

# Mental Health Status of Stable Hospitalized COVID-19 Patients in the Main COVID-19 Hospitals in Malaysia

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## Research

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# **Abstract**

## **Background**

The COVID-19 pandemic is catastrophic and caused negative psychological effects among patients, healthcare workers and their surroundings. This study aims to determine the prevalence of depression and general anxiety disorders (GAD) among stable hospitalized COVID-19 patients.

## **Methods**

A cross-sectional study via web-based online survey involving 401 patients in the main COVID-19 hospitals in Malaysia who were selected via quota sampling. The questionnaire consists of socio-demographic profile, Patient Health Questionnaire 9 items (PHQ-9), General Anxiety Disorders 7 items (GAD-7) and Brief COPE (Coping Orientation to Problems Experienced). The identified probable cases of depression, anxiety and suicidal ideation were subsequently referred to psychiatrists.

## **Result**

The prevalence of depression and anxiety were 7.5% and 7.0%, respectively. Besides that, 4.0% of respondents were suspected as having suicidal ideation. The prediction model revealed that females [aOR=5.29 (95% CI: 1.34, 20.80)], age 35-49 years old [aOR=7.47 (95% CI: 1.78, 31.30)], adopting behavioral disengagement [aOR=1.94 (95% CI: 1.31, 2.87)] and self-blame [aOR= 1.74 (95% CI: 1.31, 2.30)] as coping strategies, were significant predictors of depression.

## **Conclusions**

The findings estimate the mental health burden among COVID-19 patients in Malaysia. The establishment of continuous mental health surveillance is essential in managing cases of depression, anxiety and suicidal ideation.

# **Background**

The outbreak of pandemic disease is catastrophic and caused negative psychological effects among patients, healthcare workers and their surroundings (1). Recently, the Coronavirus Disease 2019 (COVID-19) that struck the world in every corner has reported more than 18 million infection cases worldwide and more than 9000 positive cases detected in Malaysia alone with over 100 deaths reported as of July 2020 (2). Mental health is an important marker for survival in disaster such as COVID-19 pandemic.

A recent systematic review on psychological impact of quarantine by Brooks et al. 2020 reported negative psychological effects including post-traumatic stress symptoms, confusion, and anger. Stressors included longer quarantine duration, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma (3). There is also evidence of paucity of research pertaining to the mental health impact of COVID-19 such as depression and anxiety.

Assessment of the burden of mental health such as depression and anxiety, and their risk factors among vulnerable patients are required especially for early intervention of psychiatric care during hospital quarantine. This study aimed to provide new knowledge on mental health status among hospitalized COVID-19 patients. Besides, this study seeks to develop a comprehensive predictive model of mental health status among hospitalized COVID-19 patients and its associated predictors. Furthermore, this study has practically measured the mental health surveillance performance, and the results should benefit stakeholders to utilize essential steps in preventing mental health crises during the pandemic outbreak.

## Materials And Methods

### *Study design*

This is a cross-sectional study with Cross-sectional study with web-based online survey by invitation that was conducted among COVID-19 patients hospitalized in selected hospitals from 15<sup>th</sup> April until 30<sup>th</sup> June 2020.

### *Sampling design and sample size*

#### 1. Target population

The target population was all COVID-19 patients hospitalized in two referral hospital at klang valley, one COVID-19 designated hospital at Johore and one Low-Risk Patient Quarantine & Treatment centre. The sampled population was the proportion of stable COVID-19 patients at hospitals who were selected via quota sampling technique.

#### 2. Sampling frame

The sampling frame for the study was the list of all the COVID-19 patients admitted to the general wards (non-intensive) who were in a stable condition.

#### 3. Sample size determination

The sample size was calculated using the Sample Size Calculation Formula for prevalence with finite population correction study as per the primary objective (4). The sample size calculation was based on the reported prevalence of depression among MERS-CoV patients in Korea, 40.7% (5). The calculation was done with a margin of error of 0.05 and Type 1 error determined at 5% with a finite population of 500 (2).

### *Selection of respondents*

Patients who have been diagnosed as COVID-19 and in stable condition were listed in the sampling frame. Screening for eligible respondent among COVID-19 patients in each hospital started on 15<sup>th</sup> April 2020. An eligible respondent must be of age 18 years and above, has been diagnosed with COVID-19 but in a stable condition, has been admitted in the ward for more than 24 hours and able to read and understand Malay or English. Quota sampling technique was utilized in this study whereby the first 400 eligible patients who

responded to the screening were recruited in this study. Participation in this study was on a voluntary basis as each respondent has the right to refuse or withdraw from the study at any point of time during the survey. If the respondent refused, all details of the respondent, as well as any response given, would then be deleted.

