

Association between factors related and stress, depression and suicidal risk among
health care personnel during covid-19 second outbreak in Thailand



A Thesis Submitted in Partial Fulfillment of the Requirements
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ปัจจัยที่สัมพันธ์กับความเครียด ซึมเศร้า และความเสี่ยงฆ่าตัวตายของบุคลากรทางการแพทย์และ
สาธารณสุขในสถานการณ์การระบาดของโรคโควิด-19 รอบที่ 2 ในประเทศไทย



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บุคลากรทางการแพทย์และสาธารณสุขเป็นหนึ่งในผู้ที่ได้รับผลกระทบมากที่สุดในสถานการณ์การแพร่ระบาดของโรคโควิด-19 การศึกษานี้มีวัตถุประสงค์คือ เพื่อระบุความชุกของความเครียด ภาวะซึมเศร้า และความเสี่ยงในการฆ่าตัวตาย และหาความสัมพันธ์ระหว่างปัจจัยที่เกี่ยวข้องกับภาวะทางสุขภาพจิตดังกล่าว ของบุคลากรทางการแพทย์และสาธารณสุขในช่วงการระบาดของโรคโควิด-19 รอบที่ 2 ในประเทศไทย การศึกษานี้เป็นการศึกษาแบบภาคตัดขวาง ซึ่งใช้ข้อมูลทุติยภูมิที่รวบรวมระหว่างวันที่ 17 ธันวาคม 2563 ถึง 23 กุมภาพันธ์ 2564 มีบุคลากรทางการแพทย์และสาธารณสุขเข้าร่วมทั้งหมด 4,970 คน เครื่องมือที่ใช้ในงานวิจัยนี้คือ ST-5 9Q และ 8Q ใช้การวิเคราะห์การถดถอยโลจิสติกแบบพหุ เพื่อระบุความสัมพันธ์ระหว่างปัจจัยที่เกี่ยวข้องกับความเครียด ภาวะซึมเศร้า และความเสี่ยงในการฆ่าตัวตาย ความชุกของความเครียด ภาวะซึมเศร้า และความเสี่ยงในการฆ่าตัวตายของบุคลากรทางการแพทย์และสาธารณสุขในการศึกษานี้คือ 6.2%, 9.1% และ 2.5% ตามลำดับ ในการวิเคราะห์การถดถอยโลจิสติกแบบพหุ ความเครียด มีความสัมพันธ์อย่างมีนัยสำคัญกับบุคลากรที่อยู่ในพื้นที่จังหวัดกรุงเทพมหานคร [AdjOR=2.00, 95%CI(1.30-3.07)] กลุ่มเสี่ยงที่มีความเหนื่อยล้าจากการทำงาน [AdjOR=22.34, 95%CI(16.52-30.22)] และกลุ่มที่มีความเข้มแข็งทางจิตใจน้อยถึงปานกลาง [AdjOR=14.28, 95%CI(8.56-23.81)] และ AdjOR=3.96, 95%CI(2.76-5.68)] ภาวะซึมเศร้า มีความสัมพันธ์อย่างมีนัยสำคัญกับบุคลากรที่อยู่ในพื้นที่จังหวัดกรุงเทพมหานคร [AdjOR=1.80, 95%CI(1.25-2.59)] กลุ่มเสี่ยงที่มีความเหนื่อยล้าจากการทำงาน [AdjOR=10.86, 95%CI(8.53-13.83)] และกลุ่มที่มีความเข้มแข็งทางจิตใจน้อยถึงปานกลาง [AdjOR=22.41, 95%CI(14.54-34.53) and AdjOR=4.95, 95%CI(3.74-6.54)] ความเสี่ยงในการฆ่าตัวตาย มีความสัมพันธ์อย่างมีนัยสำคัญกับบุคลากรที่อยู่ในพื้นที่จังหวัดกรุงเทพมหานคร [AdjOR=2.80, 95%CI(1.43-5.50)] กลุ่มเสี่ยงที่มีความเหนื่อยล้าจากการทำงาน [AdjOR=7.14, 95%CI(4.66-10.92)] และกลุ่มที่มีความเข้มแข็งทางจิตใจน้อยถึงปานกลาง [AdjOR=34.07, 95%CI(16.66-69.68) and AdjOR=5.74, 95%CI(3.01-10.95)] นัยสำคัญของการศึกษาค้นคว้าพบว่า นอกจากปัจจัยภายในที่มีความสำคัญต่อภาวะสุขภาพจิตแล้ว ปัจจัยภายนอกก็มีความสำคัญที่อาจส่งผลต่อภาวะสุขภาพจิตด้วยเช่นกัน

สาขาวิชา สาธารณสุขศาสตร์
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Health care personnel are one of most affected by COVID-19 situation. The aim of this study was to identify the prevalence of stress, depression and suicidal risk and associated factors among health care personnel during COVID-19 second outbreak in Thailand. This study was cross-sectional study, which used secondary data collected during December 17, 2020 to February 23, 2021. Total of 4,970 health care personnel participated in this research. The instruments of this research were ST-5, 9Q and 8Q. Multivariable logistic regression analysis was performed to identify factors associated with stress, depression and suicidal risk outcomes. The prevalence of stress, depression and suicidal risk in this study was 6.2%, 9.1% and 2.5% respectively. In multivariable logistic regression analysis showed that stress were significantly associated with participants who live in zone 5 (Bangkok Province) [AdjOR=2.00, 95%CI(1.30-3.07)], who was risk group of burnout [AdjOR=22.34, 95%CI(16.52-30.22)] and who had low-moderate resilient quotient [AdjOR=14.28, 95%CI(8.56-23.81) and AdjOR=3.96, 95%CI(2.76-5.68)]. Depression was significantly associated with participants who live in zone 5 (Bangkok Province) [AdjOR=1.80, 95%CI(1.25-2.59)], who were risk group of burnout [AdjOR=10.86, 95%CI(8.53-13.83)] and who had low-moderate resilient quotient [AdjOR=22.41, 95%CI(14.54-34.53) and AdjOR=4.95, 95%CI(3.74-6.54)]. Suicidal risk was significantly associated with participants who live in zone 5 (Bangkok Province) [AdjOR=2.80, 95%CI(1.43-5.50)], who were risk group of burnout [AdjOR=7.14, 95%CI(4.66-10.92)] and who had low-moderate resilient quotient [AdjOR=34.07, 95%CI(16.66-69.68) and AdjOR=5.74, 95%CI(3.01-10.95)]. That showed implication of this study reveals that in addition to internal factors and external factors as well.

Field of Study: Public Health

Student's Signature

Academic Year: 2020

Advisor's Signature

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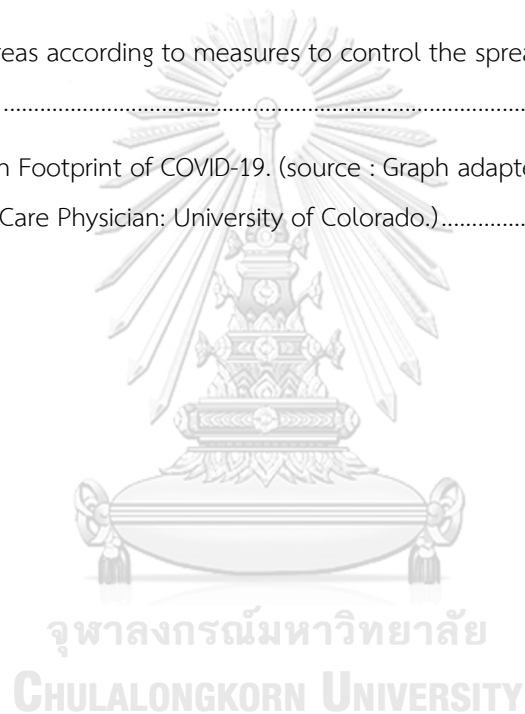


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CHAPTER 1

INTRODUCTION

1.1 Background and Rationale

In December 2019, the outbreak of a new virus was reported in Wuhan City, capital of Hubei Province, China (Zhou et al., 2020). This virus is the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which can cause the severe respiratory disease called coronavirus disease 2019 (COVID-19). The disease spread rapidly throughout China, then the rest of the world. On January 30, 2020, the World Health Organization (WHO) held a global emergency meeting and declared COVID-19 an international public health emergency (WHO, 2020b). On March 11, 2020, the WHO announced that COVID-19 had been elevated to pandemic status, the largest outbreak of respiratory and pulmonary disease since the outbreak of SARS in 2003. Within weeks of the outbreak, the number of cases rose more than the SARS outbreak (Hawryluck et al., 2004). As of April 11, 2020, COVID-19 had killed more than 95,269 people in 189 countries (Parikh et al., 2020). According to (Wu & McGoogan, 2020), who studied 72,314 cases, the overall mortality rate is 2.3%. People of both sexes and any age can be infected. The elderly and those who have chronic illnesses, such as diabetes and cardiovascular disease, often have severe symptoms and risk of death (Department of disease control, 2020a). In Thailand, the first COVID-19 case was detected on January 22, 2020, and the number of cases increased slowly from March 1 to the middle of the month. Then, the number of new cases increased sharply through March 26 at an average daily increase rate of 25.1% (Tantrakarnapa & Bhopdhornangkul, 2020). Government policies and related public health measures were strengthened. Emergency decrees were announced to control the spread of COVID-19, such as international travel restrictions and screening measures at every entry into the country. Therefore, the government has issued a curfew throughout the country. It is restricting group activities through measures such as school closures and postponement of the Thai New Year/Songkran celebration. Large places that are at high risk because of the gathering of large numbers of people, such as shopping malls, stadiums, and various entertainment venues, were ordered to temporarily close. Provincial governors have announced lockdowns, a measure prohibiting entry to and exit from an area depending on discretion ("Thai government measures with COVID-19 situation," 2020). All sectors of society are affected by this pandemic. This includes the economic sector; the income of the private sector, particularly retail stores, has considerably declined.

Hoarding and lack of protective equipment even in hospitals, which leads to psychological stress among health care personnel and other people. Especially for medical personnel, who inevitably work closely with patients, infection risk is high, and various challenges

are encountered in working to combat the spread of COVID-19. Caring for patients with serious infections, especially for workers in intensive care units (ICUs), places enormous physical and psychological pressure on health care personnel. In the time of the COVID-19 outbreak, as the number of patient rises very fast, the health care personnel have to do more and more work, longer hours, or even the pressure of dealing with something that hasn't happened before. Health care workers find themselves in an unfamiliar position due to the insufficiency of workers, which is causing substantial anxiety, and the uneasiness caused by the lack of equipment used in work—both personal protective equipment and patient care equipment, such as drugs and ventilators (Bennaoui et al., 2020). The management of hospital is uncertain. Workers are unable to plan or prepare well in advance. There is also pressure from the expectations of the public, who expect to see great results from organizations' work. These are all direct impacts of the COVID-19 situation. These do not even include common pressures, such as one's concern that they will be infected and spread the infection to their family. People also experience stigmatization and exclusion from society due to fear of infection from them (Lai et al., 2020). These effects of the pandemic create pressure and mental health problems. Stress, anxiety, and depression are expressed in a variety of symptoms, such as insomnia, excessive sleepiness, fatigue, and lack of motivation to work. A previous study showed that about one-third of surveyed medical professionals (38%) had anxiety conditions, and one-quarter (24%) had depression. People working in ICUs experience significantly higher stress than do other groups (Ma et al., 2020). Stress among medical personnel is associated with various factors; for example, stress among women is higher than that in men (Wang et al., 2020). Work roles, duties, and places are likewise salient factors. Professionals working at the forefront are more stressed than those holding other positions (Lai et al., 2020). Mental health problems inevitably affect the overall health, mental load, and working potential of health care personnel; if left ignored or not corrected, such issues can lead to chronic mental health problems, such as depression and suicidal tendencies (Brooks et al., 2020).

Therefore, the effects on mental health issues, especially stress, on medical personnel are important. Many factors depend on the context and resources of each country, including its pandemic response situations and measures (United Nations Thailand, 2020). However, in Thailand, studies on the psychological impact of the COVID-19 situation on health care professionals remain limited. Thus, this study aims to identify the prevalence of stress, depression, and suicidal risk and investigate the association between them and related factors among health care personnel during the second outbreak of COVID-19 in Thailand. This knowledge can be used to develop plans to improve the quality of living and service of health care personnel, provide assistance to such workers, and care for personnel suffering from mental health problems. With these findings, guidelines can be implemented for promoting and

preventing mental health problems at the policy level, and planning and response measures for mental health can be executed in future pandemic crises.

1.2 Research Questions

1.2.1 What is the prevalence of stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand?

1.2.2 What is the association between factors related and stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand?

1.3 Research Objectives

1.3.1 To identify the prevalence of stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand.

1.3.2 To investigate the association between factors related and stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand.

1.4 Research Hypothesis

Null Hypothesis

There is no association between factors related and stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand.

Alternative Hypothesis

There is an association between factors related and stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand.

1.5 Conceptual Framework

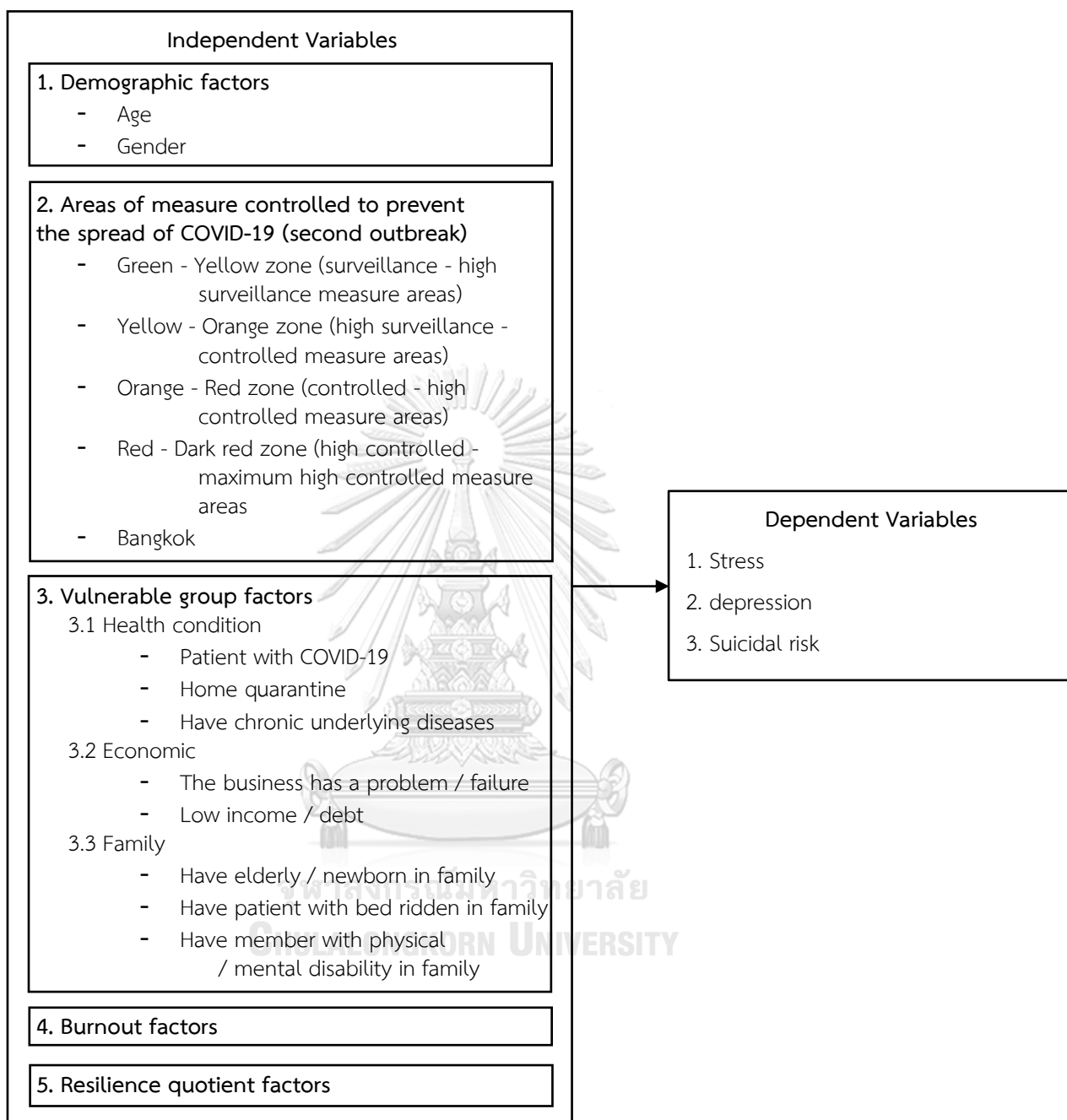


Figure 1 Conceptual framework

1.6 Operational Definition

Health care personnel : Refers to all personnel working under the Ministry of Public Health, Thailand. Whether they are doctors, nurses, nursing assistants, laboratory staff, pharmacists, administrators, hospital officers, etc.

COVID-19 second outbreak in Thailand : Refers to the time when COVID-19 outbreaks in Thailand again (second outbreak). The newly emerging started in December 2020 among migrant workers in Samut Sakhon Province. This pandemic situation had eased in late February 2021. In this research, used the secondary data those conducted during December 17, 2020 to February 23, 2021.

Surveillance areas (green zone) : Areas where no infection has been reported and there is no indication that someone will be infected.

High surveillance areas (yellow zone) : Areas with ≤ 10 infected cases and can be controlled or adjacent to controlled areas.

Controlled areas (orange zone) : Areas with more than 10 infected cases with increased tendency or adjacent to the highest controlled areas.

High controlled areas (red zone) : Areas with a high number of infected cases and > 1 area.

Maximum controlled areas (dark red zone) : Areas with a large number of infected people can't control and requires specific controlled measures.

Burnout : It is a chronic emotional response to the work done in the form of emotional weakness or lack of emotion to work, cynicism (lack of fun at work, lack of motivation for work, etc.), which leads to exhaustion in the workplace. Leading to many emotional and physical problems, such as insomnia, lack of concentration, and boredom. Which can lead to mental health problems such as depression, anxiety, and some behaviors of alcohol dependence. In this research, the question is used in the past 1 week. Do you have emotional exhaustion, feeling depleted, desperate, wasted energy psychologically or not?

