

**IMPACT OF COVID-19 PANDEMIC ON THE MENTAL
HEALTH OF HEALTH CARE PERSONNEL FROM
GOVERNMENT HOSPITALS IN YANGON REGION,
MYANMAR**

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**A Thesis Submitted in Partial Fulfillment of the Requirements
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ผลกระทบของสถานการณ์แพร่ระบาดของโรคโควิด-19
ต่อสุขภาพจิตของบุคลากรทางการแพทย์ในโรงพยาบาลรัฐในเขตอย่างกุ้ง ประเทศเมียนมา



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ชา เม นิน ชา อ่อง : ผลกระทบของสถานการณ์แพร่ระบาดของโรคโควิด-19

ต่อสุขภาพจิตของบุคลากรทางการแพทย์ในโรงพยาบาลรัฐในเขตย่างกุ้ง ประเทศเมียนมา. (IMPACT OF COVID-19 PANDEMIC ON THE MENTAL HEALTH OF HEALTH CARE PERSONNEL FROM GOVERNMENT HOSPITALS IN YANGON REGION, MYANMAR) อ.ที่ปรึกษาหลัก : อ. ดร.เทพนาถ พุ่มไพบูลย์

ก า ร ะ บ า ด ข อ ง โ ร ค โ ค วิ ด -19

ส่งผลกระทบต่อมนุษย์ทำให้มีผู้เสียชีวิตเป็นจำนวนมากและมีผู้ที่ได้รับผลกระทบทางลบต่อสุขภาพจิตของคนทั้งประเทศ อัตราการแพร่เชื้อและการเสียชีวิตที่เพิ่มขึ้นอย่างมากในประเทศเมียนมาาระหว่างการระบาดระลอกที่สองโดยเฉพาะใจกลางเมืองย่างกุ้ง การบริหารจัดการโรคโควิด-19 ทำให้บุคลากรทางการแพทย์เกิดความอ่อนล้าทั้งทางร่างกายและจิตใจ

การศึกษานี้มีวัตถุประสงค์เพื่อประเมินผลกระทบด้านสุขภาพจิตของบุคลากรทางการแพทย์โดยหาระดับของอาการซึมเศร้า ความวิตกกังวล และความเครียด และเพื่อกำหนดปัจจัยที่เกี่ยวข้อง

การศึกษากาตัดขวางโดยใช้การตอบแบบสอบถามด้วยตนเองผ่านระบบออนไลน์ในการรวบรวมข้อมูลจากบุคลากรทางการแพทย์ในเมืองย่างกุ้งที่มีส่วนร่วมโดยตรงในการบริหารจัดการโรคโควิด-19 ภาวะซึมเศร้า วิตกกังวลและความเครียดวัดโดยแบบสอบถาม DASS-21 วิเคราะห์ปัจจัยทำนายโดยใช้สถิติวิเคราะห์การถดถอยโลจิสติกแบบสองกลุ่มทั้งแบบตัวแปรเดียวและหลายตัวแปร

ในการศึกษาได้ข้อมูลจากผู้ตอบแบบสอบถามจำนวน 406 คน คิดเป็นพยาบาล ร้อยละ 75 แพทย์ ร้อยละ 18 เจ้าหน้าที่ หน้าที่ ห้ อ ง ป ฎิ บั ดิ ก า ร ร้อย ละ 6.7 พบ ผู้ มี ส่วน ร่วม ที่ มี ภาวะ ซึม เศร้า วิต ก กั ง ว ล และเครียดในระดับปานกลางจนถึงรุนแรงมากที่สุดที่ได้รับการรักษาในอัตราร้อยละ 15.5 17.9 และ 8.9 ตามลำดับ ประสิทธิภาพผู้ตรวจตราของบุคลากรทางการแพทย์มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับโอกาสสูงขึ้นไปที่จะมีภาวะซึมเศร้าและวิตกกังวล ใน ระดับ รุน แรง (AOR: 2.34, 95%CI: 1.13-4.87 และ AOR: 2.14, 95%CI: 1.08-3.45) ผู้ ที่ สูญ เสี ย บุ ค ล ก ล อ น เป็ น ที่ ร้ ก ใน ช่ว ง ก า ร ะ บ า ด ข อ ง โ ร ค โ ค วิ ด -19 มีโอกาสสูงขึ้นไปที่จะมีภาวะซึมเศร้าและความเครียดอย่างมีนัยสำคัญทางสถิติ (AOR: 3.71, 95%CI: 1.53-8.99 และ AOR: 2.55, 95%CI: 1.02-6.39) บุ ค ล ก า ร ที่ มี ผล ต ร ว จ โ ค วิ ด -19 เป็นบวกมีแนวโน้มที่จะมีภาวะซึมเศร้าและวิตกกังวลมากขึ้นอย่างมีนัยสำคัญ (AOR: 2.45, 95%CI: 1.03-5.82 และ AOR: 2.77, 95% CI: 1.17 – 6.57) นอกจากนั้นการมีเด็กอยู่ในครอบครัวทำให้แนวโน้มที่จะมีความวิตกกังวลน้อยลง (AOR: 0.40, 95%CI: 0.17-0.90)

ในขณะที่การสนับสนุนจากรัฐบาลที่ไม่เพียงพอมีความสัมพันธ์อย่างมีนัยสำคัญกับโอกาสที่จะเกิดความวิตกกังวลในระดับสูงมากขึ้น (AOR: 2.49, 95% CI: 1.22 – 5.08) จากผลการศึกษาแสดงให้เห็นถึงสัดส่วนภาวะซึมเศร้า ความวิตกกังวล และความเครียดที่เกิดขึ้นกับบุคลากรทางการแพทย์ในช่วงการระบาดของโรคโควิด-19 สุขภาพจิตที่ดีของบุคลากรทางการแพทย์ควรได้รับความใส่ใจอย่างทันที่โดยสร้างความตระหนักรู้เรื่องการติดตามต่อบุคลากรทางการแพทย์ จัดหาสิ่งจำเป็นทั้งต่อร่างกายและจิตใจ และมีระบบสนับสนุนครอบครัวบุคลากร

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Za Mae Nin Sar Aung : IMPACT OF COVID-19 PANDEMIC ON THE MENTAL HEALTH OF HEALTH CARE PERSONNEL FROM GOVERNMENT HOSPITALS IN YANGON REGION, MYANMAR . Advisor: TEPANATA PUMPAIBOOL, Ph.D.

The outbreak of COVID-19 has disastrously impacted on the human being resulting with a great number of deaths and somewhat negative mental health outcomes across the countries. A dramatic rise in transmission and death rate had profoundly hit Myanmar during the second wave especially in epicenter Yangon. The burden of managing COVID-19 have led the health care personnel (HCP) into both physical and mental exhaustion. This study intended to estimate mental health impact among HCP by quantifying the magnitude of symptoms of depression, anxiety, and stress and to determine associated factors.

A cross-sectional, online based self-administered questionnaire was used to gather the data from health care personnel in Yangon Region who were directly participating in COVID-19 management. Depression, anxiety and stress were measured by using DASS-21. Predictive factors were analyzed using bivariate and multivariate binary logistics regression. The study was carried out receiving 406 respondents including 75.0% nurses, 18.0 % doctors and 6.7% laboratory technicians. The participants with moderately to extremely severe symptoms, who required further consultation for depression, anxiety and stress were 15.5%, 17.9% and 8.9% respectively. Stigma experienced by HCP was significantly associated with higher odds of exhibiting severe symptoms of depression (AOR: 2.34, 95%CI: 1.13-4.87) and anxiety (AOR: 2.14, 95% CI: 1.08-3.45). Those who have lost their loved one during pandemic was significantly associated with higher chance of getting depressed (AOR: 3.71, 95%CI: 1.53-8.99) and stressed (AOR: 2.55, 95% CI: 1.02-6.39). HCP who tested COVID-19 positive was also significantly more likely to suffer from depression (AOR: 2.45, 95%CI: 1.03-5.82) and anxiety (AOR: 2.77, 95% CI: 1.17 – 6.57). Furthermore, presence of children in family was found less likely to be suffering from anxiety (AOR: 0.40, 95% CI: 0.17 - 0.90) while insufficiency of government support was significantly associated with higher odds of exhibiting high-level anxiety (AOR: 2.49, 95% CI: 1.22 – 5.08). The study finding revealed a significant proportion of depression, anxiety and stress symptoms were prevalent among HCP during COVID-19 pandemic. Mental health of HCP should be taken immediate attention by raising awareness of stigma against HCP, providing both physical and psychosocial needs, and ensuring family support system.

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Student's Signature
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CHAPTER I

INTRODUCTION

1.1 Background and Rationale

Coronavirus 2019 (COVID-19) is a severe acute respiratory syndrome, among a large family of ribonucleic acid (RNA) viruses, that infected to humans and resulting a great number of deaths and somewhat psychological distress across the countries. The virus was discovered in China, Wuhan City in the late of 2019 and spread to other countries, driving the WHO to announce COVID-19 as a global health emergency and pandemic disease. Dramatic arise in transmission cases and morbidity rates resulted in an increased demand on health system and health care workers. On one hand, the pandemic increases demand on health services, on the other hand, it has disrupted the health services, including mental health services. According to WHO, 93% of countries worldwide has experienced the disruption of mental health service while demand for mental health is increasing in this pandemic. Over 60% of countries reported disruptions to mental health services for vulnerable people, 67% saw disruptions of services providing psychotherapy, 65 % of critical harm reduction services and 45% of opioid against maintenance treatment for opioid dependence. (1)

Since the declaration of global health emergency on March 11, 2020, Myanmar's first COVID-19 confirmed cases were detected on March 23,2020. After detecting the first two cases, strict containment measures were put in place which included travel restrictions, partial lockdowns, closure of major businesses such as factories and shopping malls, quarantining incoming travelers, banning gatherings of five or more people, imposing stay-at-home orders, and curfews in some major cities. Closing borders and enforcing mandatory quarantine, either in a state-sponsored facility or a charity-based one, were also intensified. (2)

In the first wave, 374 cases and six deaths have been affected and, on the 16 July, local transmission was found. (3) With a fragile health system exacerbated by long ongoing civil war and conflict, Myanmar is especially vulnerable to the spread of COVID-19 because of its 2227 km border with China where migrants cross daily, as

well as borders shared with Bangladesh, India and Thailand, all of which reported higher number of cases. After almost a month without local transmission, on August 16 the second wave has started in Rakhine State which is located on the border with Bangladesh and there is a rapid local transmission with 838 cases have been reported across Rakhine between 16 August and 17 September. Gradually, local transmission has spread across the country. (4)

Myanmar has experienced a dramatic rise in transmission rate and death rate during the second wave, as compared to the first wave. To date, there is a total of 142,034 cases with 3200 fatalities and 131,672 recoveries. (7.3.2021). (5, 6) In the second wave, Yangon has become the epicenter with the mortality rate have tripled and positive cases have risen by more than 700%. (3) Hospitals are facing an overloaded work and are being beyond their inpatient capacity and health workers from other states and divisions had to be reassigned form health facilities in the region and deployed to COVID-19 treatment centers in Yangon to strengthen the overall response to the emergency. There are twelve COVID-19 treatment centers which provide care for over 6,700 patients in Yangon, Myanmar. (7)

Consequently, many health care workers have contracted the infection. Although the total number of infected health care workers had not officially been announced, in September Mizzima Journal reported 40 health care workers from Yangon General Hospital had been infected with COVID-19 since the beginning of the outbreak of the pandemic. (7) The number of health care workers including doctors, nurses and other supporting staff infected with the virus was the highest in Rakhine and in Yangon according to ministry of health and sport. It was also known that more than 10 % of those currently infected with COVID-19 in Myanmar are health care workers according to Dr. Khin Khin Gyi, the director of contagious disease prevention and eradication at the Ministry of Health and Sports Myanmar. (8)

Frontline health care workers who directly participate to diagnosis, treatment and care of patients were at risk of developing emotional stress and other mental health symptoms. (9) Health care workers were being impacted by the current pandemic on two fronts. Like general population, they were navigating social distancing, the economic crisis, closures of school and nursery school, worry about the health of

family members, and fear about uncertain future. Moreover, because of their profession, ever- rising number of COVID-19 positive and suspected cases, extended working hours, inadequate personal protective equipment (PPE) and other supplies, lack of standardized treatment and shortage of medicines and overwhelming thoughts of possible risk of transmission may all trigger the mental burden of health care personnel. In the initial phase of pandemic in Myanmar, due to poor health infrastructure and not being well prepared, medical workers had encountered a shortage of masks and other protective equipment. (10) Adverse psychological reactions were reported among health care workers in previous studies during the outbreak of severe acute respiratory syndrome (SARS) in 2003. (11) During the SARS epidemic in Canada, it was shown that nurses suffered more psychological distress because of work stress, fear and social isolation. Moreover, a qualitative study from Sierra Leone presented that health care workers who treated Ebola patients experienced mental health symptoms during 2014 - 2015 Ebola outbreak. (12)

Clearly, this epidemic provokes great stress on the health personnel working on the front line of efforts to control virus in the healthcare system. (9) Many studies have shown that most health care providers have been exhibiting stress- related symptoms such as anxiety, depression, sleep disturbances, and emotional distress, and around 50 % of them will fulfill criteria for a mental disorder. (13, 14) Consequently, these had lead health care workers troubling in the exercise of professional functions by decreasing caring, understanding, and decision-making skills. (15) Among health care provider groups, it is not clear which groups are at higher risk of experiencing mental health problem. In earlier studies, female nurses were particularly more susceptible especially those who were working long hours in direct contact with infected patients.

Moreover, whoever presents an underlying medical conditions or mental problems were at higher risk of experiencing psychological distress. (5,6) Studies depicted that health workers who had predisposing factors of having a history of taking treatment for mental illness had more chance of showing sleeplessness, anxiety, depression compared with those who did not have such history.(16) It was also stated that the deaths of loved ones also contribute to physical and mental health issues due to the loss incurred.(17) Consequently, theories testified that around 10% of bereaved

persons are vulnerable to complicated grief after the death of family members and 30% fall in the moderate mental health risks.(18)

Mental wellbeing has a significant impact on daily performance of people especially health workers during facing this critical situation. The COVID-19 impact on mental health have been well reported in many countries among variety of population groups including health professionals. (16) However, in Myanmar, there is no evidence regarding the impact of the COVID-19 pandemic on mental health of health professionals. There were a few mental health support services including telephone- and internet- based counseling and intervention provided by some NGOs and Mental Health Association (Ministry of Health) for general population, but evidence- based evaluation and mental health services targeting health workers are still not available.

Furthermore, if health care providers were hampered by mental and psychosocial health issues, infection rates will arise (also due to lower compliance with safe practices), which, in turn, would reduce staff numbers and amplify emotional distress in a vicious cycle. Indeed, this pandemic had already resulted in soaring rates of absenteeism, medical leaves, and even resignations which can even lead to the collapse of the whole health system as the human resources are the cornerstone of health system and enable the improvement of health service coverage. (13)

In addition, Myanmar has been one of the 57 crisis countries facing critical health workforce shortages (WHO) (19) and healthcare system is running with only 6.7 doctors per 10,000 people and 0.71 intensive care unit beds per 100,000 population and 0.46 ventilators per 100,000 population. (3, 20) In addition to the scarcity of health workforce, in current pandemic, more than 10% of health workers have been infected with COVID-19. The shortage of health staff and the increasing social tension they are exposed to, the increased level of verbal aggression, social stigma, violence and even attacks aggravate the situation. (2)

For the reasons mentioned above, the mental health and psychological aspects of health care personnel must be taken into consideration in any strategy and sector combating COVID-19 crisis. (13) Furthermore, it is also crucial in crisis situation to provide psychosocial support system to promote their mental well-being and timely

assessment and monitoring of their mental health needs. (16) Assessing mental health status and mental health needs of health care personnel in time during emergencies will help the management to respond and reduce psychological distress, and also adjust health professionals to the patient needs. (16) As for the first step, it is needed to provide quantifiable evidence of the mental health effect among health care personnel facing epidemic and pandemic outbreaks as well as to explore potential related risk factors. In this situation, this study intended to estimate mental health impact among health care personnel treating patients during COVID-19 pandemic by quantifying the magnitude of symptoms of depression, anxiety, and stress and by analyzing potential risk factors associated with these symptoms. In addition, the result of this study was aimed to be useful for policy makers in planning appropriate interventions and responses and the protection of mental health status of health care personnel during future pandemic or crisis.

1.2. Research Gap

- In Myanmar, evidence on the impact of COVID-19 on mental health of health care personnel that showed the prevalence of depression, anxiety has not been studied yet.

1.3. Research Questions

1. What is the level of depression, anxiety and stress among health care personnel from government hospitals in Yangon?
2. Are there socio-demographic factors, predisposing factors and work-related characteristics associated with depression, anxiety and stress among health care personnel from government hospitals in Yangon.

1.4. Research Hypothesis

1. There is association between socio-demographic factors, predisposing factors and work- related characteristics and “depression” among health care personnel from government hospitals in Yangon, Myanmar.
2. There is association between socio-demographic factors, predisposing factors and work- related characteristics and “anxiety” among health care personnel from government hospitals in Yangon, Myanmar.
3. There is association between socio-demographic factors, predisposing factors and work- related characteristics and “stress” amongst health care personnel from governmental hospitals in Yangon, Myanmar.

1.5. Research Objectives

General Objective

1. To determine the impact of COVID-19 pandemic on mental health focusing on depression, anxiety and stress of health care personnel from government hospitals in Yangon, Myanmar.

Specific Objectives

1. To describe the level of depression, anxiety, and stress among health care personnel.
2. To find the association between socio-demographic factors, work-related characteristics and mental health impact among health care personnel during COVID-19 pandemic situation in Yangon, Myanmar.

1.6 CONCEPTUAL FRAMEWORK

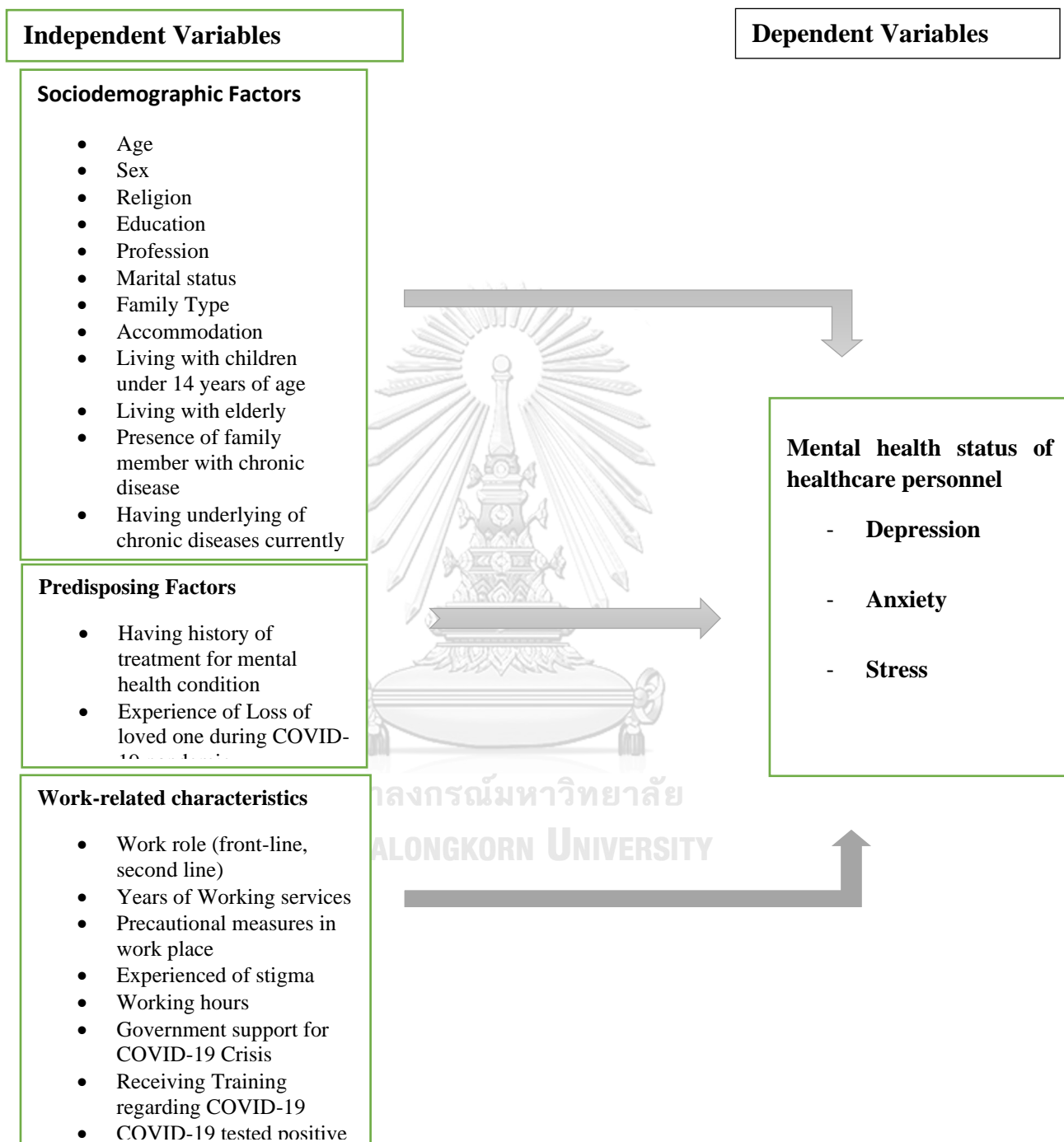


Figure 1 Conceptual framework of the study

1.7. Operational Definition

1.7.1. Sociodemographic factors

Sociodemographic factors are characteristics of applicants e.g., age, sex, marital status, education level, types of family, profession, work place, etc.”