#### *Survey instruments/Questionnaire*

Structured questionnaires were used to collect data on the scopes of the survey. The questionnaires are in Malay and English, programmed into the Google form for data collection. The front page (1st part) of the Google form is the Patient Information Sheet and Consent Form. The 2nd part of the Google form is the socio-demographic profile of respondents and factors contributing to mental health (Section A & Section B). The 3rd part (Section C) is the Patient Health Questionnaire (PHQ-9) to assess for probable depression with a cut-off score of 10 and above, the 4th part (Section D) consisted of Generalized Anxiety Disorder questionnaire (GAD-7) to assess for probable anxiety with a cut-off score of 8 and above. The 5th part (Section E) is the coping strategies via Brief COPE (Coping Orientation to Problems Experienced).

Psychometric measurements for all three questionnaires (PHQ-9, GAD-7 & Brief COPE) were locally validated beforehand (6-8).

#### *Field implementation*

A total of 8 Research Assistants (RAs) were hired for this survey and training was given. Two RAs were in-charged for central team in Institute for Public Health (IPH) and the remaining were stationed in the psychiatric department with two RAs per hospital .The RAs in hospitals conducted a briefing to all matrons or staff in charge of COVID-19 ward and *Google Form* link for the survey was given to them which then disseminated to the eligible respondent of COVID-19 patient.

Responses in the cloud server were downloaded daily by the central team in IPH and scoring was performed for PHQ-9 with the inclusion of suicidal ideation (item no. 9) score and GAD-7. Positive cases that require further assessment for diagnosis and management were referred within 24 hours to the psychiatrist in-charge at the respective hospital.

#### *Data management, Quality Control (QC), Privacy and Confidentiality*

Data processing activities were centralized at the Institute for Public Health (IPH) including data collection, data cleaning and data analysis. A minimum of 30 different responses tested the system (Google form) by various respondents started on the 15<sup>th</sup> April 2020 to ensure its reliability. The changes were made as per the feedback received from the respondents of the pilot study.

In order to ensure the privacy and confidentiality of data, the data gathered in the database was kept in a secure manner. The access control of the dataset in any format was managed by assigning unique password to each file. Only central team researchers were able to assess the personal particulars of participants and the data will be conserved.

#### *Data Analysis*

All data were cleaned and analyzed by the research team. A meaningful combination of categories was done as per indicated. Data was analyzed using SPSS version 23.0. Descriptive statistics analysis were performed to determine prevalence of depression and anxiety among stable hospitalized COVID 19 patients. Multivariate statistics via multiple logistic regression were performed to evaluate risk factors associated with prevalence of depression and anxiety.

## Results

This study revealed that 7.5% (n=30) of the respondents were categorized as having depression based on a PHQ-9 score of  $\geq 10$ . The mean PHQ-9 score was 3.01 (SD, 4.01). Regarding the patient's anxiety level, it was found that 7.0% (n=28) of the respondents were having anxiety based on a GAD-7 score of  $\geq 8$ . The mean GAD-7 score was 2.48 (SD, 3.58). Besides that, 4.0% (n=16) of the respondents were categorized as having suicidal ideation, which was one of the elements assessed by the PHQ-9 questionnaire.

The prevalence of depression is higher in females compared to males (7.9% vs 7.3%) whereas prevalence of anxiety was higher among males (7.3%). Apart from that, respondents from age group 35-49 have a higher prevalence rate of depression and anxiety compared with other age groups. Chinese ethnicity and respondents who are single or widower reported the highest prevalence rate. Depression and anxiety were more prevalent in terms of education level and occupation among respondents with tertiary education and respondents from the "not working / pensioners / students" group respectively. The respondent's monthly individual income was categorized by the classification of the Malaysian household income category, where B40 (less than RM 4000), M40 (RM 4000- RM8000) and T20 (more than RM 8000) were categorized. According to household income, prevalence rate of depression anxiety were the highest among T20 groups (See **Table 1**).