Resilience quotient : It is the emotional and mental capacity to adjust and recover back to normal. After encountering a crisis or situation that creates a difficult life, it is one of the qualities that helps a person overcome obstacles and lead a happy life. It is the process of improving your mind and recovering when you are faced with a difficult or critical situation. It shows how to overcome life's obstacles by using strong mental health energy. Moreover, many people with mental health power can use the crisis as an opportunity. Can elevate the mind and life for the better after the crisis has passed.

Stress : Stress arises when a person is in a depressed state. Until unable to solve problems with that situation, can happen to everyone There are many causes of stress such as insufficient income, debt, disaster. That causes loss, illness, etc. Stress has both benefits and

harms. Too much can have negative effects on the body and mind. As follows: the body often gets sick, migraine headache, abdominal pain, fever, allergy, back pain, shoulder pain, fatigue, palpitations, insomnia, high blood pressure. Causing sick leave, lack of mental work, anxiety, overthinking, distracted, easily forgotten, irritated, easily angered, lack of concentration, lack of mind, depression, paranoia. In terms of behavior, they often smoke, consume a lot of alcohol, resulting in quarrels with close family members. Including having an impact on work duties in this research, the stress assessment (ST-5), developed by Orawan Silpakit, was used as a 5-question stress measurement to assess symptoms or feelings that occurred in 2-4 weeks. <4 points), suspected stress (5 to 7 points), and likely to be stressed (≥ 8 points).

Depression : is a disease caused by disorders of the brain in the areas that affect thoughts, emotions, feelings, behaviors, including physical health symptoms of depression include depression, depression, depression, boredom, irritability, irritability, sensitivity, easy conflict with others. Feeling hopeless and insulting yourself may have symptoms of anxiety, stress, lack of concentration, decreased concentration, loss of appetite, insomnia, fatigue, fatigue, lack of confidence, making decisions worse, feeling desperate. And having thoughts of wanting to die or wanting to kill yourself in this research, the 9-question depression assessment (9Q) was used, developed by Thoranin Kongsuk and the group, as a tool to assess and classify the severity of depression 9 points, divided into 4 levels of severity, which are normal or very few symptoms. (<7 points), Low (7–12 points), Moderate (13–18 points), and Severe (≥ 19 points).

Suicidal risk : This is to assess the risk of suicidal thoughts or not. In this research, an 8-question suicide risk assessment (8Q) was used as a tool to assess and classify the severity of suicide risk. The severity was divided into four levels: no current suicidal tendency (0 points), less current suicidal tendency (1-8 points), current suicidal tendency. Moderate (9–16 points) and a current severely prone to suicide (≥ 17 points).

Chapter 2

LITERATURE REVIEW

2.1 COVID-19

COVID-19 disease definition

In December 2019, an outbreak of a new virus was reported in Wuhan city, capital of Hubei province, China (Zhou et al., 2020). This virus is coronavirus 2 (SARS-CoV-2), later called COVID-19, which can cause severe respiratory disease. The disease spread rapidly throughout China, followed by the rest of the world (Adhanom, 2020). On January 30, 2020, the World Health Organization (WHO) held a global emergency meeting and announcement of COVID-19, an international issue of public health emergencies (WHO, 2020b). And on March 11, 2020, the World Health Organization (WHO) announced that COVID-19 has been elevated to pandemic, the largest outbreak of respiratory and pulmonary disease. Since the outbreak of SARS in 2003, within weeks after the outbreak began, the number of cases has also skyrocketed. Until more than the previous SARS outbreak (Hawryluck et al., 2004). As of April 4, 2020, the disease has spread in more than 60 countries worldwide, with more than 1 million infected patients.¹ Based on 72,314 cases, the overall mortality rate 2.3% (Wu & McGoogan, 2020). As of April 11, 2020, COVID-19 killed more than 95,269 people in 189 countries (Parikh et al., 2020).

Pathological of disease

Characteristics of COVID-19 Similar to SARS, this is the same coronavirus, but different strains (Paules et al., 2020). There is evidence from the decoding Genetically, SARS-CoV-2 was found to be of "Red-crowned bats" but has not confirmed that Intermediary or carrier animals the infection comes to people as to what kind of animal (Department of disease control, 2020b). The corona virus can usually cause disease in both humans and animals. Especially in the respiratory and digestive systems can be infected in many animals: land animals, mammals (such as horses, cows, cats, dogs, bats, rabbits, rats, camels). Reptiles, such as snakes, can of course be transmitted from zoonotic infections, but in SARS-CoV-2, there is not enough academic evidence to determine the infection in pets The average incubation period was 5.2 days. Most were found at 2 -1 4 days. The disease was transmitted only after symptoms and signs were present (Department of disease control, 2020b). The transmission from person to person is by droplet droplets as the main channels such as saliva from coughing or sneezing, contact, etc. In addition, the infection can be excreted through feces (SARS ~ 9-14 days), crushing. eyes (infection through the conjunctiva), touching the face and mouth (Huang et al., 2020). The disease has spread rate

of 4.08 (Huang et al., 2020). Refers to one infected person has a chance of transmit infecting up to 4 people.



Vulnerable group

All sexes and ages are likely to be exposed to all diseases, especially 1. People who live in areas at risk of disease exposure. Or a country or city with ongoing disease outbreaks. 2. People who travel - out of. Or stop by changing planes in countries or cities with ongoing disease outbreaks 3. Medical and public health personnel 4. People working for tourists 5. People aged > 50 and having chronic diseases such as diabetes, cardiovascular disease, etc. (Often have severe symptoms, risk of death) (Department of disease control, 2020b).

Disease presentation

Patients infected with COVID-19 may have mild to severe symptoms. With the majority of the carrier population asymptomatic. The most commonly reported symptoms were fever (83%), cough (82%), and shortness of breath (31%) (Holshue et al., 2020). In patients with pneumonia, a chest X-ray usually shows multiple opacity (Cartwright & Cooper, 1996). Digestive symptoms such as vomiting, diarrhea and abdominal pain found in 2–10% of COVID-19 patients (Familoni, 2008). And 10% of patients had diarrhea and nausea before and respiratory symptoms (Rees & Cooper, 1992). Elderly people with underlying disease more likely to get infected and worse outcomes (Chen et al., 2020). Severe cases can lead to acute respiratory distress and death (Holshue et al., 2020). Case Fatality Rate ~ 2.0 - 3.5% (tends to increase with more widespread outbreaks). (Department of disease control, 2020b).

2.2 COVID-19 situation in Thailand

The first COVID-19 infected person in Thailand was detected on January 22, 2020, with only those traveling from abroad. Until the end of February 2020, the first domestic infected person was found. Which is a taxi driver who is exposed to people traveling from abroad The number of cases increased slowly in the first half of March. After mid-March, the number of new cases increased sharply until March 26 at an average increase rate of 25.1% per day. Government policies and related public health measures have been raised. Causing the situation of the outbreak in the first wave to gradually improve until the COVID-19 patients can be controlled in Thailand. From the first case until 6 July 2020, the most positive cases are Males were 56.7%. The mean age of positive individuals was 42.5 and 35.7 for males and females, respectively. The maximum age for men is 84 years, while women are 80 years old, the lowest age is just five months (Department of disease control, 2020b). The average mortality rate was 1.14% , much lower than the global mean of 5.4% (as of April 4, 2020) (Tantrakarnapa & Bhopdhornangkul, 2020).

Government Policy

On March 1, 2020, the Ministry of Public Health announced the coronavirus disease 2019 (COVID-19) as a dangerous communicable disease ("Names and key symptoms of dangerous communicable diseases," 2020). As a result, there are more intense legal measures for surveillance, prevention and control.

On March 26, 2020, the emergency decree was announced and established. COVID-19 Outbreak Management Center Under the Communicable Diseases Act 2015. Thailand has started using public health measures to control the spread of COVID 19, such as international travel restrictions and screening measures in every entry into the country. Including quarantine guidelines for travelers entering the country from a country designated as a dangerous communicable disease area. All Thai people with a high fever and high risk of contracting COVID-19 should be screened in hospitals and / or monitored themselves. Maintain and prevent infection in the hospital. For doctors and public health personnel against COVID-19. In addition, there are proactive measures to find patients. By identifying patient under investigation (PUI) criteria, highlighting suspected and COVID-19 risk groups, such as those who contacted people returning from neighboring countries ("Thai government measures with COVID-19 situation," 2020).

On April 3, 2020, the government issued a mandate to adopt a legal measure. During the first month centralized main measures is the time to leave the home or the 'curfew period' throughout the country Restrict group activities such as school closure and postponement of Thai new year / Songkran holidays. A large place that is at high risk because a large number of people will gather. Such as shopping malls, stadiums and other entertainment venues were ordered to be temporarily closed. 'Lockdown' measure is a measure that the governor of each province will announce the closure of the area forbidden-to-exit at its discretion ("Thai government measures with COVID-19 situation," 2020).

When the infection situation in Thailand begins to improve the number of infected in the country has decreased considerably. The government therefore announced the cancellation of curfew on June 15, 2020, but retained the sanitation measures such as international travel restrictions. And detention when entering the country as before ("Thai government measures with COVID-19 situation," 2020).

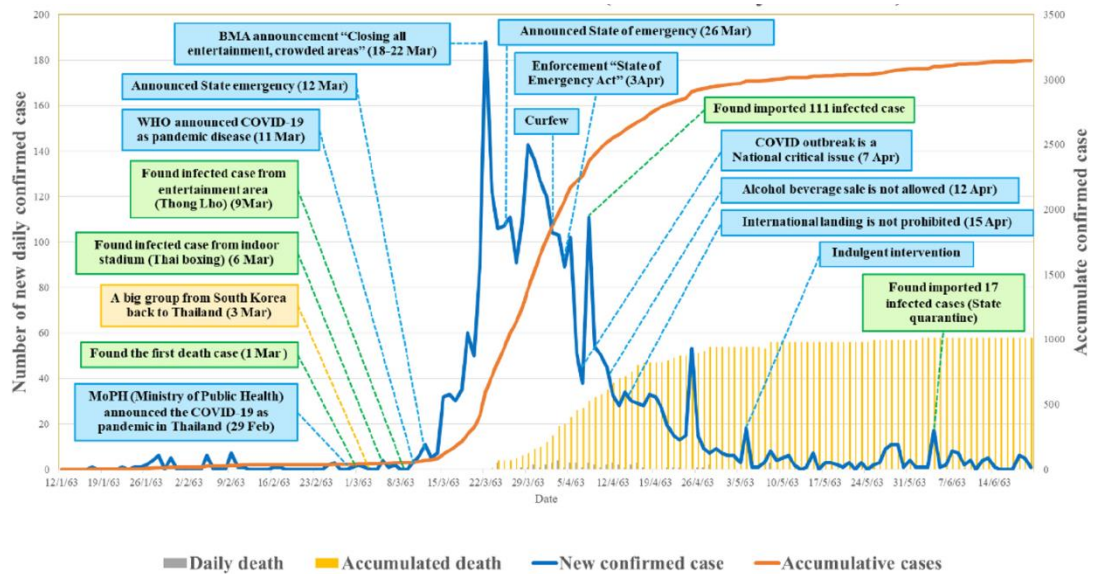


Figure 2 COVID-19 cases in Thailand and Timeline of government measure (Tantrakarnapa & Bhopdhornangkul, 2020).

Second outbreak of COVID-19 in Thailand

A second wave of outbreaks beginning on December 17, a 67-year-old Thai woman was found selling at the shrimp market in Mahachai Subdistrict, Muang District, Samut Sakhon Province. Infected without a history of leaving the country. This means that this infected person is not a "source of infection", the department of disease control had tried to find the origin or cause of infection of this woman. Which is expected to be an infected from Myanmar workers in the shrimp market, which is an area with a high density of Myanmar workers.

Upon further examination, it was found that a large number of people were infected with 90% of them in Myanmar. The rest are Thai and approximately 90% of those infected are found asymptomatic. Which makes it easy to spread to others. In addition, the Burmese workers stayed together in a crowded place. Therefore many infections have occurred. The ministry of public health was able to clearly identify the group of infected people and the extent of the epidemic. Therefore issued a "lock down" measure in Samut Sakhon province since the night of Dec 19 in order not to spread the infection elsewhere.

In addition to Samut Sakhon province, it was also found that people who traveled to the shrimp market were infected and carried the infection out of the province. Bangkok, which is connected to Samut Sakhon province, the Bangkok communicable disease committee has therefore passed a resolution on COVID-19 pandemic response measures, with the following key issues :

Create a list of places at risk for 5 types of "super spreader" with disease control measures:

1). Service establishments, pubs, bars, entertainment venues and establishments similar to entertainment venues: must be sitting and eating and tables must be at least 1.5 meters apart.
 2). Boxing stadium : reduce the amount of people entering the boxing stadium. Keep your distance and wear a 100% face mask.
 3). Market : must wear masks, 100% access point control. If it is found that any market does not comply with the measure, it will be closed immediately.
 4). Park : still open for business. But will not allow a large gathering of people especially foreign workers.
 5). Temple : do not have to do activities that cause the gathering of the masses.

On December 24, 2020. Spokesperson of the Center for COVID-19 Situation Administration (CCSA) Dr. Taweessin Visanuyothin stated that no national lockdown would be imposed in the wake of the resurgence of COVID-19, but COVID-19 control zoning has been introduced.

Five zones for COVID-19 control were designated to step up measures to prevent the spread of the disease in each area across the country.

- Dark red zone was the maximum control with high strict measures area.
- Red zone was the maximum control, involved the area where many COVID-19 cases had been found.
- Orange zone was control area, there were more than 10 cases and this number was likely to increased.
- Yellow zone was high surveillance, involved the area where not more than 10 infected persons had been reported and the situation was likely to be brought under controlled.
- Green zone was surveillance area, with no COVID-19 cases and there was no indication leading to infection.

All provincial governors are empowered to consider issuing various measures to deal with the COVID-19 situation in their respective areas.

Activities to celebrate New Year may be arranged depending on the situation in each area, but they are not allowed in the maximum control zone. Online activities are suggested instead. Festive activities can be held in other zones, but with limited numbers of participants and no crowded gatherings. Control measures must also be imposed. Only Samut Sakhon province has been designated under the maximum control zone. People can still travel to various provinces during the New Year festive season. However, they have been urged to protect themselves from the virus by wearing face masks, washing their hands frequently, and maintaining a physical distance.

On January 4, 2021. Prime Minister General Prayut Chan-o-cha has issued the Regulation No. 16, with eight measures, in an effort to remedy the emergency situation caused by the

resurgence of COVID-19. The regulation, issued and published in the Royal Gazette. It stated that the new wave of COVID-19 infections has spread widely in many areas and that the number of COVID-19 cases in the country is increasing. The Government deems it necessary to issue the regulation and enforce various measures to remedy this emergency situation. Enhance the control of disease outbreaks in every province across the country.

Later, at the end of January 2021, the situation of the pandemic in the country decreased. The government has announced the first easing of measures. And reduce the level of control in provinces that can control the disease well and no new cases are added. The situation and the number of infected people began to decline and can be controlled. On February 23, 2021, measures were eased until they were almost normal. But still strict public health measures must be followed, ie, wear a face mask, social distancing and washing your hands.



Figure 3 Show the number of new cases and the recovered patients from COVID-19 infection, Daily report, Thailand.

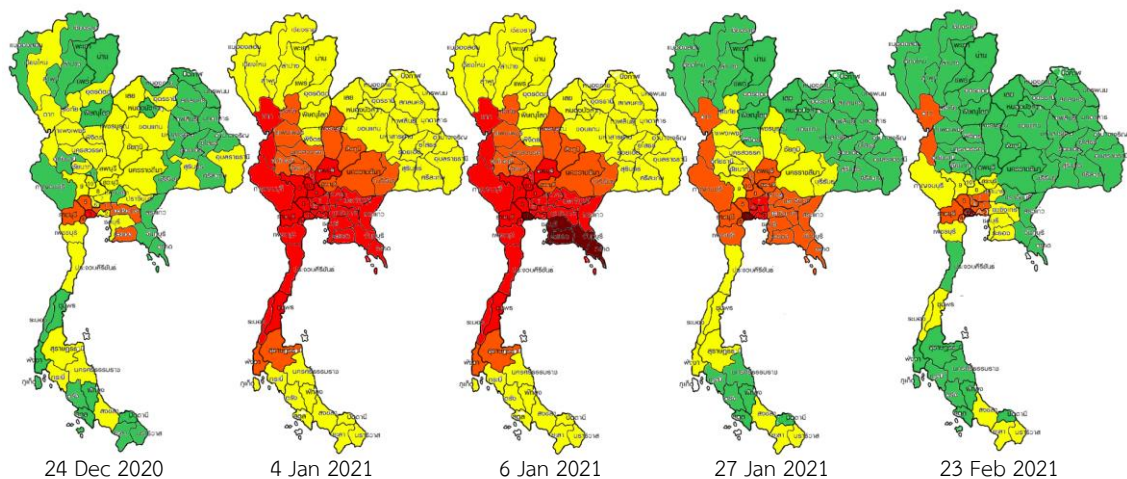


Figure 4 Allocation areas according to measures to control the spread of COVID-19 second outbreak in Thailand.

