SAFETY PRACTICES, PERCEIVED RISK, RISK COPING, STIGMA AND ANXIETY: EXPERIENCE IN DEALING WITH COVID-19 PANDEMIC INFECTIOUS DISEASE AMONG FRONTLINE HEALTHCARE WORKERS IN HOSPITAL UNIVERSITI SAINS MALAYSIA

DR NOR IRYANI BINTI MAHD NOR

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ABSTRAK

Pandemik COVID-19 telah memberi kesan kepada lebih daripada 114 negara, termasuk Malaysia. Pada Oktober 2022, Malaysia mencatatkan jumlah kes COVID-19 sebanyak 4.8 juta dengan jumlah kematian seramai 36 ribu. Sebagai barisan hadapan yang memerangi pandemik ini, petugas kesihatan (PK) mengalami beban yang besar akibat COVID-19, kerana terlibat secara langsung dalam penyaringan dan perawatan pesakit. Tujuan kajian ini adalah untuk mengkaji perkadaran amalan keselamatan, persepsi risiko, stigma, serta tahap kebimbangan, dan faktor-faktor berkaitan di kalangan PK Hospital Universiti Sains Malaysia (USM) pada penghujung pandemik COVID-19. Kajian keratan rentas melalui tinjauan atas talian terhadap 252 orang PK telah dijalankan dari September 2021 hingga Mac 2022. Data tersebut telah dianalisa menggunakan regresi linear ringkas dan berganda. Keputusan menunjukkan skor min (sisihan piawai (SD)) bagi amalan keselamatan PK 63.54 (5.78), amalan keselamatan organisasi 10.06 (1.62), persepsi risiko 11.65 (2.90), dan stigma 10.45 (4.74). Kelaziman tahap kebimbangan, dengan skor GAD-7 $\geq$ 8 adalah 14 (5.6%). Etnik, amalan keselamatan, persepsi risiko, strategi pengurusan risiko secara adaptasi negatif dan menjauhkan diri, dan stigma merupakan faktor-faktor berkaitan dengan tahap kebimbangan. Kajian menunjukkan bahawa PK Hospital USM telah mengamalkan amalan keselamatan yang baik, mempunyai persepsi risiko dan stigma yang tinggi serta memiliki tahap kebimbangan yang rendah pada penghujung wabak COVID-19. Kami mengesyorkan perlaksanaan prosedur operasi standard yang baik, penyediaan peralatan perlindungan yang mencukupi, dan sokongan kesihatan mental yang optima dalam memerangi wabak penyakit berjangkit.

ABSTRACT

The COVID-19 pandemic has affected more than 114 countries, including Malaysia. By October 2022, Malaysia had recorded a total of 4.8 million COVID-19 cases with a death toll of 36 thousand. As frontliners in the battle against the ongoing pandemic, healthcare workers (HCWs) have experienced a significant burden from COVID-19, as they are directly involved in screening and treating patients. The aims of this study were to examine the proportion of safety practices, perceived risk, stigma, as well as anxiety levels and its associated factors among the HCWs of Hospital Universiti Sains Malaysia (USM) during the late stage of the COVID-19 pandemic. A cross-sectional study involving an online survey of 252 HCWs was conducted from September 2021 to March 2022. The data were analysed using simple and multiple linear regression. The results showed mean (standard deviation (SD)) scores of 63.54 (5.78) for HCWs' safety practices, 10.06 (1.62) for organizational safety practices, 11.65 (2.90) for perceived risk, and 10.45 (4.74) for stigma. The prevalence of positive anxiety, defined as a GAD-7 score of $\geq$ 8, was 14 (5.6%). Ethnicity, safety practices, perceived risk, maladaptive and distancing coping strategies, and stigma were significant associated factors of anxiety levels. Our study highlighted that HCWs at Hospital USM had practised appropriate safety measures, experienced substantial perceived risk and stigma, while maintaining a low level of anxiety during the late stage of the COVID-19 pandemic. We recommend the implementation of good standard operating procedures, provision of adequate protective equipment, and strong mental health support in combatting infectious disease pandemics.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In the last two decades, two major outbreaks of coronavirus infection, namely severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome coronavirus (MERS-CoV), have resulted in casualties and economic instabilities in many countries. In late December 2019, SARS-CoV-2, a new strain of coronavirus that causes coronavirus disease (COVID-19), first appeared in China. It was rapidly spread and was declared a public health emergency of international concern in late January 2020, just a month after the first detection. The pandemic was later announced by the World Health Organization (WHO) on 11th March 2020 when it infected 114 countries and killed more than 4,000 people. In early 2021, a year after the emergence of the virus, more than 83.9 million people in the world were affected, resulting in 1.8 million deaths globally (World Health Organization, 2020).

