

Psychological symptoms among healthcare workers handling COVID-19 patients

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ABSTRACT

Introduction: Healthcare workers serve as the frontliners against the coronavirus 2019 disease (COVID-19) and this puts them most at risk of infection as they attend to numerous patients with unknown status. This study aimed to examine stress, anxiety, and depression among healthcare workers caring for COVID-19 patients in Sarawak General Hospital (SGH), Malaysia.

Materials and Methods: This cross-sectional observational study conducted in SGH during the pandemic with an online self-administered questionnaire composed of two parts, the socio-demographic characteristics, and the Depression Anxiety Stress Scale (DASS).

Results: A total of 105 healthcare workers responded to this study. A questionnaire in both Bahasa Melayu and English was used. The findings showed that all healthcare workers had mild anxiety, with the majority experiencing mild stress (57.1%), and almost half of the respondents experiencing mild depression (41%). Female subjects had a significant higher mean score in anxiety level and stress level compared to male subjects (10.0±3.20 vs. 8.6±2.93, $p<0.05$; 14.1±4.76 vs. 10.7±3.70, $p<0.05$, respectively). Staff who were transferred from other units to handle COVID-19 cases experienced more psychological symptoms. There were significant correlations between the depression, anxiety and stress levels among the healthcare workers and the number of children they had ($r=0.739$, $p=0.001$; $r=0.642$, $p=0.001$; $r=1$, $p=0.001$ respectively). However, the stress level among the healthcare workers was reversely correlated with their years of working experience ($r=-0.199$, $p=0.042$).

Conclusion: This study identified some socio-demographic factors associated with increased levels of stress, anxiety and depression among the healthcare workers during pandemic, which may lay ground for future interventions.

KEYWORDS:

Stress level, psychological symptoms, healthcare workers, COVID-19

INTRODUCTION

The coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome

coronavirus 2 (SARS-CoV-2), which has been declared as a pandemic by the World Health Organization (WHO) on 11th March 2020.¹ The WHO (2020) reported that no treatment has currently been shown to prevent or cure the disease, but there are coordinated efforts to develop vaccines and medicines for the prevention and treatment.² Many people have been directly or indirectly affected by the pandemic caused by the virus, and to the WHO it spreads through close contact via small droplets produced by coughing or sneezing, as well as by touching contaminated surfaces, according.² Doctors, nurses, and medical assistants play an important role as the frontliners in the fight against COVID-19, but they are also the most at risk of infection as they attend to numerous patients with unknown status. Bandyopadhyay et al. identified that a total of 152,888 infections and 1,413 deaths due to COVID-19 have been reported among healthcare workers in affected countries; 71.6% of those infected were women and 38.6% were nurses, while 70.8% of those who died were men, and 51.4% were doctors.³ The total number of infections and deaths reported in healthcare workers was 3.9% and 0.5% of the total number of 3,912,156 patients with COVID-19 worldwide and 270, 426 COVID-19 deaths worldwide respectively.³

The mental status of healthcare workers, who may experience anxiety, depression, acute stress disorders, burnout, and post-traumatic stress disorders, should be of great concern to us all. Previous studies conducted during earlier world pandemic incidents reported that the prevalence of anxiety, depression, and stress commonly occur among healthcare workers during and after outbreaks. Further, these psychological symptoms can lead to long-lasting effects, and cause delayed urgent response, as well as jeopardised attention and decision-making during the current pandemic.⁴ Based on previous studies, factors that contribute to stress in healthcare workers are their welfare of family members, closures of schools and daycares, and access to appropriate personal protective equipment (PPE).⁵ Work experience plays an important role in helping healthcare workers deal with a pandemic. A study conducted in Canada during the outbreak of SARS reported that healthcare workers with fewer years of clinical experience are prone to experience prolonged psychological distress.⁶

Immense pressure and long working hours can be one of the causes of stress among healthcare workers, and this can

This article was accepted: 22 January 2021

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further affect them mentally, physically, and emotionally. A study by Melchior et al., found that people who work in an environment with high workload and excessive pressure are more at risk of depression or anxiety compared to those who work under low physiological work demands.⁷ This shows that healthcare the psychological wellbeing of workers should not be ignored, so they can provide the highest standards of care when treating patients while they work in high pressure environments. The aim of this study was to examine stress, anxiety, and depression among healthcare workers caring for patients with COVID-19 in Sarawak General Hospital (SGH), Malaysia.