Measures to control the spread of coronavirus divided according to the severity level in each area

1. Maximum control area (area with a large number of infected and more than 1 area)

- Expedite the detection of infected people in high-risk areas, group of people at risk and risky activities/enterprises.
- Isolate the infected person with the establishment of a field hospital according to capacity (Ministry of Defense support public health in the establishment of field hospitals)
- Consider healing and caring for the family of the infected person according to their capabilities.
- Emphasize disease prevention measures, including wearing a mask 100%, focusing on cleaning (hands and frequently touched places or equipment), avoiding contact or avoiding entering places with large numbers of people. and the application of 'Morchana' was installed in addition to using the Thai-win Application.
- Limited opening-closing time of establishments that are necessary.
- Close establishments that are at risk of spreading the virus.
- Foreign workers are strictly prohibited from moving in and out of the area.
- Control the entry and exit of vehicles and Thai people without affecting trade and industry more than necessary.
- Set up screening checkpoints, extraction points, and patrols in order to control and limit entry and exit effectively.
- Implementing the work from home measure to the fullest extent.
- Educational institutions adjust the online teaching and learning model.
- Refrain from all forms of activities that gather large numbers of people.
- Every establishment and factories that are still in operation to focus on preventive measures against COVID-19 at full capacity (D/M/H/T) both in the factory area and the accommodation, if unable to operate as scheduled, consider stopping the operation.
- Fisheries can be carried out. but must pass a test for COVID-19 Before setting off the ship, the Ministry of Defense support the Ministry of Health In terms of medical personnel in the marine proactive examination.
- Wear a mask 100%.

2. Control area (area adjacent to the highest control area or has more than 10 cases and tends to increase)

- Consider proactive testing in at-risk areas, group of people at risk and risky activities/enterprises.

- Emphasize disease prevention measures, including wearing a mask 100%, focusing on cleaning (hands and frequently touched places or equipment), avoiding contact or avoiding entering places with large numbers of people and the application of 'Morchana' was installed in addition to using the Thai-win application.

- Consider limiting the opening-closing time of establishments that are necessary as appropriate.

- Consider closing or limiting the opening and closing times of establishments that are at risk of spreading the virus.

- Foreign workers are prohibited from moving in and out of the area.

- Coordinate the establishment of screening checkpoints with provinces in the red area as appropriate.

- Measure work from home for people from red areas.

- Educational institutions consider halting teaching or adjusting teaching methods to be online according to the situation in the area.

- Avoid events with large gatherings of people.

- Establishments and factories that are still operating to focus on preventive measures against COVID-19 (D/M/H/T) both in the factory area and in the worker's quarters. If unable to proceed consider stopping the operation.

- Watch out for smuggling into the area of migrant workers from the red area. If found, notify the police.

3. High surveillance area

- Accelerate the proactive detection of infected people in high-risk areas, risk group and risky activities/businesses.

- Emphasize disease prevention measures, including wearing a mask 100%, focusing on cleaning (hands and frequently touched places or equipment), avoiding contact or avoiding entering places with large numbers of people. and the application of 'Morchana' was installed in addition to using the Thai-win Application.

- Consider closing or limiting the opening-closing hours of establishments that are at risk of spreading the disease as appropriate.

- Foreign workers are prohibited from moving in and out of the area.

- Consider implementing Work from Home measures as appropriate.

- Consider using an online exam learning model. in order to prepare the system as appropriate

- Avoid any form of mass gathering.
- Activities can be organized but the number of people is limited.

4.Surveillance area

- Proactively detect infected people in the at-risk areas, group of people at risk and risky activities/businesses.

- Emphasize disease prevention measures, including wearing a mask 100%, focusing on cleaning (hands and frequently touched places or equipment), avoiding contact or avoiding entering places with large numbers of people. and the application of 'Morchana' was installed in addition to using the Thai Chana Application.

- Consider closing or limiting the opening-closing hours of establishments that are at risk of spreading the disease as appropriate.

- Foreign workers are prohibited from moving in and out of the area.

- Avoid organizing events with large gatherings if it is necessary to consult the Provincial Communicable Disease Committee by considering reducing the number of participants to have measures to reduce the density of participants To have supervision in accordance with the measures that have been planned (Department of disease control, 2020b).

2.3 COVID-19 Impact

When analyzing the nature of the outbreak according to the Health Footprint of COVID-19, as shown in Figure 5, the outbreak can be divided into 4 waves : 1st wave : Immediate mortality and morbidity of COVID-19 outbreak of disease has resulted in massive number of infections and deaths. The 2nd wave : Impact of resources restriction on urgent non-COVID-19 conditions a widespread and problematic epidemic to the patient non-infectious, including resource management urgently enough to prevent and treat the sick. In the 3rd wave : Impact of Interrupted care of chronic conditions, the outbreak will affect people with chronic disease, it may be unable to see a doctor as scheduled or need to take care of themselves at home and enter the 4th wave: psychic trauma, mental illness, economic injury, burnout. From a long pandemic will affect the economy. This causes people to stress, anxiety, and mental health problems and have increased mental illness. Health and medical workers suffer from emotional exhaustion. Burnout can lead to mental health problems or psychiatric illness (Department of mental health, 2020).

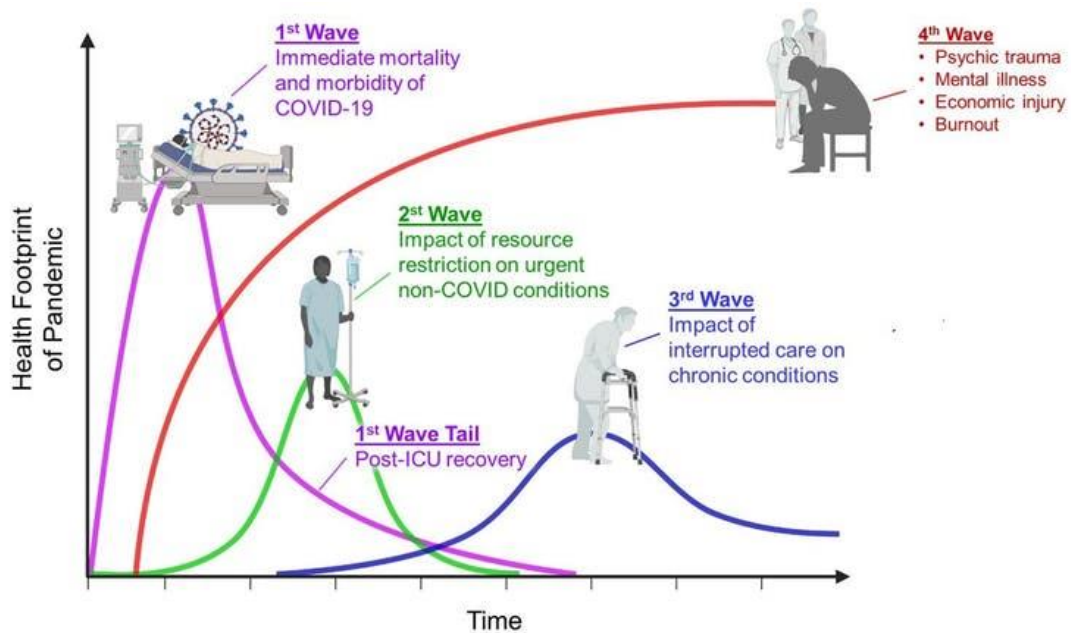


Figure 5 shows Health Footprint of COVID-19. (source : Graph adapted from Victor Tseng – Pulmonary & Critical Care Physician: University of Colorado.)

Impact on health

The pandemic crisis has transformed the work environment, resulting in high pressures. And the unfavorable interaction on the health of the workers. Front-line health workers, including doctors, nurses, certified carers, laboratory technologists and pharmacists do not have enough PPE to be used. And discrimination among people some landlords have been reported to expel nurses, doctors and other health care professionals from their rental apartments fearing the spread of the COVID-19 in the neighborhood. Or patients who have recovered when they return home will be avoided by society (Poudel & Subedi, 2020).

Impact on mental health

In the general population, COVID-19 is a global public health emergency. Mental health is affected by new situations in this world. Psychological symptoms: anxiety, depression, distress, insomnia, and suicide (Bennaoui et al., 2020). There was a high level of anxiety, mortality provoked by shocking news, with the overwhelming number of new patients and deaths, quarantine and social blockade. Unemployment, schools closed, and this resulted in a change in the lives of the population (Wang et al., 2020).

Suffering and anxiety are normal reactions to situations such as threatening and unpredictable that the spread of this COVID-19, uncertainty makes it difficult to plan (Bennaoui et al., 2020). Psychosocial stress possible stress-related reactions in the response the COVID-19

outbreak may include changes in concentration. Irritability, anxiety, insomnia, decreased productivity, and interpersonal conflicts (Vinkers et al., 2020).

There is also an ongoing shortage of masks and COVID-19 protecting equipment. The epidemic brings fear and timely understanding of mental health conditions urgently needed in society (Xiang et al., 2020). Previous research has revealed deep and mixed psychosocial effects. People at the individual, community and international levels during the epidemic on a personal level, people tend to feel afraid of falling ill or dying on their own. Powerlessness and shame (Hall et al., 2008).

Impact on economic sectors

Since the outbreak that spread rapidly of the virus. The government had an unprecedented response to slowing the spread of the virus. Lockdown measure, with limitations in traveling out of place people must stay at home. This is an effective measure to slow down the spread of the coronavirus around the world (Barkur et al., 2020) (Flaxman et al., 2020). Social distancing measures must also be taken to prevent infection and infect others at the same time. Because of the best of circumstances, developing the coronavirus vaccine tends to take up to 12-18 months (The New York Times, 2020). And although the lockdown measure is the most useful and effective at this time. But it is inevitable that there will be consequences in various sectors. The income of the private sector and retail stores fell. The inability to get out and live as usual didn't meet friends or society causing stress to build up.

Impact on education

The government shut down all schooling. Transformed into online teaching and learning Parents experience increasing difficulties and pressure to work from home. And also have to take care of studying the children at home at the same time Most parents are concerned about their children's education. Because I cannot predict when the school was suspended. And digital education causing parents to bear the burden of tuition more both internet and equipment fees. It's stressful for low-income parents struggling to get their daily wages (Poudel & Subedi, 2020).

Impact on vulnerable people

Poor people who are employed daily, small shop, people with disabilities and those who cannot help themselves are more affected than others due to the inaccessibility of essential items such as masks or alcohol gels. And many people the lack of income during this crisis. Causing many physical and mental problems in consequence.

Impact on media sectors

Today it is spreading rapidly from fakes and social rumors. Therefore, it is imperative to be thoughtful and mindful when communicating on social media and other communication platforms (WHO, 2020a). Additionally, too much news is received about the rapid epidemic of coronary disease. It may cause of stress.

Impact on agriculture

Many countries are agricultural countries. Thailand itself is one of them. The epidemic and lockdown in many countries have halted end-of-trade exports. Farmers were forced to abandon their crops. After a significant decrease in supply processing companies gradually shut down. This has led to sudden price hikes of certain products (Poudel & Subedi, 2020).

2.4 Mental health impact with COVID-19 situation

Even though the COVID-19 mortality in Thailand has been low, the direct impact of COVID-19 on mental health can be huge, and suicide mortality is already an area of relative concern. The stress is not only among people who are infected or suspected of infection and the healthcare workers and carers, it also affects the general public and vulnerable populations at risk of the disease. Lack of contacts and personal interactions during the movement control period can exacerbate mental health risks. Additional mental health threats from the economic downturn, lower household income and impending job loss, and educational disruption can all cause anxiety, leading to mental health conditions and possible increased suicide attempts.

The overall suicide death rate in 2020 could reach a level like the 1997 economic crisis of up to 8–8.8 per 100,000 population, or around 30,000 extra cases of suicide attempts and 2,000 extra suicide deaths. If we assume the same rate of increase for healthcare visits with no supply-side limitation, there will be roughly 1 million extra outpatient mental health visits in 2020. Prevention and mitigation of mental health issues is very important and broader engagement of the public, including the private sector and the media, is necessary in the fight against the upcoming mental health tsunami (Kola et al., 2021).

In any pandemic, it is common for individuals to experience stress and anxiety. Frequent reactions in the affected person (both direct and indirect) may be as follows fear of falling ill and death, avoiding hospital admission for fear of infection while receiving services, fear of lifestyle change, inability to work during isolation and get fired, fear of separation from society or being quarantined because there is a risk of disease exposure, feeling helpless in protecting their loved ones and fear of losing loved ones from viral infection, fear of being separated from loved ones and carers due to quarantine measures, feeling helpless, bored, isolated and depressed from isolation.

Fear, worry, uncertainty and ongoing stress of people during the COVID-19 pandemic has led to long-term impacts in communities, families and at-risk individuals. Local mechanism and the economy deteriorates. Stigmatization of cured patients. The community rejected, anger, anger and aggression towards the government and against the front line officials, angry with their children, spouses, and family members. (increased violence in the family and couples), do not trust information reported by governments and authorities. People who have become ill or have

a psychiatric disorder or substance addiction already have symptoms. Or other negative consequences because of avoiding access to services or being unable to reach healthcare providers some fears and reactions arise from things that are actually dangerous. But many reactions and behaviors caused by lack of knowledge, rumors and inaccurate information (IASC, 2020).

2.4.1 Mental health impact in general people during COVID-19 situation

During one influenza pandemic, about 10% to 30% of the general public. They are deeply concerned about the possibility of contracting the virus (Rubin et al., 2010). School and business closures cause more negative emotions (Van Bortel et al., 2016). During the SARS outbreak many studies have examined the psychological effects on uninfected communities. Revealing major psychiatric illnesses which was found to be associated with younger age and increased self-harm (Sim et al., 2010). Elderly, female, highly educated and has a high perceived risk of infected will have a moderate level of anxiety (Leung et al., 2003). The mental health of the general population, especially among healthcare workers and nurses were challenged during the pandemic. Health care professionals have mobilized all the resources to tackle this issue. Emergencies are common. There is always uncertainty (Bennaoui et al., 2020).

In a psychological response in general population study during the two weeks of the COVID-19 outbreak and one day after the WHO declared an international problematic public health emergency, 53.8% of respondents rated the psychological impact of the Moderate or severe outbreaks: 16.5% of respondents reported moderate to severe depression; 28.8% of respondents reported moderate to severe anxiety and 8.1% reported moderate to severe stress levels. The prevalence of moderate or severe psychological effects measured by IES-R was higher than the prevalence of depression, anxiety, and stress measured by DASS-21. That IES-R will assess the psychological impact after the event In this study, respondents may refer to the COVID-19 outbreak as an event, while DASS-21 did not identify the incident (Wang et al., 2020). And the study of Health professionals stress during COVID-19 pandemic by Fatiha Bennaouil found that the cause of stress often caused by the typical atmosphere of stress and uncertainty. Especially among health workers stoked by the general characteristics of the COVID-19 pandemic and when studying the details down to the causes of stress found that those causes were severity of COVID-19 36%, deaths of professionals and health workers 15%, deaths of family members 14%, rapid epidemic outbreaks, 90% lack of knowledge, 83% and eventually the risk of disease. Contamination, especially if symptoms are associated with 2% (Bennaoui et al., 2020).

In addition, it was found that there were many factors within the organization. Causing stress many internal issues were revealed, including personal protection running out of equipment in 54% of workers, deploying them to new areas, in 30% lack of access to rapidly

changing data among employees, 52% lacked patient beds, heavy needed care. An increase in intensive care, topical medication and a lack of ventilator in 31%, significant changes in their daily social and family life, 87% lack of training, 2% and large number of calls from family and inpatients 2%. Additional risk factors were identified, including feeling insufficient hospital support in 42%, fearful of getting an infection at home with a family member or others, in 80% being excluded, feeling uncertain, and a lack of support. Social stigmatization in 43% and finally death anxiety in 14%. In addition, the self has a high level of anxiety. Symptoms assessed qualitatively by the psychological presentation: Nightmare 19%, insomnia 48%, insomnia 18%, irritability 22%, aggression 14% and nervousness in 70%, and lethargy sleep 5% (Bennaoui et al., 2020).

2.4.2 Mental health impact in health care personnel during COVID-19 situation

The coronavirus 2019 (COVID-19) pandemic had become one of the health crises of the generation. The pandemic had affected people from all countries in the world. Continents, races and socioeconomic. Measures of situation response, such as the community quarantine, school closures and social isolation. The order had suddenly changed daily life (Adams & Walls, 2020). In particular, health care personnel (HCPs) are high risk of exposed to various infections. Include diseases transmitted by blood or other bodily fluids and / or airborne infectious agents (Shiao et al., 2007). Studies of WHO have shown that the HCPs had the highest risk of infection from direct contact with patients (WHO, 2003). Nurses, in particular, are exposed to many job hazards and experience a lot of emotional stress in their relationships to their work (Wheeler, 1997). Especially during a global infectious disease pandemic, it can lead to more stress and job burnout in HCPs (Maunder et al., 2006).

The main challenge in the spread of COVID-19 is caring for those infected with a serious condition. Especially for intensive care unit (ICU) workers, due to the need for prolonged contact with infected patients. Widespread infection and death. Lack of essential items such as ventilators and intensive care beds (ICU) for a lot of intensive care patients and although there are accessories and beds as well. It might not be of benefit unless there are enough employees (Shanafelt et al., 2020). The insufficient of workers, this increases the work of each healthcare personnel. As an increase in critically ill cases, it can take up to several months to heal. At the same time, they have to deal with social and emotional changes. Stress faced by everyone. Health care professionals Faced with greater risks of exposing more moral workloads disputes and a rapidly evolving practice environment, that is very different from what they are familiar (Sibbald et al., 2003). HCPs is subjected to both social and psychological pressures. These incidents happened during the SARS and MERS outbreaks. Healthcare personnel are at the frontline of the COVID-19. The outbreak exposes them to severe infectious diseases. More fear of their work. Have to separation from family, unusual situations and feelings of failure in the face of poor

predictions. Including inadequate technical means to assist patients. The impacts differ markedly in terms of functional organizational units, format of hours and working status and location (Talaee et al., 2020). Psychologically impact of frontline healthcare staff participating in the fight against COVID-19 and how they affect each other (Bennaoui et al., 2020). Mental suffering from loss / separation from family, depression, loneliness, suicidal thoughts, mood problems, sleep problems, worry, rejection, boredom, confusion, uncertainty, frustration, anger, fear, stigmatization, marginalization, fear of foreigners, mass hysteria and other mental health conditions (Brooks et al., 2020).

Health care personnel report concerns about themselves and their family's health. And describe their painful experience fear, anxiety and even prejudice and social stigma (Almutairi et al., 2018). It has also been shown that HCW is more likely to experience job burnout mentally. Pressure, anxiety and depression, even during pandemic mitigation (Lancee et al., 2008). Previously, research has also shown that post-traumatic stress disorder (PTSD) is common among infectious disease survivors (Hong et al., 2009).