In the early phase of the COVID-19 infection, Malaysia enforced quarantine and travel restrictions. However, as new COVID-19 cases continued to rise, the Movement Control Order (MCO)—which mandated the closure of all businesses except those offering necessities like food and shelter (Ho & Tang, 2020)—was implemented on 18th March 2020, to minimize the spread of the virus (Prime Minister's Office of Malaysia, 2020). As of this writing, in October 2022, which is almost three years after the emergence of COVID-19, Malaysia has recorded over 4.8 million cases with a death toll of 36 thousand and a total of 7,082 clusters. Among those, up to 13 clusters are still active (Ministry of Health Malaysia, 2022).

Being the frontline staff combating this ongoing pandemic, HCWs are exposed to a high level of stress, anxiety, and stigma as they are directly involved in screening and treating COVID-19 patients. In contrast to other pandemics, COVID-19 positive cases

include both symptomatic and asymptomatic people who are just slightly less infectious than the symptomatic cases (Sayampanathan et al., 2021), making the diagnosis and contact tracing more challenging. Furthermore, the susceptibility of HCWs to SARS-CoV-2 infection has not been well-described in earlier stages of the pandemic (Dzinamarira et al., 2021). In a study by Ng et al. (2020), all HCWs who practised proper personal protective equipment (PPE) did not contract COVID-19 infection while treating a severe pneumonia case that turned out to be COVID-19, even though the status of the patient was not known before. This showed the importance of PPE when handling possible infectious diseases. Hence, investigating the level of adherence to safety practises among HCWs during the pandemic is important in preventing the further spread of COVID-19 infection.

According to a Dutch study on the Influenza A pandemic, there was a higher perceived severity during the early stages of the new flu's emergence. With proper health information and infection prevention and control (IPC) measures, the perceived severity and anxiety decreased over time (Bults et al., 2011). This implies that perceived risk has a significant impact on HCWs' adaptive mechanisms for maintaining optimal physical and mental health while working in a pandemic. Thus, studying the HCWs' perception of COVID-19 risk is essential as it is closely related to their attitude change and decision-making capabilities.

Infectious disease had a significant association with stigma (Williams et al., 2011). During the previous outbreak of severe acute respiratory syndrome (SARS) in 2004, uncertainty about the disease's aetiologies and complications caused fear and stigma in SARS-affected areas in Asia (Person et al., 2004). Those who have had direct contact with the outbreak diseases are stigmatized as well, particularly the HCWs (Bai et al., 2004). The HCWs who worked in West Africa during the Ebola outbreak were upset with

the stigmatization of them and their family members (Wester & Giesecke, 2019). Likewise, special consideration should be given to the development of fear and stigmatization among the HCWs during the COVID-19 outbreak.

The psychological distress and impact of the pandemic on the healthcare system were exceptional. A study among Hong Kong HCWs showed that HCWs who had contact with SARS patients had a higher anxiety level compared to administrative staff and physicians who did not have such contact (Poon et al., 2004). The WHO projected that between January 2020 and May 2021, about 80,000 to 180,000 HCWs might have passed away from COVID-19 (World Health Organization, 2021). This estimation of a higher risk of contracting the disease could lead to anxiety among HCWs as they directly deal with infected COVID-19 cases. However, the anxiety levels of our local HCWs are still unknown.

These findings recommend that we explore the safety practices, mitigate the perceived risk and stigma, and investigate the anxiety levels of our HCWs in Hospital USM to have a clear picture of the ground reality that our HCWs have been facing. The investigation results may contribute to improving our local preparedness for handling the pandemic and developing the resilience and well-being of HCWs by empowering them with knowledge and good practices during times of crisis.

