted OR = 22.9, 95% CI: 6.145-85.343) remained significant. Social media usage and ethnicity were not significantly associated with increased anxiety symptoms among patients with depression during COVID-19 (Table 5).

### Discussion

To our knowledge, this is the first study in Malaysia assessing the association between psychosocial factors and psychological distress (depression and anxiety) during COVID-19 among psychiatric patients. Severe depressive symptoms are significantly associated with more severe insomnia, while a high level of anxiety is associated with the younger age group, greater severity of insomnia, and higher risk of COVID-19 related social media addiction.

Over half of the subjects (56.7%) reported severe anxiety symptoms, while 80.9% had moderate to severe insomnia. This is in keeping with the findings from previous studies in China and Spain, which reported worsening of existing symptomatology and additional anxiety symptoms in psychiatric patients during COVID-19. Similarly, the perceived psychosocial impact of COVID-19 by psychiatric patients is significantly greater compared to the general population, along with increased anxiety and depression severity.

Younger age was another variable that is significantly associated with higher anxiety levels in this study. One possibility is...
that COVID-19 is perceived to be more directly affecting the social and financial aspects of younger age groups compared to that of older people. This supports findings from earlier studies. The prevalence rate and mean score for anxiety symptoms during COVID-19 on standardized scales were inversely proportional to subjects’ age. A hypothesis suggested by Nwachukwu et al proposed that younger people spend a longer time browsing social media and COVID-19 related updates, where being extensively exposed to news regarding COVID-19 is associated with increased psychological distress. Nonetheless, a recent study from China reported greater anxiety and depressive symptoms related to the older age group, lower education level, divorced/widowed marital status, and agricultural occupation. Follow-up studies are required to identify any confounding factors that contribute to the psychological impact of COVID-19 among the older population.

The majority of subjects (90.4%) were social media users, while over half of them used social media as their only source in follow-up with COVID-19 updates. Several reasons for this include insufficient updates provided by traditional media, causing the public to make use of social media as their primary pandemic-related information source. Second, the freedom of expression provided by social media allows information to be actively created and shared without restrictions among users, which would not be feasible on traditional media. In addition, negative phrases regarding the disease were frequently searched and mentioned on social media during previous pandemics. As the public tends to emphasize negative information (i.e., negativity bias), more evidently in vulnerable patient groups, this might lead to further intensification of distortion in risks perception toward COVID-19.

To address misconceptions about COVID-19, the KAP structured questionnaire regarding COVID-19 was included in our online survey. Over half of the subjects answered questions regarding knowledge (i.e., negativety bias), more evidently in vulnerable patient groups, this might lead to further intensification of distortion in risks perception toward COVID-19.

As aforementioned, the strong association between at-risk social media addiction regarding COVID-19 and heightened anxiety levels emphasizes the necessity for social media users to interpret unfiltered information from a more active and knowledgeable position. Facts aiming to clarify rumors and concerns in real-time should be

| Variables | n (%) |
|-----------|-------|
| K1: COVID-19 is an infectious disease caused by a coronavirus | 175 (98.3) |
| K2: Symptoms for COVID-19 are fever, cough, sore throat, and breathing difficulty | 178 (100) |
| K3: Washing hands frequently with soap and water, or hand sanitizer can reduce the risk of COVID-19 infection | 178 (100) |
| K4: Everyone who has been infected with COVID-19 will die | 151 (84.8) |
| K5: it is infectious to be exposed to someone infected with COVID-19 for 10 minutes | 84 (47.2) |
| K6: Antibiotics can kill COVID-19 | 111 (62.4) |
| K7: Packages/goods from China can spread COVID-19 | 97 (54.5) |
| K8: Traditional Home remedies (vitamin C, garlic, neem, essential oils, sesame oil, and drinking hot water) have been proven by research that can cure and protect against COVID-19 | 108 (60.7) |
| K9: COVID-19 will only be eliminated by exposing yourself to the sunlight | 129 (72.5) |
| K10: Surgical masks are as effective as N95 masks in terms of protection toward COVID-19 | 47 (26.4) |
| K11: COVID-19 came from drinking or eating bat soup | 48 (27.0) |
| Total score for knowledge section | Mean (SD) 7.34 (2.13) |
| A1: Do you use the same mask repeatedly on the same day, during the COVID-19 pandemic? | 131 (73.6) |
| A2: Do you think we should continue mass gathering during the COVID-19 pandemic? | 168 (94.4) |
| A3: Do you think Ramadhan Bazaar should be allowed during the COVID-19 pandemic? | 169 (94.9) |
| Total score for attitudes section | Mean (SD) 2.63 (0.58) |
| P1: During the COVID-19 pandemic, are you still going out to buy food or groceries on a daily basis? | 132 (74.2) |
| P2: During the COVID-19 pandemic, do you use social media to obtain updates on COVID-19 all the time? | 61 (34.3) |
| P3: During the COVID-19 pandemic, do you try to keep the information to yourself when you are probably exposed to high-risk COVID-19 individuals? | 142 (79.8) |
| P4: During the COVID-19 pandemic, do you buy a lot of food supplies, fearing that there will be a food shortage? | 143 (80.3) |
| Total score for practices section | Mean (SD) 2.69 (1.00) |
| Total score for all sections | 12.65 (2.65) |
Table 4. Univariate and Multivariate Association Analysis of MADRS-S with the Sociodemographic Characteristics, MSPSS, KAP, ISI, and SMACOP of the Study Subjects (N = 178)