1. **Age:** self-reported age of respondent in completed year
2. **Sex:** Biology characteristics of being female or male.
3. **Religion:** Self-reported religion of the respondent that he/she practice.
4. **Education:** Highest attainment of education qualification: it includes Diploma, Bachelor, Master, and Ph.D.
5. **Profession:** The professional role of respondent: It includes doctor, nurse and lab technician
6. **Marital Status:** The marital status of respondent such as single, married, divorced, and widow/widower
7. **Family Type:** Family members that the respondent currently residing together:
 - (i) Living alone: the respondent who live himself or herself alone
 - (ii) Nuclear family: The family that the respondent lives with his/her parents and his/her unmarried siblings or the respondent lives with his/her spouse and their children.
 - (iii) Extended Family: The family that the respondent lives together with the other blood related people (e.g., grandparents, uncles, aunts, etc..) in addition to parents, spouse, children or siblings.
 - (iv) Joint Family: Two families live together in one household.
8. **Living with children less than 14 years of age:** The respondent lives with children who are younger than 14 years of age at home.
9. **Living with elderly:** The respondent lives with elderly who are older than 60 years of age.
10. **Presence of family member with chronic disease:** The respondent lives with family member who has chronic disease such as hypertension, diabetes mellitus, chronic respiratory disease, cancer, kidney disease, etc.,

11. Having underlying chronic disease: The respondent has taken treatment or medication for chronic diseases including arterial hypertension, diabetes mellitus, heart failure, obesity, kidney disease, cancer, etc.,

12. Accommodation: The place where the respondent is currently staying

- (i) **Home:** The house located in the community where the respondent resides with family or alone.
- (ii) **Hostel:** The place where the respondent is currently staying which is usually rented for temporary staying.
- (iii) **Staff House:** The place where the respondent is residing which is provided by government (government staff house).

1.7.2. Predisposing Factors

Individual's underlying factors that may enhance the development of mental health concerns are predisposing factors included following items;

- 1. **Having History of treatment for mental health problems:** The respondent has history of taking medication and treatment for mental problems.
- 2. **Loss of loved one during COVID-19 pandemic:** The respondent experienced the death of family member or his/her loved one.

1.7.3. Work related characteristics

The work-related characteristics of the respondents are included "where the respondent is assigned, and the environment and nature of work". These characteristics comprise of;

- 1. **Work role:** It is divided into two sections
 - a. Frontline: the respondent participates directly in treating and caring with COVID-19 positive patients at isolation ward in hospital or COVID-19 centers
 - b. Second line: the respondent participates in the general health care setting including outpatient department (OPD) and other respective specialty care ward

2. **Year of working Service:** The total years of professional governmental working service in official health care setting.
3. **Perception on availability of precaution measures (PPE) in work:** Self-reported statement of the respondent on sufficiently or insufficiently supplies of protective measures such as personal protective measures and safety setting etc.,
4. **Experienced of COVID-19 related stigma:** The respondent experienced of being stigmatized, being threatened, being accused of a carrier of virus due to profession and being asked to leave rented place.
5. **Working Time:** Total working hours of a shift during COVID-19 pandemic
6. **Perception on government support for COVID-19 Crisis:** Whether the respondent received the support for COVID-19 crisis situation and whether the respondent perceived it as sufficient or not sufficient. (Myanmar government has provided financial support, [50,000 kyats 4 times separately within the year 2020 and gave reward (two-months- salary)] to healthcare workers population during COVID-19 pandemic).
7. **Being infected with COVID-19:** Self-reported statement of the respondent whether he/she has been infected of COVID-19 or not while providing health care services during COVID-19 pandemic.
8. **Receiving Training regarding COVID-19:** The respondent has received training regarding COVID-19 infection control, self-care, donning and doffing PPE and procedure for testing and treatment protocol in the early time of Pandemics.

1.7.4. Dependent Variables

1. **Depression:** The feeling of sadness, worthlessness and lack of interest in usual pleasurable activities and difficult in initiating an activity.
2. **Anxiety:** Anxiety is an emotion regarding feelings of apprehension with repeated intrusive thoughts or concerns, accompanying with physical symptoms such as trembling, sweating, dizziness or increase heart rate.

3. **Stress:** Stress is a feeling of tension result from undesirable situation by presenting the symptoms such as difficult to relax, agitated, and irritable mood.

Each of the outcome variables was measured by DASS-21, and the degree from moderate to extremely severe symptoms were recognized as depression, anxiety and stress.



CHAPTER II

LITERATURE REVIEW

2.1. Definition of Coronavirus disease

A newly discovered coronavirus (CoV) is a large family of viruses and causes infectious respiratory syndrome. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. The virus causes illness ranging from a mild cold to severe diseases like severe acute respiratory syndrome (SARS-CoV-2). Since the Coronavirus disease (COVID-19) is a new strain virus, this disease has not been previously identified in humans and just found in 2019. (21)

2.2. Symptoms of Coronavirus disease

The clinical features of coronavirus disease 2019 (COVID-19) usually appear between 2 to 14 days after having contact with virus. Symptoms like fever, cough, and tiredness are common. Moreover, loss of taste or smell (ageusia or anosmia, respectively) can be experienced in the initial phase of illness. After that, other symptoms such as shortness of breath or difficulty in breathing, chills, sore throat, muscle pain, runny nose, headache, chest pain, and inflammation of the eye (conjunctivitis) can follow. In some cases, some fewer common symptoms such as rash, nausea, vomiting and diarrhea have been documented. However, children are found as less severe than adult even having the similar symptoms. (22)

The severity of COVID-19 symptoms can be different individually from mild to severe. Some patients might experience only a few symptoms, and some might not experience any symptoms at all. However, some peoples might suffer severe symptoms like shortness of breath and pneumonia about one week after symptoms begin. Eighty percent (80%) of people that are infected this virus can recover without need to hospital admission as compare to 20% that need to go to hospital while 5% of the total need intensive care with oxygen supplement. People with old age and having underlying chronic medical diseases including diabetes mellitus, heart failure, chronic

kidney disease, cancer, COPD (Chronic Obstructive Pulmonary Disease), etc., may have a higher risk of severity of COVID-19 diseases. (22)

2.3. Prevalence of COVID-19 in Global and Myanmar

A total of 117,132,788 confirmed cases, including 2,600,839 fatalities have been confirmed globally (Table 1). (6) In Myanmar, to date 9.3.2021, there were 142,059 COVID-19 confirmed cases and 3,200 deaths with 131,702 recoveries across country (Table 2). Among States and Divisions, Yangon region has reported the highest number of COVID-19 confirmed cases and deaths. A total of 84,996 positives cases have been documented across 40 townships in which Migalardon, North Okkalapa and Hlaingtharyar townships are the most prevalent than all the rest (Figure 2). (5)

Table 1 Global prevalence of Covid 19 cases (6)

Categories	Number
Confirmed cases	117, 132, 778
Confirmed deaths	2,600, 839
Countries or territories with cases	223

To date: 10 March 2021

Table 2 Prevalence of Covid 19 cases in Myanmar (6)

Categories	Number
Total specimens tested	2,505,402
Total confirmed cases	142,059
Total confirmed deaths	3,200
Total recoveries from COVID-19	131,702

To date: 9 March 2021

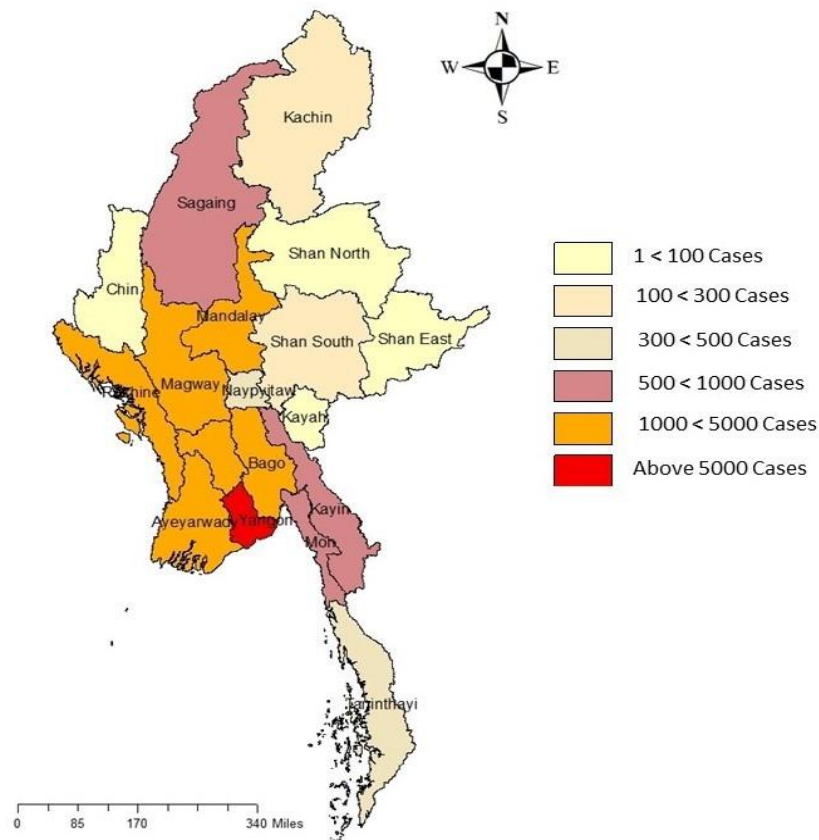


Figure 2 Prevalence of COVID-19 cases by regions of Myanmar. (5)

Nearly sixty percent (59.8%) of transmission has been spread in Yangon whereas 40% of prevalence are distributed among other 17 states and regions.

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2.4. Definition of Mental Health and Psychological Distress

Mental health is more than the mere lack of mental disorders. Concepts of mental health include subjective well-being, perceived self-efficacy, autonomy, competence, intergenerational dependence and recognition of the ability to realize one's intellectual and emotional potential. It has also been defined as "a state of well-being whereby individuals recognize their abilities, are able to cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their communities". Mental health is about enhancing competencies of individuals and communities and enabling them to achieve their self-determined goals. (23)

In addition to this, the mental health status can be assessed by measuring how much they psychologically distress. Psychological distress is commonly used as an indicator of the mental health of the population in public health, in survey and in epidemiological studies and as an outcome in clinical trial and intervention studies. There are several items that are common in the scales using for measuring psychological distress, depression disorders and general anxiety disorder. Moreover, psychological distress can be defined as “a state of emotional suffering associated with stressors and demands that are difficult to cope with in daily life” which is categorized by symptoms of depression (e.g., loss of interest, sadness, hopelessness) and anxiety (e.g., feeling tense, restlessness). (24) These symptoms may accompany with somatic symptoms including headache, insomnia, lack of energy that are likely to differ across culture. (25)

2.4.1. Anxiety

Feeling of anxiety is one of the commonest in the society universally. Anxiety arises from the chaos and confusion that exists in environment. Fears of the unknown and uncertain condition provoke a perfect breeding ground for growing anxiety. Mostly, mild anxiety can be adaptive and it can provide the necessary motivation for survival. However, when the individual is not able to cope the anxiety and let it interferes with daily functions, the anxiety becomes problematic. (26)

It has been categorized the anxiety into four levels: mild, moderate, severe, and panic.

Mild anxiety; Anxiety level is not always a problem for the individual. It is associated with the tension experienced in response to the events of day-to-day living. Mild anxiety motivates people to accomplish the action. It arouses the senses, improves motivation for productivity, enhances the perceptual field, and results in a more sensitive of the environment. With mild anxiety, learning is boosted and the individual can function at optimal level.

Moderate anxiety; the extent of the perceptual field diminishes when the anxiety level increases. Person with the moderately anxious individual is less attentive to

events happening with the environment. The ability of attention and concentration decrease, although he or she may still attend to needs with direction. Assistance may be needed with problem-solving. Muscular tension and restlessness are mostly likely to suffer.

Severe anxiety; Individual with severely anxious is profoundly diminished in concentration on one particular detail only and the perceptual field. Attention span is extremely limited, and the individual may have difficulty completing even the simplest job. Somatic symptoms such as headaches, palpitations, insomnia and emotional symptoms including confusion, horror and dread may be obvious. Discomfort is experienced to some extent that virtually all over behavior is aimed at relieving the anxiety.

Panic anxiety; the individual cannot able to focus on even one detail within the environment in panic level of anxiety. Loss of contact with reality and misperception are mostly common in this most intense state of anxiety. In addition, hallucinations or delusions may also be present. Behavior of individual with panic anxiety may be characterized by wild and desperate actions or extreme withdrawal. There is impairment in both functioning and communication with others. Panic anxiety is associated with a feeling of terror, and individuals may be convincing that they have a life-threatening illness or fear that they are “going crazy,” are losing control, or are emotionally weak. Long term panic anxiety can trigger physical and emotional fatigue and can be life threatening. (26)

Anxiety and Body

When people get anxious, a series of automatic actions occurs in the body, which prepares body for action. This reaction is called the 'fight or flight' response. The reaction consists of the brain sending a message to release adrenalin into the bloodstream and into the large skeletal muscles of the arms and legs. As it is working harder, the heart beat becomes faster and it needs more fuel so that we breathe in more oxygen. To calm down the body, sweat and blood capillaries come to the

surface. Actually, the physical symptoms are normal and not dangerous, but they appear in an inappropriate condition.

Anxiety is a normal reaction

Anxiety can be experienced by everyone at times of danger or in uncertain and concerned situations. In certain circumstances, anxiety can have a definite benefit because body is ready for action to immediately response necessarily. Moderate level of anxiety actually improves the performance, productivity and stimulating on to greater accomplishments (Figure 3).

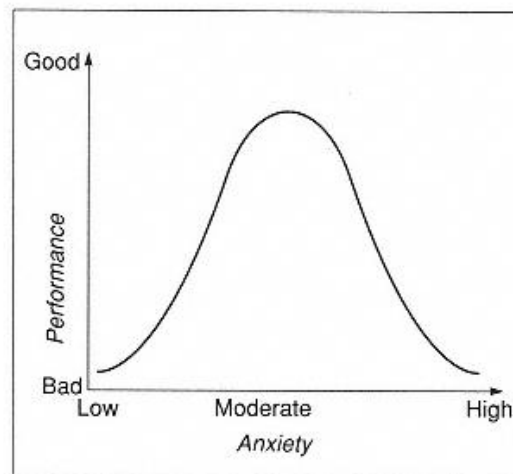


Figure 3 The relationship between level of anxiety and performance

The graph above demonstrates this point. People were given a task to do which involved remembering some numbers. When performing this, they were made anxious, some a small level, some a lot, some in between. As the graph shows, when the level of anxiety was low or high, the people could not perform well, nonetheless, when their anxiety was moderate level, they achieve highest performance. (26)

When anxiety become a problem

When anxiety interferes with people's performance or everyday basic activities, it can be supposed as a problem. In this situation, it is necessary to learn to control it. As anxiety is a normal healthy response of undesirable situations, it cannot be eliminated

completely from individual's life, however, can learn to manage it to prevent from becoming a problem.

The three systems of anxiety

Anxiety is often referred to as if it is a single phenomenon, however, this is not the case. There are three parts to the feeling of anxiety:

1. **Bodily sensation:** Somatic symptoms including rapid breathing and heart rate, churning stomach, sweating, trembling, and frequent visiting to the toilet are common.
2. **Behavior:** This is the way people behave when encounter with the fearful situation. Important behaviors are avoiding the situation, either not going into the situation, or getting out of it immediately.
3. **Thinking:** This means individual's beliefs and ideas or mental pictures about what might happen to him/her in the situation they fear. The thoughts play a major role in escalating or decreasing anxiety. Studies suggested that people suffer from anxiety make matters worse for themselves by misinterpreting of their physical symptoms. These thoughts contribute to keep the physical anxiety well stoke up. These thoughts actually are inaccurate distortion from real situation.

The vicious circle of worrying thoughts and physical symptoms is illustrated below:

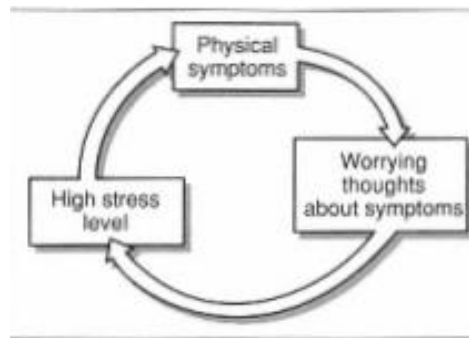


Figure 4 The vicious circle of worrying thoughts and physical symptoms

Sometimes people are not fully recognized that these terrifying thoughts are flashing through the mind. They happen very rapidly and often just below the level of consciousness. Identifying these thoughts and recognizing the role they play in creating anxiety is important to reduce anxiety. (27)

How to manage anxiety

1. Understand the process and nature of anxiety and how anxiety persists in vicious circle between physical symptoms, disturbing thoughts and changes in behavior.
2. Breaking the vicious circle by learning new skills:
 - Somatic symptoms can be reduced by excising relaxation or controlled breathing.
 - Mental symptoms i.e., worrying thoughts can be replaced with positive ones (thought switching) and/or by distracting.
 - Behavioral changes may be transformed by deliberately changing behavior and facing difficult situations in a gradual step-by-step fashion. (desensitization)
3. Change lifestyle and manage successfully the amount of stress. This includes learning assertive skill, time management, breaking bad habits and learning new skills. (27)

2.4.2. Stress

Definition: “A state of disequilibrium that occurs when there is a disharmony between demands occurring within an individual’s internal and external environment and his /her ability to cope with those demands. Stress, or a stressor, is an external pressure that is brought to bear on the individual.”

The effects of stress

Stress can cause



1. Emotional anxiety like nervousness, anxiety, tension and phobias,
2. Depression feeling like lack of happiness, decrease self-esteem, apathy, hopelessness and guilt,
3. Decrease in mental function such as difficult in concentrating and decision making, forgetfulness, increased sensitivity to criticism, self-blaming, distorted ideas and more rigid attitudes.
4. Physical Health: hypertension, coronary heart disease, Stomach ulcers, migraine, asthma/hay fever, skin rashes, amenorrhea, diarrhea, psychosis, rapid heartbeat, breathlessness, muscle aches and pains, blushing, sweating, numbness and tingling sensations, elevated blood sugar levels, pupil dilatation, frequent urination.
5. Behavioral: Difficult to fall asleep, emotional outbursts and aggression, stress eating or loss of appetite, excessive drinking and smoking, proneness to accident, avoidance of particular situations, less active,
6. Organizational: increase absenteeism, poor industrial relations, high labor turnover rates, high accident rate, poor productivity and job satisfaction.

Work Stress

Research has revealed that high levels of work stress have association with high absenteeism, high staff turnover rate, high accident rates, job dissatisfaction and poor

production. A model of work stress, which includes a number of specific factors, can help making sense of people's experiences, enabling them to plot their own work stress profile.

Relevant factors for work stress or stressors:

- Quality of work
- Role issues
- Responsibility and authority level
- Social/relationships
- Job satisfaction
- Organizational issues
- Domestic effects

Occupational Stress in Hospital

Occupational stress has been known to be one of the big health problems among health care workers in health care industry. Researches indicate that health care personnel have not only higher rates of suicide, substance abuse than other professional staff but also increase prevalence of job- related depression and anxiety. Rather than psychological distress, other job stress related outcome includes absenteeism, burnout, taking leave, reduced performance (reduce patient's satisfaction), and diagnosis and treatment errors. (28)

Causes of hospital occupational stress

According to the National Institute for Occupational Safety and Health (NIOSH), occupational stress is defined as “the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker.” (29)

The most common workplace factors in hospitals that contribute stress include long working hours, inadequate staffing level, shift work, exposure to infection and

hazardous substances and role ambiguity. Stressors among health care personnel may be different depending to the task they perform. (30) Studies on nurses have revealed that factors including work overload, time pressure, exposure to infectious diseases, accidental needle-prick injury, very limited social support from supervisor or head, exposure to work-related violence or threats, role conflict and ambiguity, insufficient staffing, career development issues and dealing with seriously ill patients are known to be linked with stress. (31) Moreover, studies of physicians who are dealing with seriously ill patients indicates the factors associated with stress are extended working-hours, excessive workload, dealing with terminally ill patients, conflict between coworkers, expectations of patient and threat of legal issue on malpractice. Patient quality care provided by a hospital may also have impact on health care worker stress. (32)

Coping Strategies for managing stress

People use different ways of coping strategies to manage life stressors in everyday life. There are some factors that can act as effective mediators to reduce stress in our lives. Four personal attributes (coping strategies) people can develop to help manage stress are:

1. Maintaining healthy lifestyle (health sustaining habits) e.g., medical compliance, balanced diet, exercises and relaxation.
2. Satisfaction of life e.g., work, family, hobbies, humor, spiritual solace, arts, nature
3. Social inclusion and support
4. Adaptive and healthy responses to stress

Managing Stress through Relaxation Techniques

Ineffective management of stress has associated with an increased incidence of a number of physical and emotional problems. There are considerable evidences that show many mind-body therapies that can be used as effective adjuncts to conventional medical treatment for many clinical conditions. Psychiatric problems that are known


to benefit from relaxation techniques include anxiety, depression, insomnia, and nightmares. (33)

Since there is no single stress-management method that is suitable for everyone, engaging a variety of techniques can provide the best results. Fundamentally, there are stress-reducing techniques for every personality type, situation, and level of stress. Exercising relaxation techniques can help to reduce the level of stress and to enhance the ability to manage own physical responses to stressors.