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CHAPTER 2

OBJECTIVES

2.1 GENERAL OBJECTIVES:

1. To determine safety practice, perceived risk, stigma, anxiety levels and its associated factors among frontliners healthcare workers in Hospital USM during COVID-19 pandemic.

2.2 SPECIFIC OBJECTIVES:

1. To determine the proportion of safety practice related to the COVID-19 among frontliners healthcare workers in Hospital USM.

2. To determine the proportion of perceived risks related to the COVID-19 among frontliners healthcare workers in Hospital USM.

3. To determine the proportion of stigma related to the COVID-19 among frontliners healthcare workers in Hospital USM.

4. To determine the anxiety levels of frontliners healthcare workers in Hospital USM.

5. To identify the associated factors (sociodemography, perceived risks, knowledge, safety practices) of anxiety levels.

CHAPTER 3

MANUSCRIPT

3.1. TITLE: SAFETY PRACTICES, PERCEIVED RISK, RISK COPING, STIGMA AND ANXIETY: EXPERIENCE IN DEALING WITH COVID-19 PANDEMIC INFECTIOUS DISEASE AMONG FRONTLINE HEALTHCARE WORKERS IN HOSPITAL UNIVERSITI SAINS MALAYSIA

Mahd Nor, Nor Iryani [1]; Muhamad, Rosediani [1]; Zakaria, Rosnani [1]; Ab Hamid, Siti-Azrin [2]; Mat Yudin, Zainab [3].

[1] Family Medicine Department, School of Medical Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia.

[2] Biostatistics and Research Methodology Unit, School of Medical Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia.

[3] School of Dental Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia.

Corresponding author: Rosnani Zakaria

Email: rosnani@usm.my

3.2 ABSTRACT

The COVID-19 pandemic has affected more than 114 countries, including Malaysia. By October 2022, Malaysia had recorded a total of 4.8 million COVID-19 cases with a death toll of 36 thousand. As frontliners in the battle against the ongoing pandemic, healthcare workers (HCWs) have experienced a significant burden from COVID-19, as they are directly involved in screening and treating patients. The aims of this study were to examine the proportion of safety practices, perceived risk, stigma, as well as anxiety levels and its associated factors among the HCWs of Hospital Universiti Sains Malaysia (USM) during the late stage of the COVID-19 pandemic. A cross-sectional study involving an online survey of 252 HCWs was conducted from September 2021 to March 2022. The data were analysed using simple and multiple linear regression. The results showed mean (standard deviation (SD)) scores of 63.54 (5.78) for HCWs' safety practices, 10.06 (1.62) for organizational safety practices, 11.65 (2.90) for perceived risk, and 10.45 (4.74) for stigma. The prevalence of positive anxiety, defined as a GAD-7 score of ≥ 8, was 14 (5.6%). Ethnicity, safety practices, perceived risk, maladaptive and distancing coping strategies, and stigma were significant associated factors of anxiety levels. Our study highlighted that HCWs at Hospital USM had practised appropriate safety measures, experienced substantial perceived risk and stigma, while maintaining a low level of anxiety during the late stage of the COVID-19 pandemic. We recommend the implementation of good standard operating procedures, provision of adequate protective equipment, and strong mental health support in combatting infectious disease pandemics.

Keywords: COVID-19, healthcare workers, safety practices, perceived risk, risk coping, stigma, anxiety

3.3 INTRODUCTION

A new strain of coronavirus, SARS-CoV-2 which caused Coronavirus disease (COVID-19) was declared a public health emergency of international concern in late January 2020, just a month after the first detection in December 2019. The pandemic was later announced on 11th March 2020, when it infected 114 countries and killed more than 4,000 people (1).

In the early phase of the COVID-19 infection, Malaysia enforced quarantine and travel restrictions. However, as new COVID-19 cases continued to rise, a Movement Control Order (MCO)—which mandated the closure of all businesses except those offering necessities like food and shelter (2)—was implemented on 18th March 2020, to minimize the spread of the virus (3). In October 2022, almost three years after the emergence of COVID-19, Malaysia recorded over 4.8 million cases with death toll of 36 thousand and a total of 7,082 clusters. Among those, up to 13 clusters are still active, with 23 thousand active cases (4).