MATERIALS AND METHODS

Study population

During the pandemic, we conducted a cross-sectional observational study to determine the stress, anxiety and depression levels of healthcare workers caring for patients with COVID-19. This study was conducted in Sarawak General Hospital (SGH), Malaysia, from June 2020 until July 2020. A convenient sampling method was used to select the participants. The sample size was determined using Raosoft, an online sample size calculator (http://www.raosoft.com/sample_size.html).⁸ The estimated population of the study was around 150, confidence level was set to 95%, and the margin error was 5%. The estimation of the minimum possible sample size was 109. The inclusion criteria were healthcare workers who cared for COVID-19 patients. A self-administered questionnaire was used to identify the socio-demographic factors that might associate with the psychological symptoms among healthcare workers.

Measures and Variables

Psychological symptoms were assessed using the Depression Anxiety Stress Scale (DASS). The questionnaire was in both Bahasa Melayu and English to make it easier for the participants and minimise any misinterpretation. The questionnaire was comprised of two parts. Part A assessed the socio-demographic characteristics of patients, which included age, gender, family structure, profession, working experience, and educational level. Participants were not asked to provide any personal information on the questionnaire. Part B was the DASS test, which was divided into depression, anxiety, and stress subscales, with seven questions for each subscale. For each question, the lowest score was 0 and the highest was 3; the highest total score for each category was 21.9 For the total score, the sum of each subscale was multiplied by two, which shows the levels of stress, anxiety, and depression scored by the respondents where the range of each subscale was different.⁹ The categories for the stress level scores were: normal (0-10), mild (11-18), moderate (19-26), severe (27-34), and extremely severe (35-42). In terms of anxiety, the ranges were: normal (0-6), mild (7-9), moderate (10-14), severe (15-19), and extremely severe (20-42). Lastly, for the levels of depression, the score categories are as follows: normal (0-9), mild (10-12), moderate (13-20), severe (21-27), and extremely severe (28-42). All data were collected through an online questionnaire using Google Forms.

Procedure

An invitation email was sent to the heads of the departments at SGH via the coordinating staff that explained the objectives of the study, inclusion criteria for subject selection, which were attached to the patient information sheet (PIS), both in Bahasa Melayu and English, and the link to access the online questionnaire. The PIS and link to the questionnaire were disseminated to the healthcare workers through their respective heads of departments. Participants were able to decide whether they agreed or disagreed to participate in the study after reading the PIS. Implied consent was obtained through Google Forms (at the beginning of the questionnaire). Participants were not required to sign into any account to fill in the survey, which took approximately 10 to 15 minutes to complete. The final submission date for the questionnaire was listed as the 13th of July 2020, which was about 10 weeks after the distribution of the questionnaire. After such time, the link was disabled and no other personnel except the researchers was able to access it. The data were then retrieved from Google Forms and recorded in a separate offline Excel document, before being permanently deleted.

Ethics and confidentiality

Ethical approval was obtained from the Medical Research & Ethics Committee (MREC), Ministry of Health Malaysia (NMRR-20-819-54744), and the University Malaysia Sarawak (UNIMAS) Faculty of Medicine & Health Sciences Research Ethics Committee (UNIMAS/NC-21.02/03-02 Jld.4 (91) prior to the start of any study-related activities. The researchers adhered to the principles of the Declaration of Helsinki and the Malaysian Good Clinical Practise Guidelines. All the information recorded in the offline Excel document was kept confidential and permanently deleted from the computer system two months after the final report was completed. Personal information (name, identity card, passport number, staff number, phone number, or email address) was not required by the questionnaire. The subjects were coded by random numbers according to the time of submission. All information collected was used only for research purposes and were not disclosed to the participants' supervisors/employers. The participants were allowed to withdraw from the study at any time before the conclusion of data collection.