| Variables                     | MADRS-S |          |          | P    | Adjusted odd ratio (95% CI) | P     |
|-------------------------------|---------|----------|----------|------|----------------------------|-------|
| Age (years)                   |         |          |          |      |                            |       |
| ≤30                           | 40 (35.4) | 73 (64.6) | 0.877 (0.466-1.647) | .683 |                            |       |
| >30                           | 25 (38.5) | 40 (61.5) |          |      |                            |       |
| Gender                        |         |          |          |      |                            |       |
| Male                          | 30 (48.4) | 32 (51.6) | 2.170 (1.148-4.101) | <.016 | 1.585 (0.782-3.212) | .201  |
| Female                        | 35 (30.2) | 81 (69.8) |          |      |                            |       |
| Ethnicity                     |         |          |          |      |                            |       |
| Malay                         | 32 (33.0) | 65 (67.0) | 0.716 (0.388-1.322) | .285 |                            |       |
| Non-Malay                     | 33 (40.7) | 48 (59.3) |          |      |                            |       |
| Marital status                |         |          |          |      |                            |       |
| Married                       | 16 (34.0) | 31 (66.0) | 0.864 (0.429-1.738) | .681 |                            |       |
| Non-Married                   | 49 (37.4) | 82 (62.6) |          |      |                            |       |
| Education level               |         |          |          |      |                            |       |
| Secondary and below           | 12 (30.8) | 27 (69.2) | 0.721 (0.347-1.544) | .399 |                            |       |
| Tertiary                      | 53 (38.0) | 86 (61.9) |          |      |                            |       |
| Employment status             |         |          |          |      |                            |       |
| Working                       | 29 (37.2) | 49 (62.8) | 1.052 (0.569-1.945) | .871 |                            |       |
| Not working                   | 36 (36.0) | 64 (64.0) |          |      |                            |       |
| Smoking                       |         |          |          |      |                            |       |
| Yes                           | 12 (34.3) | 23 (65.7) | 0.886 (0.408-1.925) | .760 |                            |       |
| No                            | 53 (37.1) | 90 (62.9) |          |      |                            |       |
| Alcohol intake                |         |          |          |      |                            |       |
| Yes                           | 13 (33.3) | 26 (66.7) | 0.837 (0.395-1.770) | .640 |                            |       |
| No                            | 52 (37.4) | 87 (62.6) |          |      |                            |       |
| Staying with                  |         |          |          |      |                            |       |
| Family/significant other/     | 57 (35.0) | 106 (65.0) | 2.125 (0.733-6.160) | .157 |                            |       |
| friends                       | 8 (53.3) | 7 (46.7) |          |      |                            |       |
| Alone                         | 8 (53.3) | 7 (46.7) |          |      |                            |       |
| Household income              |         |          |          |      |                            |       |
| < RM 5000                     | 33 (35.1) | 61 (64.9) | 0.879 (0.477-1.620) | .679 |                            |       |
| ≥ RM 5000                     | 32 (38.1) | 52 (61.9) |          |      |                            |       |
| Social media usage            |         |          |          |      |                            |       |
| Yes                           | 56 (34.8) | 105 (65.2) | 0.474 (0.173-1.297) | .139 |                            |       |
| No                            | 9 (52.9) | 8 (47.1) |          |      |                            |       |
| MSPSS                         |         |          |          |      |                            |       |
| Low support                   | 8 (30.8) | 18 (69.2) | 0.741 (0.303-1.813) | .510 |                            |       |
| Moderate to high support      | 57 (37.5) | 95 (62.5) |          |      |                            |       |
| KAP score                     |         |          |          |      |                            |       |
| <10                           | 9 (39.1) | 14 (60.9) | 1.136 (0.462-2.793) | .780 |                            |       |
| ≥10                           | 56 (36.1) | 99 (63.9) |          |      |                            |       |
| SMACOP score                  |         |          |          |      |                            |       |
| <13                           | 35 (42.2) | 48 (57.8) | 1.580 (0.855-2.919) | .143 |                            |       |
| ≥13                           | 30 (31.6) | 65 (68.4) |          |      |                            |       |
| ISI score                     |         |          |          |      |                            |       |
| Subthreshold insomnia (8-14)  | 26 (78.8) | 7 (21.2) | 10.095 (4.057-25.123) | <.001 | 9.101 (3.613-22.924) | <.001 |
| Moderate to severe insomnia   | 39 (26.9) | 106 (73.5) |          |      |                            |       |