In contrast to other pandemics, COVID-19 positive cases include both symptomatic and asymptomatic people who are slightly less infectious than symptomatic cases (5), making diagnosis and contact tracing more challenging. A recent study reported that all HCWs who practised proper personal protective equipment (PPE) did not contract COVID-19 infection while treating a severe pneumonia case that turned out to be COVID-19, even though the status of the patient was not known before (6). This reflects the importance of adherence to infection prevention and control (IPC) measures in handling infectious diseases.

The previous study stated a higher perceived severity in the early phase of the Influenza A pandemic, but it was reduced with proper health information and IPC

adherence (7). This implies that perceived risk significantly influences HCWs' adaptive mechanisms to maintain their optimal physical and mental well-being while working during the pandemic. During the previous outbreak of severe acute respiratory syndrome (SARS), uncertainty about the disease's aetiologies and complications caused fear and stigma in SARS-affected areas in Asia (8). Those who have had direct contact with the outbreak diseases are also stigmatized, particularly among HCWs (9,10). Thus, as a new virus emerged, the perceived risk, fear, and stigmatization of HCWs during the COVID-19 outbreak should be studied.

The psychological distress and impact of the pandemic on the healthcare system were intense. A study among Hong Kong HCWs found that those who had contact with SARS patients had a higher anxiety level compared to administrative staff and physicians who did not have such contact (11). The World Health Organization projected that between January 2020 and May 2021, about 80,000 to 180,000 HCWs would die from COVID-19 (12). The estimation of a higher risk of contracting this deadly disease could lead to anxiety among HCWs as they directly deal with infected COVID-19 cases.

Currently, there are limited number of published studies on safety practices, perceived risk, stigma, and anxiety among HCWs in Malaysia, especially among those working at Hospital University. Hence, it demonstrates the importance of investigating the proportion of safety practices, perceived risk, stigma, anxiety level, and associated factors among HCWs at Hospital USM during the late stage of the COVID-19 pandemic. Subsequently, this study aims to improve our local preparedness for handling the pandemic and develop better resilience and well-being among HCWs.

3.4 METHODOLOGY

3.4.1 Study Design and Population

This was a cross-sectional study conducted at Hospital Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan from September 2021 until March 2022. The study involved HCWs from the Family Medicine Department, Obstetrics and Gynaecology Department and Paediatric Department. HCWs from the Medical Department, Emergency Department, Anaesthesiology, Intensive Care Department and all HUSM clinical laboratories were not selected, as they had already been involved in an earlier validation study conducted from January to August 2021. Eligible participants were required to have at least 3 months of working experience as frontline HCWs during the study period. HCWs who were unable to understand either the Malay or English language were excluded from the study. A convenient sampling method via online networks was implemented in the selection of eligible participants.

3.4.2 Sample Size Estimation

The sample size was calculated using single proportion estimation (13), considering that 82% of the participants had reduced social contact due to being worried about the COVID-19 pandemic (14), with a precision of 5%. The required sample size was 227 respondents. Accounting for a 10% dropout rate, the total number of participants needed was 252.

3.4.3 Research Tools

The data was collected through the Malay language questionnaire on safety practices, perceived risk, coping strategies, and stigma among frontline HCWs in Hospital USM in dealing with COVID-19 pandemic infectious disease. It was validated with good

reliability (15). This questionnaire was further merged with the validated published Malay questionnaire of Generalised Anxiety Disorder-7 (GAD-7) (16). The questionnaires consisted of two sections. The first section gathered information on the demographic characteristics of the participants. The second section was divided into six parts, safety practices of HCWs, organizational safety practices, perceived risk, risk coping strategies and stigma. Detailed descriptions on the scales and scores used in the questionnaire can be found in Table 1.