Statistical Analysis

The collected data were coded, entered, and analysed using Statistical Package for Social Sciences Program (SPSS) version 22.0. Descriptive analysis, median, mean and standard deviation were calculated. An independent t-test and analysis of variance (ANOVA) test were conducted to compare the DASS scores of healthcare workers according to their socio-demographic features. Pearson's correlation was used to evaluate the relationship between the DASS scores and years of working experience, number of children, number of working days per week, and number of working hours per day. Findings were considered statistically significant at the $p < 0.05$ level.

RESULTS

Socio-demographic profile of the respondents

Table I summarises the socio-demographic profile of the respondents. The mean age of the respondents was 32.7 years. Among the 105 healthcare workers, 31.4% were males and 68.6% were females; 43.8% were doctors, 43.8% were nurses, 10.9% were medical assistants, and 1.9% were pharmacists and medical laboratory technicians. The mean years of service experience for the respondents was 8.5. Among all of the respondents 61.9% were married, while 38.1% were single. A majority of the respondents, 87.6%, were worried about spreading COVID-19 to family members.

DASS distribution of healthcare workers.

Table II shows the distribution of the respondents based on the classification of their stress, anxiety, and depression levels. Among the respondents, 42.9% experienced normal stress levels, while the others 57.1% experienced mild stress. In addition, all of the respondents experienced mild anxiety, while 59% showed normal depression levels and 41% showed mild depression levels.

DASS score of healthcare workers according to their socio-demographic profiles

Independent t-tests were conducted to compare the DASS scores of healthcare workers according to their socio-demographic data. As shown in Table III, there was a significant difference in the mean score of the stress levels between the male and female groups (10.7 ± 3.70 vs. 14.1 ± 4.76 , $p < 0.05$). There was also a significant difference in the mean score of the anxiety levels between both groups (8.6 ± 2.93 vs. 10.0 ± 3.20 , $p < 0.05$). However, no significant difference was found for the depression levels.

Significant differences were found between single and married groups for all three variables: stress, anxiety and depression. Significant differences for depression levels were only found between those who lived and did not live with their families (9.7 ± 3.31 vs. 11.5 ± 4.32 , $p < 0.05$). Moreover, no significant differences in the mean scores were found between participants who answered 'yes' and 'no' to the question of whether they were worried about spreading COVID-19 to family members. In terms of sleeping disturbances, significant differences were noted for stress, anxiety, and depression levels between the groups who did and did not experience sleeping disturbances since the MCO started. Finally, in terms of transferring from other units to handle COVID-19 patients as a frontliner, there was a significant difference in the mean score of the stress levels among the groups that did and did not transfer (16.1 ± 3.52 vs. 12.8 ± 4.74 , $p < 0.05$). There was also a significant difference between these groups in terms of both anxiety (11.7 ± 3.24 vs. 9.3 ± 3.11 , $p < 0.05$) and depression (13.4 ± 4.19 vs. 10.1 ± 3.67 , $p < 0.05$).

An ANOVA test was conducted to compare the DASS scores of healthcare workers with different educational levels and profession statuses. From Table IV, it can be seen that there were no significant differences noted in the mean scores of stress, and anxiety or depression levels across the different educational level groups. Similarly, no significant differences were found in the stress, anxiety, and depression levels of the healthcare workers across different professions.