Some Relaxation technique are;

1. Deep Breathing Exercises
2. Guided Imagery
3. Progressive Relaxation
4. Meditation/ Mindfulness/ Yoga
5. Physical Exercise

2.4.3. Depression



People may suffer depression in various ways; however, the most obvious feature is a low or sad mood. Other typical symptoms of depression include loss of interest or pleasure, fatigue, sleep problem or early morning-wakening, tiredness, pessimistic negative thoughts, difficulty in thinking straight, poor decisions making, change in appetite. A lack of energy and weakness and fatigue is a classical symptom of depression. People may present different types of depressive reaction ranging from mild mood fluctuations or 'the blues' to severe clinical depression. At the severe end of the scale people often experience more marked physical symptoms and it seems likely that this is related to biochemical changes in the brain. For most people a depressive reaction is triggered by a set of life events which they are finding difficult to cope with. (27)

Precipitating Factors

A depressive state may be precipitated by many factors. These include a significant loss or disappointment, severe or prolonged stress: perceived inadequacy of personal

strivings, unresolved conflicts, inadequate positive reinforcement or excessive negative reinforcement, chronic feelings, fears, or anger, disturbances in the regulation of neurotransmitters and structure of the brain, infection, and/or injury. (34)

Related risk factors for depression

Factors that enhance for developing depression are female gender, adverse childhood experience, traumatic/stressful life events, history of major depressive disorder in first-degree family member, unhealthy personality like neuroticism which is a negative personality trait characterized by anxiety, fear, moodiness, worry, envy, frustration, jealousy, and loneliness, other disorders such as substance use, anxiety, and personality disorders, chronic or disabling medical conditions. (35, 36)

Protective factors for vulnerability to depression (27)

Some people are more vulnerable to depression than others. There are some protective factors which can decrease vulnerability to depression. These include:

1. High self-esteem based on self-worth, not achievements.
2. Practicing optimism (positive thinking habits.)
3. Being assertive on expressing of needs, ideas, feelings and thoughts.
4. Established social support network and effectively using it.
5. Reducing unnecessary stress.

Comorbidity

Depression frequently accompanies other mental disorder such as schizophrenia, substance abuse, eating disorders, schizoaffective disorder, bipolar disorder, and borderline personality disorder. The combination of anxiety and depression is one of the most common psychiatric presentations. Symptoms of anxiety occur in an average of 70% of cases of major depression. Some clinicians believe that mixed anxiety and depression should be a stand-alone diagnosis and be treated as a distinct entity.

2.5. Risk Factors for developing mental health impact during COVID-19 pandemic Situation

The prevalence of mental distress is hard to identify due to the variety of the scales assessing distress, however, it can reach higher levels in some vulnerable groups who have experienced particular risk factors. (25) Common risk factors that contribute to negative mental impact contain stress-related and socio-demographic factors and inadequate inner and external resources. Stress is significantly related to depression, anxiety and burnout. (37, 38) Work-related characteristics, such as poor support, high demands, and lack of control, can contribute to psychological consequences. (39) Similarly, during current COVID-19 pandemic, overstrained health care systems cause health care personnel in hard hit countries struggling with extreme mental problem due to prolong working hours and fatigue. (40) Moreover, Stigmatization is one of the factors that enhances an unnecessary burden and stress to the lives of vulnerable population and can trigger to worker burnout. (41)

2.5.1. The effect of sociodemographic and predisposing factors on mental health impact during COVID-19 pandemic situation

From sociodemographic characteristics, the associated variables of psychological distress, “acute stress, depression, and anxiety” symptoms were being female, having history of mental illness, having history of underlying medical diseases, and having suspected or confirmed COVID-19 family members or relatives, and working services more than 10 years. Many studies have analyzed and described that the female gender was an important predictor for developing stress, anxiety and depression. (9, 42, 43) Similarly, studies from Italy and Saudi Arabia also consistent with the finding and this can be attributed to gender differences in the hormonal response to stress. (44) Moreover, owing to rooted social roles traditionally, women were positioned at a large dilemma, which occurred between working and caring of family and between the avoidance of contact with family members and family care. (45)

Health care personnel living with older people and young children were more concern about their family member regarding transmission of infection from them.(46) Study from Sweden shows that the household members of frontline health care workers have double risk of being transmitted from COVID-19.(40) Similarly in Myanmar, health

care personnel who are living with elderly and children and having family members with chronic disease leave their homes to stay in government-provided staff house or temporary hostel and can't see their partners, children and parents for weeks because of fear for probably transmission of the virus from them. (47). Longer working service years in the hospital was closely linked with psychological impact as most health care workers with more than 10 working-years had already got married and have children and had more job-related tiredness and family responsibilities. (48) Furthermore, it is found that living away from home were also most likely to contribute psychological distress among health workers. (49)

Moreover, studies depicted that health workers who had predisposing factors of having a history of taking treatment for mental illness had more chance of showing sleeplessness, anxiety, depression compared with those who did not have such history. (16) In consistent with this, significant higher rates of seropositivity for CoVs has been found in patients with a history of mood disorder. It was also stated that the deaths of loved ones also contribute to physical and mental health issues due to the loss incurred. (17) Consequently, theories testified that around 10% of bereaved persons are vulnerable to complicated grief after the death of family members and 30% fall in the moderate mental health risks. (18)

2.5.2. The effect of work characteristics on mental health impact during COVID-19 pandemic situation

It has been widely demonstrated that the work environment, work organization, and work-related behaviors are factors capable of influencing mental health and psychological well-being of workers (50) The coronavirus disease (COVID-19) pandemic has profoundly affected on healthcare systems globally, have significantly threaten the lives of anesthesiologists, medical doctors, lab technicians, and nurses who were providing care among COVID-19 confirmed patients. Such high-acuity patient care imposes a substantial physical and psychological burden, which is additional intensified by increased workloads, deficiency of staff, and unavailability of adequate of protective equipment, social isolation, physical burnout, and separation from families.

Frequent direct patient contact and involving in aerosol-generating procedures could increase risk of infection. (45) In addition, government-imposed control measures had led to social isolation and inhibited access to usual coping methods. Contagion exposure also provoked concerns from staff living with elderly and young children. **In the former pandemic** outbreak of SARS, it had substantial negative psychosocial effects on health care staff. That pandemic had led emotional exhaustion, depression, anxiety and burnout bothering health care workers. (51, 52)

Similarly, the finding is also consistent with studies on health care professionals from China and Italy during the COVID-19 pandemic. (9, 53) Additional specify that female nurses informed more severe symptoms of depression, anxiety, and distress. Furthermore, frontline nurses who provide cares to patients with COVID-19 were expected exposed to the maximum risk of infection because of their close, frequent contact with patients and working longer hours than usual. (54) That has led to emotional strain resulting from worrying of being infected.

Moreover, another work- related factors such as being stigmatized of profession during widespread outbreaks of the virus, accused of being a disease carrier, being threatened and being asking to leave rented hostel had been experienced by health care workers during Covid-19 pandemic situation. In Myanmar, most junior doctors, nurses and lab technicians who work in area far from their homes have to stay in hostel since Ministry of Health is unable to provide with accommodation. In the meantime of COVID-19 crisis, dozens of health care workers who stay in hostel had been evicted as the landlords are afraid of transmission of virus from them.(55) Those kind of being stigmatization is stressful and it had provoked the negative psychological consequences among health care workers.(56) The studies from Nepal showed that the stigma among health workers affected their attention on work.(17) A comparable article was found in Italy where health care workers facing stigma during COVID-19 were seen to have more weariness, exhaustion and psychological distress.(57) Stigmatization was associated with biopsychosocial health of health care professionals. Health care personnel who have experienced higher levels of stigmatization conveyed more psychological distress, and this expected increased somatic symptoms. (58)

Furthermore, role of frontline health care provider increased health care workers experiencing of greater symptoms of depression, anxiety, stress, somatic symptoms and sleeplessness. Zhang, study from China suggested that frontline health staff had higher negative mental health outcome than general population. (59) In addition to this, among health staff, frontline health care personnel encountered increased chances of severe distress relative to the rest of health care staff, which was found in both studies from Italy and Saudi Arabia. (54, 60) The chief causes of mentally distress for frontline health care workers included prolong working hours, exposing to the high risk of infection because of frequent and close contact with positive patients, and as well as putting their families at life-threatening risk. (9, 61)

Another factor that enhances mental problem among health care workers is deficient precautionary measures which were significantly related with anxiety and depression symptoms among health care providers. Deficiency of protective measures including PPE (personal protective equipment) led to compromised working conditions, feeling of being insecure and increase risk of transmission to infection.(17) Majority of COVID-19 cases were asymptomatic (62), therefore, lack of proper sense of protection among health care personnel probably increased their psychological distress and affected their mental well-being as evident by three out of four health workers reported inadequate protective measures in work place. In addition, many studies globally, have depicted that to equip health personnel with PPE is as compulsory. WHO stated that due to inadequate access to PPE such as goggles, gloves, gowns, medical masks, respirators, face shields, and aprons, there was an increased risk of transmission had been experienced among health care personnel (63)

Regarding work experiences, young health care staff who had fewer working experiences (<5 years) had lower chance of suffering stress, anxiety and depression relative to those with having work experiences more than 10 years. (17) These findings regarding work-related characteristics from different studies have proof the influence negative mental health impact of health care personnel to an extent.

2.6. Psychometric Instruments

There are several tools that are used to evaluate the mental impact of different study population. Depression symptoms can usually be assessed by Patient Health Questionnaires PHQ-9 and Beck Depression Inventory (BDI) and Patient Health Questionnaires PHQ-9. The Beck Depression Inventory (BDI) is a 21-item on a 4-point scale from 0 (symptom absent) to 3 (severe symptoms), self-reporting questionnaire for evaluating the severity of depression in normal and psychiatric populations. The BDI shows high internal consistency, with alpha coefficients of 0.86 and 0.81 for psychiatric and non-psychiatric populations respectively. (64) In occupational health, the BDI-II can be used as a screening tool to detect depression in normal populations or as a tool to assess symptom severity in clinical populations. Another instrument, PSQ-9 composes of nine items which assess depressive symptoms, and participants reported the frequency of symptoms experienced over the past two weeks. The PHQ-9 is the depression module, which scores each of the nine DSM-IV criteria as "0" (not at all) to "3" (nearly every day). It has been validated for use in primary care. (65) It is not a screening tool for depression but it is used to monitor the severity of depression and response to treatment. However, it can be applied to make a tentative diagnosis of depression in risky populations.

Anxiety is usually evaluated by using (GAD-7) Generalized Anxiety Disorder Scale which is a short self-reported scale used in clinical practice for assessing severity of generalized anxiety disorder with good reliability and validity. (66) The questions assess how frequently the participants have bothered by various symptoms in the past two weeks. Cut- off points of 5, 10, and 15 may be interpreted as representing mild, moderate and severe levels of anxiety on the GAD-7. A score of > 10 would require further evaluation.

The most widely used psychological instrument for measuring the perception of stress is Perceived Stress Scale (PSS-10). It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with at least a junior high school education.

The questions in the PSS ask about feelings and thoughts during the last month. PSS items have been found to have good correlations with other stress measures, self-reported health and health service measures, health behavior measures, smoking status, and help seeking behavior.

Another instrument, the Hospital Anxiety and Depression Scale (HADS) is a self-administered measure with 14 items in total that ask the client to reflect on their mood in the past week that used to screen for the presence of depression and anxiety. The HADS was developed to provide clinicians with an acceptable, reliable, valid and easy to use practical tool for identifying and quantifying depression and anxiety. The HADS can be used in a variety of settings (e.g. community, primary care, in-hospital, and psychiatry). In addition, the HADS is not intended for complete diagnostic tool, but as a means for identifying general hospital patients who need further psychiatric evaluation and assistance. (67)

The HADS assess depression, 5 of which are markers for anhedonia (an inability to experience pleasure), and 2 concern appearance and feelings of slowing down. Seven items assess anxiety, of which 2 assess autonomic anxiety (panic and butterflies in the stomach), and the remaining 5 assess tension and restlessness. (68) Each item is rated on a 4-point scale (ranging from 0 = no not at all, to 3 = yes definitely), for a total score ranging from 0-21 for each subscale. A higher score indicates higher distress. A number of items are reverse scored (ranging from 3 = no not at all, to 0 = yes definitely), including two from the HADS-Anxiety and four from the HADS-Depression.

In addition to this, a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress is DASS-21. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Participants should decide how much the statements apply for them using a scale from “0” to “3” where “0” refers “did not

apply to me at all” and “3’ refers” apply to me very much or most of the time”. The score of each axis is multiplied by 2 to lie within a 0 to 42 scale where higher scores indicate worse outcomes. (69) The reliability of the DASS-21 was considered “acceptable” and has “good” Cronbach’s alpha values of “0.81” and “0.89” for the depression and anxiety subscales, respectively. The alpha value for the stress subscale was observed at 0.78, which can be considered “fair”. (70)

Though there are many tools and instruments for measuring of depression, anxiety and stress, in Myanmar all of them have not been translated into Burmese language. Some of them including GAD-7, PHQ-9, DASS-21, Beck Anxiety Inventory and Beck Depression Inventory had been done. In which Beck’s instrument are usually used in hospitalized patients in Myanmar. Among them, DASS-21 Burmese version has been used in the National Survey for measuring COVID-19 related psychological distress of the general population. In this study, DASS-21 was applied to measure the level of depression, anxiety and stress of health care personnel.

CHAPTER III

METHODOLOGY

3.1. Study Design

This study was a cross-sectional study, through online-based self-administered questionnaires to determine the magnitude of depression, anxiety and stress of health care personnel including medical doctors, nurses, and laboratory technicians who worked in front- and second -line services during COVID-19 pandemic and also to find out the factors related to their mental health impact. The online questionnaire was designed on “Google Forms” and distributed in multiple social platforms including health care personnel groups on Facebook, Messenger, Telegram, Viber and WhatsApp. In order to limit responses from health care workers who did not involve in COVID-19 treating, caring and diagnosis process, questionnaires was sent to specific potential participants. There was also a specific “Yes or No” questions to confirm that participant truly get involved in COVID-19 management process. Only those who answer “Yes” were allowed to continue to fill the survey. The participants were encouraged to answer within two weeks. If the potential participants had not reached within two weeks, the link would be extended.

3.2 Study Area

The study was conducted with health care personnel who works or had worked at governmental hospitals including general hospitals, COVID-19 hospitals and COVID-19 treatment centers in Yangon region Myanmar. There were twelve COVID-19 treatment centers provide care for over 6,700 patients in Yangon, Myanmar (Table 3).

Table 3 COVID-19 treatment centers and hospitals in Yangon

No	Hospitals or COVID-19 Center	Capacity for COVID-19 Patients beds	Types of Hospital
1.	Yangon General Hospital	150	Permanent +ICU service
2.	Wai Bar Gi Specialist Hospital (National Center for Infectious disease)	70	Permanent +ICU service
3.	North Okkalapa General Hospital	70	Permanent +ICU service
4.	South Okkalapa Women Hospital	70	Permanent +ICU service
5.	Phaung Gyi COVID-19 Center	1,050	Temporary +ICU service
6.	Ayar COVID-29 Center	500	Temporary
7.	Fortune COVID-19 Center	Around 1,000 (variation in number of beds)	Temporary
8.	Aung Myint Mo COVID-19 Center	Around 1,000 (variation in number of beds)	Temporary
9.	Hlaing University COVID-19 Center	Around 1,000 (variation in number of beds)	Temporary
10.	Yangon University of Nursing COVID-19 Center	Around 1,000 (variation in number of beds)	Temporary
11.	Yankin Cultural University COVID-19 Center	Around 1,000 (variation in number of beds)	Temporary
12.	Yoma COVID-19 center	600	Temporary

The Irrawaddy, Myanmar&COVID-19: Myanmar Builds Temporary Hospitals as COVID-19 Centers Near Capacity. (71)

Among them, the four hospitals and one COVID-19 center (Phaung Gyi) have ICU services whereas other centers are mostly treating for patients with mild symptoms. The bed capacities of temporary centers are around 1,000 beds, and vary in number of

beds time to time. Since Yangon region had been an epicenter with a highest prevalence and mortality rate of COVID-19, almost sixty percent (59.8%) of transmission has been spread in Yangon whereas 40% of prevalence are distributed among other 17 states and regions. Due to demand of services and shortage of workforce in Yangon, some government health care staff from other states and regions had been assigned to temporary COVID-19 centers to give care to the patients.

3.3 Study Population

The population of this study were health care personnel including doctors, nurses, and laboratory technicians who are currently working or have worked in treating, diagnosing and caring of COVID-19 at government hospitals in Yangon, Myanmar.

3.4 Inclusion and Exclusion Criteria

Inclusion Criteria

- Medical doctors, nurses and laboratory technicians (Health Care Personnel) who are currently working or who had worked in governmental hospitals or COVID-19 treatment centers during pandemic from 23 March, 2020 to 31 December, 2020 in Yangon, Myanmar.
- Health care personnel who directly participated and worked in treating and caring with COVID-19 positive patients at isolation ward in hospitals or COVID-19 centers.
- Health care personnel who participated and worked in the general health care setting including outpatient department (OPD) and other respective specialty care wards.

Exclusion Criteria

- Health care workers from private clinics, volunteer health staffs (not government staff), medical or nursing students.

- Medical doctors, nurses and lab technician who worked in governmental hospitals or COVID-19 treatment centers for less than one month.

3.5 Duration of the study

The study was conducted in June 2021. The estimated time to fill each questionnaire was around 15 minutes by online questionnaire via Google forms, a widely used survey application that facilitates online surveys.