The last part of the second section of this questionnaire was on GAD-7 which consisted of seven items that measured GAD, panic disorder, social anxiety, and post-traumatic stress disorder (PTSD) symptoms that occurred two weeks before the participants were involved in the study. There were seven questions with 4 points Likert scale ranging from 0 (not at all) to 3 (nearly every day). Total scores were calculated by summation of all the scores, which can be categorized into normal or minimal (0-4), mild (5 to 9), moderate (10-14) and severe (15 and above) (17).

3.4.4 Data Collection

The constructed online questionnaires were distributed to the head of the departments, the chief of the wards and clinics. It was then blasted in the departments' WhatsApp group or forwarded personally to the HCWs by the head nurses. The eligibility for enrolment in the study and virtual consent form were provided on the first page of the Google form. The HCWs were well versed that their participation in this research were voluntary, and they could withdraw their participation at any time. Eligible and consented participants were able to proceed to the first section of the study while those ineligible or not willing to participate were directed to the last page of the research tool and submitted their responses. The Mental Health and Psychosocial Support (MHPSS), 'Talian Kasih'

and Befrienders' contact numbers were provided in the last part of the second section in case the participants needed any support after answering the questionnaire.

3.4.5 Statistical Analysis

The data entry and analysis were performed using IBM SPSS version 26.0. The data were checked for any missing or duplicated entries and cleaned prior to the analysis. Descriptive analysis was done with categorical data was presented as frequency and percentage while numerical data was presented as mean and standard deviation (SD). Simple and multiple linear regression were used to identify the associated factors of anxiety among HCWs. Backward and forward variables selection methods were used. Model assumption and model fitness were tested. Findings were presented with crude and adjusted regression coefficient, 95% confidence interval (CI) and P value.

3.4.6 Ethical Approval

The study was approved by the Human Research Ethics Committee (HREC) at USM (USM/JEPeM/COVID-19-32). No participant could be identified from this study because the data were obtained anonymously.

Table 1: Summary of the questionnaires used

Part	Item	Domains	Factors/Themes	Number of items	Scale	Score	Content and Face Validity	Cronbach's α
1	A1	Safety practices of HCWs	Changes at workplace during pandemic	1	-	*	S-CVI/Ave 0.99 S-CVI/UA	-
	A2 - A3		Management after contact with person under investigation (PUI)	2	4 points Likert scale 0 - Strongly disagree 1 – Disagree 2 – Agree 3 - Strongly agree	Higher summed up scores represent the better practice of safety practices	0.96 S-FVI/Ave 0.99 S-FVI/UA 0.96	-
	A4 - A15	Safety practices	Preventive measures	12	5 points Likert scale 0 – Never 1 – Seldom 2 – Sometimes 3 – Often 4 – Always	Higher summed up scores represent the better practice of safety practices		0.901
	A16 - A22		PPE stocks at workplace	7	3 (Yes / No / Not available)	*		-
	A23 - A26		Advice for patients	4	5 points Likert scale 0 – Never 1 – Seldom 2 – Sometimes 3 – Often 4 – Always	Higher summed up scores represent the better practice of safety practices		0.970

2	B1 - B2 B3 - B5	Organizational safety practices	PPE adherence order Attitude toward infection control	2 3	2 (Yes / No) 5 points Likert scale 0 – Very dissatisfied 1 – Dissatisfied 2 – Not sure 3 – Satisfied 4 - Very satisfied	* Higher summed up scores represent the better organization safety practices	S-CVI/Ave 1.00 S-CVI/UA 1.00 S-FVI/Ave 1.00 S-FVI/UA 1.00	- 0.970
3	C1	Perceived risk	Risk to be infected	1	5 points Likert scale 0 – Definitely not 1 – Probably not 2 - Possibly 3 - Probably 4 - Definitely	Higher scores represent a higher perceived risk of COVID-19 infection	S-CVI/Ave 0.97 S-CVI/UA 0.85	-
	C2 - C3 C4 - C5 C6 - C7		Worry Effect on daily life Mental health	2 2 2	4 points Likert scale 0 - Strongly disagree 1 – Disagree 2 – Agree 3 - Strongly agree	Higher summed up scores represent a higher perceived risk	S-FVI/Ave 0.98 S-FVI/UA 0.85	0.856 0.766 0.761
	C8		Vaccine consent	1	3 (Yes / No / Not sure)	*		-
	C9		Reason of vaccine refusal	1	-	*		-