Workplace stress related to mental health is practiced by critical care professionals. Has been reported negatively. Affected among health care professionals (HCPs) caring for COVID-19 patients, HCP has been reported to be at high risk. Experiencing physical exhaustion, sleep problems. Stress / fear of infecting and distributing viral among relatives. And problems during family care counseling were hindered by strict vigilance measures (Ma et al., 2020).

Studies have shown that with high stress, work tends to make it more tiring. With the focus on nurses, job burnout can be less common. Willingness to take a leadership position, lower quality of healthcare, reduced hospital patient satisfaction levels, increased levels of healthcare-related infections and higher mortality among the patient. Previous studies have further indicated that nurses experiencing job burnout are more likely to become dissatisfied with their jobs and look for opportunities to quit their jobs (Talaee et al., 2020).

Health care personnel who have long term stress often susceptible to burnout, the highest prevalence of burnout was found in health care personnel who worked in emergency environments and the ICU. Because they are exposed to many job-related stress. Known factors that contributing to the high risk of job burnout include intensive care and high mortality, inadequate and conditions of work in the sense of high workload, not having enough time to handle the needs of the patient. Therefore, the health care personnel experiences associated stress levels beyond the capacity which can lead to job burnout (Talaee et al., 2020).

Job burnout was not only the health of the individual and living at risk. But also related to frequency of medical errors and the quality of health services. Therefore, it is vital to identify the factors contributing to job stress. And burnout in health care personnel. The knowledge can

be invented to protect and retain employees while improving the quality of service to patients (Talaee et al., 2020).

During the 2003 the severe acute respiratory syndrome (SARS) and 2009 H1N1 outbreak, researchers assessed health care personnel psychological stress by various methods and observe the high level stress, other emotional stress factors common in health care personnel include exaggerated anxiety. About their own or their family's health, fears, and feelings of distress to work at the hospital (Mobaraki & Ahmadzadeh, 2019).

When faced with this critical situation frontline healthcare workers who are directly involved the diagnosis, treatment and care of COVID-19 patients are at risk of psychological development distress and other mental health symptoms, a number of confirmed and in case of suspicion, overloaded workload, personal protective equipment is widespread, media coverage, lack of specific drugs and feelings that there is not enough support, maybe at all. Causing the psychological burden of these health care workers previous studies have been reported. Psychological adverse reactions following the 2003 SARS outbreak among healthcare workers. Studies show that those health care workers were afraid of being contacted. And infections in family, friends and colleagues. Feeling insecure and stigmatized. Reported reluctance to work or contemplated quitting and reported high levels of stress, anxiety and depression, which can have long-term psychological effects. With mental health psychological adjustment and recovery of the healthcare workers who treat and care for the patients, COVID-19 is now occurring (Lai et al., 2020).

A study of factors associated with mental health outcomes among health care personnel exposed to coronavirus disease 2019 by Jianbo Lai in all public health personnel 1830 found that, a considerable proportion of participants had symptoms of depression 50.4% , anxiety 44.6%, insomnia 34.0%, and distress 71.5% of health care workers against the spread of infectious diseases complicated sources of suffering can include feelings of vulnerability or lose control and concerns about their health. The spread of the virus, the health of the family and others, the change of work and being isolated. The fact that COVID-19 can be transmitted from person to person is related to high illness and may be fatal may cause the perception of the danger to aggravate In addition, a predictable material shortage. And the influx of suspects and the actual case of COVID-19 has contributed to the pressure and concern of health care workers (Lai et al., 2020).

The best way to understand in what health care professionals most of the concern is to ask. Tait Shanafelt's study was conducted in meetings with a group of advanced medicine nurses. Residents and others (involving a total of 69) were conducted during the first week of COVID-19 survey 3 key topics. What is the most concerned about health workers? What communication and behavior they want from their leaders? And the other tangible support sources they believe

will be of greatest benefit to them. These discussions found 8 sources of anxiety. (1) Access to appropriate personal protective equipment (2) Was disclosed to COVID-19 at work and taking home infection to their family. (3) Not accessing testing if they developed COVID-19 symptoms and was born. Concurrent fear of spreading infection at work (4) Not sure the organization will support / take care of the personal and family needs if they develop an infection. (5) Access to child care during increased working hours and school closures (6) Support for other individual and family needs as work, hours and needs increase. (7) Able to provide medical care if deployed to a new area (e.g. non-ICU nurses must serve as ICU nurses) and (8) Lack of access to information and communication that modern (Shanafelt et al., 2020).

Evaluating mental health support and treatment is an important part of the response to the COVID-19 outbreak. And policies at the national and local levels address these. Mental health problems at the same time online mental health services the stress associated with the epidemic is widespread. Provided by local and national mental health institutions. To provide support for the general public including health care personnel (Ma et al., 2020).

2.5 Related factors and mental health impact during COVID-19 pandemic

2.5.1 Sociodemographic factors

From the study of Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China Found that the sociodemographic can affect stress. It was found that females have more stress than males. But males had higher scores for anxiety and depression than females. Student status had more stress and anxiety scores and depression than other occupations. Uneducated status was associated with higher scores for depression (Wang et al., 2020). And the study of factors associated with mental health outcomes among health care workers exposed to Coronavirus Disease 2019 It was found that female sex was associated with high stress levels as well, while other factors such as age, marriage, children, family size were not found to have a clear relationship with stress (Lai et al., 2020).

2.5.2 Working factors

Work related factors are one of major factors associated with stress and mental health problems. As we know already that the workload and the nature of the work performed has a direct impact on the mental status. There have been many studies on occupational factors that are related to mental health, such as the study of Jainbo Lai, was found that occupations Nurses and frontline workers in Wuhan reported experiencing more severe symptom levels of depression, anxiety, insomnia, and distress than other occupations and work positions, and when compared with those working in tertiary hospitals, depression was found. More nervous than

participants working in secondary hospitals but not distress (Lai et al., 2020). In addition, when studying in the characteristic of work and workplace. It was found that people who work in stressful locations and jobs, such as in the ICUs / RM group, are found to be highly stressed and depressed (Ma et al., 2020). Due to the workload that must be responsible critically ill and bear more expectations than any other part of the hospital. There is also a high risk of infection (Li et al., 2020) and it has been documented to have experienced a fear of contagion and in addition spreading the virus to their family, friends or colleagues (Xiang et al., 2020). Combining stress, preventive equipment, and preventative procedures into a medical, difficult task (Lehmann et al., 2015).

2.5.3 Health Status

As you already know that in the elderly and people with chronic hospitalization are vulnerable groups that will develop severe symptoms when infected. Therefore, it is not surprising that among these people. There will be more worries and stress in these worrisome situations than others. The study of Cuiyan Wang have shown that those at clinic consultations and hospitalizations were significantly associated with higher anxiety score. Poor or very poor self-rated health status and history of chronic illness were significantly associated with a greater psychological impact of the outbreak and higher stress scores as compared. to those with very good or good self-rated health status (Wang et al., 2020).

2.5.4 Patients with COVID-19 infection and People with quarantines groups

Complete separation from close and loved ones, feelings that cause disease transmission to others, discrimination. There are also concerns about one's own health that can caused severe emotional trauma and can lead to mental health disorders (Roy et al., 2020).

2.5.5 Economic vulnerable groups

The poor groups are at risk. Because it is a receiving economic impact worst of all groups. Have a high level of stress from the fear that the disease will spread to their families. Slums were concerned because they cannot take part in social distancing. Some people have no means of self-containment because there is no money to pay for the place of isolation. Significantly lower income level making them more anxious and prone to mental health problems (United Nations Thailand, 2020). Including stress, depression and suicide due to the problems.

In addition of previous studies in 3 countries found that under lockdown or social distancing measures to prevent the spread of COVID-19. This puts the population at high risk of stress, anxiety and depression from economic vulnerability and the risk of economic downturn (Codagnone et al., 2020). Sudden economic hardships such as declining jobs and loss of income.

Subsequent analyzes indicated that such economic hardship led to a higher prevalence of adverse mental health conditions including feelings of depression and anxiety (Witteveen & Velthorst, 2020).



2.5.6 Family factors

Most health care personnel were concerned those they will spread the infection to their family. These can causes of stress, anxiety and depression (Wang et al., 2020). Especially when family members are elderly or have a medical condition. The elderly are one of the major risk of severe infection cases because they are more prone to have chronic underlying diseases such as diabetes and high blood pressure. Globally, approximately 66% of people aged 70 and over have at least one underlying disease that puts them at risk of severe symptoms of COVID- 19 increasingly (United Nations Thailand, 2020).

Increased burden of work while the school was closed children are unable to go to school causing concern about taking care of them during this hard time (Shanafelt et al., 2020). Due to the measures to control the spread of COVID-19 in the country, schools were closed and the teaching format has been changed to online format. Some areas may not be ready for this new studying style. Students can not leave their homes to met friends or go to school. Therefore decreased activity children feel bored, lonely and depressed. Some children may turn to games and drug addiction. There are studies showing that adolescents are at increased risk of domestic violence and teen pregnancy may be increased (United Nations Thailand, 2020).

2.5.7 Controlled measure for spreading of COVID-19

At the start of the COVID-19 outbreak in China, more than half of the respondents rated their psychological effects moderately to severe, and about a third reported it was moderate to severe anxiety. Having specific physical symptoms is more correlated. The psychological effects of outbreaks and higher levels of stress, anxiety and depression (Wang et al., 2020). Because in the early stages there was a rapid outbreak and there was no control measure. But when there are measures to control the spread of disease causing the number of people infected to decrease. But those measures still have many consequences. Especially about economy and income Including the stress of staying at home, did not go out, did not meet closed people, many activities must be limited. Therefore the impact on the mental health of the public as well (Poudel & Subedi, 2020).

2.5.8 Burnout

Burnout (especially from work) was associated with significant mental health conditions. There have been reports of effects seen in healthcare personnel who caring for COVID-19 patients found to be at high risk of experiencing physical exhaustion, sleep problems and have stress/fear of spreading the virus in their family. Including limited family care by strict surveillance measures (Ma et al., 2020). Previous studies have shown that when stress was high at work often makes it more tiring than it actually was. The quality of healthcare services has declined, leading

to an increase in the level of infection and has a higher mortality rate of patients. The studies also further identified that healthcare personnel experiencing burnout at work tend to be dissatisfied with their job and look for opportunities to quit (Talaee et al., 2020). Healthcare personnel with long-term stress are more at risk of burnout. The highest prevalence of occupational burnout was found among healthcare professionals working in emergency and ICU environments. Due to the stress of a lot of work. Known factors that contribute to a higher risk of job burnout include : caring for a large number of critically ill patients and high mortality rates, insufficient workers, high workload, not enough time to manage their own needs. Healthcare personnel who experience these conditions regularly and for a long time, it may lead to power outages in the work (Talaee et al., 2020). Burnout was not just a matter of individual health but also related to medical errors and the quality of health services. Therefore, it is important to identify the factors that cause job stress and burnout from working in healthcare personnel to be able to apply knowledge to design preventive and treatment intervention in healthcare personnel to provide quality patient services as well as standard (Talaee et al., 2020).

The previous studies evaluated a wide range of interventions to reduce burnout, including: individual-focused level such as emotion regulation, mindfulness, meditation, self-care workshop, stress management skills, communication skills training, yoga and massage. Structural or organizational level such as stress management training program, workload or schedule-rotation, Balint training, group face-to-face delivery, teamwork/transitions and debriefing sessions. Combine interventions such as stress management, resiliency training, stress management workshop and improving interaction with colleagues through personal training (Zhang et al., 2020).

2.5.9 Resilience quotient

Mental strength or resilience, if compared to see the concrete of the object is the ability of a material to quickly return to its original state after being bent, stretched, or warped. Resilience is a similar concept, it is the ability of a person to return to normalcy by bouncing back from the ups and downs of life. Resilience people tend to choose optimism about life. An optimistic attitude is one of the hopeful expectations for a positive outcome. Resilient optimism does not dampen the negative events of life but looking at reality look for the best results in every situation to find the best solution. Resilient people go through difficult times and get them back to normal quickly, for example, for stress and depression. An important element for being flexible in this regard is knowing how to manage stress and practicing stress relief, etc.(Kakunje, 2011). That is to say, people with high resilience or mental strength. This will help reduce the risk of developing mental health problems.

The previous studies of mental health conditions were found that resilience was strongly/moderately significantly correlated with other measures of mental health outcomes. People with resilience were highly associated with depression but in the opposite direction (Simon et al., 2021).

There were previous studies showed consensus that resilience is a malleable characteristic, wherein an individual's ability to adapt and 'bounce-back' effectively from adversity can be developed and enhanced. Previous study found suggest that resilience training, particularly those based on mindfulness and/or cognitive and behavioral skills, may be able to enhance resilience. The positive benefits of such strategies as treatment interventions for established mental health conditions have been examined thoroughly in the past. Several reviews have high- lighted the value of such skills when treating common mental health conditions such as anxiety and depression and have also been associated with improving psychological and physical health. In spite of these parallels, considerable uncertainty remains regarding what type, if any, of resilience training can be recommended. There was considerable variation in the type of CBT or mindfulness skills offered in the intervention studies examined, and training times varied mad difference result in the studies (Joyce et al., 2018).

From literature reviews about factors related to mental health conditions during the COVID-19 situation as mentioned above. The researchers divided factors that may be associated with mental health problems (for this research were stress, depression, and suicide risk) were classified into 6 main groups : 1. Demographic factors, including age and gender 2. Factors for control measures for the pandemic of COVID-19 by area. 3. Health vulnerability factors, including those infected with COVID-19, home quarantine and who had chronic underlying disease 4. Economic vulnerability factors are those whose businesses have problems or failure and those with low income or debt 5. Family factors include had elderly or an newborn in family, had a patient with bed ridden in family and had member with physical / mental disability in family 6. Mental health factors that may affect stress, depression and suicide risk include burnouts and resilience. To analyze the association which factors associate the likelihood of stress, depression, and suicide risk.

2.6 Mental health assessment during COVID-19 situation in Thailand

During the COVID-19 outbreak in Thailand, the department of mental health, which is responsible for promoting, prevention, treatment and recovery of the mental health of Thai people. Have explored a wide variety of mental health conditions. One of the largest mental health databases of surveys is the 'mental health check-in' survey.

MENTAL HEALTH CHECK IN

It is a basic mental health assessment tool. And screening for the risk of mental health problems from the situation of COVID-19. Developed to facilitate health workers and volunteers find people who have mental health problems, to promote mental health self-screening and to develop a dashboard which presents analytical information. The assessment consists of SBSD :

S : Stress, B : Burnout, S : Suicide and D : Depression

With immediate assessment results. There are instructions on how to act. Along with the online expert consultation channel. developed by mental health center 1 - 13, department of mental health.

Program structure

1. Identifying status and access
2. Taking a mental health assessment : Burnout, resilient quotient, ST5, 2Q, 9Q and 8Q
3. Give advice on self-care and provide consulting services for severe cases : line chat, leave phone number for the staff to contact back etc.

Data collection

Department of Mental Health collected the data by promoting the Thai people able to access the assessment form by themselves via online website. And can access the assessment form in every occupation groups, whether were the general people, public health workers and other government officials. And for those who cannot access to the online assessment, there will be a mental health center staff going to the area to assess for them. For people with relatives, patients, or the elderly who can't do it on their own. Relatives can go in to do an assessment for them. By reading questions to the patient or the elderly listen.

Ethical consideration

Before starting the assessment at the system, a notification will be displayed for consent. Take personal information for overall analysis. Anonymously. Participants must sign their consent or without consent before doing the assessment every time.

Participants who completed the assessment via the mental health check-in website will receive analysis results and recommendations immediately after completing the assessment. If the results of the analysis are in the normal group, the website will show recommendations for

preliminary mental health care and show the way to contact for more advice at hotline 1323. If participants are in a risk group, they will be prompted to log in to the chat for further instructions. For high-risk groups, mental health personnel in that area of responsibility will contact participants back via phone to evaluate and counseling. The consent of the participant must be obtained before contacting. If unable to contact the mental health center will also be able to coordinate public health volunteers in that area to contact the assessment and provide assistance to participants who are assessed in the high-risk group.

Mental health assessment in 'Mental health check-in' website

there are 6 parts follow :

1. General data

1.1 Type of participants

- General people
- Village health volunteers
- Health care personnel
- Educational personnel
- Other government personnel

2. Gender Male Female

3. Age.....years

4. Address.....

Province.....

1.2 Vulnerable risk (can answers more than 1)

- Patient with COVID-19
- Home quarantine
- Have family member with patient with COVID-19 / home quarantine
- Unemployed / laid off
- The business has a problem / failure
- Low income / debt
- Have chronic underlying diseases
- Physical disability
- Mental disability
- Have elderly / newborn in family
- Have family member with physical / mental disability in family
- Have patient with bed ridden in family

No conditions of vulnerable above



2. Resilience quotient (RQ)

In the past 2 weeks, Do you have confidence in these issues below?

"1 means less confident and 10 means very confident "

Issues	1	2	3	4	5	6	7	8	9	10
1. I can overcome obstacles and problems in life.										
2. I am encouraged and supported by those around me.										
3. I can deal with my problems and stress.										
Total score										

3. Burnout assessment

	rarely	sometime	often	always
During the past 1 week You have emotional exhaustion. Feeling depleted, desperate, wasted energy Psychologically or not.				

4. Srithanya stress scale (ST-5) for stress assessment

ST-5 is the short version of stress questionnaire. There are 5 items of this questionnaire including 1.sleep problem, 2.decrease in concentration, 3.aggressive/anxiety/irritable, 4.boring and 5.don't want to meet any people. ST-5 has high internal reliability (cronbach alpha = 0.85) and highly correlate to Hospital anxiety depression scale (HAD) (pearson correlation = 0.61) (Silpakit, 2008)

The details of the stress assessment form ST-5 are as follows :

	Symptoms or feelings that occur in period of 2-4 weeks.	rarely	sometime	often	always
1	Have sleep problems. Can't sleep or sleep too much	0	1	2	3
2	Decrease in concentration	0	1	2	3
3	Aggressive/anxiety/irritable	0	1	2	3
4	Boring	0	1	2	3
5	Don't want to meet any people	0	1	2	3
Total scores					

Footnote : Rarely means There are no symptoms or symptom occurs only 1 time.