Relationship between DASS score and years of working experience, number of children, working days per week, and working hours per day

Pearson's correlations were conducted to evaluate the relationship between the DASS scores and years of working experience, number of children, number of working days per week, and number of working hours per day. From Table V, it can be seen that there was a significant correlation between the stress level and years of working experience followed by the number of children the respondents had ($r = -0.199$, $p < 0.05$ vs. $r = 1$, $p < 0.05$). The more years of working experience, the lower the stress level of the respondents. The higher the number of children of the respondents, the higher their stress levels with this factor being perfectly correlated. Furthermore, there was no significant correlation between the stress levels and number of working days per week or number of working hours per day. There was no significant correlation between anxiety levels and years of working experience ($r = -0.101$, $p > 0.05$). In addition, there was no significant correlation between anxiety levels and the number of working days per week ($r = -0.049$, $p > 0.05$), and between anxiety levels and the number of working hours per day ($r = -0.086$, $p > 0.05$). As for depression levels, there was no significant correlation between depression levels and the years of working experience ($r = -0.150$, $p > 0.05$), and between depression levels and the number of working days per week ($r = 0.093$, $p > 0.05$), or working hours per day ($r = -0.026$, $p > 0.05$).

DISCUSSION

The COVID-19 virus that struck the world can have detrimental effects on the mental status of healthcare workers, such as their stress, anxiety, or depression levels. This study used the DASS to report the relationships between the levels of stress, anxiety, and depression and the socio-demographic factors of healthcare workers facing the COVID-19 outbreak in SGH. The overall findings of this study shows that all healthcare workers had mild levels of anxiety, with the majority of them experiencing mild stress, and almost half those sampled experienced mild depression. This is in agreement with a report stating that increased anxiety levels are the most prevalent among healthcare workers during and after an outbreak, followed by depression, and stress.⁴ However, none of the respondents scored within the moderate range on any of the DASS subscales, showing that this pandemic is only mildly associated with stress, anxiety, and depression levels among healthcare workers.

Gender was found to be associated with stress and anxiety levels, with more females experiencing mild stress and anxiety compared to males. However, both males and females were more associated with stress than anxiety. According to a study by Jianbo et al., stress, depression, anxiety and insomnia symptoms were more severe in nurses (7.1%), women (5.8%) and frontline workers (1.7%) compared to physicians (4.9%), men (3.4%) and second-line workers (0.4%).¹⁰

Factors such as transfers to COVID-19 frontline units, sleep disturbances, having children at home, and respondents' marital status were also shown to be related to stress, anxiety, and depression levels of healthcare workers in the present

Table I: Socio-demographic profile of respondents (N=105)

	n	%	Mean (SD)
Age (year)			32.7 (±5.34)
Gender			
Male	33	31.4	
Female	72	68.6	
Profession			
Doctor	46	43.8	
Nurse	46	43.8	
Medical assistant	11	10.5	
Other (Pharmacist, medical laboratory technician)	2	1.9	
Educational level			
Diploma	48	45.7	
Undergraduate	27	25.7	
Postgraduate	19	18.1	
Doctorate	2	1.9	
Other (Post-basic diploma)	9	8.6	
Years of experience			8.5 (±5.61)
Work unit			
Accident and emergency department	31	29.5	
Intensive care unit	28	26.7	
Infectious disease unit	10	9.5	
Other (Medical ward, surgical ward, haemodialysis unit, obstetrics and gynaecology and biochemistry unit)	36	34.3	
Marital status			
Married	65	61.9	
Single	40	38.1	
Staff with children			
Yes	53	50.5	
No	52	49.5	
Living with family during the COVID-19 pandemic			
Yes	64	61	
No	41	39	
No. of working days per week			5.7 (±0.86)
No. of working hours per day			9.6 (±5.81)
Worried about spreading COVID-19 to family members			
Yes	92	87.6	
No	13	12.4	
Sleeping disturbances since Movement Control Order (MCO) started			
Yes	27	25.7	
No	78	74.3	
Transferred from other units to handle COVID-19 as frontliner			
Yes	9	8.6	
No	96	91.4	