3.6. Sample size

$$n = z^2 [p q]/d^2$$

$$n = z^2[p(1-p)]/d^2$$

$$n = 1.96*1.96(0.5*0.5)/ (0.05*0.05)$$

$$n = 384$$

n= sample size of population

z= standard normal deviation 1.96 in case of 95% confidence interval

p= the estimate proportion of risk perception
adult 50% = 0.5

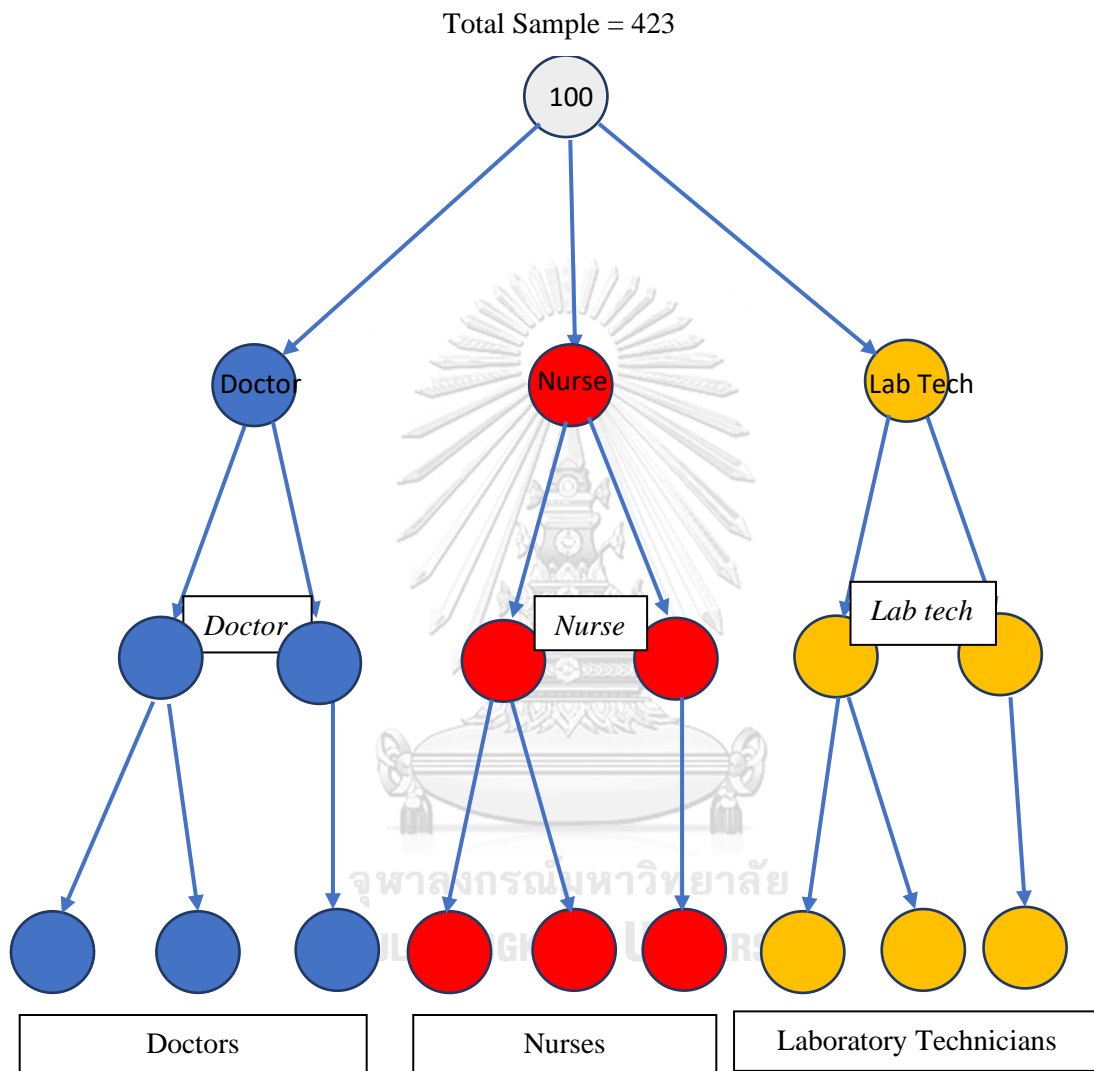
q= 1-p

d= allowance for error 5%= 0.05

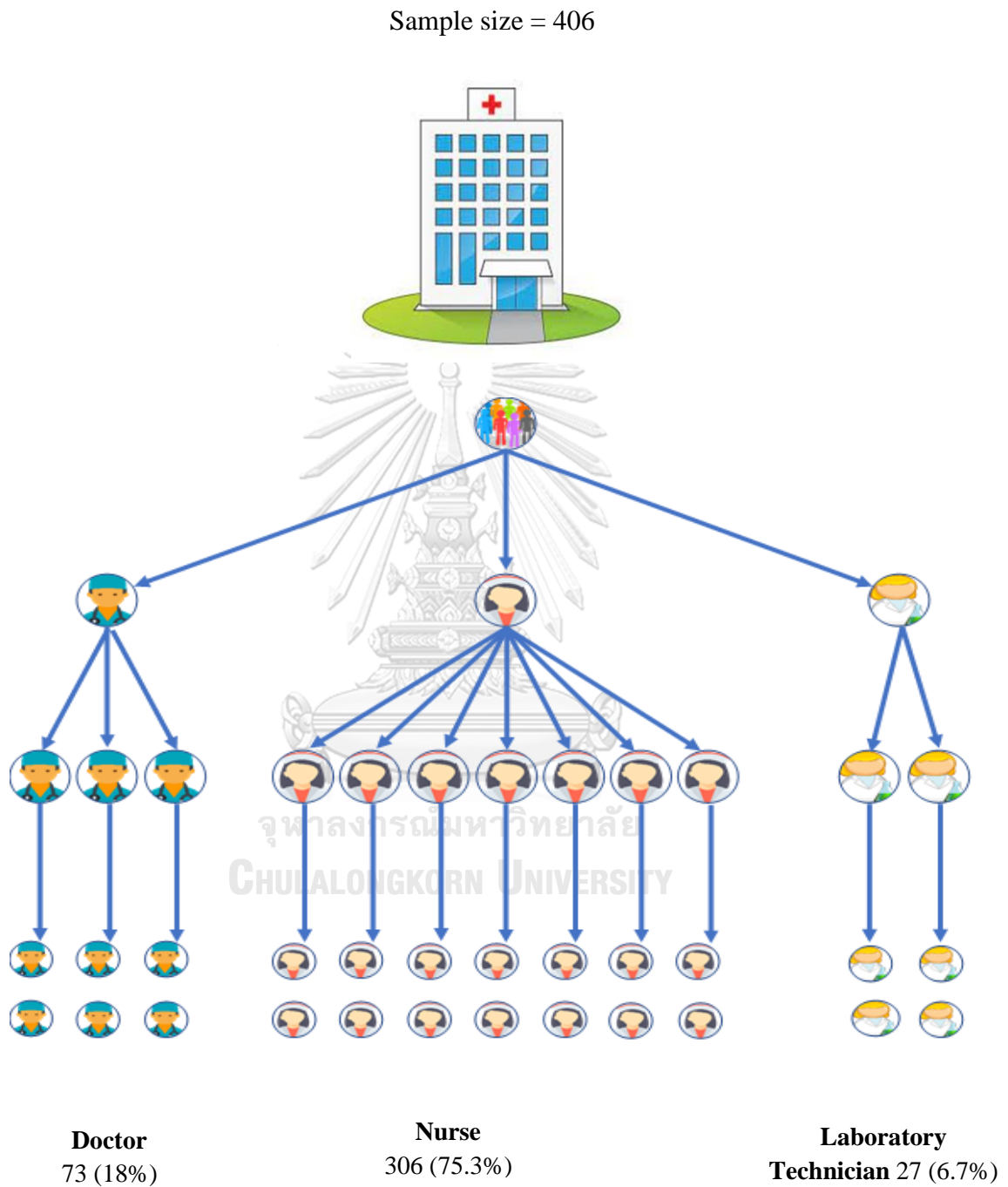
By adding 10 % of non- response rate, final sample size will be: 384+39= 423

3.7. Sampling technique

Non-probability sampling method by using snowball sampling was applied to recruit participants in this study. Participants who have direct experience in working with COVID-19 confirmed patients or suspected patients were selected in the study. Researcher firstly contacted to representative doctors, nurses and laboratory technicians from each study hospitals and COVID-19 centers. Since the sampling frame was not easily available because of political crisis and, to meet the sample size within a short period of time, the existing subjects from each sub-group were selected first and requested to provide multiple referrals of his/her colleagues that they work together during COVID-19 management process.



Proposed snowball sampling frame



Actual snowball sampling structure of the study

Figure 5 Sampling Structure

3.8. Measurement tools

In this study, the online self-administered questionnaire was used to collect the data. The questionnaire was designed according to previously published literatures. (17, 41) This was conducted in Myanmar language. The questions in google form was comprised of five sections. Each section took 2-3 minutes so the estimated time to fill the whole questionnaires was around 15 minutes. The first section was screening to identify the potential participants and questionnaires regarding sociodemographic characteristics, predisposing factors and work-related characteristics were in the second, third and fourth section respectively. DASS21 Myanmar version was administered in the last section. In order to avoid risk of un-response to important questions, mandatory response action was applied.

1. Sociodemographic characteristics

There were 13 questions consisting of participant's work residence, sex, age, religion, education level, occupation, marital status, family type, accommodation, presence of children under 14 years of age, presence of elderly over 60 years of age and presence of family with chronic disease and the respondent having chronic medical disease.

2. Predisposing factors

Two factors were asked for investigating presenting of predisposing factors including presence of history of receiving treatment for mental health condition, and presence of experienced with loss of loved one during pandemic.

3. Work -related characteristics

In this part, 9 questions on work-related characteristics were employed as followed:

- a. participant's work role: participant have to choose one from 2 responses of front- line or second -line.
- b. Total years of government service: participant have to fill his/her service years
- c. Personal opinion on availability of PPE during COVID-19 pandemic, the responses were categorized as (1) completely sufficient, (2) sufficient, (3) insufficient and (4) very insufficient.

- d. Experienced of being stigmatized or discriminated against as a health care worker due to COVID-19. The responses were either “Yes” or “No”. For those who response “Yes” had to continue to answer further question about types of stigmatizations.
- e. Types of stigmatizations or discrimination: The answers were contained 4 types of responses including
 - i. Being threatened
 - ii. Being accused of virus carrier due to profession
 - iii. Being asked to leave rented place or hostel.
 - iv. Other
- f. Working hours in a shift during COVID-19 pandemic
- g. Personal opinion on receiving COVID-19 support from government: Participant’s response will be characterized as (1) Completely sufficient, (2) Sufficient, (3) Insufficient, (4) Very insufficient.
- h. Have training on COVID-19 infection control, self-care, donning and doffing PPE and procedure for testing and treatment protocol in the early time of pandemics: the responses were either “Yes” or “No”.
- i. Have you ever been tested for COVID-19? The responses were either “yes”, or “no” and, for the answer “yes”, another question was employed “If so, have you got tested positive or negative”. The respondent had to choose one response “positive or negative.”

3.8.1. Item- Objective Congruence (IOC)

Validity

The index of item-objective congruence was a procedure used in test development for evaluation content validity at the item development stage. This measure was limited to the assessment of unidimensional items or items that measure specified composites of skills.

Step one: The questionnaire was presented to the thesis committee for any suggestion for improvement.

Step two: The questionnaire was corrected and adjusted in accordance with comments and recommendations made by advisory committee.

Step three: After receiving feedback and recommendations from the advisory committee, the Index of Item-Objective Congruence (IOC) was used so as to find the content validity. In this process, the questionnaire was checked by three experts. (See in Appendix A)

The Item-Objective Congruence (IOC) was used to evaluate the items of the questionnaire based on the score range from -1 to +1.

Congruent = + 1

Questionable = 0

Incongruent = -1

For the questions with the value of the result less than 0.5, were adjusted according to the three experts' recommendations and till they accepted. These questionnaires were already validated by the above three experts and all of them accepted the questionnaire.

3.8.2. Reliability

The reliability of the questionnaire was determined so as to ensure that the responses collected through the instrument were reliable and consistent. The questionnaires were tested with 30 health care personnel from Myitkyina General Hospital, Kachin State, Myanmar who did not include in the sample group.

The reliability value was calculated by using Cronbach's alpha to ensure whether there was internal consistency within the items. George and Mallery (2010) illustrated the value of Coefficient Cronbach's Alpha as the following: ≥ 0.9 = Excellent, ≥ 0.8 = Good, ≥ 0.7 = Acceptable, ≥ 0.6 = Questionable, ≥ 0.5 = Poor, and ≤ 0.5 =Unacceptable.

Therefore, for the research questionnaire to be reliable, its value of Coefficient Cronbach's Alpha must be at least 0.7. The result of the reliability test was shown in table 4.

Table 4 Internal consistency and inter-item correlation of DASS-21 (Myanmar) from Pretest

No	Sub-scale	From Pretest (Myanmar)			Cronbach alpha from Original (English)
		Item Numbers	Cronbach alpha	Inter-item correlation	
1.	DASS_Stress	1S, 6S, 8S, 11S, 12S, 14S, 18S	0.83	0.43- 0.78	0.78
2.	DASS_Depression	3D, 5D, 10D, 13D, 16D, 17D, 21D	0.80	0.36 -0.80	0.81
3.	DASS_Anxiety	2A, 4A, 7A, 9A,15A,19A,20A	0.86	0.47-0.76	0.89
Total	DASS21	21 items	0.94	0.39-0.87	0.78 -0.91

3.8.3. Measurement Tool for mental health assessment

Depression, Anxiety and Stress Scale - 21 Items (DASS-21) Myanmar version was used to measure mental health outcome. The DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content.

The depression scale evaluates “dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement in activities, anhedonia and inertia.”

The anxiety scale assesses “skeletal muscle effects, autonomic arousal, situational anxiety, and subjective experience of anxious affect.”

The stress scale is sensitive to levels of chronic nonspecific arousal. It examines “difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient”.

All the items that assessed for depression, anxiety and stress were all mixed up in questionnaires. Questions no. 1, 6, 8, 11, 12, 14, and 18 were for assessing the stress level, no. 2, 4, 7, 9, 15, 19, and 20 for anxiety and no. 3, 5, 10, 13, 16, 17, and 21 for depression respectively.

Scores for depression, anxiety and stress were calculated by summing the scores for the relevant items. The initial total score of each subscale (DASS-21) was multiplied by 2 to get the final score for categorization into “Normal”, “Mild”, “Moderate”, “Severe”, or “Extremely Severe” (Table 4). The reliability of the DASS-21 was

considered “acceptable” and has “good” Cronbach’s alpha values of “0.81” and “0.89” for the depression and anxiety subscales, respectively. The alpha value for the stress subscale was observed at 0.78, which can be considered “fair”. (70)

Table 5 Interpretation of depression, anxiety, and stress scores

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

3.9. Data collection

The data were collected in June 2021 by using online questionnaire platform. The online questionnaire was designed on “Google Forms” and distributed in multiple social platforms including health care personnel groups on Facebook, Messenger, Telegram, and Viber.

Google Form Link for data collection

[https://docs.google.com/forms/d/e/1FAIpQLSc6wAE59noR11-8cfTbS7qvq8K8GxDpt_GKnS2CIzoOubrbIw/viewform?usp=sf link](https://docs.google.com/forms/d/e/1FAIpQLSc6wAE59noR11-8cfTbS7qvq8K8GxDpt_GKnS2CIzoOubrbIw/viewform?usp=sf_link)

In order to limit responses from health care workers who didn’t involve in COVID-19 treating, caring and diagnosis process, questionnaires were only sent to potential participants. There was a specific “Yes or No” questions to confirm that participant truly get involved in COVID-19 management process. Only those who answer “Yes” were allowed to continue to fill the survey. The participants were encouraged to answer within two weeks. The targeted population received their personal message to make sure that they received and responded to the broadcast. All respondents were requested to fill a consent form before answering the questionnaires to register their

willingness to participate. All the responses from respondents were automatically received by the researcher in Excel form (.xlsx) for further cleaning and coding steps before entry. The respondents were excluded who did not give consent to participate in the study or did not answer the questions completely.

3.10. Approaching to the participants

Under the unexpected obstacles of atrocious situation due to political crisis, approaching to the participants and collecting data had been incredibly challenging. Currently, the illegitimate military council has been putting restrictions such as curfews, limits gathering, limiting internet accessibility, and threatening of arbitrary detaining on health care staff including other civil service staff since they committed to Civil Disobedience Movement (CDM).

Approaching individually was taking much time to get response from them, because of intermittent internet connectivity. Thus, sharing the link in the health care workers groups on various social platforms was found favorable.

Therefore, before circulating the study link in the variety of groups, researcher contacted to the admins of each health care staff group on Facebook namely “Medical Against dictatorship”, “Myanmar Doctors Public group”, “Nurses in Myanmar”, “Research Training Guide” and “Telegram Channel” for requesting permission to post the research link in the group. After obtaining permission from each of the group’s admin, the google link was shared and participants were invited to participate in the study by informing of participant information and voluntary process as well.

In addition, researcher also contacted to the resource person of each profession (nurses, doctors, and laboratory technicians) from each of COVID-19 treatment center, and made request for delivering the research link to appropriate potential participants. In summary, data were collected by sharing the link mainly on Facebook groups and as well individually by Messenger and email.

3.11. Data entry and analysis

The entry of all responses was stored in the Microsoft Excel format which went through the cleaning and coding process after the data collection period closed. After

that data from Excel changed to SPSS. This study was analyzed in two major steps using SPSS 22.0 software.

3.11.1. Data Grouping for analysis

1. Age: Age was grouped into three categories 20-29, 30-39, and 40 and above in order to have equally distribution of the participant in each group.

2. Years of government working services: It was categorized as 5 years and below and above 5 years because in Myanmar context, generally it took around five years to step into another higher position, so that less than five years of working service used to assume junior staff and health care staff with more than five years were addressed as senior staff.

3. Working hours: Normal working hours for health care staff was usually 8 hours in shift. However, according to the situation, work nature and work-load, sometimes health care had to personnel worked more than the usual working hours. Hence, in order to expedite in data analysis and interpretation, working hours has grouped as 1-8 hours and 8-24 hours.

4. Perception on PPE supply in work and government financial support during COVID-19 pandemic: The participant who stated their perception as “very sufficient” and “sufficient” were recognized as “Sufficiently supply” and who responded as “not sufficient” and “very insufficient” were assumed as “Insufficiently supply”.

3.11.2. Descriptive Statistics

To describe the independent variables, sociodemographic characteristics, predisposing factors and work- related characteristics of the participants, descriptive statistics was used.

For continuous variables, normal distribution was tested with Shapiro Wilk test, and found that the variables had skewed distribution, and so median with interquartile range were used to present the data.

For categorical variables, the distribution of frequencies(n) and percentage (%) were described.

To describe the level for depression, anxiety, and stress of health care personnel, descriptive statistics was applied and shown in frequencies (n) and percentage (%).

3.11.3. Inferential Statistics

Step 1 - Bivariate Analysis

To find association of socio-demographic factors, predisposing factors and work-related characteristics with mental health outcomes, each outcome variable (Depression, Anxiety and Stress) was recoded into two categories in which first group included the range between “normal and mild” and from “moderate to extremely severe” were included in the second group.

To explore the unadjusted association between each independent variable and dependent variable, **simple logistic regression** was used and p- value less than 0.05 was considered as significant.

Step 2 - Multivariate Analysis

The variables with p-value less than 0.2 in bivariate analysis and no collinearity with other variables were included in multivariate analysis.

Multiple logistic regression was used to investigate the association of independent variables with $p < 0.2$ with each mental health outcome.

Step 3 – selection of associated predictor variables

The variables from multiple logistic regression with $p < 0.05$ were considered as statistically significant associated predictor variables.

3.12. Ethical Considerations

Ethical approval was obtained on 11 June 2021 from the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University in Thailand (COA No. 141/2021). (Appendix C) Participant information and voluntary process was explained, and whoever desire to accept consent were participated.

Researcher followed the ethical principles to ensure confidentiality, safety and privacy of the participants. (72) Participants received online written explanation about introduction of the researcher, what was expected from them, type of research intervention, participant selection, number of participants involved in the study, inclusion criteria of the study, voluntary participation in the study and the right to withdraw from the study, time duration of responding the questionnaires, minimum risks and discomforts, benefits, compensation, anonymity of the participants, confidentiality of the results, sharing the results, no potential financial benefit for investigator, no conflict of interest, contact person for the study no personal information was maintained, and the information will be destroyed within one year after completion of the study.

In order to ensure confidentiality of the participants, identity such as name and address were not asked. Only investigator could have access to the data. Regarding for referral process for those who revealed severe and extremely severe depression, anxiety and stress, researcher contacted and got advice from Professor Dr. U Tin Oo, (President), Mental Health Project Manager, Yangon Mental Health Hospital. By then, informing and referral have been made to every respondent who exhibit severe and extremely severe mental outcomes to the following services centers for further mental health support and help.

1. Yangon Mental Health Hospital (Ywar Thar Gyi) (9:00 AM – 12:00 NOON)
2. North Okkalapa General Hospital, Yangon (9:00 AM – 12:00 NOON)
3. Thingan Kyunn Hospital, Yangon. (9:00 AM – 12:00 NOON)

Moreover, who those cannot go and get service to those hospitals, online consultation and services centers were suggested.

Among the participants who assessed for requiring further consultation, there was a total of 21 participants could have been contacted and made referral. Informing and referral process had been done individually by email and text message in respecting of confidentiality. However, those who did not provide their contact address have been out of reach.



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CHAPTER IV

RESULT

This study was a cross-sectional descriptive study to determine the impact of COVID-19 pandemic on mental health of health care personnel from government hospitals in Yangon, Myanmar by quantifying their level of depression, anxiety and stress and to find the association between socio-demographic factors, predisposing factors and work-related characteristics and mental health impact among health care personnel during COVID-19 pandemic situation. Data were collected through online questionnaires circulated by Email, Facebook health professional groups and Messengers groups in June, 2021. This chapter presented about the result of data analysis of the study.

The results were presented into 2 parts; descriptive and inferential findings. The first part contained descriptive findings of socio-demographic characteristics, predisposing factors, work-related characteristics and the distribution of level of depression, anxiety and stress. The second part included the bivariate analysis and multivariable analysis to find the association between the independent and the outcome variables.

4.1. Descriptive characteristics of the participants

4.1.1. Sociodemographic characteristic of the participants

In this study, there were total 406 participants including 306 (75.3%) nurses, 73 (18.0%) doctors and 27 (6.7%) laboratory technicians, in which the majority (82.0%) were female health care personnel. The median (IQR) of participants' age was 29 (8) years. Over half of the participants (52.0%) belonged to the age group between 20-29 years, whereas 41.6% and 6.4% were in the age group between 30-39 years, and 40 and above years groups respectively.

In terms of education, nearly half of the participants, 188 (46.3%), were bachelor holders whereas Ph.D. holders were only 9 (2.2%). The rest participants 148 (36.5%) and 61 (15%) were diploma and master holders respectively. The vast majority of the participants 332 (81.8%) were Buddhism. Three quarter of respondents 307 (75.6%) were single whilst one quarter of respondents 91 (22.4%)

were married. Few numbers of participants were divorce and widow 5 (1.2%) and 3 (0.7%) respectively (Table 6).

Table 6 Socio-demographic Characteristics of participants (n=406)

Characteristics	Frequency	Percentage (%)
Age (years)		
20-29	211	52.0
30-39	169	41.6
≥40	26	6.4
Median (IQR)= 29 (8) Q1-Q3 = 26-34		
Sex		
Male	73	18.0
Female	333	82.0
Education		
Diploma	148	36.5
Bachelor	188	46.3
Master	61	15.0
Ph.D.	9	2.2
Occupation		
Nurses	306	75.3
Lab Technicians	27	6.7
Doctors	73	18.0
Religion		
Buddhism	332	81.8
Muslim	5	1.3
Christian	67	16.5
Atheism	1	0.2
Hindu	1	0.2
Marital Status		
Single	307	75.6
Married	91	22.4
Separated/Divorce	5	1.3
Widow/Widower	3	0.7

Table 6 Socio-demographic Characteristics of participants (n=406) (continue)

Characteristics	Frequency (N=406)	Percentage (%)
Family Type		
Living Alone	109	26.8
Nuclear	207	51.0
Extended	73	18.0
Joint	17	4.2
Accommodation		
Home	187	46.1
Rented-house	39	9.6
Staff-house	180	44.3
Presence of chronic disease		
Yes	14	3.4
No	392	96.6
Presence of under 14 -year-old children in family		
Yes	137	33.7
No	269	66.3
Presence of elderly (over 60 years of age) in family		
Yes	193	47.5
No	213	52.5
Presence of family member with medical condition		
Yes	182	44.8
No	224	55.2

In terms of family type, half of the total respondents 207 (51%) were from nuclear type, a quarter 109 (26.8 %) lived alone, and other 18.0% and 4.2% were from extended and joint family respectively. Nearly the same proportion of participants

(46.1% and 44.3%) were resided at home and staff-house, and only 39 (9.6%) stayed at rented- hostel. More than a quarter of health care personnel in this study 137 (33.7%) had children under 14-years-old in their family. Moreover, nearly half of the respondents, 193 (47.5%) and 182 (44.8%) had elderly and family member with chronic medical condition in their family. Of the total participants, it was noted that only 3.4% (14) health care personnel had underlying chronic medical condition.