Sometimes means Symptom occurs more than 1 time, but not often.

Often means Symptoms occur almost every day.

Always means Symptoms occurs every day.

Interpretation and recommendations

0 - 4 points mean that there is no stress on the level that causes problems and can still manage the stress that occurs in daily life. And adapt to various situations appropriately.

5 - 7 points mean suspected stress or there is feeling uneasy and unresolved, which takes time to adjust or solve the problem. Counsel or advice on relaxation should be given. Stress by talking to or in consultation with close people. To relieve stress or unravel the origins of problems and may take multiple inhalations (5-10 times) or use religious principles to relieve anxiety.

8 points above refer to the high level of stress that may affect the body, such as aches, back pain, insomnia, etc. Consulted by public health personnel In order to find the cause of the cause stress and find solutions.

5. 9 questions (9Q) for depression assessment

The 9-question depression assessment form (9Q) was developed by Thoranin Kongsuk and colleagues as a tool to assess and classify the severity of depression. It has a sensitivity of 75.68% and specificity 93.37% compared with the diagnosis of MDD (Major Depressive Disorder). The probability of depression was 11.41 times with the accuracy. To measure changes in depression at a relatively high level, it took less time to assess symptoms. The 9-question depression assessment (9Q), compared with the Hamilton Rating Scale for Depression (HRSD-17), had a relative coefficient of 0.719 (P-value <0.001), a sensitivity of 85%, a specificity of 72%. And Likelihood Ratio 3.04 (Kongsuk et al., 2018).

The details of the depress assessment form 9Q are as follows :

	In the past 2 weeks include today, How often do you have these symptoms?	Never	Sometimes (1-7days)	Often (>7days)	Always (Everyday)
1	Boring, not interested in doing anything.	0	1	2	3
2	Uneasy, depressed, discouraged.	0	1	2	3
3	Difficulty sleep or sleep too much.	0	1	2	3
4	Being tired easily or not having energy.	0	1	2	3
5	Loss of appetite or overeating.	0	1	2	3
6	Feel bad about yourself. Thinking that you	0	1	2	3

	are a failure or have caused frustrated self or family.				
7	Poor concentration when doing things such as watching television, listening to the radio, or doing work that requires attention.	0	1	2	3
8	Speak slowly, do something slower Until others notice or become restless unable to remain as still as it used to be.	0	1	2	3
9	Thinking of harming self or think that if death would be good.	0	1	2	3
Total scores					

Interpretation

- <7 points mean no symptoms of depression or very few symptoms of depression.
- 7-12 points mean have mild symptoms of depression.
- 13-18 points mean have symptoms of moderate depression.
- =>19 points mean have symptoms of severe depression.

Recommendations

1. Caring and helping patients with depression who do not have symptoms of depression or very few symptoms of depression (<7 points)

1.1 Notifying the results of depression assessment and providing mental health education.

1.2 Evaluate the psychosocial problems and provide counseling and self-solving skills.

1.3 Recommended to exercise 30 - 45 minutes at least 3 times a week, except for who those with limitation for exercise.

1.4 Recommend self-assessment of depression with a depression screening question 2 questions (2Q). When found that the effect is likely to suffer from depression to meet with public health personnel to assess depression again.

2. Caring and supporting patients with mild symptoms of depression (7-12 points)

2.1 The case transferred from the community should re-evaluated with 9Q again.

2.2 Notifying the results of depression assessment and provide mental health education.

2.3 Physician diagnoses the physical disease and evaluates the drug used by the patient. Stop or reduce drugs that can cause symptoms are similar to depression.

2.4 Notifying the diagnosis results to patient. Recommend non pharmacotherapy such as exercise 30 - 45 minutes at least 3 times a week.

2.5 Evaluate the psychosocial problems and provide counseling.

2.5 Follow up for severity of depression evaluation with 9Q.

3. Caring and supporting patients with moderate symptoms of depression (13-18 points)

3.1 The case transferred from the community should re-evaluated with 9Q again.

3.2 Notifying the results of depression assessment and provide mental health education.

3.3 Physician diagnoses the physical disease and evaluates the drug used by the patient. Stop or reduce drugs that can cause symptoms are similar to depression.

3.4 Evaluate the psychosocial problems and provide counseling.

3.5 Consider to giving antidepressant according to the guidelines.

3.6 Consider to referring to psychosocial care by specialize professional.

3.7 If patient has high suicidal risk, refer to psychiatric hospital.

4. Caring and supporting patients with severe symptoms of depression (=>19 points)

4.1 The case transferred from the community should re-evaluated with 9Q again.

4.2 Notifying the results of depression assessment and provide mental health education.

4.3 Physician diagnoses the physical disease and evaluates the drug used by the patient. Stop or reduce drugs that can cause symptoms are similar to depression.

4.4 Evaluate the psychosocial problems and provide counseling.

4.5 Use antidepressant according to the guidelines.

4.6 Refer to psychiatric hospital.

6. 8 questions (8Q) for suicidal risk assessment

This 8Q for suicide assessment, the Department of Mental Health, was drawn from part of the M.I.N.I., suicidal risk assessment part. For convenience and ease of use, actually simple.

Mini - International Neuropsychiatric Interview (M.I.N.I.), is a tool for interviewing structure for diagnosis psychiatric illness according to the both criteria of the American Psychiatric Association and of the World Health Organization. Has been developed from 2 groups of professors, David V.Sheehan, university of South Florida college of medicine and Dr.Yves Lecrubier's from hopital de la salpetriere, France. These tools were developed for the accurate diagnosis of common psychiatric disorders. M.I.N.I. consists of initial screening questions and symptom-specific questions for each diagnosis. The interview will begin with questions for each module, which contains 16 diagnostic kits and starts with 1 - 2 screening questions.

M.I.N.I.-Thai version, current suicidal risk part has Cohen's Kappa >0.75 , sensitivity >0.81 , specificity >0.81 , positive predictive value >0.81 , negative predictive value >0.81 (Kittirattanapaiboon & Khamwongpin, 2005).



The details of the depress assessment form 8Q are as follows :

	Times	Questions	No	Yes
1	In the past of 1 month include today	Thinking of wanting to die or thinking that it would be better to die.	0	1
2		Want to hurt yourself or injure yourself.	0	2
3		Thinking about suicide	0	6
		(If you answered yes, ask more) Can you control your suicidal thinking? Or can you tell you won't follow that idea at the moment?	8	0
4		Have a suicidal plan.	0	8
5		Prepare to harm yourself or to commit suicide by really decided that.	0	9
6		Harmed yourself but did not intend to death.	0	4
7	Attempted suicide, expecting / intending to die	0	10	
8	Whole of life	Attempted suicide	0	4
Total scores				

Interpretation

- 0 point mean there is no current suicidal tendency.
 1-8 points mean there is current suicidal tendency, mild level.
 9-16 points mean there is current suicidal tendency, moderate level.
 =>17 points mean there is current suicidal tendency, severe level.

The health care personnel who answered 'mental health check-in' website during December 17, 2020, to February 23, 2021 were 59,034. Separated by provinces as below.

Table 1 The number of health care personnel who answered the 'mental health check-in' website during December 17, 2020 to February 23, 2021 separated by provinces.

	Province	Number		Province	Number
1	Amnat Charoen Province	802	40	Phatthalung Province	492
2	Ang Thong Province	309	41	Phayao Province	155
3	Bangkok	1113	42	Phetchabun Province	1285
4	Bueng Kan Province	513	43	Phetchaburi Province	953
5	Buriram Province	339	44	Phichit Province	250
6	Chachoengsao Province	3387	45	Phitsanulok Province	593
7	Chai Nat Province	438	46	Phra Nakhon Si Ayutthaya Province	57
8	Chaiyaphum Province	582	47	Phrae Province	225
9	Chanthaburi Province	1040	48	Phuket Province	518
10	Chiang Mai Province	621	49	Prachinburi Province	941
11	Chiang Rai Province	118	50	Prachuap Khiri Khan Province	701
12	Chonburi Province	789	51	Ranong Province	341
13	Yellow-orange zone	1119	52	Ratchaburi Province	294
14	Green-yellow zone	1299	53	Rayong Province	1076
15	Kamphaeng Phet Province	1218	54	Roi Et Province	2035
16	Kanchanaburi Province	875	55	Sa Kaeo Province	1035
17	Khon Kaen Province	306	56	Sakon Nakhon Province	334
18	Krabi Province	1536	57	Samut Prakan Province	1641
19	Lampang Province	116	58	Samut Sakhon Province	302
20	Lamphun Province	124	59	Samut Songkhram Province	158
21	Loei Province	391	60	Saraburi Province	27
22	Lopburi Province	324	61	Satun Province	227
23	Mae Hong Son Province	65	62	Sing Buri Province	14
24	Maha Sarakham Province	1807	63	Sisaket Province	3205
25	Mukdahan Province	906	64	Songkhla Province	1119
26	Nakhon Nayok Province	183	65	Sukhothai Province	882

27	Nakhon Pathom Province	197	66	Suphan Buri Province	933
28	Nakhon Phanom Province	1152	67	Surat Thani Province	948
29	Nakhon Ratchasima Province	1000	68	Surin Province	1555
30	Nakhon Sawan Province	1687	69	Tak Province	1058
31	Nakhon Si Thammarat Province	1132	70	Trang Province	621
32	Nan Province	246	71	Trat Province	732
33	Narathiwat Province	342	72	Ubon Ratchathani Province	2292
34	Nong Bua Lamphu Province	136	73	Udon Thani Province	746
35	Nong Khai Province	270	74	Uthai Thani Province	409
36	Nonthaburi Province	446	75	Uttaradit Province	562
37	Pathum Thani Province	133	76	Yala Province	176
38	Pattani Province	255	77	Yasothon Province	1508
39	Phang Nga Province	1318		Total	59034

Chapter 3

METHODOLOGY

3.1 Study Design

The study was retrospective cross-sectional descriptive study

3.2 Study Area

The study area was the secondary data from department of mental health, the ministry of public health, Thailand. Data from 'mental health check-in' databases. The data was collected during December 17, 2020, to February 23, 2021

3.3 Study population and Sample

3.3.1 Study Population

Health care personnel, who answered the 'mental health check-in' questionnaire of department of mental health. During December 17, 2020, to February 23, 2021.

3.3.2 Inclusion, Exclusion and Discontinuation Criteria

Inclusion Criteria

All health care personnel age 18-60 years old, who answered the mental health check-in questionnaire of the Department of Mental Health. During December 17, 2020, to February 23, 2021.

Exclusion Criteria

Health care personnel who did not complete all questions.

Discontinuation Criteria

None

3.4 Sampling procedure and Sample size

Sampling procedure in this research was divided into 3 parts :

1. Selection of research period.
2. Selection of area and sample size.
3. Selection of questions from mental health check-in questionnaires.

1. Selection of research periods

This research will use the data that collected during December 17, 2020, to February 23, 2021. Because this research was a study of association between factors related and stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand. Which the COVID-19 second outbreak in Thailand began on December 17, 2020 (โชคครรชิตไชย, 2563). During this time there are major measures to control the spread of disease. By dividing the concentration of measures according to number of cases infected and spreading areas. And when the outbreak gets better, the government therefore reduced the level of control. It came in at almost the same level as normal on February 23, 2021.

2. Selection of area and sample size

2.1 During the period mentioned in article 1 the Thai government had divided the intensity of pandemic control measures. According to the number of infected people and the spread of the disease, divided into 5 zones according to the level of severity as follows : 1. green zone 2. yellow zone 3. orange zone 4. red zone and 5. dark red zone

The control measure zone had been adjusted 5 times according to the changing pandemic situation as follows table 3.1

Table 2 showed pandemic control measures according to the number of infected people and the spread of the disease in each province had been adjusted 5 times during December 17, 2020 to February 23, 2021


	24/12/20 - 3/1/21	4/1/21 - 6/1/21	6/1/21 - 26/1/21	27/1/21 - 22/2/21	23/2/21
Amnat Charoen Province	Green	Yellow	Yellow	Green	Green
Ang Thong Province	Yellow	Red	Red	Orange	Green
Bangkok	Orange	Red	Red	Red	Orange
Bueng Kan Province	Green	Yellow	Yellow	Green	Green
Buriram Province	Green	Orange	Orange	Yellow	Green
Chachoengsao Province	Orange	Red	Red	Orange	Yellow
Chai Nat Province	Yellow	Orange	Orange	Yellow	Green
Chaiyaphum Province	Yellow	Orange	Orange	Yellow	Green
Chanthaburi Province	Green	Red	Red	Orange	Green


Chiang Mai Province	Yellow	Yellow	Yellow	Green	Green
Chiang Rai Province	Green	Yellow	Yellow	Green	Green
Chonburi Province	Yellow	Red	Red	Orange	Yellow
Yellow-orange zone	Green	Red	Red	Yellow	Yellow
Green-yellow zone	Green	Yellow	Yellow	Green	Green
Kamphaeng Phet Province	Yellow	Orange	Orange	Yellow	Green
Kanchanaburi Province	Yellow	Red	Red	Orange	Yellow
Khon Kaen Province	Yellow	Yellow	Yellow	Green	Green
Krabi Province	Yellow	Yellow	Yellow	Green	Green
Lampang Province	Green	Yellow	Yellow	Green	Green
Lamphun Province	Green	Yellow	Yellow	Green	Green
Loei Province	Yellow	Yellow	Yellow	Green	Green
Lopburi Province	Yellow	Red	Red	Orange	Green
Mae Hong Son Province	Green	Yellow	Yellow	Green	Green
Maha Sarakham Province	Green	Yellow	Yellow	Green	Green
Mukdahan Province	Green	Yellow	Yellow	Green	Green
Nakhon Nayok Province	Yellow	Red	Red	Orange	Yellow
Nakhon Pathom Province	Green	Red	Red	Orange	Orange
Nakhon Phanom Province	Orange	Yellow	Yellow	Green	Green
Nakhon Ratchasima Province	Yellow	Orange	Orange	Yellow	Green
Nakhon Sawan Province	Yellow	Orange	Orange	Yellow	Green
Nakhon Si Thammarat Province	Yellow	Yellow	Yellow	Green	Green
Nan Province	Green	Yellow	Yellow	Green	Green
Narathiwat Province	Yellow	Yellow	Yellow	Yellow	Yellow
Nong Bua Lamphu Province	Green	Yellow	Yellow	Green	Green
Nong Khai Province	Green	Yellow	Yellow	Green	Green
Nonthaburi Province	Orange	Red	Red	Red	Orange
Pathum Thani Province	Yellow	Red	Red	Red	Orange
Pattani Province	Green	Yellow	Yellow	Green	Green
Phang Nga Province	Green	Orange	Orange	Yellow	Green
Phatthalung Province	Green	Yellow	Yellow	Green	Green
Phayao Province	Green	Yellow	Yellow	Green	Green
Phetchabun Province	Yellow	Orange	Orange	Yellow	Green
Phetchaburi Province	Orange	Red	Red	Orange	Yellow
Phichit Province	Yellow	Yellow	Yellow	Green	Green
Phitsanulok Province	Green	Yellow	Yellow	Green	Green
Phra Nakhon Si Ayutthaya Province	Yellow	Red	Red	Orange	Yellow
Phrae Province	Green	Yellow	Yellow	Green	Green
Phuket Province	Yellow	Yellow	Yellow	Green	Green
Prachinburi Province	Yellow	Red	Red	Orange	Green
Prachuap Khiri Khan Province	Green	Red	Red	Yellow	Green
Ranong Province	Orange	Red	Red	Yellow	Yellow
Ratchaburi Province	Orange	Red	Red	Orange	Orange
Rayong Province	Green	Red	Red	Orange	Yellow
Roi Et Province	Green	Yellow	Yellow	Green	Green
Sa Kaeo Province	Green	Red	Red	Orange	Green


Sakon Nakhon Province	Green	Yellow	Yellow	Green	Green
Samut Prakan Province	Orange	Red	Red	Red	Orange
Samut Sakhon Province	Red	Red	Red	Red	Red
Samut Songkhram Province	Orange	Red	Red	Orange	Orange
Saraburi Province	Yellow	Red	Red	Orange	Yellow
Satun Province	Yellow	Yellow	Yellow	Green	Green
Sing Buri Province	Green	Red	Red	Orange	Green
Sisaket Province	Green	Yellow	Yellow	Green	Green
Songkhla Province	Yellow	Yellow	Yellow	Yellow	Yellow
Sukhothai Province	Yellow	Orange	Orange	Yellow	Green
Suphan Buri Province	Yellow	Red	Red	Orange	Yellow
Surat Thani Province	Yellow	Orange	Orange	Yellow	Green
Surin Province	Yellow	Yellow	Yellow	Green	Green
Tak Province	Yellow	Red	Red	Orange	Orange
Trang Province	Yellow	Yellow	Yellow	Green	Green
Trat Province	Green	Red	Red	Orange	Green
Ubon Ratchathani Province	Yellow	Yellow	Yellow	Green	Green
Udon Thani Province	Yellow	Yellow	Yellow	Green	Green
Uthai Thani Province	Green	Orange	Orange	Yellow	Green
Uttaradit Province	Yellow	Yellow	Yellow	Green	Green
Yala Province	Green	Yellow	Yellow	Yellow	Yellow
Yasothon Province	Green	Yellow	Yellow	Green	Green

Note :  means Surveillance areas (green zone) : Areas where no infection has been reported and there is no indication that someone will be infected.

 means High surveillance areas (yellow zone) : Areas with ≤ 10 infected cases and can be controlled or adjacent to controlled areas.

 means Controlled areas (orange zone) : Areas with more than 10 infected cases with increased tendency or adjacent to the highest controlled areas.

 means High controlled areas (red zone) : Areas with a high number of infected cases and > 1 area.

 means Maximum controlled areas (dark red zone) : Areas with a large number of infected people can't control and requires specific controlled measures

2.2 During the research period, every provinces has changed the intensity of disease control measures according to the changing situation. None of the provinces were in the original measures zone from beginning to end of the research period. Therefore cannot randomly represent each one color zone.