Table II: DASS distribution of healthcare workers

	n	%
Stress		
Normal (0-10)	45	42.9
Mild (11-18)	60	57.1
Moderate (19-26)	0	0
Severe (27-34)	0	0
Extremely severe (35-42)	0	0
Anxiety		
Normal (0-6)	0	0
Mild (7-9)	105	100
Moderate (10-14)	0	0
Severe (15-19)	0	0
Extremely severe (20-42)	0	0
Depression		
Normal (0-9)	62	59
Mild (10-12)	43	41
Moderate (13-20)	0	0
Severe (21-27)	0	0
Extremely severe (28-42)	0	0

Table III: DASS score of healthcare workers according to socio-demographic variables

Associated Factors	Mean (±SD)		
	Stress	Anxiety	Depression
Gender			
Male	10.7 (3.70)	8.6 (2.93)	9.6 (3.70)
Female	14.1 (4.76)	10.0 (3.20)	10.7 (3.85)
p -Value	0.001	0.034	0.171
Marital status			
Married	12.2 (4.14)	9.0 (2.80)	9.5 (3.07)
Single	14.5 (5.30)	10.4 (3.63)	11.7 (9.5)
p -Value	0.021	0.036	0.010
Living with family during the COVID-19 pandemic			
Yes	12.4 (4.05)	9.2 (2.97)	9.7 (3.31)
No	14.1 (5.52)	10.1 (3.43)	11.5 (4.32)
p -Value	0.094	0.135	0.025
Worried about spreading COVID-19 to family members			
Yes	12.9 (4.71)	9.4 (3.13)	10.1 (3.57)
No	13.7 (5.01)	10.3 (3.52)	12.2 (5.05)
p -Value	0.596	0.356	0.180
Sleeping disturbances since Movement Control Order (MCO) started			
Yes	15.8 (4.39)	11.9 (3.71)	12.7 (3.99)
No	12.1 (4.49)	8.7 (2.51)	9.5 (3.41)
p -Value	0.001	0.001	0.001
Transferred from other units to handle COVID-19 as frontliner			
Yes	16.1 (3.52)	11.7 (3.24)	13.4 (4.19)
No	12.8 (4.74)	9.3 (3.11)	10.1 (3.67)
p-Value	0.041	0.035	0.011

*p value<0.05 indicated a significant difference.

Table IV: DASS score of healthcare workers according to education and profession

	Stress	Anxiety	Depression
Education			
Diploma	13.4 (3.99)	9.5 (3.12)	10.0 (3.29)
Undergraduate	12.3 (5.86)	9.2 (2.95)	10.4 (4.78)
Postgraduate	13.0 (5.27)	10.9 (3.98)	11.6 (4.34)
Doctorate	11.5 (6.36)	8.0 (1.41)	12.5 (0.71)
Other	13.8 (3.77)	8.1 (1.27)	9.0 (1.41)
P Value	0.870	0.172	0.406
F Value	0.311	1.630	1.010
Profession			
Doctor	12.5 (5.41)	9.7 (3.39)	11.1 (4.54)
Nurse	14.2 (3.82)	9.4 (2.83)	10.0 (3.17)
Medical Assistant	10.2 (2.27)	8.6 (3.23)	9.4 (2.73)
Other	16.5 (10.61)	13.0 (5.66)	7.5 (0.71)
P Value	0.137	0.329	0.236
F value	2.935	1.159	1.437

*p value<0.05 indicates a significant difference

Table V: Relationship between DASS score and years of working experience, number of children, working days per week, and working hours per day

	Depression		Anxiety		Stress	
	r value	p value	r value	p value	r value	p value
Years of working experience	-0.150	0.126	-0.101	0.306	-0.199	0.042
No. of children	0.739	0.001	0.642	0.001	1	0.001
No. of working days per week	0.093	0.345	-0.049	0.617	0.035	0.720
No. of working hours per day	-0.026	0.791	0.086	0.386	0.003	0.976

*p value<0.05 indicated a statistically significant correlation

study. It was observed that all these factors were associated with higher levels of mental stress among healthcare workers, followed by depression and anxiety. Specifically, healthcare workers who were transferred to COVID-19 frontline units were more stressed, anxious, and depressed compared to those who were not. This can be due to the differences in workload as COVID-19 frontline healthcare workers tend to work more compared to those in other departments. Furthermore, having to work in a new team with a new protocol and standard operating procedures may be an additional burden. In addition, knowing that working in the COVID-19 frontline unit is associated with a higher risk of becoming infected as exposure to high-risk patients increases, may be one of the reasons for the transfer contributing to stress, anxiety, and depression among healthcare workers.