	C10		Collaboration with private sector able to reduce outbreak	1	3 (Yes / No / Not sure)	*		-
	C11		Worry about PPE stocks at workplace	1	3 (Yes / No / Do not know)	*		-
4	D1 - D3	Risk coping strategies	Dietary change	3	5 points Likert scale 0 – Never 1 – Seldom 2 – Sometimes 3 – Often 4 – Always	*Each factors' scores determined separately*	S-CVI/Ave 1.00 S-CVI/UA 1.00 S-FVI/Ave 0.99 S-FVI/UA 0.94	0.479 0.852 0.772 0.756 -
	D4 - D7		Maladaptive	4				
	D8 - D12		Adaptive	5				
	D13 - D15		Distancing	3				
	D16 - D17		Mental health support	2	4 points Likert scale 0 - Strongly disagree 1 – Disagree 2 – Agree 3 - Strongly agree	Higher summed up scores represent a higher agreement for mental health support		
5	E1 - E3	Stigma	Self-stigma	3	4 points Likert scale 0 - Strongly agree 1 – Agree 2 – Disagree 3 - Strongly disagree	Higher summed up scores represent a higher stigma	S-CVI/Ave 0.98 S-CVI/UA 0.90 S-FVI/Ave 0.99 S-FVI/UA 0.90	0.714 0.940
	E4 - E10		Concerns of disclosure and public attitudes	7				

*Factors were not clinically significant to be measured

3.5 RESULTS

3.5.1 Demographic and work background of the respondent

A total of 252 HCWs completed the questionnaires. The respondents had a mean age of 36.4 years, with the majority being female (88.5%), of Malay ethnicity (94.8%), and married (79.8%). The respondents included medical practitioners at various levels and paramedics, with most of them holding a degree or higher (44.4%). The median working experience was 9 years, ranging from less than a year up to 39 years. The majority of respondents had contact with COVID-19 patients (80.6%) and nearly all had received at least one dose of the COVID-19 vaccine (99.2%). The work background of the respondents was summarized in Table S1.

3.5.2 Safety Practice, Perceived Risk, Coping and Stigma

Among the respondents, the most common changes to ensure the continuity of clinical services during the COVID-19 pandemic at their workplace were shortening patient's consultation time (65.1%) and cancelling or changing regular non-acute patient appointments (56.3%) but none of them had their clinic closed. Responses on changes in clinical services were listed in Table S2.

In terms of self-safety practices at the workplace, almost half of the respondents strongly agree that they will undergo self-isolation after contact with patients investigated for COVID-19 (49.6%) and the majority strongly agree that they will sanitize their workplace after managing patients with confirmed COVID-19 (75.8%). The most common practice includes wearing a facemask (95.2% always), handwashing (90.9% always), checking the patient's body temperature (86.5% always) and being compliant with cough etiquette (84.5% always). On contrary, proper ventilation and

wearing eye protection were less practised. More than 90% of the respondents agree that surgical facemask, gloves, gown, face shield and apron were adequately supplied in their workplace, however, 23.0% responded that N95 mask was not adequately supplied and 51.2% responded that protective eyewear were not supplied at all. All respondents either often or always advised the patient on COVID-19 infection spread prevention, with 78.2% claiming they always advised on when to seek medical treatment, 74.2% home quarantine if at risk, 66.7% of preventives measures and 62.3% of the risk of COVID-19 infection. The self-safety practices were summarised in Table S3, Table S4, Table S5 and Table S6.

In terms of organizational safety practices, almost all respondents responded that their department had instructed them to wear a facemask (99.2%) and other personal protective equipment (94.8%) at work. The respondents were also either satisfied or very satisfied with the implementation of infection control and prevention guidelines at their workplace, with only less than 10% of the respondents either not sure, dissatisfied or very dissatisfied. The safety practices at the organizational level were summarized in Table S7 and Table S8.