4.1.2. Predisposing Factors

Table 7 shows the percentage of the participants who have conditions that have effect on mental impact of the health care personnel. Only 8 (2.0%) respondents of the study population had history of receiving treatment for mental health condition. Moreover, the number of health care personnel who experienced loss of their loved one during COVID-19 pandemic were 41 (10.1%).

Table 7 Predisposing Factors of participants (n= 406)

Characteristics	Frequency	Percentage (%)
History of receiving treatment for mental health condition		
Yes	8	2.0
No	398	98.0
Experienced loss of your loved one		
Yes	41	10.1
No	365	89.9

4.1.3 Work-related Characteristics of participants

Table 8 depicts the work-related characteristics of the study participants. Of the study 406 participants, 297 (73.0%) were front-line health care workers. The median (IQR) of service years of the respondents was 7 (5) years, and over half of the proportion, 251 (61.8%), had more than 5 years of working services. Nearly three-quarter (74.6%) of health care personnel assumed that PPE were sufficiently supplied in work, however, more than half of the participant (56.4%) did not perceive as insufficient with government financial support during pandemic.

A quarter of the respondents, 110 (27.1%), have faced stigmatization, of which 56.4 % had been accused of virus carrier, 17.3% threatened, 5.4 % asked to leave from rented-hostel and the rest 21.0% had experienced various way of discriminations including not selling goods, avoidance and mocking. During pandemic, it was reported that half of the study participants 208 (51.2%) had to work between 9 - 24 hours and the rest participants worked between 1-8 hours in a shift. The median (IQR) of working hours of the participants was 10 (4) hours. Regarding training on COVID-19 infection control and management, only 45.1% of health care workers had received the training in the early time of pandemics. During working with COVID-19, nearly two third (63.5%) of health care personnel had been tested of COVID-19, among them 38 (14.7%) had been tested positive.

Table 8 Work-related Characteristics of participants (n=406)

Characteristics	Frequency	Percentage (%)
Work Role		
Front-line	297	73.2
Second-line	109	26.8
Years of government service		
≤ 5 years	155	38.2
>5 years	251	61.8
Median (IQR) = 7 (5) Q1-Q3 = 4-9		
Perception on availability of PPE at work		
Completely sufficient	44	10.8
Sufficient	259	63.8
Insufficient	97	23.9
Very insufficient	6	1.5
Experienced of being stigmatized due to occupation		
Yes	110	27.1
No	296	72.9

Table 8 Work-related Characteristics of participants (n=406) (continue)

Characteristics	Frequency	Percentage (%)
Types of Stigmatizations (n=110)		
Being threatened	19	17.3
Being accused of a carrier of virus.	62	56.4
Being asked to leave rented hostel	6	5.5
Discrimination by others	14	12.7
Not selling goods	2	1.8
Mocking	1	0.9
Discrimination by family	1	0.9
Missing	5	4.5
Working hours		
1-8 hours	198	48.8
9-24 hours	208	51.2
Median (IQR) = 10 (4)		
Q1-Q3 = 8-12		
Perception on government financial supports during COVID-19 pandemic		
Completely sufficient	6	1.5
Sufficient	171	42.1
Insufficient	205	50.5
Very insufficient	24	5.9
Received training		
Yes	183	45.1
No	223	54.9
Have tested COVID-19		
Yes	258	63.5
No	148	36.5
Test Result (n=258)		
Positive	38	14.7
Negative	220	85.3

4.1.4. Different degree of Depression, Anxiety and Stress among Health Care Personnel

Table 9 illustrates the distribution of degree of depression, anxiety and stress across entire sample. The score of the vast majority (69.5%, 65.5%, 78.8%) of the respondents showed normal range in depression, anxiety and stress. Around 15.0 % of health care workers have suffered from mild symptom of each mental outcomes. Similarly, the same proportion (10.6%) of the respondents exhibited moderate symptoms of depression and anxiety whereas 6.2 % have suffered moderate level of stress.

There were 3.2 % and 1.7 % of health care personnel were severely and extremely depressed respectively. Moreover, the same number of respondents 15(3.7%) showed severe and extremely severe symptoms of anxiety. Plus, those suffered from severe and extremely severe level of stress had shared almost the same percentage of 1.5% and 1.2% respectively.

The severity level of depression, anxiety and stress were categorized into two groups. The range between normal and mild were belonged to the group “No presenting of symptoms” and, the range from “moderate to extremely severe” were grouped into “presenting of symptoms”.

Table 10 shows the number of participants who had suffered moderate to extremely severe depression, anxiety and stress which prevalence was shown 63 (15.5%), 73 (17.9%) and 36 (8.9%) respectively. The respondent who showed only a single symptom of depression, anxiety and stress were 30 (7.3%), 36 (8.7%) and 6 (1.5%) individually. Furthermore, the prevalence of presenting dual symptoms of depression and anxiety, depression and stress, and anxiety and stress were 31 (7.6%), 24 (5.9%) and 28 (5.4%) respectively. There were 22 (5.4%) participants who had exhibited all three symptoms of depression, anxiety and stress (Figure 6).

Table 9 Different Degree of Depression, Anxiety and Stress Among Health Care Personnel (n=406)

Severity Level	Frequency (N=406)	Percentage (%)
Depression		
Normal	282	69.5
Mild	61	15.0
Moderate	43	10.6
Severe	13	3.2
Extremely Severe	7	1.7
Anxiety		
Normal	266	65.5
Mild	67	16.5
Moderate	43	10.6
Severe	15	3.7
Extremely Severe	15	3.7
Stress		
Normal	320	78.8
Mild	50	12.3
Moderate	25	6.2
Severe	6	1.5
Extremely Severe	5	1.2

Table 10 Prevalence of Depression, Anxiety and Stress among Health Care Personnel

Mental Outcomes	(Moderate to Extremely Severe level)	Percentage (%)
Depression	63	15.5%
Anxiety	73	17.9%
Stress	36	8.9%

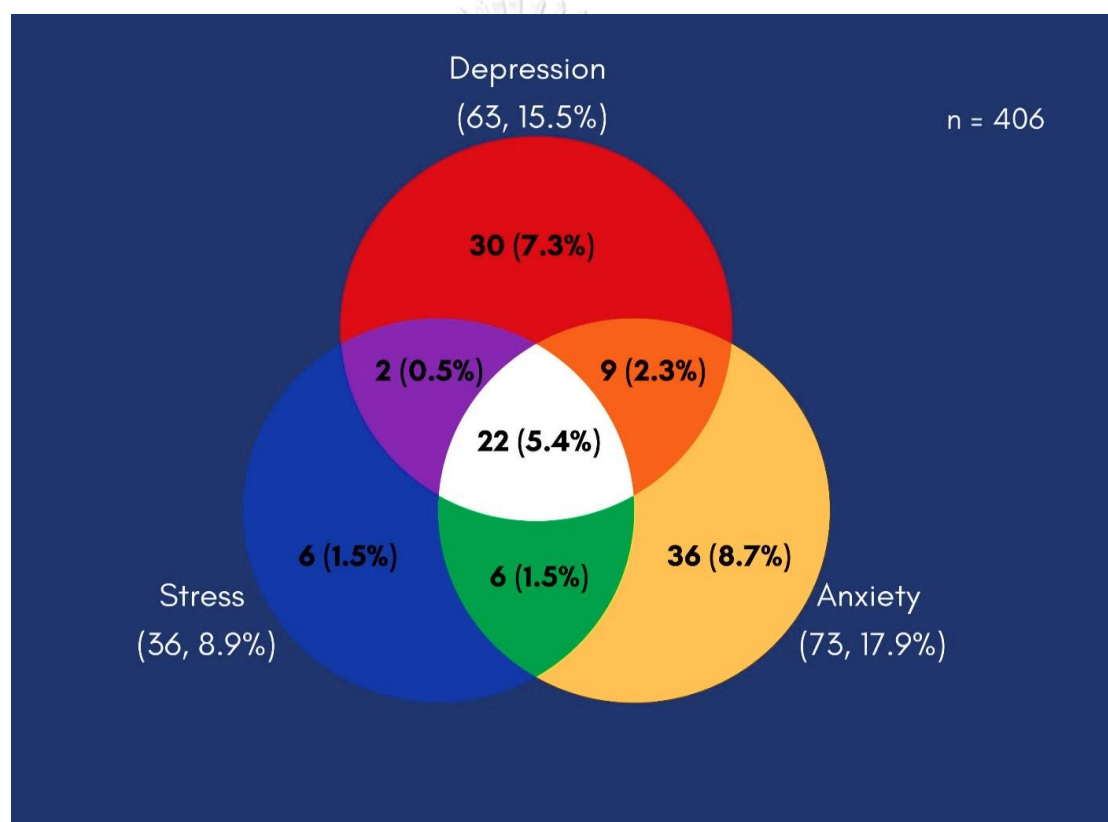


Figure 6 Prevalence of depression, anxiety and stress among health care personnel

4.2. Bivariate Analysis

To find the association between each of the independent variables and outcome variables of the study (depression, anxiety and stress), bivariate analysis by using Simple Logistic Regression was applied. In the first step of analysis, the factors with p-value < 0.05 were considered as statistically significant. However, in the second

step of analysis, those predictors that possessed p- value < 0.2 were also added in the multivariable analysis model.

The predictors variables were sociodemographic characteristics, predisposing factors and work-related characteristics. The outcome variables were depression, anxiety and stress, in which the range between moderate to extremely severe level of each dependent variables was determined as presenting of depression, anxiety and stress.

4.2.1 Association of sociodemographic characteristics and depression

Table 11 shows the association between the sociodemographic factors of health care personnel and depression. These sociodemographic factors included age, sex, education, occupation, marital status, religion, family type, accommodation, presence of under 14-year-old children, presence of elderly, presence of family member with medical condition and participant presence of chronic disease. Among those characteristics, age, family type (Extended + Joint), occupation, accommodation, and participant presence of chronic disease possessed p value less than 0.2 whereas only family type (Nuclear) showed p value less than 0.05. The remaining factors were not found association with depression. All of significant variables were at 95% confidence interval. The health care personnel who were from “Nuclear” family was found 2.23 times higher chance of developing severe level of depression than those who lived alone. (Crude OR=2.23, 95% CI: 1.06 -4.66, p value=0.034).

Table 11 Bivariate analyses of sociodemographic characteristics and depression

Predictors	Normal and Mild n (%)	Moderate to Extremely severe n(%)	Moderate to Extremely Severe level of Depression			
			β	P-Value	Crude OR	95 % CI
Age (years)						
30-39 (ref)	149 (88.2)	20 (11.8)				
20-29	173 (82.0)	38 (18.0)	0.493	0.098*	1.64	0.91 - 2.93
≥ 40	21 (80.8)	5 (19.2)	0.537	0.299	1.77	0.60 – 5.23
Sex						
Male (ref)	62 (84.9)	11(15.1)				
Female	281(84.4)	52 (15.6)	0.042	0.907	1.04	0.52 - 2.11
Education						
Bachelor + Postgrad (ref)	221 (85.7)	37 (14.3)				
Diploma	122 (82.4)	26 (17.6)	0.241	0.388	1.27	0.74 - 2.20
Occupation						
Other (doctor +lab tech) (ref)	85 (85.0)	15 (15.0)				
Nurses	258 (84.3)	48 (15.7)	0.053	0.869	1.05	0.56 – 1.98
Religion						
Buddhism (ref)	283 (85.2)	49 (14.8)				
Other (Christian, Muslim, Atheism)	60 (81.1)	14 (18.9)	0.298	0.373	1.35	0.70 - 2.60
Marital Status						
Married +Broken(ref)	78 (85.7)	13 (14.3)				
Single	265 (84.1)	50 (15.9)	0.124	0.713	1.132	0.59 - 2.16

* p value < 0.2, ** p value < 0.05

Table 11 Bivariate analyses of sociodemographic characteristics and depression
(continue)

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Depression			
			β	P-Value	Crude OR	95 % CI
Family Type						
Alone (ref)	99 (90.8)	10 (9.2)				
Nuclear	169 (81.6)	38 (18.4)	0.800	0.034**	2.23	1.06 - 4.66
Extended (joint)	75 (83.3)	15 (16.7)	0.683	0.117*	1.98	0.84 - 4.65
Presence of chronic disease						
No (ref)	333 (84.9)	59 (15.1)				
Yes	10 (71.4)	4 (28.6)	0.814	0.181*	2.26	0.69 - 7.44
Accommodation						
Staff-House +Rented Hostel (ref)	191 (87.2)	28 (12.8)				
Home	151 (81.3)	35 (18.7)	0.452	0.102*	1.57	0.91 - 2.70
Presence of children in the family						
Yes (ref)	118 (86.1)	19 (13.9)				
No	225 (83.6)	44 (16.4)	0.194	0.513	1.21	0.69 - 2.17
Presence of elderly in the family						
No (ref)	159 (82.4)	34 (17.6)				
Yes	184 (86.4)	29 (13.6)	0.305	0.267	1.36	0.79 - 2.33
Presence of family member with medical condition						
No (ref)	195 (87.1)	29 (12.9)				
Yes	148 (81.3)	34 (18.7)	0.435	0.114*	1.55	0.90 - 2.65

* p value < 0.2, ** p value < 0.05

4.2.2 Association of predisposing factors and depression

There were two variables under predisposing factors; having history of receiving treatment for mental health problem and experienced of loss of loved one. The

respondents who had experienced of loss of loved one was significantly associated with higher odds of exhibiting the severe symptoms of depression than who had not experienced. (Crude OR= 2.55, 95%CI: 1.22-5.31, p value = 0.013) (Table 12).

Table 12 Bivariate analyses of predisposing factors and depression

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Depression (Require further consultation)			
			β	P-Value	Crude OR	95 % CI
History of receiving treatment for mental health condition						
No(ref)	337 (84.7)	61 (15.3)				
Yes	6 (75.0)	2 (25.0)	0.611	0.461	1.84	0.36 – 9.34
experienced loss of loved one						
No (ref)	314 (86.0)	51 (14.0)				
Yes	29 (70.7)	12 (29.3)	0.935	0.013**	2.55	1.22 – 5.31

** p value < 0.05

4.2.3 Association of work- related characteristics and depression

Table 13. depicts the association between work- related characteristics and depression. Among work- related characteristics including years of working services, experience of stigma, and the COVID-19 test result had been found to be significantly associated with developing depression.

The test showed that health care staff with junior titles who had fewer years of working experience (≤ 5 years) were 1.85 times more likely to show depressive symptoms than senior staff (Crude OR = 1.85, 95%CI: 1.08- 3.17, p = 0.026). Plus, those who faced stigma due to their profession during pandemic were significantly associated with 2.55 times higher chance of suffering severe level of depression than who had not faced stigma. (Crude OR = 2.55, 95%CI: 1.46- 4.44, p = 0.001). The participants who had tested COVID-19 positive were having more than double chance of exhibiting severe symptoms of depression compared with who tested negative. (Crude OR = 2.31, 95%CI: 1.05 - 5.10, p = 0.039). However, no association is found

between work role, satisfaction on availability of PPE, types of stigmas, working hours, satisfaction on government financial support during COVID-19 pandemic, received training, having COVID-19 test and depression.

Table 13 Bivariate analyses of work-related characteristics and depression

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Depression			
			β	P-Value	Crude OR	95 % CI
Work Role						
Second-line (ref)	91 (83.5)	18 (16.5)				
Front-line	252 (84.4)	45 (15.2)18	- 0.102	0.737	0.90	0.49– 1.64
Years of government service						
>5 years (ref)	220 (87.6)	31 (12.4)				
≤5years	123 (79.4)	32 (20.6)	0.613	0.026**	1.85	1.08 – 3.17
Perception on availability of PPE at work						
Insufficient (ref)	88 (85.4)	15 (14.6)				
Sufficient	225 (84.2)	48 (15.8)	0.099	0.757	1.10	0.59 – 2.07
Experienced of being stigmatized due to occupation						
No (ref)	261 (88.2)	35 (11.8)				
Yes	82 (74.5)	28 (25.5)	0.935	0.001**	2.55	1.46 – 4.44
Types of Stigmatizations						
Being Discriminated (ref)	34 (79.1%)	9 (20.9%)				
Being accused of virus carrier	44 (71.0%)	18 (29.0)	0.435	0.352	1.55	0.62- 3.87
Working hours						
1-8 hours (ref)	171 (86.4)	27 (13.6)				
9-24 hours	172 (82.7)	36 (17.3)	0.282	0.308	1.33	0.77 – 2.28

** p value < 0.05

Table 13 Bivariate analyses of work-related characteristics and depression (continue)

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Depression			
			β	P-Value	Crude OR	95 % CI
Perception on government financial supports						
Sufficient (ref)	153 (86.4)	24 (13.6)				
Insufficient	190 (83.0)	39 (17.0)	0.269	0.339	1.31	0.75 - 2.27
Received training						
No (ref)	190 (85.2)	33 (14.8)				
Yes	153 (83.6)	30 (16.4)	0.121	0.659	1.13	0.66 - 1.93
Have tested COVID-19						
No (ref)	129 (87.2)	19 (12.8)				
Yes	214 (82.9)	44 (17.1)	0.334	0.260	1.40	0.78 - 2.50
Test Result						
Negative (ref)	187 (85.0)	33 (15.0)				
Positive	27 (71.1)	11 (28.9)	0.837	0.039**	2.31	1.05 - 5.10

** p value < 0.05

4.2.4. Association of sociodemographic characteristics and anxiety

Table 14 shows the association between the sociodemographic characteristics and anxiety. The independent variables including age and presence of under 14- year-old children were tested as

significantly associated with anxiety whereas other sociodemographic factors were not having association with anxiety.

The binary logistic regression showed that the age group (20-29) was statistically significantly associated with 1.86 times higher odds of experiencing anxiety than the older age group (30-39) (Crude OR = 1.86, 95%CI: 1.07- 3.24, p value = 0.028).

Interestingly, the respondents who did not have children (<14 years) in their family were found significantly associated 1.86 times probable of suffering high-level anxiety than those who have children in family (Crude OR = 1.86, 95%CI: 1.03 - 3.34, p value = 0.039).

Moreover, the predictive factors including sex, education, and marital status were computed p-value < 0.2.

Table 14 Bivariate analyses of sociodemographic characteristics and anxiety

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Anxiety			
			β	P-Value	Crude OR	95 % CI
Age (years)						
30 -39 (ref)	147 (87.0)	22 (13.0)				
20-29	165 (78.2)	46 (21.8)	0.622	0.028**	1.86	1.07 – 3.24
≥ 40	21 (80.8)	5 (19.2)	0.464	0.397	1.59	0.54 - 4.65
Sex						
Male (ref)	65 (89.0)	8 (11.0)				
Female	268 (80.5)	65 (19.5)	0.678	0.089*	1.97	0.90- 4.31
Education						
Bachelor +Postgrad (ref)	217 (84.1)	41 (15.9)				
Diploma	116 (78.4)	32 (21.6)	0.378	0.149*	1.46	0.87- 2.44
Occupation						
Lab Technicians (ref)	23 (85.2)	4 (14.8)				
Nurses	248 (81.0)	58 (19.0)	-0.296	0.598	0.74	0.25 -2.23
Doctors	62 (84.9)	11 (15.1)	-0.276	0.441	0.76	0.38 – 1.53
Religion						
Buddhism (ref)	273 (82.2)	59 (17.8)				
Other (Christian, Muslim, Atheism)	60 (81.1)	14 (18.9)	0.077	0.816	1.08	0.57 – 2.06
Marital Status						
Married + broken (ref)	79 (86.8)	12 (13.2)				
Single	254 (80.6)	61 (19.1)	0.458	0.179*	1.58	0.81 – 3.09

* p value < 0.2, ** p value < 0.05

Table 14 Bivariate analyses of sociodemographic characteristics and anxiety
(continue)

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of anxiety			
			β	P-Value	Crude OR	95 % CI
Family Type						
Alone (ref)	90 (82.6)	19 (17.4)				
Nuclear	166 (80.2)	41 (19.8)	0.157	0.609	1.17	0.64- 2.13
Extended	77 (85.6)	13 (14.4)	-0.223	0.569	0.80	0.37- 1.72
Accommodation						
Staff-House + Rented(ref)	181 (82.6)	38 (17.4)				
Home	152 (81.3)	35 (18.7)	0.092	0.721	1.09	0.66 – 1.82
Presence of chronic disease						
No (ref)	322 (82.1)	70 (17.9)				
Yes	11 (78.6)	3 (21.4)	0.227	0.733	1.26	0.34 – 4.62
Presence of under 14-years-old children in family						
Yes (ref)	120 (87.6)	17 (12.4)				
No	213 (79.2)	56 (20.8)	0.618	0.039**	1.86	1.03 – 3.34
Presence of elderly (over 60 years of age) in family						
No (ref)	162 (83.9)	31 (16.1)				
Yes	171 (80.3)	42 (19.7)	-0.250	0.339	0.78	0.47 – 1.30
Presence of family member with medical condition						
No (ref)	187 (83.5)	37 (16.5)				
Yes	146 (80.2)	36 (19.8)	0.220	0.395	1.25	0.75 - 2.07

** p value < 0.05

4.2.5. Association of predisposing factors and Anxiety

Table 15 describes the association of predisposing factors and anxiety. It is found that there is no association between both of predisposing factors and anxiety. However, participants who experienced loss their loved one during COVID-19 situation showed p value < 0.2.