*Omnibus test P value: <.01; Hosmer–Lemeshow test P value: .932; Nagelkerke R square: 22.7%.
MADRS-S, Montgomery-Åsberg Depression Rating Scale-Self Assessment; MSPSS, Multidimensional Scale of Perceived Social Support; KAP, Knowledge, Attitudes, and Practices toward COVID-19 in Malaysia; ISI, Insomnia Severity Index; SMACOP, Social Media Addiction During COVID-19 Pandemic.
Table 5. Univariate and Multivariate Association Analysis of GAD-7 with the Sociodemographic Characteristics, MSPSS, KAP, ISI, and SMACOP of the Study Subjects (N = 178)

| Variables                          | GAD-7 | Odds ratio (95% CI) | P     | Adjusted odd ratio | Adjusted odd ratio (95% CI) | P     |
|------------------------------------|-------|---------------------|-------|--------------------|-----------------------------|-------|
|                                    | Less than 15, n (%) | 15 and more, n (%) |       |                   |                             |       |
| Age (years)                        | ≤ 30  | 39 (34.5)           | 74 (65.5) | 0.374 (0.200-0.701) | .002*                       | 2.274 (1.090-4.746) | .029* |
|                                    | > 30  | 38 (58.5)           | 27 (41.5)  |                     |                             |       |
| Gender                             | Male  | 33 (53.2)           | 29 (46.8)  | 1.862 (0.998-3.476) | .050                        |       |
|                                    | Female | 44 (37.9)          | 72 (62.1)  |                     |                             |       |
| Ethnicity                          | Malay | 33 (34.0)           | 64 (66.0)  | 0.434 (0.236-0.795) | .006†                       | 0.476 (0.215-1.054) | .067  |
|                                    | Non-Malay | 44 (54.3)   | 37 (45.7)  |                     |                             |       |
| Marital status                     | Married | 26 (55.3)        | 21 (44.7)  | 1.942 (0.990-3.810) | .052                        |       |
|                                    | Non-married | 51 (38.9)   | 80 (61.1)  |                     |                             |       |
| Education level                    | Secondary or lower | 22 (56.4) | 17 (43.6)  | 1.976 (0.964-4.054) | .061                        |       |
|                                    | Tertiary | 55 (39.6)        | 84 (60.4)  |                     |                             |       |
| Employment status                  | Working | 35 (44.9)        | 43 (55.1)  | 1.124 (0.619-2.043) | .701                        |       |
|                                    | Not working | 42 (42.0)   | 58 (58.0)  |                     |                             |       |
| Smoking                            | Yes    | 15 (42.9)          | 20 (57.1)  | 0.980 (0.464-2.067) | .957                        |       |
|                                    | No     | 62 (43.4)          | 81 (56.6)  |                     |                             |       |
| Alcohol intake                     | Yes    | 17 (43.6)          | 22 (56.4)  | 1.017 (0.497-2.083) | .962                        |       |
|                                    | No     | 60 (43.2)          | 79 (56.8)  |                     |                             |       |
| Staying with                       | Family/significant other/friends | 66 (41.3) | 94 (58.8)  | 0.312(0.092-1.056) | .050                        |       |
|                                    | Alone  | 9 (69.2)           | 4 (30.8)   |                     |                             |       |
| Household income                   | < RM 5000 | 41 (43.6)      | 53 (56.4)  | 1.031 (0.569-1.868) | .919                        |       |
|                                    | ≥ RM 5000 | 36 (42.9)     | 48 (57.1)  |                     |                             |       |
| Social media usage                 | Yes    | 64 (76.5)          | 97 (60.2)  | 0.203 (0.063-0.650) | .004*                       | 0.357 (0.089-1.431) | .146 |
|                                    | No     | 13 (39.8)          | 4 (23.5)   |                     |                             |       |
| MSPSS                              | Low support | 9 (34.6)        | 17 (65.4)  | 0.654 (0.274-1.559) | .336                        |       |
|                                    | Moderate to high support | 68 (44.7) | 84 (55.3)  |                     |                             |       |
| KAP score                          | <10    | 12 (52.2)          | 11 (47.8)  | 1.510 (0.628-3.635) | .355                        |       |
|                                    | ≥10    | 65 (41.9)          | 90 (58.1)  |                     |                             |       |
| SMACOP score                       | < 13   | 44 (53.0)          | 39 (47.0)  | 2.12 (1.159-3.879)  | .014*                       | 2.122 (1.008-4.466) | .047* |
|                                    | ≥ 13   | 33 (34.7)          | 62 (65.3)  |                     |                             |       |
| ISI score                          | Subthreshold insomnia (8-14) | 30 (90.9) | 3 (9.1)   | 20.851 (6.054-71.817) | <.001*                     | 5.064 (2.922-8.777) | <.001* |
|                                    | Moderate to severe insomnia (≥15) | 47 (32.4) | 98 (67.6) |                     |                             |       |