2.3 The researcher therefore used the criteria for selecting provinces to enter, which is a province with no more than 1 level of change in measures during the research period.

2.4 Divided into 5 zones as follows:

- Zone 1 was Surveillance - High surveillance areas (green-yellow zone)
- Zone 2 was High surveillance - Controlled areas (yellow-orange zone)
- Zone 3 was Controlled - High controlled areas (orange-red zone)
- Zone 4 was High controlled - Maximum controlled areas (red-dark red zone)
- Zone 5 was Bangkok

Reasons for separating Bangkok into specific zones because Bangkok had many measures that are more special than other areas, they are heavily regulated and have a huge impact on the economy. Therefore, the researcher saw that separating Bangkok to compare with other areas will make the analysis clearer and more useful.

Table 3 showed provinces that qualify for inclusion criteria (provinces had changed measures during the research period, not more than 1 level) divided by zones reorganized according to article 2.4 in total of 43 provinces and the number of health care personnel who completed the questionnaire in each province

zone		24/12/20 - 3/1/21	4/1/21 - 6/1/21	6/1/21 - 26/1/21	27/1/21 - 22/2/21	23/2/21	N
1	Amnat Charoen Province						802
	Bueng Kan Province						513
	Chiang Mai Province						621
	Chiang Rai Province						118
	Green-yellow zone						1299
	Khon Kaen Province						306
	Krabi Province						1536
	Lampang Province						116
	Lamphun Province						124
	Loei Province						391
	Mae Hong Son Province						65
	Maha Sarakham Province						1807
	Mukdahan Province						906
	Nakhon Si Thammarat Province						1132
	Nan Province						246
	Nong Bua Lamphu Province						136
	Nong Khai Province						270
	Pattani Province						255
	Phatthalung Province						492
	Phayao Province						155
	Phichit Province						250
	Phitsanulok Province						593
	Phrae Province						225
Phuket Province						518	

	Roi Et Province					2035
	Sakon Nakhon Province					334
	Satun Province					227
	Sisaket Province					3205
	Surin Province					1555
	Trang Province					621
	Ubon Ratchathani Province					2292
	Udon Thani Province					746
	Uttaradit Province					562
	Yala Province					176
	Yasothon Province					1508
2	Narathiwat Province					342
	Songkhla Province					1119
3	Nonthaburi Province					446
	Ratchaburi Province					294
	Samut Prakan Province					1641
	Samut Songkhram Province					158
4	Samut Sakhon Province				302	
5	Bangkok				1113	

Note : N = the number of health care personnel who completed the questionnaire

2.5 After dividing the provinces into area zones, the researcher used quota randomization to randomized the province in each zone area, 1 province per area.

Inclusion criteria of provinces were at least 300 the number of personnel who answered the questionnaire.

And no exclusion criteria.

2.6 **Sample size :** All health care personnel in the province were randomly in each zone, who answered in the 'mental health check-in' website from December 17, 2020 to February 23, 2021 will be all participants in this research.

3. Selection of questions from mental health check-in questionnaires.

From literature reviews about factors related to mental health conditions during the COVID-19 situation among health care personnel. The researcher divided factors that may be associated with mental health problems (for this research were stress, depression, and suicide risk) were classified into 7 main groups of independent variables as : 1. Demographic factors 2. Factors for control measures for the pandemic of COVID-19 by area. 3. Health vulnerability factors 4. Economic vulnerability factors 5. Family factors 6. Burnouts and 7. Resilience quotient. To analyze the association which factors associate the likelihood of dependent factors as stress, depression, and suicide risk.

Therefore, when compared with the questions in the mental health check-in questionnaires, the questions related to the variables in this studied are as follows:

Independent variables

Group 1 Demographic factors, had questions in the mental health check-in that were relevant to this topic, including

- Age
- Gender

Group 2 Area of measure controlled to prevent the spread of COVID-19, had questions in the mental health check-in that were relevant to this topic, including

- Province address

Group 3 Health vulnerability factors, had questions in the mental health check-in that were relevant to this topic, including

- Participants who infected with COVID-19
- Participants who were in home quarantine
- Participants who had chronic underlying disease

Group 4 Economic vulnerability factors, had questions in the mental health check-in that were relevant to this topic, including

- Participants who had businesses problems or failure
- Participants who with low income or debt

Group 5 Family factors, had questions in the mental health check-in that were relevant to this topic, including

- Participants who had elderly or infant in family
- Participants who had patient in the family

Group 6 Burnout, had questions in the mental health check-in that were relevant to this topic, including

- During the past 1 week You have emotional exhaustion. Feeling depleted, desperate, wasted energy Psychologically or not

Group 7 Resilient quotient, had questions in the mental health check-in that were relevant to this topic, including

- I can overcome obstacles and problems in life
- I am encouraged and supported by those around me.
- I can deal with my problems and stress.

Dependent variables

1. Stress
2. depression
3. Suicidal risk

3.5 Research Instrument

In this study, used the secondary data from 'mental health check-in' database from department of mental health, the ministry of public health, Thailand.

From the questionnaire selection criteria mentioned in the selection questions section. The 'mental health check-in' questionnaires drawn in this research were composed of 7 parts are stratified as follows

Part I: There are 3 items structured-questionnaire in this part. These questions are group 1 independent variables - demographic status as age, gender and group 2 independent variables - area of measure controlled to prevent the spread of COVID-19 was address (province). Part 1 questionnaire type was multiple choice type.

Part II: There are 8 items structured-questionnaire in this part. These questions are vulnerable group factors (group 3-5 independent variables) as patient with COVID-19, people with home quarantine, have chronic underlying diseases, the business has a problem/failure, low income/debt, have elderly/newborn in family, have patient with bed ridden in family, have member with physical/mental disability in family. Part 2 questionnaire type was multiple choice type.

Part III: There are 3 items structured-questionnaire in this part. These questions about resilience quotient factors (group 7 independent variables) such as able to overcome obstacles, able to handle the problem and have encouragement. Part 3 questionnaire type was multiple choice type.

Part IV: There are 1 item structured-questionnaire in this part. These questions about burnout factors (group 6 independent variables). Part 4 questionnaire type was multiple choice type.

Part V: In this section, Stress will be measured by using the Srithanya stress scale (ST-5),

ST-5 is the short version of stress questionnaire. There are 5 items of this questionnaire including 1.sleep problem, 2.decrease in concentration, 3.aggressive/anxiety/irritable, 4.boring and 5.don't want to meet any people.

The answer is divided into 4 frequency levels and is graded as follows:

0	=	rarely
1	=	sometime
2	=	often
3	=	away

With the criteria for interpreting results into 3 groups as follows :

- no problem group 0-4 points
- might have a problem group 5-7 points
- have a problem group ≥ 8 points

ST-5 has high internal reliability (cronbach alpha = 0.85) and highly correlate to Hospital anxiety depression scale (HAD) (pearson correlation = 0.61) (Silpakit, 2008).

Part VI: In this section, depression will be measured by using the 9 questions of depression assessment (9Q), The 9-question depression assessment form (9Q) was developed by Thoranin Kongsuk and colleagues as a tool to assess and classify the severity of depression, dividing the assessment of 4 levels of symptoms as or none = 0 points, sometimes = 1 point, often = 2 points and always = 3 points.

With divided into 4 levels of severity of symptoms of depression as follow :

- normal <7 points
- mild symptoms of depression 7-12 points
- moderate symptoms of depression 13-18 points
- severe symptoms of depression 19 points

The 9Q has a sensitivity of 75.68% and specificity 93.37% compared with the diagnosis of MDD (Major Depressive Disorder). The probability of depression was 1.41 times with the accuracy. To measure changes in depression at a relatively high level, it took less time to assess symptoms. The 9-question depression assessment (9Q), compared with the Hamilton Rating Scale for Depression (HRSD-17), had a relative coefficient of 0.719 (P-value <0.001), a sensitivity of 85%, a specificity of 72%. And Likelihood Ratio 3.04 (Kongsuk et al., 2018).

Part VII: In this section, Suicidal risk will be measured by using the 8 questions (8Q) of suicidal risk assessment. The department of mental health, was drawn 8Q from the part of the M.I.N.I., suicidal risk assessment part. Mini - International Neuropsychiatric Interview (M.I.N.I.), is a tool for interviewing structure for diagnosis psychiatric illness.

With divided into 4 levels of severity of suicidal risk as follow :

- No current suicidal tendency 0 point
- Current suicidal tendency, mild level 1-8 points
- Current suicidal tendency, moderate level 9-16 points
- Current suicidal tendency, severe level =>17 points

M.I.N.I.-Thai version, current suicidal risk part has Cohen's Kappa >0.75, sensitivity >0.81, specificity >0.81, positive predictive value >0.81, negative predictive value >0.81 (Kittirattanapaiboon & Khamwongpin, 2005).

3.6 Data collection

This study uses secondary data from department of mental health, Thailand. The researcher has submitted a request for data from the department of mental health. To be analyzed according to research objectives.

This databases, the department of mental health conducted on Thai people on mental health check-in website. In this research will use on health care personnel parts.

3.7 Data analysis

This study will use Statistical Package for Social Science (SPSS) Version 22 for analysis

The data from the 'mental health check-in' database of the Department of Mental Health were collected in excel format. Data can be extracted from excel file to be analyzed by SPSS program directly without having the file conversion process.

Variables : This research uses variable in the form of categorize variables to correlate the statistics calculations as follows

Independent variables

1. Age this variant, continuous data and categorize data formats were used. The continuous data was used to analyzed descriptive. Categorize data was used to analyzed the association. For the categorize format, this variable was divided into 3 groups : 1.early working age (18-29 years old), 2.middle working age (30-44 years old) and 3.late working age (45-60 years old)
2. Gender divided into two groups : male and female
3. Area zone divided into 5 zones: zone 1 green-yellow zone, zone 2 was yellow-orange zone, zone 3 was orange-red zone, zone 4 was red-dark red zone and zone 5 was Bangkok
4. Vulnerable group there are two groups in each of the vulnerable groups : no and yes group.
5. Burnout divided into 2 groups : normal group (0-2 scores of burnout) and risk group (≥ 3 scores of burnout).
6. Resilience quotient divided into 3 groups : low resilience group (3-14 scores of RQ), moderate resilience group (15-23 scores of RQ) and high resilience group (24-30 scores of RQ).

Dependent variable

1. Stress divided into 2 groups : normal group (0-7 scores of ST5) and stress group (≥ 8 scores of ST5).
2. Depression divided into 2 groups : normal group (0-6 scores of 9Q) and depression group (≥ 7 scores of 9Q).
3. Suicidal risk divided into 2 groups : no risk group (0 score of 8Q) and have suicidal risk group (≥ 1 scores of 8Q).

Statistical Analysis

The significance level was set at $\alpha = .05$, and all tests were 2-tailed.

Descriptive statistics : mean and standard deviation will be used to calculate for continuous variables. Frequency and percentage percentages were calculated to summarize data. The median and interval quartiles are used to represent the data if the data is distributed not according to the normal curve. The prevalence of stress, depression, and suicide risk for each level is expressed in numbers and percentages.

Multivariable logistic regression : were used to determine factors associated with stress, depression, and suicide risk among participants. The relationship between risk factors and outcomes is presented as odds ratios (ORs) and 95% CI.

The association analysis in this research used statistical method - multivariate logistic regression to manage confounding, enter selection technique. Control for factors or variables with p-value < 0.2 from univariate logistic regression into the model and present adjusted odds ratio (adjOR) confidence interval (CI) of 95%.

3.8 Ethical Consideration

This research has been approved ethical from ethics review committee of Department of mental health. Certificate number was DMH.IRB.COA 019/2564.

This research used secondary data for analysis. Therefore, it did not pose any risk to the participants. All data analysis and presentation will be done in groups. No individualized information is presented so that subjects cannot be indirectly identifiable through contextual considerations. There will be data destruction by deleting all data files after the completion of the research within 1 year.

Chapter 4

RESULTS

This study aimed to identify the prevalence and investigate the association between factors related of stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand. The study intended to describe independent variables, namely, demographic factors, areas of measure controlled to prevent the spread of COVID-19, vulnerable group factors, burnout factors and resilience quotient factors. Also, intended to describe dependent variables, namely, stress, depression and suicidal risk. And the study designed to evaluate associations between these independent variables and a dependent variable among health care personnel during COVID-19 second outbreak in Thailand. The study population consisted of 4,970 health care personnel.

This result contained descriptive statistical results of these independent variables and dependent variables which mentioned above among health care personnel during COVID-19 second outbreak in Thailand. The inferential statistical results of bivariate analysis were done by binary logistic regression. In the bivariate analysis, all variables with a p-value of less than 0.2 in a binary logistic regression analysis were considered for inclusion in a multivariable logistic regression model. The multivariate analysis was done by multivariable logistic regression among independent variables with each of dependent variables.

Descriptive statistic

4.1 Demographic, areas of measure controlled to prevent the spread of COVID-19, vulnerable group factors, burnout factors and resilience quotient factors.

Table 4 showed the demographic factors, areas of measure controlled to prevent the spread of COVID-19, vulnerable group factors, burnout factors and resilience quotient factors of the participants. There were 4,970 health care personnel participated in the study. Among 4,970 participants. The participants were female participants 84.1% and male participants 15.9%. Most of the participants (43.8%) were in middle working age group (30-44 years old) and the least of participants (27.5%) were in early working age group (18-29 years old). According to the areas of measure controlled to prevent the spread of COVID-19. There were 5 area zones, zone1 green-yellow zone had 1,045 participants (21.0%), zone2 yellow-orange zone had 1,110 participants (22.3%), zone3 orange-red zone had 1,514 participants (30.5%), zone4 red-dark red zone had 222 participants (4.5%) and zone5 Bangkok province had 1,079 participants (21.7%).

In accordance with the vulnerable group factors, participants who were vulnerable groups sorted from most to least as follows : have elderly/newborn in family 22.3%, low income/dept 22.2%, have chronic underlying disease 6.1%, home quarantine 4.0%, have patient with bed ridden in family 2.8%, have member with physical/mental disability in family 2.5% and patient with COVID-19 group and the business has problem/failure group both were 2.2%. The burnout factors, there were 556 participants (11.2%) were in risk group. For resilience quotient factors, most of participants (64.0%) had high level of resilience quotient, moderate level and low level of resilience quotient were 32.5% and 3.4%, respectively.

Table 4 Number and percentage of participants by demographic, areas of measure controlled to prevent the spread of COVID-19, vulnerable group, burnout factors and resilience quotient factors (n=4,970)

Demographic factors	Number	(%)
Age		
Early working age (18-29)	1367	(27.5)
Middle working age (30-44)	2179	(43.8)
Late working age (45-60)	1424	(28.7)
Mean (sd)	37.8	(10.56)
Range	18-60	
Gender		
Male	791	(15.9)
Female	4179	(84.1)
Area of measure controlled to prevent the spread of COVID-19		
zone 1 : Green - yellow zone	1045	(21.0)
zone 2 : Yellow - orange zone	1110	(22.3)
zone 3 : Orange - red zone	1514	(30.5)
zone 4 : Red - dark red zone	222	(4.5)
zone 5 : Bangkok	1079	(21.7)

Table 4 (continued)

Demographic factors	Number	(%)
Vulnerable groups		
Patient with COVID-19		
No	4861	(97.8)
Yes	109	(2.2)
Home quarantine		
No	4770	(96.0)
Yes	200	(4.0)
Have chronic underlying diseases		
No	4666	(93.9)
Yes	304	(6.1)
The business has problems/failure		
No	4863	(97.8)
Yes	107	(2.2)
Low income/debt		
No	3915	(78.8)
Yes	1055	(21.2)
Have elderly/newborn in family		
No	3863	(77.7)
Yes	1107	(22.3)
Have patient with bed ridden in family		
No	4833	(97.2)
Yes	137	(2.8)
Have member with physical/mental disability in family		
No	4847	(97.5)
Yes	123	(2.5)

Table 4 (continued)

Demographic factors	Number	(%)
Burnout		
Normal (0-2)	4414	(88.8)
Risk group (≥ 3)	556	(11.2)
Resilience quotient		
Low (3-14)	171	(3.4)
Moderate (15-23)	1617	(32.5)
High (24-30)	3182	(64.0)

4.2 Prevalence and severity of stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand.

Stress

From the ST5 assessment, stress was divided into 3 levels : mild (ST5 score 0-4), moderate (ST5 score 5-7) and severe (ST5 score ≥ 8). The most common stress levels were mild level (73.0%), followed by moderate (20.8%) and severe level (6.2%) respectively. Of the ST5 assessment, if participants scored greater than or equal to 8, they were at risk for stress. That is, this study had a 6.2% stress prevalence.

Depression

On the part of depression from the 9Q assessment, depression can be divided into 4 levels : normal (9Q score 0-6), mild (9Q score 7-12), moderate (9Q score 13-18) and severe level (9Q score ≥ 19). The most common in this study was normal group (90.9%), followed by mild (7.7%), moderate (1.2%), and severe level (0.3%), respectively. The total prevalence of depression in this study was 9.1%.

Suicidal risk

The suicide risk from the 8Q assessment, suicide risk can be divided into 4 levels: no risk (8Q score 0), low risk (8Q score 1-8), medium risk (8Q score 9-16) and severe risk (8Q score ≥ 17). The most common was no risk group (97.5%), followed by low risk (1.9%), moderate risk (0.4%), and severe risk (0.1%), respectively. The total prevalence of suicidal risk in this study was 2.5%.