Table 15 Bivariate analyses of predisposing factors and anxiety

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of anxiety			
			β	P-Value	Crude OR	95 % CI
History of receiving treatment for mental health condition						
No (ref)	326 (81.9)	72 (18.1)				
Yes	7 (87.5)	1 (12.5)	- 0.436	0.686	0.65	0.08 – 5.34
experienced loss of your loved one						
No (ref)	303 (83.0)	62 (17.0)				
Yes	30 (73.2)	11 (26.8)	0.583	0.124*	1.79	0.85 – 3.77

* p value < 0.2

4.2.6. Association of work-related characteristics and anxiety

Those who faced stigmatization during COVID-19 pandemic were significantly associated with nearly triple chance of having severe anxiety level than who did not have such experience. (Crude OR = 2.74, 95%CI:1.62- 4.64, p value = 0.001). Additionally, health care personnel who perceived as insufficient with government support were significantly identified to have double chance of showing anxiety symptoms than who perceived as sufficient. (Crude OR = 2.02, 95%CI: 1.17 - 3.48, p value = 0.011) (Table 16).

From the output of binary logistic regression, the following work-related characteristics: work role, years of working services, working hours, having COVID-19 test and test result were recorded as adjusted variables with p value < 0.2 to put in the multivariable analysis.

Table 16 Bivariate analyses of work-related characteristics and anxiety

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of anxiety			
			β	P-Value	Crude OR	95 % CI
Work Role						
Second Line(ref)	238 (80.1)	59 (19.9)				
Front line	95 (87.2)	14 (12.8)	0.520	0.105*	1.68	0.90 - 3.16
Years of government service						
>5 years (ref)	211 (84.1)	40 (15.9)				
≤5years	122 (78.7)	33 (21.3)	0.355	0.174*	1.43	0.86 – 2.38
Perception on availability of PPE at work						
Insufficient (ref)	87 (84.5)	16 (15.5)				
Sufficient	246 (81.2)	57 (18.8)	0.231	0.455	1.26	0.69 – 2.31
Experienced of being stigmatized due to occupation						
No (ref)	256 (86.5)	40 (13.5)				
Yes	77 (70.0)	33 (30.0)	1.009	0.001**	2.74	1.62 – 4.64
Types of Stigmatizations						
Being Discriminated (ref)	33 (76.7)	10 (23.3)				
Being accused of virus carrier	42 (67.7)	20 (32.3)	0.452	0.317	1.57	0.65 – 3.81
Working hours						
1-8 hours (ref)	169 (85.4)	29 (14.6)				
9-24 hours	164 (78.8)	44 (21.2)	0.447	0.089*	1.56	0.93 – 2.62
Perception on government financial support						
Sufficient (ref)	155 (87.6)	22 (12.4)				
Insufficient	178 (77.7)	51 (22.3)	0.702	0.011**	2.02	1.17 - 3.48

* p value < 0.2, ** p value < 0.05

Table 16 Bivariate analyses of work-related characteristics and anxiety (continue)

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of anxiety			
			β	P-Value	Crude OR	95 % CI
Received training						
No (ref)	184 (82.5)	39 (17.5)				
Yes	149 (81.4)	34 (18.6)	0.074	0.776	1.08	0.65 – 1.79
Have tested COVID-19						
No (ref)	128 (86.5)	20 (13.5%)				
Yes	205 (79.5)	53 (20.5%)	0.504	0.078*	1.66	0.95 – 2.90
Test Result						
Negative (ref)	179 (81.4)	41 (18.6%)				
Positive	26 (68.4)	12 (31.6%)	0.701	0.072*	2.02	0.94 – 4.32

* p value < 0.2

4.2.7. Association of sociodemographic characteristics and stress

Table 17 described the result of the bivariate analysis of sociodemographic characteristics and stress. The binary logistic regression computed that there is no sociodemographic factor that have association with stress. Nevertheless, age and presence of elderly in family presented p value < 0.2.

Table 17 Bivariate analyses of sociodemographic characteristics and stress

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Stress			
			β	P-Value	Crude OR	95 % CI
Age (years)						
30 - 39 ref	158 (93.5)	11 (6.5)				
20-29	189 (89.6)	22 (10.4)	0.514	0.182*	1.67	0.79 – 3.55
≥ 40	23 (88.5)	3 (11.5)	0.628	0.362	1.874	0.49 – 7.22
Sex						
Male (ref)	67 (91.8)	6 (8.2)				
Female	303 (91.0)	30 (9.0)	0.100	0.830	1.11	0.44 – 2.76

* p value < 0.2

Table 17 Bivariate analyses of sociodemographic characteristics and stress (continue)

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of Depression			
			β	P-Value	Crude OR	95 % CI
Education						
Bachelor +Postgrad (ref)	236 (91.5)	22 (8.5)				
Diploma	134 (90.5)	14 (9.5)	0.114	0.751	1.12	0.56 – 2.26
Occupation						
Lab Technicians (ref)	25 (92.6)	2 (7.4)				
Nurses	280 (91.5)	26 (8.5)	0.149	0.845	1.16	0.26- 5.18
Doctors	65 (89.0)	8 (11.0)	0.431	0.601	1.54	0.31 – 7.75
Religion						
Buddhism (ref)	303 (91.3)	29 (8.7)				
Other (Christian, Muslim, Atheism)	67 (90.5)	7 (9.5)	0.088	0.843	1.09	0.46 – 2.60
Marital Status						
Married +Broken (ref)	82 (90.1)	9 (9.9)				
Single	288 (91.4)	27 (8.6)	- 0.171	0.675	0.84	0.38 – 1.87
Family Type						
Alone (ref)	97 (89.0)	12 (11.0)				
Nuclear	191 (92.3)	16 (7.7)	-0.390	0.332	0.68	0.31 -1.49
Extended	82 (91.1)	8 (8.9)	-0.237	0.621	0.79	0.31 -2.02
Accommodation						
Staff-House + Rented(ref)	197 (90.0)	22 (10.0)				
Home	173 (92.5)	14 (7.5)	0.322	0.368	1.38	0.69 – 2.78
Presence of chronic disease						
No (ref)	358 (91.3)	34 (8.7)				
Yes	12 (85.7)	2 (14.3)	0.562	0.473	1.76	0.38 – 8.17
Presence of 14-years-old children in family						
Yes (ref)	128 (93.4)	9 (6.6)				
No	242 (90.0)	27 (10.0)	0.462	0.249	1.59	0.72 – 3.48
Presence of elderly in family						
No (ref)	180 (93.3)	13 (6.7)				
Yes	190 (89.2)	23 (10.8)	-0.516	0.154*	0.60	0.29 – 1.21
Presence of family member with medical condition						
No (ref)	207 (92.3)	17 (7.6)				
Yes	163 (89.6)	19 (10.4)	0.350	0.317	1.42	0.72 – 2.82

* p value < 0.2

4.2.8. Association of predisposing factors and stress

Bivariate analysis result of predisposing factors of participants and stress was shown in Table 18. It was noted that health care personnel who experienced loss of their loved one was having nearly three times probability of being severely stressed in comparison with who did not experienced (Crude OR = 2.92, 95%CI: 1.23-6.92, p value = 0.015). However, association between health workers who have history of having treatment for mental problem and stress was not found in this study.

Table 18 Bivariate analyses of predisposing factors and stress

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of stress			
			β	P-Value	Crude OR	95 % CI
History of receiving treatment for mental health condition No (ref)	363 (91.2%)	35 (8.8%)				
	Yes 7 (87.5%)	1 (12.5%)	0.393	0.717	1.48	0.18 – 12.39
experienced loss of your loved one No (ref)	337 (92.3%)	28 (7.7%)				
	Yes 33 (80.5%)	8 (19.5%)	1.071	0.015**	2.92	1.23 – 6.92

** p value < 0.05

4.2.9. Association of work-related characteristics and stress

Table 19 presented the result of binary logistic regression of the independent variables, work-related characteristics and the outcome stress.

The binary logistic regression showed that the participant who faced stigma was significantly associated with more than two times chance of suffering from high-level stress (Crude OR = 2.67, 95%CI: 1.33-5.34, p value = 0.006).

Furthermore, health care workers who worked prolong working hours (9-24 hours) were found 2.69 times higher odds of getting stressed than those who worked less than 8 hours in a shift (Crude OR = 2.69, 95%CI: 1.26– 5.73, p value = 0.011).

In terms of working characteristics, the work-role of health care personnel, years of working service, types of stigmas, working hours, satisfaction on government support were noted as p value < 0.2.

Table 19 Bivariate analyses of work-related characteristics and stress

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of stress			
			β	P-Value	Crude OR	95 % CI
Work Role Second line (ref)	104 (95.4)	5 (4.6)				
Frontline	266 (89.6)	31 (10.4)	0.885	0.074*	2.41	0.92 – 6.40
Years of government service >5 years (ref)	233 (92.8)	18 (7.2)				
≤ 5years	137 (88.4)	18 (11.6)	0.531	0.130*	1.70	0.86 – 3.38
Perception on availability of PPE at work Sufficient (ref)	278 (91.7)	25 (8.3)				
Insufficient	92 (89.3)	11 (10.7)	0.285	0.455	1.33	0.63 – 2.81
Experienced of being stigmatized due to occupation No (ref)	277 (93.6)	19 (6.4)				
Yes	93 (84.5)	17 (15.5)	0.980	0.006**	2.67	1.33 - 5.34
Types of Stigmatizations Being Discriminated (ref)	39 (90.7)	4 (9.3)				
Being accused of virus carrier	50 (80.6)	12 (19.4)	0.850	0.167*	2.34	0.70 7.82
Working hours 1-8 hours (ref)	188 (94.9)	10 (5.1)				
9-24 hours	182 (87.5)	26 (12.5)	0.988	0.011**	2.69	1.26 – 5.73
Perception on government financial supports Sufficient (ref)	166 (93.8)	11 (6.2)				
Insufficient	204 (89.1)	25 (10.9)	0.615	0.103*	1.85	0.88 – 3.87
Received training Yes (ref)	167 (91.3)	16 (8.7)				
No	203 (91.0)	20 (9.0)	0.028	0.937	1.03	0.52– 2.05

* p value < 0.2, ** p value < 0.05

Table 19 Bivariate analyses of work-related characteristics and stress (continue)

Predictors	Normal and Mild n (%)	Moderate to Extremely Severe n (%)	Moderate to Extremely level of stress			
			β	P-Value	Crude OR	95 % CI
Have tested COVID-19						
No (ref)	135 (91.2)	13 (8.8)				
Yes	235 (91.1)	23 (8.9)	0.016	0.964	1.02	0.50 – 2.07
COVID-19 test result						
Negative (ref)	200 (90.9)	20 (9.1)				
Positive	35 (92.1)	3 (7.9)	-0.154	0.811	0.86	0.24 – 3.04

* p value < 0.2, ** p value < 0.05

4.3 Multivariable Logistic Regression of predictors and outcomes variables

Those with significance of $p < 0.2$ in the bivariate analysis of each hypothesized predictors of sociodemographic factors, predisposing factors and work-related characteristics were included in the multivariable logistic regression model.

After choosing those independent variables with ($p < 0.2$), the Variance Inflated Factor (VIF) was calculated before fitting into the model for each of the psychometric scales which revealed no evidence of multicollinearity (less than 5).

4.3.1. Adjusted relationship of predictor variables with depression

In the multivariable logistic model, the effect of age, family type, accommodation, presence of family member with chronic medical condition, participant with chronic disease, experienced of loss of loved one, working services years, experienced of stigma, and the COVID-19 test result was adjusted to identify the factors associated with depression symptom.

The test computed that health care personnel who experienced loss of loved one during pandemic and experienced of stigma were significantly associated with higher odds of exhibiting the symptoms of depression (AOR: 3.71, 95% CI: 1.53 - 8.99, $p = 0.004$) and (AOR: 2.34, 95% CI: 1.13 - 4.87, $p = 0.023$) respectively. Plus, respondents who tested COVID-19 positive was also found significantly associated with higher odds of developing depression compared with those who had tested negative (AOR: 2.45, 95% CI: 1.03 - 5.82, $p = 0.042$) (Table 20).

Table 20 Multivariable logistics analysis of predictors and depression

Predictors	Depression			
	β	P value	AOR	95% CI
Sociodemographic characteristics				
Age_20-29 years (Other age ^{ref})	0.413	0.387	1.51	0.59 - 3.85
Family Type_ Nuclear (Alone/Extended ^{ref})	0.525	0.320	1.69	0.60 - 4.76
Family Type _Extended (Alone/Nuclear ^{ref})	0.292	0.656	1.34	0.37 - 4.84
Accommodation _ Home (Staff/Rented House ^{ref})	0.760	0.085	2.14	0.90 - 5.08
Participant with chronic disease _ Yes (No ^{ref})	0.776	0.440	2.17	0.30 - 15.60
Presence of family member with chronic medical condition_ Yes (No ^{ref})	-0.296	0.450	0.74	0.35 - 1.60
Predisposing Factor				
Experienced of loss of loved one _ Yes (No ^{ref})	1.312	0.004**	3.71	1.53 - 8.99
Work-related Characteristics				
Years of working services _ ≤5yrs (> 5 yrs ^{ref})	0.381	0.413	1.46	0.59 - 3.65
Experienced of stigma _ Yes (No ^{ref})	0.851	0.023**	2.34	1.13 - 4.87
COVID-19 test result _ Positive (Negative ^{ref})	0.897	0.042**	2.45	1.03 - 5.82

** Statistically significant at p-value < 0.05

From the output of binary logistic regression, variables with p value lower than 0.2; age, family type, accommodation, having chronic disease, presence of family member with chronic medical condition, experience of loss of loved one, working service years, experienced of stigma and COVID-19 test result were adjusted in multivariate analysis.

4.3.2. Adjusted relationship of predictors variables and anxiety

To find the association between predictors variable and anxiety, the effect of age, sex, education, marital status, presence of children under 14 years of age, experienced of loss of loved one, work-role, working services years, experienced of stigma, working hours, perception on government support and the COVID-19 test result was adjusted in multivariable logistic analysis. Among them, health care personnel who have children in their family were less likely to be suffering from anxiety than those who did not have children (AOR: 0.40, 95% CI: 0.17 - 0.90, p=0.028).

Similarly, those who faced stigma due to profession was found significantly associated with higher odds of experiencing high level of anxiety than those who have not faced stigma (AOR: 2.14, 95% CI: 1.08-3.45, p=0.030). Dissatisfaction on government support during COVID-19 pandemic also had significant association with higher odds of exhibiting symptoms of high -level anxiety (AOR:2.49, 95% CI: 1.22 – 5.08, p=0.012). Lastly, health care staff who had tested COVID-19 positive were significantly associated with higher likelihood of experiencing symptoms of anxiety (AOR: 2.77, 95% CI: 1.17 – 6.57, p = 0.021) (Table 21).

Table 21 Multivariable logistics regression for predictors and anxiety

Predictors	Anxiety			
	β	P value	AOR	95% CI
Sociodemographic characteristics				
Age_20-29 years (Other age ^{Ref})	0.832	0.077	2.30	0.91 - 5.78
Sex _ Male (Female ^{Ref})	0.644	0.185	1.90	0.74 - 4.93
Education _ Diploma (Bachelor +Postgrad ^{Ref})	0.044	0.911	1.05	0.49 - 2.23
Marital Status _ Married (Single ^{Ref})	0.512	0.307	1.67	0.63 - 4.45
Presence of Children _ Yes (No ^{Ref})	-0.926	0.028**	0.40	0.17 - 0.90
Predisposing Factor				
Experienced of loss of loved one_ Yes (No ^{Ref})	0.875	0.058	2.40	0.97 - 5.92
Work-related Characteristics				
Work- role _ front-line (Second line ^{Ref})	0.368	0.408	1.45	0.60 - 3.45
Years of working services _ ≤5 years (> 5 years ^{Ref})	-0.118	0.790	0.89	0.37 -3.45
Experienced of stigma _ Yes (No ^{Ref})	0.759	0.030**	2.14	1.08 -3.45
Working- hours _ 9-24 hours (1-8 hours ^{Ref})	0.076	0.835	1.08	0.53 - 2.20
Government support _ Insufficient (Sufficient ^{Ref})	0.913	0.012**	2.49	1.22 – 5.08
COVID-19 test result _ Positive (Negative ^{ref})	1.019	0.021**	2.77	1.17 – 6.57

** = Statistically significant at p-value < 0.05

From the output of binary logistic regression, variables with p value less than 0.2; age, sex, education, marital presence of children, experience of loss of loved one, work-role, working services, experienced of stigma, working hours, government support, and COVID-19 test result were adjusted in multivariate analysis.

4.3.2. Adjusted relationship of explanatory variables with stress

After adjusting the effect of predictors variable including age, presence of elderly, experienced of loss of loved one, work-role, years of working services, experienced of stigma, working hours and perception on government support, it is revealed that only those who experienced of loss of loved one was significantly associated with higher odds of likely to be stressful than who did not experience (AOR: 2.55, 95% CI: 1.02 – 6.39, p=0.046) whereas socio-demographic and work-related characteristics were not found to be associated with developing stress (Table 22).

Table 22 Multivariable logistics regression of predictors and stress

Predictors	Stress			
	β	P value	AOR	95% CI
Sociodemographic characteristics				
Age _ 20-29 years (Other age ^{Ref})	-0.182	0.721	0.83	0.31- 2.26
Presence of elderly Yes (No ^{Ref})	0.420	0.272	1.52	0.72 - 3.22
Predisposing Factor				
Experienced of loss of loved one _ Yes (No ^{Ref})	0.936	0.046**	2.55	1.02 – 6.39
Work-related Characteristics				
Work- role _ frontline (Second line ^{Ref})	0.750	0.145	2.12	0.77 -5.80
Years of working services _ ≤5 years (> 5 years ^{Ref})	0.621	0.202	1.86	0.72 – 4.83
Experienced of stigma _ Yes (No ^{Ref})	0.696	0.063	2.00	0.96 – 4.18
Working- hours _ 9-24 hours (1-8 hours ^{Ref})	0.717	0.077	2.05	0.93 – 4.5
Government support _ Insufficient (Sufficient ^{Ref})	0.516	0.193	1.68	0.77 – 3.64

** Statistically significant at p-value < 0.05

From the output of binary logistic regression, variables with p value less than 0.2; age, presence of elderly, experience of loss of loved one, work-role, working services, experienced of stigma, working hours, and government support were adjusted in multivariate analysis.

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1. Discussion

This study examined the mental health impact among health care personnel from Yangon Region who have participated in the screening, diagnosing, and treatment of COVID-19 positive patients and suspected patients during COVID-19 pandemic by quantifying the magnitude of degree of depression, anxiety, and stress and determined predictive factors. The participants of this study were government staff; nurses, doctors and laboratories technicians. There was total 406 respondents including 75.3 % nurses, 18.0 % doctors and 6.7 % laboratory technicians. The majority were front-line female health care providers and between 20-29 years of age. In Myanmar health care system, the vast majority of human workforce are nurses in every State and Region. Moreover, in term of age group, respondents with over 40 -years of age were the smallest portion in this study compared to the other age groups. This may be due to being not familiar with technology and being inaccessible of internet among older age group.

The result revealed that the prevalence of moderate to extremely severe symptoms of depression, anxiety and stress among health care personnel were 15.5%, 17.9% and 8.9% respectively. This prevalence in this study is higher than the studies of mental health problem found in health care workers from India and Singapore which prevalence showed 11.4 %, 17.7% and 3.7 % and 8.1%, 10.8% and 6.4% respectively. In contrast, the prevalence of depression, anxiety and stress in this study is relatively lower than that the earlier studies in Wuhan, China and Saudi and Egypt where (50.4%, 44.6% and 71.5 %) and (29.6%, 27.0% and 19.3 %) of health care personnel were reported to suffer high level of depression, anxiety and stress. One possible reason could be that even without a pandemic, health care personnel from Myanmar have been working under a great burden of workload with shortage of human resources, limited material supply under fragile health system. (73) In addition, the

severity of COVID 19 might have differently hit the countries time to time. So that, experiencing different level of COVID-19 severity among countries may contribute variation in percentage of prevalence of depression, anxiety and stress among health care personnel.

Doctors and nurses from Myanmar have already been exposed and getting stressed, anxious and depressed from unfavorable work environment according to previous studies of pre pandemic situation. (74, 75) Long term exposed to such stressful job environment would produce the paradoxically result of lower negative mental outcomes among Myanmar medical staffs in comparison with those from high income countries with well- structured health system. However, it would be difficult to claim that the prevalence among of mental outcomes in this study is higher or lower than the other countries because of high heterogeneity among sociodemographic characteristics, country background and the used of measurements and cut-offs used for psychometric instrument.

Regarding the related factors with mental impact of health care workers, variables such as age (young age), sex (female), marital status (married) have been found to have significantly associated with negatives metal outcomes among health care personnel in the existing studies. (9, 76-78). Moreover, in agree with those findings, the study from UK also reported that the age group between 18-39 years, women and people living with children were more mentally distressed in COVID-19 pandemic than previous trend. (79) However, in this study age, sex, education level, marital status, type of family, living with elderly, having family member with chronic medical condition have no significant effect on any mental health outcomes which is consistent with the study from Nepal. (17) Still, it is undeniable that despite the evidence for this association being limited, in reality, health care workers may have somewhat anxiety about spreading the infection to their children, families and especially those who are elderly or have chronic medical condition.