### *Prediction Models for Depression and Anxiety*

The risk factors associated with depression and anxiety in relation to socio-demographic factors, stressors and coping strategies among COVID 19 patients were examined using simple and multiple logistic regression analyses. Risk factors associated with depression were females, (aOR = 5.29, 95% CI: 1.34, 20.80), age group 35-49 (aOR = 7.47, 95% CI: 1.78, 31.30) and coping strategies such as behavioral disengagement (aOR = 1.94, 95% CI: 1.31, 2.87) and self-blame (aOR = 1.94, 95% CI: 1.31, 2.87) (See **Table 2**). With regards to anxiety, respondents who are singles/ widowers were 2.87 times higher odds of having anxiety than those who are married (aOR = 2.87, 95% CI: 1.01, 8.18). Besides that, in terms of stressors, fear of infection (OR = 1.82, 95% CI: 1.08, 3.04) and lack of information (aOR = 1.82, 95% CI: 1.08, 3.04) were risk factors significantly associated with anxiety. Anxiety was correlated with adaptive coping mechanisms such as instrumental help (aOR = 0.65, 95% CI: 0.47, 0.90). However, it was also found that maladaptive coping mechanisms such as behavioural disengagement (aOR = 2.03, 95% CI: 1.30, 3.18) and self-blame (aOR = 1.74, 95% CI: 1.31, 2.30) were associated with anxiety (See **Table 3**).

## Discussion

To the best of our knowledge, this is the first study in Malaysia to provide a prevalence data on depression and anxiety among hospitalized COVID-19 patients. The results showed that among hospitalized COVID-19 patients, 7.5% had depression, 7.0% had anxiety, and 4.0% were categorized as having suicidal ideation. Of note, the prevalence of depression among hospitalized COVID-19 patients in Malaysia is three-fold higher compared to the 2.3% national prevalence among the general population reported in the National Health & Morbidity Survey (NHMS) 2019 (9). This shows that the COVID-19 pandemic contributed a vast impact on mental health status.

A recent cross-sectional survey done in China during the COVID-19 pandemic found that the prevalence of people suffered from moderate to severe depression was 16.5% and the prevalence of people suffered from moderate to severe anxiety was 28.8% (10). The first outbreak emerged in China around November 2019 and since then has reported 10 folds higher number of cases compared to Malaysia. This catastrophic impact is most likely to be the reason of a much higher prevalence of depression and anxiety in China compared to Malaysia.

Moreover, cases of depression, anxiety and suicidal ideation also noted to be higher among those who required quarantine and isolation after being confirmed to have acquired COVID-19. Thus, psychiatric evaluation and medication prescription during their hospital stays are much required. This group of patients could actually continue having sustained mental health problems after having been discharged (11).

Our prediction model also revealed gender as the main predictor of depression. Female is more vulnerable in terms of psychological wellbeing during the COVID-19 pandemic. Our study showed that females were 5 times more prone in developing higher levels of depression compared to males. In addition, our findings revealed that patients in the age range of 35-49 years old were significantly more likely to have depression. Single or widowed patients were also more likely to be anxious than those who were married.

Our study indicated that fear of COVID-19 infection and lack of information regarding COVID-19 are the main stressors contributing to anxiety. Public health measures such as quarantine, self-isolation, social distancing and the unavailability of COVID-19 vaccines were most likely to affect people both in emotion and psychological wellbeing which leads to higher rates of anxiety (12). This is evidently proved in a recent publication that fear of COVID-19 infection is a main causative agent for aggravated suicidal incidences in India (13). The lack of information regarding COVID-19 is another stressor which should be given a priority in terms of public health prevention and treatment. It is crucial to rely only on the official information sources and disregarding those which come from unofficial channels and uncontrolled sources (14).

While most studies have revealed that maladaptive copings were associated with psychological distress, our study indeed found that behavioral disengagement and self-blame are the main predictors for depression and anxiety (15). This may be reflected towards patients who were full of self-doubt and despair, blaming themselves for acquiring the virus or maybe those who simply feel hopeless after learning that they were infected which eventually leads to discouragement and if they pursuit these feeling beyond the extreme length, it could possibly lead to suicidal ideation (16). In terms of adaptive coping strategies, instrumental support such as financial assistance was associated with anxiety. This finding was supported by the hypothesis that financial constrain is a main focus of coping. If the financial support is optimal,

patients should not be focusing in coping with it and adequate support has been proven in inducing positive psychological wellbeing and to avoid developing trauma-related psychopathology (17).