Among the respondents, most of them perceived that they have at least possible to get COVID-19 infection in the future. Among the most common issues that the respondents perceived as affected were daily activities with 52.8% agree and 42.5% strongly agree, and quality of life with 50.0% agree and 35.7% strongly agree. In contrast, feeling depressed was the least with only 19.0% agree and 7.1% strongly agree. In terms of the vaccination program, almost all will agree to receive future COVID-19 vaccine (99.6%), with only one respondent unsure, the reason was due to the perceived idea that there was a short duration for vaccine development and inadequate testing. The majority of the respondents also agreed that cooperation between the government and private sector may reduce the risk of the spread of COVID-19 infection (89.3%). Most

respondents were unsure of the stock of personal protective equipment at the workplace (65.1%). The perceived risks related to COVID-19 were summarised in Table S9, Table S10, Table S11, Table S12 and Table S13. In dealing with the COVID-19 risk, the most common activities that the respondents did was spiritual and religious prayer (40.5% often and 25.0% always), taking supplements or vitamins (31.0% often and 16.3% always) and consuming caffeinated beverages or coffee (24.2% often and 15.9% always). In contrast, the respondents were never or seldom involved in either drinking alcohol, smoking, taking an antidepressant, taking unpaid leave, thinking of changing workplace or occupation, or isolate from friends and family. The majority of the respondents also feel that training to improve mental health was needed (55.2% strongly agree, 41.7% agree) and their workplace should provide a psychological support team for staff (52.8% strongly agree, 44.8% agree). Coping strategies among respondents were summarised in Table S14 and Table S15.

There were three subscales of stigma which were self-stigma, disclosure concerns and concern with public attitudes. Two questions related to self-stigma had a high percentage of agree or strongly agree, including 'Feel guilty cause others to be at risk of contracting COVID-19' (13.1% strongly agree, 30.2% agree) and 'Stay away from others to prevent spreading the COVID-19' (7.9% strongly agree, 33.3% agree). However, for another question of self-stigma on 'Feel lonely because at risk of spreading COVID-19' only 2.8% strongly agree and 11.9% agree. Most of the respondents disagree or strongly disagree with the question related to disclosure concerns and concern with public attitudes, with the highest percentage on 'Feel like lost friends after informing them that they were managing COVID-19 patients' (25.4% strongly disagree, 66.3% disagree) or 'Afraid to tell family members that they were involved in managing COVID-19 patients' (26.2%

strongly disagree, 65.9% disagree). The stigmas related to managing covid-19 patients among respondents were summarised in Table S16.

The summed-up mean (SD) and median (IQR) scores for the domain safety practices of HCWs, organizational safety practices, perceived risk, stigma, and the scores for the factors of coping strategies were shown in Table 2.

Table 2: Safety practices of HCWS, organizational safety practices, perceived risk, coping strategies, and stigma scores (n=252)

Variable	Mean (SD)	Median (IQR)
Safety Practices of HCWs Total Score	63.54 (5.78)	65.0 (60.0, 68.0)
Organizational Safety Practices Total Score	10.06 (1.62)	9.0 (9.0, 12.0)
Perceived Risk Total Score	11.65 (2.90)	11.0 (10.0, 14.0)
Risk Coping Strategies:		
Dietary Change Score	5.41 (2.55)	6.0 (4.0, 7.0)
Maladaptive Score	0.25 (1.05)	0.0 (0.0, 0.0)
Adaptive Score	9.85 (3.87)	10.0 (7.0, 12.0)
Distancing Score	0.87 (1.79)	0.0 (0.0, 1.0)
Mental Health Support Score	5.02 (1.04)	5.0 (4.0, 6.0)
Stigma Total score	10.45 (4.74)	10.5 (8.0, 13.0)

3.5.3 Anxiety and Factors Associated

The median anxiety score among the respondents was 0, ranging from 0 to 20. The score was then categorized with a cut point of ≥8 as positive for anxiety (18) and found that 5.6% of the respondent had anxiety. The anxiety scores were summarized in Table 3, and the factors associated with anxiety were shown in Table 4.