Remarkably, the result of this study displays that health care personnel who are living with children in their family are 63.0 % less likely to develop anxiety symptoms in comparison with those living without children in the family. Although rearing children is challenging, according to Myanmar culture, having children in family is

considered ideally happy and enjoyable in a family life. Even in increasing modernization era, this notion still remains in Myanmar people.(80) Hence, the sense of being together with children in family would be more mentally relaxing for health care personnel, that could support their sense of control and coping ability which are associated with health care staff's resilience against the development of mental health problems.(81) To support this result and the explanation for being not significant of marital status (married) and living with elderly would be that family bonding and connectedness would support maintaining the emotional resilience which prevent health care personnel from being lonely and helps them to be mentally healthy. Moreover, in the previous studies that has proven that living away from family were most likely to feel lonely and which itself was a significant risk factor for negative mental outcomes. (41, 82-84)

In term of predisposing factors, health care staffs who had a history of taking treatment for mental health problem was not found as associated factor for developing negative mental outcomes, whereas studies conducted from China and Nepal (17, 47) observed as higher likelihood of exhibiting the symptoms of depression, anxiety and insomnia compared with those without underlying mental health problem. However, another predisposing factors which was experienced of loss of loved one during pandemic showed significantly higher chance of developing depression and anxiety among health care personnel. In this study, there are a total of 41 (10.1%) health care staff have experienced loss of loved one during pandemic. Population-based studies from United States revealed that unexpected loss of a loved one was the most frequently reported potentially traumatic condition that trigger mental health consequences. (85) Regardless of profession, loss or death of loved one can propel anyone into devastating emotional condition. Hence, for health care personnel who keep working amid of infection and stressful work atmosphere, this factor has become a significant risk factor for experiencing severe depression and anxiety among health care professionals.

In this study, the majority (73.2%) of participants are front-line medical staff who directly provide care to COVID-19 confirmed patients from different COVID-19 centers and government hospitals. Although tons of earlier literatures have proven that

frontline work role was a major factor for provoking depression, anxiety, stress and psychological distress among frontline medical staff compared with non-frontline staff, the result of this study do not conform with the existing finding.(9, 54, 59, 86) The possible reason could be that the COVID-19 associated concerns including fear, uncertainty, lonely, frustration might equally vulnerable to both frontline and second line health care personnel from Yangon.

In the initial period of pandemic, most of the countries have experienced the scarcity of PPE across the globe. (87, 88) In the first wave in Myanmar, with the 374 confirmed patients, ministry of health could manage properly without much transmission and death rate under inadequate PPE support and poor hospital infrastructure. Unlike the first wave, the second wave had greatly hit the health system with dramatic rise of prevalence and death rate. However, with a rapid support and collaboration of international donors, NGO, CSO and local charity groups, PPE resources would seem well- equipped during combating the virus in the second wave in Yangon. Therefore, this study observed that most (74.6%) of the health care personnel reported being satisfied with PPE supply in their work. As a consequence, this study did not find any association between the PPE supply and any mental health outcomes whereas studies from other countries have identified that inadequate precautionary measures in workplace was significantly associated with elevated depression and anxiety.(17, 89) In addition, studies done across the countries, (90-92) have pointed out the need to equip medical staff with PPE in order to reduce mental health burden of insecure and fear of transmission of virus from patients to health care staff.(93)

Interestingly, although PPE supposed to be well-equipped among study participants, the COVID-19 positive rate is still accounting for 14.7% out of 63.5 % of total tests among health care personnel. These data reveal a higher prevalence of positive cases than Spanish study conducted on similar population. (94) In this scenario, it is necessary to take consideration of others causes for virus transmission like prolong exposure with COVID-19 patients (work shift), working services years and competency on professional skill regarding COVID-19 management practice including donning and doffing of PPE, intensive care practice, proper method of

disinfection and so on. More than half of respondents have over 5-years of working services, and it is not found significantly associated with any of study outcomes.

It is also recorded that slightly over half of the participants were working in prolong work shift during pandemic. Moreover, only 55% of the respondents reported receiving training regarding COVID-19. Although, both hypothesized factors are not statistically significantly associated with developing mental health outcomes in this study, adjusting working hours and providing training to a large percentage of population before deployment should be implemented to reduce infection transmission among health care workers, because this study reveals that being COVID-19 tested positive is significantly associated with highly chance of suffering depression and anxiety. In consistent with this, it has identified that COVID-19 positive health care staff were at increased risk of anxiety due to fear of spreading the virus to their families and relatives especially people at risk.(91) Moreover, confirmed positive health care staff have to stay in quarantine, and the feeling of guilt for being unable to collaborate in the critical situation may trigger feelings of worthlessness and frustration at their incapability to contribute to the combating against the pandemic. (95)

Moreover, the COVID-19 pandemic has had a profound impact on not only the global economy but also individual family's financial situation. (96) The global economic downturn has led people into jobless condition in following of COVID-19 precaution measures; closure of factories, restrictions of transportation, stay at home measures and so on. Based on this study result, more than half of the participants assumed that financial support from government was insufficient during COVID-19 pandemic. Subsequently, this study shows that dissatisfaction on government financial support during COVID-19 pandemic is found significantly associated with exhibiting anxiety symptoms among health care staff. One systematic review and meta-analysis has reported that studies conducted in China, Italy, Turkey Spain and Iran have shown mutual finding that socioeconomic situation is one of the risk factors of heavier psychological burden. (97)

It has been known that in any biological disaster, fear and stigmatization are heightened, and health care professionals used to become a victim of the latter and

being the target of stigmatization, which is stressful.(56) During the outbreaks of infectious disease, health care personnel are often stigmatized by the people in their society by different way of discriminations including being avoided, feared, shunned or ostracized due to public fear that they see medical staff as infection carriers. (98, 99) Likewise, this study shows that of which stigmatized participants, the majority of them were being accused of carrier of virus, follow by being threatened, and being asked to leave from their rented residence. Moreover, other ways of discriminations like shunning, avoidance, not selling goods, mocking, and not hiring taxi have been notably experienced by health care personnel in Yangon region.

In the same way, during the outbreak of Ebola and SARS epidemics, considerable stigmatizations along with loneliness and loss of trust within communities had been experienced. (100) Correspondingly, the finding of this study unveils that nearly one third of health care personnel experienced COVID-19 related stigmas which significantly affected on both depression and anxiety. In support of evidence from other countries, where health workers facing stigma during COVID-19 were found to have more burnout, fatigue and adverse mental condition. (17, 57) In the meantime, of struggling with new challenges and a great work stress in work, being stigmatized by the public may drive them to enhance rising the adverse psychological effects.

Unlike other studies, some particular variables that are mostly found significant association in other studies including sex(female), work-role, working-hours, presence of underlying medical condition and mental health problem, presence of elderly, and marital status are not found association in this study. Several reasons might have behind. However, to the best of researcher's knowledge, one of the possible reasons would be that by the time of data collection, Myanmar civilian including health care personnel might be equally suffering detrimental effects of military coup both physically and mentally across the country. Due to the political violence, most of health care functions and institutions were temporary closed and health care staffs also have briefly withdrawn from work. This catastrophic political effect may confound on each of the study outcomes and as well on factors association in this study.

In summary, in this study, 12-sociodemographic characteristics, 2- predisposing factors and 10- work related characteristics were included as hypothesized factors for developing mental health outcomes among health care personnel during COVID-19 pandemic situation. Among those predictive factors, this study has proven that experience of loss of loved one, experience of stigma, being tested COVID-19 positive, and insufficient financial support from government showed strongly associated with experiencing negative mental outcomes while presence of children in family has shown negatively associated with study outcomes.

5.2. Conclusion

The fallout from COVID-19 has had a profound impact on every facet of human life, producing both physically and mentally strained especially to those vulnerable population. In the face of the COVID-19 patients, health care personnel are under unprecedented tremendous mental distress. Therefore, it becomes necessary to research urgently to explore and solve the needs of health care staff.

During the COVID-19 outbreak, many studies has proven that factors such as sociodemographic, predisposing and work- related characteristics influenced on mental status of the health care professionals. This study not only examined mental health outcomes of health care personnel by quantifying level of depression, anxiety and stress but also identified the associated factors for each study outcomes during the COVID-19 pandemic in Yangon region Myanmar using cross-sectional data collected from online google form.

The study applied descriptive statistics and logistic regression model to find out the important variable related to COVID-19 related mental outcomes. The study finding revealed a significant proportion of depression, anxiety and stress symptoms (15.5%, 17.9% and 8.9%) were prevalent among HCP during COVID-19 pandemic. Moreover, experienced of loss of loved one, being experienced of stigma, insufficient government financial support, and being tested COVID-19 positive were significantly associated with higher chance of exhibiting depression, anxiety and stress. An additional result is that among health care personnel those living with children were found less likely to suffer from anxiety in comparison with those without children in the family which is contradict to the findings from some existing studies.

Finally, the result of the study provide evidence that can be applied by policy makers for making preparation and in implementing necessary interventions for preventing mental distress of health care personnel during prolong pandemic and as well for the future outbreak of similar nature. Despites the contribution made by this study to figure out the mental health status of health care staff, there are limits which call for future research to validate this result.

5.3. Recommendation

Base on the study result, it was found that health care personnel from epicenter region Yangon were suffering considerate level of depression, anxiety and stress which are comparable to the other countries.

In look back to the first wave of COVID-19, Myanmar responded early to the impending COVID-19 breakout with the establishment of the Inter-Ministerial Working Committee a few days before the World Health Organization (WHO) declared it as a global health emergency. This was followed by the setting up of the National Central Committee to prevent, control and treat COVID-19, intended at smoothing out and fast-tracking activities at the central level such as case investigation and management, providing community awareness and disseminating updates regarding the pandemic, and securing funding, procurement of essential medicine and equipment in time. Although this may be considered as a timely and bold move by a developing country, concerns were raised with such a centralized command and control approach. Despite taking a quick actions and preparation, the second wave of COVID-19 has hit greatly on both the civilian and health care system.

Furthermore, unlike the second wave, since at the end of May 2021, the third wave has been approaching in the midst of political crisis in Myanmar while many of hospitals, charity- based quarantine centers, and temporary COVID-19 centers has stopped functioning. Additionally, large numbers of Myanmar citizens including health care staff have been committed in the Civil Disobedience Movement, in believing peaceful protest is the best way to avoid a politically and economically disastrous slide back into military dictatorship, and to get back on the right track of Myanmar democracy. In such a challenging and deteriorating situation, the effects of COVID-19 third wave could enormously intensify on the adverse mental condition of

the health care professionals eventually. Therefore, based on this study, the following interventions are suggested to be taken into consideration to promote the mental well-being of health care personnel and prevent them from being mentally strained and distressed during ongoing prolonged pandemic.

Firstly, since the study found stigmatization as a significant risk factor for developing negative mental outcomes, government should take the initiatives on reduction of stigma among health care staff working in COVID-19 management, through the mobilization of mass media and community engagement strategy. For those who stay in rented hostel, provision should also be made for alternative accommodation in close proximity to the assigned hospital which may help reduce the stigma experienced by health care personnel at their residence and the community. This might also lessen the guilt and concerns of being a potential virus carrier and exposing to the family members to infection among health care staff. Moreover, legislation or strict measure against stigmatization should be imposed in some serious condition such as forcing health care workers to leave rented hostel or threatening and assault. Innovative technologies such as interactive mobile apps to support mental wellbeing can be developed and tested for effectiveness in future experimental studies.

Secondly, online-based psychosocial support and counselling through telephone including fast track referral pathways to those requiring psychological and psychiatric care should be encouraged for health care personnel in order to cope with adverse mental outcomes and to enable them to carry on with the highest quality of patient care to win the battle against this epidemic.

Thirdly, since the salary of the government health care staff is relatively lower than that of INGO staff and company staffs, comprehensive support system should be arranged. During this crisis situation, government should provide additional financial support and compensation above normal salaries to health care professional. In addition, other support measure such as free transport, accommodation, and child care facilities should also be included during pandemic crisis.

Fourthly, competency on professional skill is one of the important assets for health care workers especially in the time of emergency or crisis. Incompetency in professional practice brings lots of consequences including adverse mental outcomes

as discussed before. Therefore, training on COVID-19 management must be provided to every health care staff before deploy to job setting especially to those with fewer working services.

Finally, according to data obtained, more than half of the medical personnel have to work in prolong work shift during pandemic. The working hours and duty shift should also need to be justified to prevent health care workers from prolong exposure to infection, exhaustion and also from getting stressed.

In conclusion, it is necessarily important to evaluate the impact of these initiatives to inform strategies for delivering an effective crisis response in the future. In addition, the mental health and well-being of health workers should be routinely assessed both during the crisis and after. Beyond the crisis period, providing appropriate long-term mental health support, adequate salaries and other compensation should be measures for further evaluation as core components of developing a sustainable health workforce. Plus, importantly, as this study was conducted during the atrocious political crisis in Myanmar, this situation might have affected on each of the mental outcomes. Therefore, the predictions should be interpreted with caution, as associations and not implying causation. Thus, future study is suggested to perform a follow-up on this sample in order to validate this finding.

5.4 Limitation of the study

Since this study use of judgmental sampling as snowball method and collect data from only an outbreak region, generalizability of the study may be weak. However, the result of the study could be a representative of pandemic effect since Yangon was the most widespread COVID-19 outbreak region in Myanmar.

Due to the unexpected current political violence in Myanmar, most of the hospitals and COVID-19 centers has temporary stopped functioning and some of health care personnel have been detained. Moreover, most of health care workers were committed in Civil Disobedience Movement (CDM), and are hiding from work because of being threaten of detention. (<https://www.frontiermyanmar.net/en/striking-health-staff-boycott-covid-19-jabs-as-the-cdm-grows/>) In this scenario, other sampling method could not be feasible to be applied.

In addition, internet accessibility has dropped dramatically and unstable since February 2021, the political violence started. Internet connectivity has shutdown including mobile and wireless internet which is the only available internet for most of the people in the country. Currently, cable internet and some mobile operator internets are available to some extent. This situation may contribute to selection bias as those health workers without internet access, older health worker and hiding health care staff could not participate in the study. Moreover, there might be respondent bias as it is self-reported by health care personnel and based on a subjective scale.

In this study, although the history of taking treatment for mental health condition was included, the specific type of mental illness was not asked which may or may not have affected on the study mental. Additionally, family income of the health care personnel was also not identified which was literally related to the sufficiency of government financial support. Another concern is the over-representation of sex (female) and particular profession but in this study comparison between groups were not done.

In addition to this, since the study was cross-sectional data, it may not control for unobserved heterogeneity among the participants. Plus, importantly, as this study was conducted during the atrocious political crisis in Myanmar, this situation might have confounded on each of the mental outcomes.

5.5. Strength of the study

Although the study has its own limitations, it provides early evidence on the mental health status of health care personnel during the COVID-19 pandemic in Myanmar. The research findings of this study could help policymakers and health officials, in developing and establishing both immediate actions and long – term strategic plans in managing mental wellbeing of health care personnel during COVID-19 pandemic and any future crisis of similar nature. Besides, the result of the study population can be used for comparison between future study of any vulnerable groups.

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Appendix A

Content Validity

Indexes of Item-objective Congruence: IOC

Content validity of the questionnaires are provided by three experts.

1. Assoc. Prof Ratana Somrongthong, Ph.D. College of Public Health Sciences. Chulalongkorn University.
2. Asst. Prof. Naowarat Kanchankhan, Ph.D : College of Public Health Sciences. Chulalongkorn University.
3. Dr. Nipunorn Voramongkol, M.D. MPH. College of Public Health Sciences. Chulalongkorn University.

IOC (item-objective congruence) – content experts rate items regarding how well they do or do not tap the established objectives. The rating are as follows.

+1 = item clearly taps the study objective

0 = uncertain or questionable

-1 = item clearly does not tap objective

And bring the information from the expert's consideration and calculate the Indexes of Item-Objective Congruence: IOC value from the formula.

$$\text{IOC} = \frac{\Sigma R}{N}$$

ΣR The sum of the points from the expert's consideration

N Number of experts

In order to validating the questionnaires, three experts scored the questionnaire as IOC and summed up and divided by three. The score is ranging from -1 to +1. Interpret IOC manually. The criteria for determining the IOC value, if the value is 0.50 or higher, indicates that the question is measured at the purpose. Or exactly that content, indicating that the question is valid.

IOC Score Table

No.	Part.1 Sociodemographic factors	Expert 1	Expert 2	Expert 3	IOC	Result
Q.1.1	Name of Hospital and Township	1	1	1	1	Agree
Q.1.2	What is your age?	1	1	1	1	Agree
Q.1.3	Sex	1	1	1	1	Agree
Q.1.4	Religion	1	1	1	1	Agree
Q.1.5	Highest completed level of Education	1	1	1	1	Agree
Q.1.6	What is your occupation?	1	1	1	1	Agree
Q.1.7	What is your marital status?	1	1	1	1	Agree
Q.1.8	What kind of family type do you belong?	1	1	1	1	Agree
Q.1.9	Accommodation	1	1	1	1	Agree
Q.1.10	Presence of children (under 14 years of age) in family	1	0	1	0.66	Agree
Q.1.11	Presence of elderly (over 60 years of age) in family	1	0	1	0.66	Agree
Q.1.12	Presence of family member who has chronic disease that has been diagnosed by medical doctor (such as diabetes, hypertension, heart failure, cancer, COPD, Kidney disease, e.t.c)	1	1	1	1	Agree
Q.1.13	Do you currently suffer from any of these diseases that has been diagnosed by medical doctor? (Obesity, Arterial Hypertension, another heart disease, Diabetes Cancer, Immune Disease)	1	1	1	1	Agree
CODE	Part 2: Predisposing Factors					
Q.2.1	Do you have any history of receiving treatment for mental health condition?	1	1	0	0.66	Agree
Q.2.2	In the past month, have you experienced loss of your loved one? (friend, spouse, family member, etc.,)	1	1	1	1	Agree

CODE	Part 3: Work- related Characteristics					
Q.3.1	What is your role participate in treating, diagnosing and caring of COVID-19 patients?	1	1	0	0.66	Agree
Q.3.2	Total years of government service	1	0	1	0.66	Agree
Q.3.3	How do you perceive availability of PPE (Personal Protective Equipment) supply from government during COVID-19 pandemic?	1	1	1	1	Agree
Q.3.4	Have you ever experienced of being stigmatized or discriminated against as a health care personnel due to the COVID-19 pandemic?	1	1	1	1	Agree
Q.3.5	Types of Stigmatization or discrimination.	1	1	1	1	Agree
Q.3.6	How many working hours are you requested to work in a shift during COVID-19 pandemic?	1	1	1	1	Agree
Q.3.7	How do you perceive on receiving government financial supports during COVID-19 pandemic?	1	0	1	0.66	Agree
Q.3.8	Have you received specific training on precaution, diagnosing, treating and caring of COVID-19 patients and suspected patient?	1	1	1	1	Agree
Q.3.9	Have you ever been tested for COVID-19 during providing care in COVID-19 pandemic?	1	1	1	1	Agree
Q.3.10	If so, have you got tested positive or negative?	1	1	1	1	Agree

Appendix B

Questionnaires

Data Collection Form

**Mental Health impact among health care workers from government hospitals
during COVID-19 pandemic situation in Yangon, Myanmar.**

No	Question	Responses	Code	Remark
Sociodemographic Characteristics				
1	Name of Hospital and Township			
2	Age		---- Years	
3	Sex	- Male - Female	1 2	
4	Religion	- Buddhist - Islam - Christian - Hindu - Other	1 2 3 4 5	
5	Highest completed level of Education	- Diploma - Graduate (Bachelor) - Master Degree - Ph.D - Other	1 2 3 4 5	

6	Occupation	<ul style="list-style-type: none"> - Nurse - Lab-Technician - Doctor 	<p>1</p> <p>2</p> <p>3</p>	
7	Marital Status	<ul style="list-style-type: none"> - Single - Currently married - Divorce/Separated - Widow/widower 	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	
8	Family Type	<ul style="list-style-type: none"> - Alone - Nuclear - Extended family - Joint family 	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	
8	Accommodation	<ul style="list-style-type: none"> - Home - Rented Hostel - Staff-house - Other 	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	
9.	Presence of children (under 14 years of age) in family	<ul style="list-style-type: none"> - Yes - No 	<p>1</p> <p>2</p>	
10.	Presence of elderly (over 60 years of age) in family	<ul style="list-style-type: none"> - Yes - No 	<p>1</p> <p>2</p>	

11.	Presence of family member who has chronic disease that has been diagnosed by medical doctor. (such as diabetes, hypertension, heart failure, cancer, COPD, Kidney disease, e.t.c)	- Yes - No	1 2	
12	Do you currently suffer from any of these diseases that has been diagnosed by medical doctor? (Obesity, Arterial Hypertension, another heart disease, Diabetes Cancer, Immune Disease)	- Yes - No	1 2	
No	Question	Responses	Code	Remark
		Predisposing Factors		
1	Do you have any history of receiving treatment for mental health condition?	- Yes - No	1 2	
2	In the past month, have you experienced loss of your loved one? (friend, spouse, family member, etc.,)	- Yes - No	1 2	
No	Question	Responses	Code	Remark
		Work- related Characteristics		

1	What is your role participate in treating, diagnosing and caring of COVID-19 patients?	<ul style="list-style-type: none"> - Front-line (You have participated directly in treating and caring with COVID-19 positive patients at isolation ward in hospital or COVID-19 centers.) - Second Line (You have participated in the general health care setting including outpatient department (OPD) and other respective specialty care ward.) 	1 2	
2	Total years of government service		----- yrs	
3	How do you perceive availability of PPE (Personal Protective Equipment) supply from government during COVID-19 pandemic?	<ul style="list-style-type: none"> - Completely sufficient - Sufficient - Insufficient - Very insufficient 	1 2 3 4	
4.	Have you ever experienced of being stigmatized or discriminated against as a health care personnel due to the COVID-19 pandemic?	<ul style="list-style-type: none"> - Yes - No 	1 2	<p>If you answer “Yes”, go to No (5)</p> <p>If you answer “No” go to No (6)</p>