*Omnibus test P value: < .01; Hosmer–Lemeshow test P value: .932; Nagelkerke R square: 39%.
GAD-7, General Anxiety Disorder-7; MSPSS, Multidimensional Scale of Perceived Social Support; KAP, Knowledge, Attitudes, and Practices toward COVID-19 in Malaysia; ISI, Insomnia Severity Index; SMACOP, Social Media Addiction During COVID-19 Pandemic.
included in public health education by relevant authorities. For instance, WHO has created the “Mythbusters” page, which aims to debunk misinformation that is being massively circulated. Public could conveniently download and share the explanations as images, consequently flattening the “infodemic” curve.

Moreover, supportive measures that are available on social media, such as “abuse resources” and “suicide and self-injury resources” provide effective support during psychosocial crises. Self-help handbooks and guidelines for managing potential mental distress could also be made available on social media platforms, which increases the likelihood of the public seeing these resources.

Trained psychiatrists could deliver adaptation of video and phone consultations. A similar healthcare model endorsed by the Royal College of Psychiatrists in Wales had facilitated mental health services delivery during the nationwide lockdown, as regular outpatient visits became more difficult to attend. Patients could have their follow-up and therapy appointments with their psychiatrists, as usual, collaborating between hospitals and commercial courier services to deliver medication to patients’ homes. Nonetheless, to combat the said issue at its root cause, government laws regarding fake news, such as the Communications and Multimedia Act 1998 are to be implemented and tightened as well.

Unexpectedly, levels of perceived social support are not associated with both depressive and anxiety symptoms among subjects in our study. Previous studies have well-validated that perceived social support is directly associated with a lower risk of depressive and anxiety symptoms. Higher levels of perceived social support also increase self-efficacy of individuals, with family and friends providing emotional support and shared empathy with them. Our negative finding could be attributed to the small sample size (n = 178), making the association between perceived social support and psychological distress likely to be underpowered. Besides, the majority of the subjects in our study are relatively well-supported, with 85.4% (n = 152) reported receiving moderate to high support in MSPPS. We suggest studying the said association in a more diverse population across all strata of society.

Several limitations in this study need to be acknowledged. First, the cross-sectional nature of this study makes it difficult to elicit a direct, causal relationship between COVID-19 related social media addiction and variation in psychiatric illness severity. Additionally, the lack of baseline data regarding depression severity among subjects prior to COVID-19 signifies that changes in depressive symptoms over time could not be assessed. Longitudinal studies in the future would be essential to demonstrate the causal onset of additional anxiety symptoms and deterioration of pre-existing symptomology. Second, the sample size is relatively small, which might not accurately represent the entire group of patients with depression in Malaysia. Moreover, all subjects were recruited from University Malaya Medical Centre, Kuala Lumpur. Future studies that involve patients from different hospital sites across Malaysia would be encouraged. Subjects could also be categorized according to the types of treatment they received for depression. Lastly, the instruments utilized in this study are all self-reported by subjects. “Gold standard” measures, such as clinical rated scales and social media diary, would minimize the possible response bias among subjects.

In summary, this study demonstrates the psychosocial impact of the COVID-19 pandemic on patients with depression, expressed as the increased level of sleep disturbances and anxiety symptoms. These are closely linked to the younger age group and at-risk social media addiction related to COVID-19. Besides promptly clarifying false news, public education on critical thinking development among social media consumers should be initiated by healthcare authorities and relevant stakeholders. Incorporating technology and social media in intervention models for each phase of pandemic crisis control would be crucial in managing the ongoing COVID-19.

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