Table 3: Anxiety score and prevalence of anxiety among respondents (n = 252)

Variable	n (%)
GAD-7 Score	0.0 (3.0)[a]
Anxiety Category	
Negative (Score <8)	238 (94.4)
Positive (Score >8)	14 (5.6)
Anxiety Category	
Minimal (0-4)	221 (87.7)
Mild (5-9)	23 (9.1)
Moderate (10-14)	5 (2.0)
Severe (≥15)	3 (1.2)

[a]Median (IQR)

Table 4: Factors associated with higher anxiety level using simple linear and general linear regression (n=252)

Variable	Simple Linear Regression		General Linear Regression[2]	
	Crude Beta (95% CI[1])	p-value	Adjusted Beta (95% CI[1])	p-value
Age (Year)	0.01(-0.04, 0.06)	0.606		
Gender				
Male (ref.)	—			
Female	-0.89 (-2.12, 0.34)	0.154		
Ethnicity				
Malay (ref.)	—			
Non-Malay	3.47 (1.74, 5.19)	<0.001	2.70 (1.32, 4.07)	**<0.001**
Position				
Medical Officer (ref.)	—			
Master Medical Candidate	0.05 (-1.20, 1.30)	0.936		
Staff Nurse	-0.32 (-1.38, 0.74)	0.551		
Hospital Attendant	-0.23 (-1.47, 1.01)	0.719		
Other	-0.54 (-2.91, 1.84)	0.657		
Education				
Certificate (ref.)	—			
Diploma	-0.38 (-1.53, 0.77)	0.516		
Degree or higher	-0.19 (-1.32, 0.95)	0.748		
Marital Status				
Single (ref.)	—			
Married	-0.66 (-1.71, 0.38)	0.213		
Separated	-0.02 (-2.42, 2.38)	0.987		
Work Experience (Year)	0.02 (-0.03, 0.06)	0.495		
Contact COVID-19				
No (ref.)	—			
Yes	-0.02 (-1.01, 0.98)	0.976		
Safety practices of HCWs	-0.09 (-0.15, 0.02)	0.014	-0.08 (-0.14, -0.03)	**0.003**
Organizational safety practices	-0.33 (-0.57, -0.09)	0.007		
Perceived Risk	0.36 (0.3, 0.48)	<0.001	0.24 (0.13, 0.35)	**<0.001**
Risk coping strategies				
Dietary change	0.21 (0.06, 0.36)	0.008		
Maladaptive	0.24 (-0.14, 0.61)	0.213	-0.43 (-0.74, -0.12)	**0.007**
Adaptive	-0.06 (-0.17, 0.04)	0.214		
Distancing	0.91 (0.72, 1.10)	<0.001	0.76 (0.57, 0.95)	**<0.001**
Mental health support	0.17 (-0.543, 0.21)	0.387		
Stigma	0.28 (0.21, 0.36)	<0.001	0.13 (0.06, 0.20)	**<0.001**

[1]CI = Confidence Interval
[2]R^2 = 42.3%, no multicollinearity

Table 4 shows the associated factors for anxiety score using simple linear regression and general linear regression analysis. Non-Malay ethnicity, perceived risk, distancing coping strategies, and stigma were directly associated with a higher anxiety score ($p<0.001$) while safety practices of HCWs and maladaptive coping strategies were inversely associated with a higher anxiety score. Other variables were not statistically significant.

3.6 DISCUSSION

This cross-sectional study intended to evaluate the proportion of safety practice, perceived risk, coping strategies, and stigma related to COVID-19 among frontline HCWs in Hospital USM. The anxiety level and the associated factors of anxiety were also explored. Three departments were selected as frontline HCWs because the Family Medicine Department is responsible for providing primary care services, the Obstetrics and Gynaecology Department deliver comprehensive care for women's health and manage direct admission of obstetric patients through the Patient Assessment Centre (PAC) while the Paediatric Department is accountable to screen unstable paediatric cases in Emergency Department and manage ill COVID-19 cases in the paediatric High Dependency Unit (HDU). Moreover, these departments did not involve in the prior validation study.

During the COVID-19 pandemic, the majority of our HCWs reduced patients' consultation time, followed by changing regular, non-acute patients' appointments. Besides, none of our HCWs chose to close their clinics. These strategies were parallel to the interim report by the WHO second round national pulse survey on the continuity of essential health services that reported half of 112 countries supported the scheduling of medical appointments while 38% of 108 countries limited their outpatient services but