### **Strength and limitation of study**

The major strength of this study is the involvement of main COVID-19 hospitals in Malaysia. This data should have adequate external validity in terms of the national level representation. This study also demonstrates the establishment of mental health surveillance which was well performed with the standard of care protocol being fully complied. Patients who were detected as having probable depression, anxiety and suicidal ideation during the survey were referred to the psychiatrist in-charge at the respective hospital within 24 hours for further assessment. .

One of the limitations of this study is the cross-sectional design which cannot be used to determine cause-and-effect relationships between different variables in the study. A comprehensive research such as cohort studies or interventional studies are much in need. Other than that, the Google form questionnaire cannot be used with illiterate patients.

## **Conclusion**

The current study provides a comprehensive predictive model of mental health status among hospitalized COVID-19 patients. Our findings on prevalence of depression and anxiety may serve as baseline data to the government authorities for paying more attention in psychological care during a pandemic. Therefore, mental health surveillance system is essential in identifying probable cases of depression and anxiety including suicidal ideation which should be managed appropriately by the psychiatrist. Moreover, the findings of this study were expected to aid in the strategic planning in improving existing plans of action for managing mental health issues on the current outbreak.

## **Abbreviations**

COVID-19: Coronavirus Disease 2019; PHQ-9: Patient Health Questionnaire 9 items; GAD-7: General Anxiety Disorders 7 items; Brief COPE: Brief Coping Orientation to Problems Experienced; NHMS: National Health & Morbidity Survey; IPH: Institute for Public Health; QC: Quality control.

## **Declarations**

### **Acknowledgment**

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### **Author Contributions**

MSAK, NAA, UAS, NMA, NH, MSR, NS, CYY contribute to the conceptualization and writing of this manuscript. All authors reviewed the final manuscript and approved the final version for publication.

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## Availability of data and materials

The datasets used during the current study is available from the corresponding author on reasonable request.

## Consent for publication

Not applicable as there is no image or other confidentiality related issues.

## Competing interests

The authors declare that they have no competing interests

## Ethics and Dissemination

This study was registered under the National Medical Research Registry (NMRR), Ministry of Health Malaysia (Registration number NMRR-20-711-54541) and obtained ethical approval from Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia.

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## Tables

**Table 1: Prevalence of depression and anxiety by socio-demographic characteristics**

<b>Socio-demographic characteristics</b>		n	Depression (%)	Anxiety (%)
<b>Gender</b>	Male	274	7.3	7.3
	Female	127	7.9	6.3
<b>Age group (years)</b>	18-34	258	7.0	7.8
	34-49	106	9.4	5.7
	>50	37	5.4	5.4
<b>Ethnicity</b>	Malay	274	9.5	8.4
	Chinese	27	11.1	11.1
	Indian	20	5.0	0.0
	Other Bumiputera	7	0.0	0.0
	Others	73	0.0	2.7
<b>Marital Status</b>	Single/widower	204	9.3	9.8
	Married	197	5.6	4.1
<b>Level of Education</b>	No formal education	33	6.1	3.0
	Primary education	64	3.1	4.7
	Secondary education	102	5.9	5.9
	Tertiary education	202	9.9	8.9
<b>Occupation</b>	Civil servant	34	5.9	2.9
	Private sector employee	138	5.8	5.1
	Self-employed	50	8.0	2.0
	Healthcare workers	19	0.0	0.0
	Not working/ Pensioner/ Student	151	10.6	11.9
	Housewife	9	0.0	11.1
<b>Household Income Group</b>		288	5.6	5.2
B40		68	8.8	10.3
M40		45	17.8	13.3
T20				
<b>Citizenship</b>	Malaysian	328	9.1	7.9
	Non-Malaysian	73	0.0	2.7

**Table 2: Simple and Multiple Logistic Regression for Mental Health Covid-19 (Depression)**

Predictors	Crude OR (95% CI)	Adjusted OR (95% CI)	p-value
<b>Gender</b>			
Male	1	1	
Female	1.09 (0.49,2.39)	<b>5.29 (1.34,20.80)</b>	<b>0.017*</b>
<b>Marital Status</b>			
Single/widow	1.74 (0.80, 3.75)		
Married	1		
<b>Education Level</b>			
No Formal Education	1		
Primary	0.50 (0.07, 3.72)		
Secondary	0.97 (0.19, 5.05)		
Tertiary	1.70 (0.38, 7.65)		
<b>Occupation</b>			
Civil Servant	1		
Private Sector employee	1.02 (0.21, 5.02)		
Self-Employment	1.41 (0.41, 4.91)		
Not Working/student/pensioner	1.93 (0.80, 4.65)		
<b>Age Group (years)</b>			
18-34	1	1	
35-49	1.39 (0.62, 3.12)	<b>7.47 (1.78, 31.30)</b>	<b>0.006*</b>
>50	0.76 (0.17, 3.43)	5.97 (0.74, 48.46)	0.095
<b>Household Income Group</b>			
B40	0.27 (0.11, 0.68)		
M40	0.45 (0.14, 1.39)		