Table 5 Prevalence and severity of stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand. (n=4,970)

Severity	Number	(%)	Prevalence
Stress (ST5)			
Mild (score 0-4)	3630	(73.0)	
Moderate (score 5-7)	1033	(20.8)	6.2
Severe (score =>8)	307	(6.2)	
Depression (9Q)			
Normal (score 0-6)	4518	(90.9)	
Mild (score 7-12)	381	(7.7)	9.1
Moderate (score 13-18)	57	(1.2)	
Severe (score =>19)	14	(0.3)	
Suicidal risk (8Q)			
No risk (score 0)	4847	(97.5)	
Low risk (score 1-8)	98	(2.0)	2.5
Moderate risk (score 9-16)	18	(0.4)	
Severe risk (score =>17)	7	(0.1)	

Inferential statistic

Bivariate logistic regression

In the logistic regression analysis, all variables with p-value of less than 0.2 in a bivariate logistic regression analysis were considered for inclusion in a multivariate logistic regression.

4.3 Association between related factors and stress

Table 6 showed the association between stress and demographic factors, areas of measure controlled to prevent the spread of COVID-19, vulnerable group factors, burnout factors and resilience quotient factors. The association between stress and areas of measure controlled to prevent the spread of COVID-19. On bivariate logistic regression analysis, a significantly higher proportion of participants who lived in zone 3 (orange-red zone) and zone 5 (Bangkok province) and stress compared to those who lived in zone 1 (green-yellow zone) [OR=1.27, 95%CI (0.89 - 1.82)] and [OR=2.28, 95%CI (1.61 - 3.24)], respectively.

The association between stress and vulnerable group factors. Participants who were home quarantine had less stress than who were not [OR=0.38, 95%CI (0.16 - 0.93)].

The association between stress and burnout factors. A significantly higher proportion of participants who were risk group of burnout and stress compared to who were normal group [OR=40.57, 95%CI (30.58 - 53.82)]. There was also significantly higher proportion of participants who had low resilience quotient group and moderate resilience quotient group and stress compared to who had high resilience quotient group [OR=48.40, 95%CI (31.77 - 73.74)] and [OR=9.08, 95%CI (6.54 - 12.60)], respectively.

Table 6 Association between related factors and stress

Related factors	Unadjusted OR	(95%CI)	p-value
Age			
Early working age (18-29)	1.06	(0.77 -1.45)	0.726
Middle working age (30-44)	1.14	(0.86 -1.51)	0.357
Late working age (45-60)	Ref.		
Gender			
Male	Ref.		
Female	1.02	(0.74 -1.41)	0.890
Area			
zone 1 : Green - yellow zone	Ref.		
zone 2 : Yellow - orange zone	0.92	(0.61 -1.38)	0.683
zone 3 : Orange - red zone	1.27	(0.89 -1.82)	0.191
zone 4 : Red - dark red zone	1.16	(0.61 -2.22)	0.651
zone 5 : Bangkok	2.28	(1.61 -3.24)	<0.001
Vulnerable groups			
Patient with COVID-19			
No	Ref.		
Yes	0.73	(0.29 -1.79)	0.488
Home quarantine			
No	Ref.		
Yes	0.38	(0.16 -0.93)	0.034

Table 6 (continued)

Related factors	Unadjusted OR	(95%CI)	p-value
Vulnerable groups			
Have chronic underlying diseases			
No	Ref.		
Yes	1.01	(0.63 -1.64)	0.957
The business has problems/failure			
No	Ref.		
Yes	0.92	(0.43 -2.00)	0.842
Low income/debt			
No	Ref.		
Yes	1.06	(0.80 -1.40)	0.683
Have elderly/newborn in family			
No	Ref.		
Yes	0.91	(0.69 -1.21)	0.535
Have patient with bed ridden in family			
No	Ref.		
Yes	0.45	(0.17 -1.22)	0.118
Have member with physical/mental disability in family			
No	Ref.		
Yes	1.06	(0.51 -2.19)	0.879
Burnout			
Normal (0-2)	Ref.		
Risk group (=>3)	40.57	(30.58 -53.82)	<0.001
Resilience quotient			
Low (3-14)	48.40	(31.77 -73.74)	<0.001
Moderate (15-23)	9.08	(6.54 -12.60)	<0.001
High (24-30)	Ref.		

4.4 Association between related factors and depression

Table 7 showed the association between depression and demographic factors, areas of measure controlled to prevent the spread of COVID-19, vulnerable group factors, burnout factors and resilience quotient factors. The association between depression and areas of measure controlled to prevent the spread of COVID-19. On bivariate logistic regression analysis, a significantly higher proportion of participants who lived in zone 3 (orange-red zone) and zone 5 (Bangkok province) and depression compared to those who lived in zone 1 (green-yellow zone) [OR=1.55, 95%CI (1.15 - 2.08)] and [OR=2.11, 95%CI (1.56 - 2.86)], respectively.

The association between depression and burnout factors. A significantly higher proportion of participants who were risk group of burnout and depression compared to who were normal group [OR=20.32, 95%CI (16.29 - 25.36)]. There was also significantly higher proportion of participants who had low resilience quotient group and moderate resilience quotient group and depression compared to who had high resilience quotient group [OR=49.23, 95%CI (33.78 - 71.75)] and [OR=8.48, 95%CI (6.54 - 11.00)], respectively.

Table 7 Association between related factors and depression (n=4,970)

Related factors	Unadjusted OR	(95%CI)	p-value
Age			
Early working age (18-29)	1.13	(0.87 -1.47)	0.350
Middle working age (30-44)	1.09	(0.86 -1.39)	0.455
Late working age (45-60)	Ref.		
Gender			
Male	Ref.		
Female	0.90	(0.70 -1.16)	0.414
Area			
zone 1 : Green - yellow zone	Ref.		
zone 2 : Yellow - orange zone	1.15	(0.82 -1.60)	0.423
zone 3 : Orange - red zone	1.55	(1.15 -2.08)	0.004
zone 4 : Red - dark red zone	1.19	(0.69 -2.07)	0.534
zone 5 : Bangkok	2.11	(1.56 -2.86)	<0.001

Table 7 (continued)

Related factors	Unadjusted OR	(95%CI)	p-value
Vulnerable groups			
Patient with COVID-19			
No	Ref.		
Yes	0.79	(0.38 -1.63)	0.520
Home quarantine			
No	Ref.		
Yes	0.57	(0.31 -1.06)	0.075
Have chronic underlying diseases			
No	Ref.		
Yes	0.93	(0.62 -1.41)	0.735
The business has problems/failure			
No	Ref.		
Yes	0.80	(0.39 -1.66)	0.557
Low income/debt			
No	Ref.		
Yes	1.05	(0.83 -1.32)	0.713
Have elderly/newborn in family			
No	Ref.		
Yes	0.92	(0.73 -1.17)	0.501
Have patient with bed ridden in family			
No	Ref.		
Yes	0.78	(0.41 -1.50)	0.460
Have member with physical/mental disability in family			
No	Ref.		
Yes	0.88	(0.46 -1.70)	0.707

Table 7 (continued)

Related factors	Unadjusted OR	(95%CI)	p-value
Burnout			
Normal (0-2)	Ref.		
Risk group (≥ 3)	20.32	(16.29 -25.36)	<0.001
Resilience quotient			
Low (3-14)	49.23	(33.78 -71.75)	<0.001
Moderate (15-23)	8.48	(6.54 -11.00)	<0.001
High (24-30)	Ref.		

4.5 Association between related factors and suicidal risk

Table 8 showed the association between suicidal risk and demographic factors, areas of measure controlled to prevent the spread of COVID-19, vulnerable group factors, burnout factors and resilience quotient factors. For the association between suicidal risk and related factors, on bivariate logistic regression analysis, a significantly higher proportion of participants who were middle working age group (30-44 years old) and suicidal risk compared to those who were late working age group (45-60 years old) [OR 1.62, 95%CI (1.03 – 2.54)].

The association between suicidal risk and areas of measure controlled to prevent the spread of COVID-19. A significantly higher proportion of participants who lived in zone 3 (orange-red zone) and suicidal risk compared to those who lived in zone 1 (green-yellow zone) [OR=2.21, 95%CI (1.18 - 4.14)]. Similarly, there was also significantly higher proportion of participants who lived in zone 4 (red-dark red zone) and suicidal risk compared to those who lived in zone 1 (green-yellow zone) [OR=2.59, 95%CI (1.02 - 6.55)], participants who lived in zone 5 (Bangkok province) and suicidal risk compared to those who lived in zone 1 (green-yellow zone) [OR=3.54, 95%CI (1.90 - 6.58)].

The association between suicidal risk and burnout factors. A significantly higher proportion of participants who were risk group of burnout and suicidal risk compared to who were normal group [OR=18.45, 95%CI (12.53 - 27.16)]. There was also significantly higher proportion of participants who had low resilience quotient group and moderate resilience quotient group and suicidal risk compared to who had high resilience quotient group [OR=100.13, 95%CI (51.81 - 193.50)] and [OR=10.89, 95%CI (5.86 - 20.23)], respectively.

Table 8 Association between related factors and suicidal risk

Related factors	Unadjusted OR	(95%CI)	p-value
Age			
Early working age (18-29)	1.16	(0.69 -1.96)	0.578
Middle working age (30-44)	1.62	(1.03 -2.54)	0.038
Late working age (45-60)	Ref.		
Gender			
Male	Ref.		
Female	0.87	(0.54 -1.38)	0.546
Area			
zone 1 : Green - yellow zone	Ref.		
zone 2 : Yellow - orange zone	1.16	(0.56 -2.43)	0.691
zone 3 : Orange - red zone	2.21	(1.18 -4.14)	0.013
zone 4 : Red - dark red zone	2.59	(1.02 -6.55)	0.045
zone 5 : Bangkok	3.54	(1.90 -6.58)	<0.001
Vulnerable groups			
Patient with COVID-19			
No	Ref.		
Yes	0.36	(0.05 -2.60)	0.311
Home quarantine			
No	Ref.		
Yes	0.59	(0.19 -1.87)	0.371
Have chronic underlying diseases			
No	Ref.		
Yes	0.92	(0.43 -2.00)	0.842
The business has problems/failure			
No	Ref.		
Yes	0.75	(0.18 -3.06)	0.685

Table 8 (continued)

Related factors	Unadjusted OR	(95%CI)	p-value
Vulnerable groups			
Low income/debt			
No	Ref.		
Yes	1.20	(0.79 -1.83)	0.386
Have elderly/newborn in family			
No	Ref.		
Yes	0.93	(0.60 -1.45)	0.759
Have patient with bed ridden in family			
No	Ref.		
Yes	0.88	(0.28 -2.80)	0.828
Have member with physical/mental disability in family			
No	Ref.		
Yes	0.65	(0.16 -2.64)	0.543
Burnout			
Normal (0-2)	Ref.		
Risk group (>=3)	18.45	(12.53 -27.16)	<0.001
Resilience quotient			
Low (3-14)	100.13	(51.81 -193.50)	<0.001
Moderate (15-23)	10.89	(5.86 -20.23)	<0.001
High (24-30)	Ref.		

Multivariable logistic regression analysis

Multivariate analysis was used to describe association between related factors and stress, depression and suicidal risk. All significant different variables associated with stress, depression and suicidal risk in bivariate logistic regression analysis with a p-value of less than 0.2 were considered in a multivariable logistic regression. According to prediction of stress : area of measure controlled to prevent the spread of COVID-19, vulnerable group - home quarantine, burnout and resilience quotient were put into multivariable logistic regression.

For prediction of depression : area of measure controlled to prevent the spread of COVID-19, vulnerable group - home quarantine, burnout and resilience quotient were considered in a multivariable logistic regression.

Regarding the suicidal risk : age groups, area of measure controlled to prevent the spread of COVID-19, burnout and resilience quotient were considered in a multivariable logistic regression

4.6 Multivariable logistic regression analysis between related factors and stress

Table 9, the multivariable logistic regression analysis showed that stress was significantly associated with participants who lived in zone 5 (Bangkok province) compare to those who lived in zone 1 (green-yellow zone). Those who lived in zone 5 (Bangkok province) were 2.00 times more likely to be at risk of stress than those who lived in zone 1 (green-yellow zone) [Adjusted OR 2.00, 95%CI (1.30 - 3.07)].

According to the burnout factors, participants who were risk group of burnout showed significant association with stress compared to those who were normal group. Those who were risk group of burnout were more likely to have stress by 22.34 times than those who were normal group [Adjusted OR=22.34 95%CI (16.52 - 30.22)].

There was significant association between participants who had low resilience quotient group and moderate resilience quotient group and stress. When compared to those who had high resilience quotient group, participants who had low resilience quotient group and moderate resilience quotient group were more likely to have stress by 14.28 times and 3.96 time than those who had low resilience quotient, respectively [Adjusted OR=14.28, 95%CI (8.56 - 23.81) and Adjusted OR=3.96, 95%CI (2.76 - 5.68)].

Table 9 Multivariable logistic regression analysis between related factors and stress

	Adjusted OR	(95%CI)	p-value
Area			
zone 1 : Green - yellow zone	Ref.		
zone 2 : Yellow - orange zone	1.09	(0.67 -1.77)	0.734
zone 3 : Orange - red zone	0.98	(0.64 -1.51)	0.924
zone 4 : Red - dark red zone	0.77	(0.35 -1.69)	0.514
zone 5 : Bangkok	2.00	(1.30 -3.07)	0.002
Vulnerable groups			
Home quarantine			
No	Ref.		
Yes	0.37	(0.13 -1.03)	0.057
Have patient with bed ridden in family			
No	Ref.		
Yes	0.72	(0.22 -2.31)	0.578
Burnout			
Normal (0-2)	Ref.		
Risk group (=>3)	22.34	(16.52 -30.22)	<0.001
Resilience quotient			
Low (3-14)	14.28	(8.56 -23.81)	<0.001
Moderate (15-23)	3.96	(2.76 -5.68)	<0.001
High (24-30)	Ref.		

4.7 Multivariable logistic regression analysis between related factors and depression

Table 10 showed the factors associated with depression using multivariate logistic regression. Regarding to the areas of measure controlled to prevent the spread of COVID-19, participants who lived in zone 5 (Bangkok province) compare to those who lived in zone 1 (green-yellow zone). Those who lived in zone 5 (Bangkok province) were 1.80 times more likely to be at risk of depression than those who lived in zone 1 (green-yellow zone) [Adjusted OR 1.80, 95%CI (1.25 - 2.59)].

According to the burnout factors, participants who were risk group of burnout showed significant association with depression compared to those who were normal group. Those who were risk group of burnout were more likely to have depression by 10.86 times than those who were normal group [Adjusted OR=10.86 95%CI (8.53 - 13.83)].

There was significant association between participants who had low resilience quotient group and moderate resilience quotient group and depression. When compared to those who had high resilience quotient group, participants who had low resilience quotient group and moderate resilience quotient group were more likely to have depression by 22.41 times and 4.95 time than those who had low resilience quotient, respectively [Adjusted OR=22.41, 95%CI (14.54 - 34.53) and Adjusted OR=4.95, 95%CI (3.74 - 6.54)].

Table 10 Multivariable logistic regression analysis between related factors and depression

	Adjusted OR	(95%CI)	p-value
Area			
zone 1 : Green - yellow zone	Ref.		
zone 2 : Yellow - orange zone	1.41	(0.96 -2.09)	0.084
zone 3 : Orange - red zone	1.27	(0.89 -1.81)	0.186
zone 4 : Red - dark red zone	0.81	(0.42 -1.56)	0.522
zone 5 : Bangkok	1.80	(1.25 -2.59)	0.002
Vulnerable groups			
Home quarantine			
No	Ref.		
Yes	0.60	(0.30 -1.22)	0.159
Burnout			
Normal (0-2)	Ref.		
Risk group (=>3)	10.86	(8.53 -13.83)	<0.001
Resilience quotient			
Low (3-14)	22.41	(14.54 -34.53)	<0.001
Moderate (15-23)	4.95	(3.74 -6.54)	<0.001
High (24-30)	Ref.		

4.8 Multivariable logistic regression analysis between related factors and suicidal risk

Table 11 showed the factors associated with suicidal risk using multivariate logistic regression. Regarding to the areas of measure controlled to prevent the spread of COVID-19, participants who lived in zone 5 (Bangkok province) compare to those who lived in zone 1 (green-yellow zone). Those who lived in zone 5 (Bangkok province) were 2.80 times more likely to be at risk of suicidal risk than those who lived in zone 1 (green-yellow zone) [Adjusted OR=2.80 95%CI (1.43 - 5.50)].

According to the burnout factors, participants who were risk group of burnout showed significant association with suicidal risk compared to those who were normal group. Those who were risk group of burnout were more likely to have suicidal risk by 7.14 times than those who were normal group [Adjusted OR=7.14 95%CI (4.66 - 10.92)].

There was significant association between participants who had low resilience quotient group and moderate resilience quotient group and suicidal risk. When compared to those who had high resilience quotient group, participants who had low resilience quotient group and moderate resilience quotient group were more likely to have suicidal risk by 34.07 times and 5.74 time than those who had low resilience quotient [Adjusted OR=34.07, 95%CI (16.66 - 69.68) and Adjusted OR=5.74, 95%CI (3.01 - 10.95)], respectively.

Table 11 Multivariable logistic regression analysis between related factors and suicidal risk

	Adjusted OR	(95%CI)	p-value
Age			
Early working age (18-29)	1.03	(0.58 -1.84)	0.911
Middle working age (30-44)	1.41	(0.86 -2.32)	0.176
Late working age (45-60)	Ref.		
Area			
zone 1 : Green - yellow zone	Ref.		
zone 2 : Yellow - orange zone	1.44	(0.66 -3.17)	0.360
zone 3 : Orange - red zone	1.79	(0.91 -3.51)	0.091
zone 4 : Red - dark red zone	1.85	(0.66 -5.17)	0.239
zone 5 : Bangkok	2.80	(1.43 -5.50)	0.003

Table 11 (continued)

	Adjusted OR	(95%CI)	p-value
Burnout			
Normal (0-2)	Ref.		
Risk group (≥ 3)	7.14	(4.66 -10.92)	<0.001
Resilience quotient			
Low (3-14)	34.07	(16.66 -69.68)	<0.001
Moderate (15-23)	5.74	(3.01 -10.95)	<0.001
High (24-30)	Ref.		