In addition, the pandemic was also found to be associated with sleep disturbances among healthcare workers. Even though only 25.7% of healthcare workers reported sleep disturbances, the present study showed that they were more prevalent among those experiencing mild stress, anxiety, and depression. This is consistent with a previous study which stated that the levels of anxiety among healthcare workers in China significantly affected stress levels, leading to a reduction in self-efficacy and sleep quality.¹¹ Moreover, the levels of stress, anxiety, and depression were associated with whether the staff has children; the higher the number of children, the higher their levels for these psychological symptoms.

Married workers not only needed to worry about their own protection, but also the safety of their family members, as they might be the source of infection to their loved ones. Mild stress, anxiety, and depression were found to be associated with single healthcare workers more than married ones, which could be explained by not having any support from partners. As shown in a study by Han et al., anxiety and stress levels in healthcare workers can be reduced by providing social support through family and friends, which helps improve their self-efficacy, resulting in better sleep quality.¹¹ Finally, it was also shown that the living environment is associated with depression levels; those who were not living with their families tended to have higher depression rates compared to those who had their family's support after they got off work.

The other aim of this study was to assess the relationship between years of working experience and the stress levels of healthcare workers. The longer the working experience, the lower their stress levels when confronting the COVID-19 pandemic. This is consistent with the findings of Paul and Teris, that showed that frontline nurses with clinical experience of less than 10 years were more prone to stress.¹² In another study conducted on nurses by Caputi and Humpel, it was shown that nurses with longer working experience were less associated with occupational stress than those with shorter working experience.¹³ Another study conducted among public health nurses in Taiwan by Wang and Lee, reported that occupational stress was more prominent in younger public health nurses with shorter working experience.¹⁴ Therefore, working experience is an important factor as it helps to provide a realistic

understanding of emotional and physical aspects of working with patients. The results of our study suggest that supportive interventions can be provided to healthcare workers with shorter working experience as they are more likely to experience psychological distress.¹⁵

In general, healthcare workers caring for patients with COVID-19 in SGH experienced mild levels of stress, anxiety, and depression. Staff who were transferred from other units to handle COVID-19 cases experience more psychological symptoms. And healthcare workers with longer period of work experience have lower stress levels compared to others.

LIMITATIONS OF THE STUDY

This study has a few limitations. This was a single-centred study and conducted using an online self-administered questionnaire with convenience sampling method. The information gathered here may not represent other hospitals. The study could be improved by including multi-centres, applying probabilistic sampling (such as random sampling and stratified sampling), and using multivariate analysis in order to control for confounding factors.

CONCLUSION

The psychological symptoms among healthcare workers during pandemic should not be ignored, as these can affect their work performance in treating COVID patients, especially now that there is still no cure and frontliners are expected to continue in this fight against the disease for the unforeseeable future. Besides, these psychological symptoms may lead to long-lasting health effects as well. Mental health screening is important during pandemic to identify the healthcare workers at risks, and the DASS is a simple and useful screening tool for this. This study has identified some sociodemographic factors that were associated with the levels of stress, anxiety and depression among the healthcare workers, which may lay the grounds for future interventions, for example, early identification and psychological counselling for vulnerable groups (female staff, unmarried staff, staff with children, staff who stays away from family, and staffs being transfer to frontline from other units). The findings of this study may also be a useful reference for other frontliners such as police and army force.

ACKNOWLEDGEMENTS

We would like to thank the Director General of Health Malaysia for his permission to publish this article. We would also like to thank the Director of Sarawak General Hospital for giving us permission to conduct this study in the hospital.

FUNDING

There was no funding for this study.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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