<b>Stressors</b>			
Fear of Infection	1.99 (1.33, 2.98)		
Social Discrimination	1.15 (0.80, 1.64)		
Financial Burden	1.09 (0.77, 1.54)		
Lack of Information	1.00 (0.68, 1.47)		
<b>Coping strategies</b>			
Self-distraction	1.53 (1.23, 1.89)	1.31 (0.99, 1.74)	0.061
Active coping	1.37 (1.12, 1.68)		
Denial	1.39 (1.10, 1.75)		
Substance use	1.98 (1.20, 3.25)		
Emotional support	1.20 (0.99, 1.45)		
Instrumental support	1.17 (0.97, 1.42)		
Behavioral disengagement	2.67 (1.96, 3.63)	<b>1.94 (1.31, 2.87)</b>	<b>0.001*</b>
Venting	1.49 (1.20, 1.84)		
Positive reframing	1.17, 0.97, 1.43)		
Planning	1.32 (1.08, 1.63)		
Humor	1.64 (1.25, 2.14)		
Acceptance	1.14 (0.93, 1.39)		
Religion	1.14 (0.89, 1.46)		
Self-blame	2.16 (1.73, 2.71)	<b>1.74 (1.31, 2.30)</b>	*<0.001

**Table 3: Simple and Multiple Logistic Regression for Mental Health Covid-19 (Anxiety)**

Predictors	Crude OR (95% CI)	Adjusted OR (95% CI)	<i>p-value</i>
<b>Gender</b>			
Male	1		
Female	0.85 (0.37, 1.99)		
<b>Marital Status</b>			
Single/widow	2.57 (1.10, 5.98)	<b>2.87 (1.01, 8.18)</b>	<b>0.048*</b>
Married	1	1	
<b>Education Level</b>			
No Formal Education	1		
Primary	1.57 (0.16, 15.75)		
Secondary	2.00 (0.23, 17.25)		
Tertiary	3.13 (0.40, 24.28)		
<b>Occupation</b>			
Civil Servant	0.57 (0.07, 4.77)		
Private Sector employee	1		
Self-Employment	0.38 (0.05, 3.19)		
Not Working/student/pension	2.53 (1.02, 6.27)		
Housewife	2.34 (0.26, 21.40)		
<b>Age Group</b>			
18-34	1		
35-49	0.71 (0.28, 1.83)		
>50	0.68 (0.15, 3.04)		
<b>Household Income</b>			
B40	0.36 (0.13, 0.98)		
M40	0.75 (0.23, 2.38)		

<b>Stressors</b>			
Fear of Infection	2.20 (1.42, 3.40)	<b>1.82 (1.08, 3.04)</b>	<b>0.024*</b>
Social Discrimination	1.31 (0.90, 1.90)		
Financial Burden	1.31 (0.92, 1.87)		
Lack of Information	1.51 (1.02, 2.22)	<b>1.68 (1.01, 2.79)</b>	<b>0.047*</b>
<b>Coping strategies</b>			
Self-distraction	1.38 (1.12, 1.69)		
Active coping	1.28 (1.04, 1.57)		
Denial	1.35 (1.06, 1.71)		
Substance use	2.35 (1.37, 4.01)		
Emotional support	1.15 (0.95, 1.41)		
Instrumental support	0.99 (0.81, 1.20)	<b>0.65 (0.47, 0.90)</b>	<b>0.009*</b>
Behavioral disengagement	2.35 (1.74, 3.17)	<b>2.03 (1.30, 3.18)</b>	<b>0.002*</b>
Venting	1.50 (1.21, 1.87)		
Positive reframing	1.12 (0.93, 1.37)		
Planning	1.15 (0.94, 1.41)		
Humor	1.78 (1.35, 2.34)		
Acceptance	1.11 (0.91, 1.36)		
Religion	1.02 (0.81, 1.28)		
Self-blame	2.16 (1.72, 2.72)	<b>1.75 (1.27, 2.40)</b>	<b>0.001*</b>