5	Types of Stigmatization or discrimination	<ul style="list-style-type: none"> - Being threatened - Being accused of a carrier of virus due to profession - Being asked to leave rented place. - Other 	1 2 3 -----	
6.	How many working hours are you requested to work in a shift during COVID-19 pandemic?	-	---- hours	
7.	How do you perceive on receiving government financial supports during COVID-19 pandemic?	<ul style="list-style-type: none"> - Completely sufficient - Sufficient - Insufficient - Very insufficient 	1 2 3 4	
8	Have you received specific training on precaution, diagnosing, treating and caring of COVID-19 patients and suspected patient?	<ul style="list-style-type: none"> - Yes - No 	1 2	
9	Have you ever been tested for COVID-19 during providing care in COVID-19 pandemic?	<ul style="list-style-type: none"> - Yes - No 	1 2 3	If “ Yes” please go to No.10 question.
10	If so, Have you got tested positive or negative?	<ul style="list-style-type: none"> - Positive - Negative 	1 2	

DASS-21

Please read each statement and select a number 0,1,2,3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follow:

0 Do not apply to me at all
 1 Applied to me to some degree, or some of the time
 2 Applied to me to a considerable degree or a good part of time
 3 Applied to me very much or most of the time

No	Description	Response			
1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (e.g., in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Data Collection Form
ကိုဗစ်-၁၉ ကပ်ရောဂါကာလအတွင်း ကျန်းမာရေး ဝန်ထမ်းများ
စိတ်ပိုင်းဆိုင်ရာဖိစီးမှုများကို လေ့လာသောသုတေသန



စဉ်	မေးခွန်း	အဖြေ	ကုဒ်	မှတ်ချက်
အခြေခံ အချက်အလက်များ				
၁။	ပြည်နယ်/ တိုင်းဒေသကြီးနှင့် ဆေးရုံအမည်			
၂။	အသက် (ပြည့်ပြီးသောအသက်)	-----နှစ်		
၃။	ကျား/ မ	- ကျား - - မ -	၁ ၂	
၄။	ကိုးကွယ်သည့်ဘာသာ	- ဗုဒ္ဓဘာသာ - မွတ်စလင် ဘာသာ - ဟိန္ဒူဘာသာ - ခရစ်ယာန် ဘာသာ - အခြား	၁ ၂ ၃ ၄ ၅	
၅။	အမြင့်ဆုံး ရရှိသော ပညာအရည်အချင်း	- ဒီပလိုမာ - - ဘွဲ့ရ (Bachelor) - မဟာဘွဲ့ (M.Sc) - ပါရဂူဘွဲ့. (Ph.D) - အခြား	၁ ၂ ၃ ၄	
၆။	အလုပ်အကိုင်	- သူနာပြု - - ဓါတ်ခွဲကျွမ်းကျင်- - ဆရာဝန်	၁ ၂ ၃	
၇။	အိမ်ထောင်ရှိ/ မရှိ (Marital Status)	- အိမ်ထောင်မရှိ (Single) - အိမ်ထောင်ရှိ(Married) - အိမ်ထောင်ကွဲ (separated) - မှဆိုးဖို/မှဆိုးမ ((Window/Windower)-	၁ ၂ ၃ ၄	
၈။	အတူနေမိသားစု အမျိုးအစားကို ဖော်ပြပါ။ (Family Type)	- တဦးတည်းနေထိုင်သည် (living alone)- - မိသားစုတခုတည်းနေသည်။	၁ ၂	

		<p>(Nuclear dyad)</p> <ul style="list-style-type: none"> - အဖိုးအဖွား၊ ဦးလေးအဒေါ် <p>အဖေအမေ မောင်နှမ၊</p> <p>သားသမီးများနှင့် စုပေါင်း</p> <p>နေထိုင်သည်။ (Extended</p> <p>Family)</p> <ul style="list-style-type: none"> - မိသားစုနှစ်ခုနှင့် အထက်အတူ <p>နေထိုင် (Joint family)</p>	၃	
			၄	
၉။	အတူနေ မိသားစုတွင် အသက်(၁၂) အောက်ကလေးများရှိပါသလား	<ul style="list-style-type: none"> - ရှိ - - မရှိ - 	၁	J
၁၀။	အတူနေ မိသားစုတွင် အသက် (၆၀)နှစ် အထက်လူကြီး ရှိပါသလား	<ul style="list-style-type: none"> - ရှိ - - မရှိ - 	၁	J
၁၁။	မိသားစုတွင် ဆရာဝန်စမ်းသပ် အတည်ပြုထားသော နာတာရှည်ရောဂါ (ဆီးချို၊ သွေးတိုး၊ နှလုံးရောဂါ၊ အဆုတ်ရောဂါ၊ ကင်ဆာ၊ ကျောက်ကပ်ရောဂါ) စသည့် ရောဂါတစ်ခုခု ခံစားနေရသူ ရှိပါသလား	<ul style="list-style-type: none"> - ရှိ - မရှိ - 	၁	J
၁၂။	သင်သည် ဆရာဝန် စမ်းသပ် အတည်ပြုထားသော နာတာရှည် (Chronic Diseases) (ဆီးချို၊ သွေးတိုး၊ နှလုံးရောဂါ၊ အဆုတ်တီဘီ၊ ကျောက်ကပ်ရောဂါ၊ ကင်ဆာ စသည်...)ရောဂါတစ်ခုခု ခံစားနေပြီး ဆေးဝါးကုသမှု ခံယူနေသူ ဟုတ်ပါသလား။	<ul style="list-style-type: none"> - ဟုတ်ပါသည် - မဟုတ်ပါ 	၁	J

၁၃။	နေရာထိုင်ခင်းပုံစံ	<ul style="list-style-type: none"> - အိမ် (Home) - အငှားဆောင် (rented hostel) - ဝန်ထမ်းအိမ်ရာ (Staff – house) - အခြား 	၁ ၂ ၃ ၄	
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Predisposing Factor (ဖြစ်စေရန်တွန်းအားပေးသော သုတေသနဆိုင်ရာအချက်အလက်များ)				
၁။	သင်သည် စိတ်ကျန်းမာရေး ပြဿနာ နှင့် ပတ်သက်၍ ဆေးဝါးကုသမှု ခံယူခဲ့ဖူးခြင်း ရှိပါသလား။	<ul style="list-style-type: none"> - ရှိ - - မရှိ - 	၁ ၂	
၂။	သင်သည် လွန်ခဲ့သော တစ်လတွင် မိသားစုဝင်တစ်ဦးဦး (သို့) ချစ်သူ (သို့) ချစ်ခင်ရသော သူငယ်ချင်း၊ မိတ်ဆွေ တဦးဦး ဆုံးပါးမှုနှင့် ကြုံတွေ့ခဲ့ ရပါသလား။	<ul style="list-style-type: none"> - ကြုံတွေ့ခဲ့ပါသည် - - မကြုံတွေ့ခဲ့ပါ 	၁ ၂	

Work-related Characteristics (လုပ်ငန်းခွင်ဆိုင်ရာ သုတေသနအချက်အလက်များ)				
၁။	သင်သည် COVID-19 ကုသ ကာကွယ်ရေးလုပ်ငန်းတွင် မည်သည့် အခန်းကဏ္ဍ၌ ပါဝင်ခဲ့ပါသနည်း။	<ul style="list-style-type: none"> - ရှေ့တန်း (Front- line) (COVID-19 positive or suspected) လူနာများအား တိုက်ရိုက် စမ်းသပ်ခြင်း, စစ်ဆေးခြင်း, (သို့) ကုသပေးရသောနေရာ -isolation ward, COVID-19 centre, Fever Clinic, OPD စသည့်နေရာ) တွင်လုပ်ဆောင်ခဲ့ပါသည်။ - ဒုတိယအတန်း (Second line) COVID-19 Pandemic ကာလ၌ 	၁ ၂	

		အထွေထွေ ရောဂါကုဆေးရုံများတွင် ပြင်ပလူနာဌာန OPD အပါအဝင် အခြား လူနာဆောင်များတွင် ပါဝင်လုပ်ဆောင်ခဲ့ပါသည်။		
၂။	အစိုးရဝန်ထမ်းလုပ်သက် နှစ်စုစုပေါင်း		--- - နှစ်	
၃။	သင်၏ လုပ်ငန်းခွင်၌ COVID- 19 လူနာများအား ပြုစုကုသမှုပေးရာတွင် ရောဂါကူးစက်မှုမှာ ကာကွယ်နိုင်စေရန် အကာအကွယ်ပစ္စည်း (PPE – Personal Protective Equipment) နှင့် အခြားအကာအကွယ်ပစ္စည်း အထောက်အပံ့ အစိုးရထံ မှ လုံလောက်စွာ ရရှိပါသည်။	- အလွန်သဘောတူပါသည်။ - သဘောတူပါသည်။ - သဘောမတူပါ။ - အလွန်သဘောမတူပါသည်။	၁ ၂ ၃ ၄	
၄။	သင်သည် COVID-19 လူနာများအား ပြုစုကုသမှုပါဝင်ခြင်းကြောင့် (သို့) ကျန်းမာရေးဝန်ထမ်းဖြစ်ခြင်း ကြောင့် ရပ်ကွက်နေ ပြည်သူလူထုအချို့ထံမှ ခွဲခြား ဆက်ဆံခံရခြင်း ကြုံခဲ့ဖူးပါသလား	- ကြုံခဲ့ဖူးပါသည်။ - မကြုံခဲ့ဖူးပါ။	၁ ၂	မေးခွန်း (၅) ဆက်ဖြေရန် မေးခွန်း (၆) ဆက်ဖြေရန်

၅။	ခွဲခြား ဆက်ဆံခံရသည့်ပုံစံ	<ul style="list-style-type: none"> - ကျန်းမာရေးဝန်ထမ်းဖြစ်၍ ခြိမ်းခြောက်ခံရခြင်း - COVID-19 ရောဂါပိုးသယ်ဆောင်သူဟု စွပ်စွဲခံရခြင်း - ဆေးရုံဝန်ထမ်းဖြစ်သော ကြောင့် မိမိငှားနေသောအဆောင် မှ နှင်ထုတ်ခံရခြင်း - အခြား... သူ ဟု စွပ်စွဲပြီး ဖယ် ကျဉ် ခံရခြင်း 	၁ ၂ ၃ ၄	
၆။	COVID-19 ကာလတွင် သင်၏ တစ်နေ့တာ ပျမ်းမျှအလုပ်ချိန် မည်မျှရှိပါသနည်း။		---- နာ ရီ	
၇။	သင်သည် COVID-19 ကာလအတွင်း အစိုးရထံမှ အထောက်အပံ့နှင့် ငွေကြေးလက်ခံရရှိမှုအပေါ် လုံလောက်သည်ဟု ယူဆပါသည်။	<ul style="list-style-type: none"> - အလွန်သဘောတူပါသည်။ - သဘောတူပါသည်။ - သဘောမတူပါ။ - အလွန်သဘောမတူပါသည်။ 	၁ ၂ ၃ ၄	
၈။	COVID-19 ကာကွယ်ကုသရေး လုပ်ငန်းနှင့် ပတ်သက်၍ သင်တန်းတစ်ခုတစ်ရာ တက်ရောက်ခဲ့ရပါသလား။	<ul style="list-style-type: none"> - တက်ရောက်ခဲ့ရပါသည်။ - မတက်ရောက်ခဲ့ရပါ။ 	၁ ၂	
၉။	သင်သည် တာဝန်ထမ်းဆောင်နေ စဉ်တွင် COVID-19 ရောဂါစစ်ခံရဖူးပါသလား။	<ul style="list-style-type: none"> - စစ်ခံရဖူးပါသည်။ - စစ်မခံရဖူးပါ။ 	၁ ၂	စစ်ခံရဖူးပါလျှင် မေးခွန်း နံပါတ် ၁၀ ကို ဆက်လက်ဖြေဆိုပါ
၁၀	စစ်ဆေးမှု အဖြေကို ဖော်ပြပါ	<ul style="list-style-type: none"> - COVID-19 ပိုးတွေ့ရှိ။ - COVID-19 ပိုးမတွေ့ရှိ။ 		

“စိတ်ကျခြင်း၊ စိုးရိမ်ခြင်း၊ စိတ်ဖိစီးခြင်း ဆန်းစစ်လွှာ”					
<p>ဤဆန်းစစ်လွှာတွင် ဖော်ပြထားသောအချက်များကို သေချာစွာဖတ်ပြီးလျှင် လွန်ခဲ့သော ရက်သတ္တပတ် တစ်ပတ် အတွင်း သင်ခံစားခဲ့ရမှုများနှင့် ကိုက်ညီသောအခြေအနေအတိုင်း၊ အမှန်စဉ် “ဝ”၊ “၁”၊ “၂” သို့မဟုတ် “၃” တစ်ခုခုကို ရွေးချယ်ပြီး ဝိုင်းပေးပါ။</p> <p>အဖြေမှန်၊ အဖြေမှား ဟူ၍ မရှိပါ။ အချိန်ကြာမြင့်စွာ မစဉ်းစားပါနှင့်။</p> <p>အမှန်စဉ် “ဝ”၊ “၁”၊ “၂” သို့မဟုတ် “၃” ၏ သတ်မှတ်ချက်မှာ အောက်ပါအတိုင်းဖြစ်သည်။</p> <ul style="list-style-type: none"> - “ဝ”၊ ကျွန်ုပ်နှင့် လုံးဝ မသက်ဆိုင်ပါ။ - “၁” ၊ အနည်းငယ်ခံစားရပါသည်။ သို့မဟုတ်၊ တစ်ခါတစ်ရံ ခံစားရပါသည်။ - “၂” ၊ အတော်အတန် ခံစားရပါသည်။ သို့မဟုတ်၊ အချိန်တော်တော် ခံစားရပါသည်။ <p>“၃” ၊ အလွန်ခံစားရပါသည်။ သို့မဟုတ်၊ အချိန်တိုင်းလိုလို ခံစားရပါသည်။</p>					
စဉ်	အကြောင်းအရာ	အဖြေ			
၁	ကျွန်ုပ်သည် စိတ်အေးလက်အေး မနေနိုင်ခဲ့ပါ။	ဝ	၁	၂	၃
၂	ကျွန်ုပ်သည် အာခေါင် ခြောက်နေတတ်သည်ကို သတိထားမိခဲ့သည်။	ဝ	၁	၂	၃
၃	ကျွန်ုပ်သည် စိတ်ပျော်ရွှင်ကျေနပ်မှုများ လုံးဝ မခံစားခဲ့ရဟု ထင်မိသည်။	ဝ	၁	၂	၃
၄	ကျွန်ုပ်သည် အသက်ရှူရခက်ခဲသလို (ကိုယ်လက်လှုပ်ရှားမှု မပြုလုပ်ဘဲ၊ အသက်ရှူမြန်လွန်းနေသလို၊ အသက်ရှူ မဝသလို) ခံစားခဲ့ရသည်။	ဝ	၁	၂	၃
၅	ကျွန်ုပ်သည် လုပ်ဆောင်ရမည့်ကိစ္စများကို ကိုယ်တိုင်အစပြု လုပ်ဆောင်ရန် ခက်ခဲသည်။	ဝ	၁	၂	၃
၆	ကျွန်ုပ်သည် အခြေအနေကိစ္စရပ်များကို လိုအပ်သည်ထက် ပို၍တုံ့ပြန်လိုခဲ့ မိသည်။	ဝ	၁	၂	၃
၇	ကျွန်ုပ်သည် တုန်တုန်ယင်ယင် ခံစားခဲ့ရသည်။ (ဥပမာ ၊ လက်တုန်ခြင်း)	ဝ	၁	၂	၃
၈	ကျွန်ုပ်သည် စိတ်လှုပ်ရှားပြီး စိတ်အင်အား၊ ကိုယ်အင်အား များစွာ စိုက်ထုတ်ရသည်ဟု ခံစားခဲ့ရသည်။	ဝ	၁	၂	၃
၉	ကျွန်ုပ်သည် အလွန်အမင်း ကြောက်ရွံ့သွားပြီး၊ စိတ်လွတ်၍ အဆင်အခြင်မဲ့ပြုမှု လိုက်မည်ကို စိုးရိမ်နေခဲ့မိသည်။	ဝ	၁	၂	၃

၁၀	ကျွန်ုပ်သည် မျှော်လင့်ဖွယ်ရာ လုံးဝမရှိတော့ဟု ခံစားခဲ့ရသည်။	၀	၁	၂	၃
၁၁	ကျွန်ုပ်သည် စိတ်ဂဏာမငြိမ် ဖြစ်လွယ်နေခဲ့သည်။	၀	၁	၂	၃
၁၂	ကျွန်ုပ်သည် စိတ်ကို ဖြေလျှော့ရန် ခက်ခဲခဲ့သည်။	၀	၁	၂	၃
၁၃	ကျွန်ုပ်သည် စိတ်ပျက်အားလျော့သလို၊ စိတ်ညှိုးငယ်သလို ခံစားခဲ့ရသည်။	၀	၁	၂	၃
၁၄	ကျွန်ုပ်သည် လုပ်ဆောင်နေသည့်ကိစ္စများ ရှေ့ဆက်မရအောင် ဟန့်တားမှုမှန် သမျှကို သည်းမခံ နိုင်ခဲ့ပါ။	၀	၁	၂	၃
၁၅	ကျွန်ုပ်သည် ရုတ်တရက်အလွန်အမင်း ကြောက်လန့်သလို ဖြစ်လှနိုးပါး ခံစားခဲ့ရသည်။	၀	၁	၂	၃
၁၆	ကျွန်ုပ်သည် မည်သည့်အရာကိုမျှ တက်တက်ကြွကြွ မရှိခဲ့ပါ။	၀	၁	၂	၃
၁၇	ကျွန်ုပ်သည် ကိုယ့်ကိုယ်ကို တန်ဖိုး မရှိသူတစ်ယောက်ကဲ့သို့ ခံစားခဲ့ရသည်။	၀	၁	၂	၃
၁၈	ကျွန်ုပ်သည် စိတ်ဆတ်လွယ်လည်သည်ဟု ခံစားခဲ့ရသည်။	၀	၁	၂	၃
၁၉	ကျွန်ုပ်သည် ကိုယ်လက်လှုပ်ရှားမှုမရှိဘဲ နှလုံးခုန်မြန်ခြင်း၊ နှလုံးခုန်မမှန်ခြင်း များကို သတိပြုမိခဲ့သည်။	၀	၁	၂	၃
၂၀	ကျွန်ုပ်သည် အကြောင်းပြချက် ကောင်းကောင်းမရှိဘဲ ထိတ်လန့် နေတတ်ခဲ့သည်။	၀	၁	၂	၃
၂၁	ဘဝသည် အဓိပ္ပါယ် မရှိဟု ကျွန်ုပ်ခံစားခဲ့ရသည်။	၀	၁	၂	၃

Appendix C

Ethical Approval Document



AF 02-12
The Research Ethics Review Committee for Research Involving Human Research
Participants, Group I, Chulalongkorn University
Jamjuree 1 Building, 2nd Floor, Phayathai Rd., Patumwan district, Bangkok 10330, Thailand,
Tel: 0-2218-3202, 0-2218-3049 E-mail: eccu@chula.ac.th

COA No. 141/2021

Certificate of Approval

Study Title No. 094.1/64 : IMPACT OF COVID-19 PANDEMIC ON MENTAL HEALTH OF
HEALTH CARE PERSONNEL FROM GOVERNMENTAL HOSPITALS
IN YANGON REGION, MYANMAR

Principal Investigator : MS. ZA MAE NIN SAR AUNG

Place of Proposed Study/Institution : College of Public Health Sciences,
Chulalongkorn University

The Research Ethics Review Committee for Research Involving Human Research
Participants, Group I, Chulalongkorn University, Thailand, has approved constituted in accordance
with Belmont Report 1979, Declaration of Helsinki 2013, Council for International Organizations of
Medical Sciences (CIOM) 2016, Standards of Research Ethics Committee (SREC) 2017, and National
Policy and guidelines for Human Research 2015.

Signature: Prida Tasanapradit
(Associate Prof. Prida Tasanapradit, M.D.)
Chairman

Signature: Raveenan Mingpakane
(Assistant Prof. Raveenan Mingpakane, Ph.D.)
Secretary

Date of Approval : 11 June 2021

Approval Expire date : 10 June 2022

The approval documents including:

- 1) Research proposal
- 2) Participant Information Sheet and Consent Form
- 3) Researcher
- 4) Questionnaire



Protocol No. 094.1/64
Date of Approval 11 JUN 2021
Approval Expire Date 10 JUN 2022

The approved investigator must comply with the following conditions:

1. It's unethical to collect data of research participants before the project has been approved by the committee.
2. The research/project activities must end on the approval expired date. To renew the approval, it can be applied one month prior to the expired date with submission of progress report.
3. Strictly conduct the research/project activities as written in the proposal.
4. Using only the documents that bearing the RECCU's seal of approval: research tools, information sheet, consent form, invitation letter for research participation (if applicable).
5. Report to the RECCU for any serious adverse events within 5 working days.
6. Report to the RECCU for any amendment of the research project prior to conduct the research activities.
7. Report to the RECCU for termination of the research project within 2 weeks with reasons.
8. Final report (AF 01-13) and abstract is required for a one year (or less) research/project and report within 30 days after the completion of the research/project.
9. Research project with several phases; approval will be approved phase by phase, progress report and relevant documents for the next phase must be submitted for review.
10. The committee reserves the right to site visit to follow up how the research project being conducted.
11. For external research proposal the dean or head of department oversees how the research being conducted.

VITA

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CHULALONGKORN UNIVERSITY