Chapter 5

DISCUSSIONS, CONCLUSION AND RECOMMENDATION

5.1 Discussions

Characteristic of participants

This study had 2 objectives were : 1. To identify the prevalence of stress, depression and suicidal risk among health care personnel during COVID-19 second outbreak in Thailand. 2. To investigate the association between factors related and stress, depression and suicidal. risk among health care personnel during COVID-19 second outbreak in Thailand

The study is retrospective cross-sectional descriptive study The instruments used in this study were ST5, used to assess stress, 9Q to assess depression, and 8Q to assess suicide risk.

There are 4,970 participants who were recruited. The health care personnel in Thailand randomly selected representatives from 5 zones, divided according to the measures to control the outbreak of COVID-19. These personnel completed the mental health check-in questionnaire of the Department of Mental Health, Ministry of Health. During December 17, 2020 to February 23, 2021. The participants had a mean age of 38 and had range of 18-60 years old, the women were 5:1 times more than men.

Health care personnel randomly selected from provinces from 5 zones across Thailand to represent population. The selected province has more than 1000 personnel in every province. Except Samut Sakhon province, which represents zone 4 which is the only one of province in red-dark red zone. Due to the outbreak of COVID-19, second outbreak started the outbreak from this province. Therefore, there are more clearly controlled than other provinces. And in zone 5, only Bangkok is in this zone. The reason for separating Bangkok from other zones because Bangkok is a densely populated capital city. And is a province near Samut Sakhon that has an outbreak in the second outbreak There is a risk of infection and spread widely. It is also a province that has particularly strict control measures. Affect the well-being lifestyle and economy.

From the outbreak of COVID-19 that spread rapidly. It has a wide impact on everyone in society, especially in vulnerable groups. This study found that the most of vulnerable groups were participants who had elderly/newborn in the family, followed by low-income/debt groups. The least vulnerable groups in this study were those who were patient with COVID-19 and who had business had problems/failure.

For considering other mental health factors in the study, there were 11% of participants were in the burnout risk group, and most participants had a high resilience quotient.

Prevalence

In this study, stress was measured by using ST5 to assess about symptoms of stress. In the ST-5 assessment, stress was divided into 3 levels: mild, moderate and severe levels. As recommended by the Department of Mental Health, who are at severe stress levels or had a score of more than 8, it is necessary to be consulted by the professional. In this research, the criteria those with a score more than 8 were considered the stressed group (Silpakit, 2008). The group with low to moderate stress level was considered normal group. Because stress are normal reactions to a situation as threatening and unpredictable as the COVID-19 pandemic. This uncertainty makes it difficult to plan and thus generates additional psychosocial stress. Possible stress-related reactions in response to the COVID-19 pandemic may include changes in concentration, irritability, anxiety, insomnia, reduced productivity, and interpersonal conflicts (Vinkers et al., 2020).

For depression in this study, the 9 Q assessment was divided depression into 4 levels: normal, mild, moderate, and severe (Kongsuk et al., 2018). In this research, the prevalence was calculated by assuming that those who are depressed whether the level is mild, moderate or high, is positive. In terms of suicidal risk, use the 8Q assessment as a risk assessment tool. The 8Q assessment is divided suicidal risk into 4 levels, namely no risk, low risk, moderate risk and severe risk (Kittirattanapaiboon & Khamwongpin, 2005). In this research, the prevalence was calculated by assuming that who is at risk both low, moderate and severe risk is a positive group.

The results of this study found that there was a prevalence of stress among health care personnel at 6.2%, a prevalence of depression 9.1%, and a prevalence of suicide risk 2.5%. Compared to the study of mental health impacts among health care personnel in other countries as a study of medical personnel in China (n=34) during 22-29 February 2020. The study found that moderate level of perceived stress (PSS) 38% and depressed (PHQ-9) 24% (Ma et al., 2020a). Alternatively, another study of health care personnel in China (n=1257), conducted January 29, 2020, to February 3, 2020, found a considerable proportion of participants reported symptoms of depression 50.4% and distress 71.5% (Lai et al., 2020). It can be seen that the prevalence of this study was much lower than the previous study from China. This may be because the pandemic situation was different severity. The strictness of lockdown measures that are different. Including other area-specific contexts are different. Those can cause different psychological effects. Another possible reason is research period. In the two Chinese studies conducted during the first phase of the coronavirus outbreak, which the preparation or the readiness to manage may not be good enough and the outbreak spread rapidly, the course of treatment is still unclear. Thus having a higher negative effect on the mental health more than the second outbreak.

When compared this study with other studies in Thailand. It was found in studies among health care personnel had relevant results, although the studies was conducted at different

times. Such as the study of stress and depression among medical personnel at Surin Hospital, Surin Province, Thailand (n=179) during 12 March 2020 to 23 April 2020, They collected data every 2 week for 3 times, the study found that the prevalence of stress (ST5>8) during the first, second, and third visit were 14.07%, 7.29%, and 8.64%, and the prevalence of depression (9Q) was 69.83%, 26.04 and 9.88 percent (Sangsirilak & Sangsirilak, 2020).

Compared to the general Thais, for example, studies on stress and depression in the situation of COVID-19 in the general population, at the age of 20 years and over, admitted to a family clinic in Chiang Mai Province, Thailand. Conducted in June 2020 (n=2030). The study found that 0.9% of the highest and highest levels of stress (ST5) had stress (ST5). Depressed (9Q) 1.6 percent (Wijitraphan, 2021). It can be seen that the prevalence of stress and depression among health care personal is significantly higher because medical personnel were a group of people, inevitably they must work closely with the patient. Infection risk is highest and various challenges in working to combat the spread of COVID-19. Whether it is working to take care of patients with serious infections. Especially the workers in the intensive care unit (ICU) put enormous physical and psychological pressure on them. As the number of patients increases, each work day is multiplied by many times more. Workload that increases beyond their potential Giving them little time to rest or return to their families. Having to be transferred to an unfamiliar position due to insufficient workers causing great anxiety and uneasiness lack of equipment used in work both personal protective equipment and patient care equipment such as drugs and ventilators (Bennaoui et al., 2020).

But when compared to the people who were infected with COVID-19 in Bangkok, Thailand. it was found that among the COVID-19 patients who join the study from 1 April to 29 May 2020 found prevalence of perceived stress was 30.8% prevalence of depression was 16.5% (Sawangsrri et al., 2021). Which was higher than this study and other studies in health care personnel. may be due to the COVID-19 patients are directly affected both physically and mentally. Anxiety from physical symptoms including various restrictions and the effects are greater in both normal people and health care personnel.

Compared to the overall prevalence under normal situation, the 2013 National survey found that 1.8% of Thai people had Life time prevalence of MDD, Life time prevalence of suicidal experience 3.5% (Kittirattanapaiboon et al., 2017). Which compared to the results of this study, this study found that the prevalence of both depression and suicide was higher, likely due to the COVID-19 crisis. The similar the SARS outbreak situation (Chong et al., 2004). Another noteworthy point is that in the 2013, National survey on suicide, that survey was a suicide experience survey, but in this study it was only a questionnaire risk assessment, which is understandable If the suicidal risk outcome is greater than the suicidal experience.

Related factors association with stress

In this study factors that were not significant associated with stress were gender, unlike previous studies that was found that females have more stress than males. But males had higher scores for anxiety and depression than females (Wang et al., 2020). And the study of factors associated with mental health outcomes among health care workers exposed to Coronavirus Disease 2019 It was found that female sex was associated with high stress (Lai et al., 2020).

In this study, there was association between area of measure controlled to prevent the spread of COVID-19, burnout and resilience quotient and stress. According to the severity of pandemic affects the mental health of those in the area whether general people or health care personnel. Especially health care personnel in the dark red or red areas. Those had to bear the burden of caring for a large number of patients. They are also struggling with measures taken by the state to control the spread of the disease in that area, whether under lockdown or extreme social distancing measures. Studies have shown that these factors are all high risk of stress, anxiety, and depression (Codagnone et al., 2020). Which is consistent with this study, the association between areas of measure controlled to prevent the spread of COVID-19 and stress was found significantly, the health care personnel were found that those who lived in zone 5 (Bangkok province) were 2.00 times more likely to be at risk of stress than those who lived in zone 1 (green-yellow zone).

In the time of the COVID-19 outbreak, health care personnel have to work multiple times. As the patient rises very fast, labour underwork have to more work, longer hours, or even the pressure of dealing with something that hasn't happened before (Shanafelt et al., 2020) or even lack of resource (Rodríguez & Sánchez, 2020). These things when faced for a long time can cause a feeling of discouragement can be bored. Especially in the fight against the unknown the end of pandemic, it can cause burnouts in healthcare workers. Burnout is a chronic emotional response to the work done in the form of emotional weakness or lack of emotion to work, cynicism (lack of fun at work, lack of motivation for work, etc.), which leads to exhaustion in the workplace. Leading to many emotional and physical problems, such as insomnia, lack of concentration, and boredom. In this study, during the second outbreak of the COVID-19, the long-running battle against the pandemic have led to burnouts. According to burnout factor. The association between burnout and stress was found significantly. In this study, health care personnel who were risk group of burnout were more likely to have stress by 22.34 times than those who were normal group.

There was significant association between participants who had low resilience quotient group and moderate resilience quotient group and stress. When compared to those who had high resilience quotient group, participants who had low resilience quotient group and moderate resilience quotient group were more likely to have stress 14.28 time and 3.96 time than those

who had high resilience quotient, respectively. Which is consistent with the study of capability well-being (OxCAP-MH) that found capability well-being was significantly strongly/moderately associated with all other outcome measures, the strongest correlation being with depression, but of opposite directions (Simon et al., 2021). Because resilient quotient is the ability to return to the original state. Compared to an object that can quickly return to its original state after being bent, stretched, or distorted. Psychological flexibility is a similar concept. is the ability of people to return to normal by bouncing back from the ups and downs of life. Flexible person tend to choose to be optimistic about life. Optimistic attitude is one of the hopeful expectations for a positive outcome. It's also flexible, because of flexible optimism not diminished life negative events but intentionally and truthfully. Look for the best results in every situation. That draws flexible people through difficult times and put them back into shape. Positive attitude reduces potential for stress and depression. The resilience person are knowing how to manage stress and practicing stress relief (Kakunje, 2011).

Related factors association with depression

In this study, the factors that were not significant associated with depression were gender, unlike previous studies that found males had higher scores for anxiety and depression than females (Wang et al., 2020). Vulnerable groups such as patient with COVID-19 group, had patient with bed ridden in family, had patient with physical/mental disability in family were not significant associated with depression as well.

In this study, there was association between area of measure controlled to prevent the spread of COVID-19, burnout and resilience quotient and depression. According to the severity of the pandemic affects the mental health of those in the area. whether it is the general people or health care personnel. Especially health care personnel in the dark red or red areas, have to bear the burden of caring for a large number of patients. There are also difficulties from the measures taken by the government to control the spread of the disease in that area. Whether under lockdown or extreme social distancing measures. It has been studied that these factors are all high risk of stress., anxiety, and depression (Codagnone et al., 2020). There is also a study about COVID-19 lockdown impact in Austrian. That found 31% of the participants reported low mental well-being and association with increased levels of depression (Simon et al., 2021). Which is consistent with this study found that, the association between areas of measure controlled to prevent the spread of COVID-19 and depression was found significantly, the health care personnel were found that those who lived in zone 5 (Bangkok province) were 1.80 times more likely to be at risk of depression than those who lived in zone 1 (green-yellow zone).

In the COVID-19 outbreak, healthcare workers must work multiple times. As patients rising very fast, people underwork, more work, longer hours, or even the pressure of dealing with

something that hasn't happened before (Shanafelt et al., 2020) or even the lack of resource (Rodríguez & Sánchez, 2020). These can be cause a feeling of discouragement can be bored. Especially in the fight against the unknown ending pandemic, it can cause burnouts in healthcare workers. Burnout is a chronic emotional response to the work done in the form of emotional weakness or lack of emotion to work, cynicism (lack of fun at work, lack of motivation for work, etc.), which leads to exhaustion in the workplace. Leading to many emotional and physical problems, such as insomnia, lack of concentration, and boredom. In this study, during the second outbreak of the COVID-19 pandemic, burnouts in the long-running battle against the epidemic have led to burnouts. According to burnout factor. The association between burnout and depression was found significantly. In this study, health care personnel who were risk group of burnouts were more likely to have depression by 10.86 times than those who were normal group.

There was significant association between participants who had low resilience quotient group and moderate resilience quotient group and depression. When compared to those who had high resilience quotient group, participants who had low resilience quotient group and moderate resilience quotient group were more likely to have depression by 22.41 time and 4.95 time than those who had high resilience quotient, respectively. Which is consistent with the study of capability well-being (OxCAP-MH). That found capability well-being was significantly strongly/moderately associated with all other outcome measures, the strongest correlation being with depression, but of opposite directions (Simon et al., 2021) for the same reason mentioned in the matter of stress.

Related factors association with suicidal risk

In this study Factors not associated with suicidal risk include : gender and vulnerable groups such as patient with COVID-19 group, had chronic underlying disease, had elderly/newborn in family, had patient with bed ridden in family and had patient with physical/mental disability in family group.

In this study, there was association between area of measure controlled to prevent the spread of COVID-19, burnout and resilience quotient and depression. According to the severity of the pandemic affects the mental health of those in the area. whether it is the general people or health care personnel. Especially health care personnel in the dark red or red areas, have to bear the burden of caring for a large number of patients. There are also difficulties from the measures taken by the government to control the spread of the disease in that area. Whether under lockdown or extreme social distancing measures. It has been studied that these factors are all high risk of stress., anxiety, and depression (Codagnone et al., 2020). There is also a study about COVID-19 lockdown impact in Austrian. That found 31% of the participants reported low mental

well-being and association with increased levels of depression (Simon et al., 2021). Which is consistent with this study found that, the association between areas of measure controlled to prevent the spread of COVID-19 and suicidal risk was found significantly, the health care personnel were found that those who lived in zone 5 (Bangkok province) were 2.8 times more likely to be at risk of suicidal risk than those who lived in zone 1 (green-yellow zone).

In the COVID-19 outbreak, healthcare workers must work multiple times. As patients rising very fast, people underwork, more work, longer hours, or even the pressure of dealing with something that hasn't happened before (Shanafelt et al., 2020) or even the lack of resource (Rodríguez & Sánchez, 2020). These can be cause a feeling of discouragement can be bored. Especially in the fight against the unknown ending pandemic, it can cause burnouts in healthcare workers. Burnout is a chronic emotional response to the work done in the form of emotional weakness or lack of emotion to work, cynicism (lack of fun at work, lack of motivation for work, etc.), which leads to exhaustion in the workplace. Leading to many emotional and physical problems, such as insomnia, lack of concentration, and boredom. In this study, during the second outbreak of the COVID-19 pandemic, burnouts in the long-running battle against the epidemic have led to burnouts. According to burnout factor. The association between burnout and suicide risk was found significantly. In this study, health care personnel who were risk group of burnout were more likely to have suicide risk by 7.14 times than those who were normal group.

There was significant association between participants who had low resilience quotient group and moderate resilience quotient group and depression. When compared to those who had high resilience quotient group, participants who had low resilience quotient group and moderate resilience quotient group were more likely to have suicide risk by 34.07 time and 5.74 time than those who had high resilience quotient, respectively. Which is consistent with the study of capability well-being (Ox CAP-MH). That found capability well-being was significantly strongly/moderately associated with all other outcome measures, the strongest correlation being with depression, but of opposite directions (Simon et al., 2021) for the same reason mentioned in the matter of stress and depression.

5.2 Conclusions

Covid-19 pandemic situation is a major crisis in today's world. Dealing with and changing into the new normal is a challenge. All sectors are affected, whether directly or indirectly. Especially in public health, Health care personnel play an important role and has been greatly affected in this crisis. In addition to the physical side that is tired from the increased workload. Psychologically, it was equally affected. This study aims to determine the prevalence and related factors associated with stress, depression and suicidal risk among health care personnel during the second outbreak of the COVID-19 situation in Thailand. Data were analyzed from secondary data of mental health check-in database from the Department of mental health, Thailand. A total of 4,970 participants, mean age 38 years old, range 18-60 years old, mostly female. The participants were represented from 5 zones, divided by severity of the outbreak and measures to control the spread of the COVID-19. In accordance with the vulnerable group factors, most of participants (22.3%) have elderly/newborn in family. Participants who were vulnerable groups sorted from most to least as follows : low income/dept 21.2%, have chronic underlying disease 6.1%, home quarantine 4.0%, have patient with bed ridden in family 2.8%, have member with physical/mental disability in family 2.5% and patient with COVID-19 group and the business has problem/failure group both were 2.2%. There were 11.2% of burnout risk group. And most of participants had high level of resilience quotient (64.0%).

From association analysis between related factors and stress, depression, and suicide risk. The factors that were significantly associated with stress were : areas of measure controlled to prevent the spread of COVID-19, risk group of burnout, participants who had low resilience quotient group and moderate resilience quotient group. These factors were associated with increased stress, depression and suicidal risk. That showed implication of this study reveals that in addition to internal factors such as burnout and resilience quotient that were important to mental health, the external factors such as situation measure controlled to prevent the spread of COVID-19 were also important, that can affect mental health as well.

5.3 Limitation

1 This study use the secondary analysis, so the sample size is predetermined, cannot be randomized or scaled.

2. This research used secondary data. Consequently, there were limitations in the analysis of some variables that may affect outcomes, such as the type or position of work of health care personnel, such as those who work at the frontline or who work in the ICU or ER, may be stressful or higher mental health problems than the other work positions, etc.

3. This study was cross-sectional study. Therefore, it was not possible to determine whether the stress, depression and suicidal risk found were the result of the response to the COVID-19 pandemic or a pre-existing condition.

4. The questionnaire were self-administered and symptoms was not verified by trained professional raters, may be found subjective bias.

5.4 Recommendation

For future study

1. Due to the impact on mental health in crisis, especially the COVID-19 crisis. There are many factors involved. For the next study, there should be a more comprehensive and diverse study of factors involved such as the type or position of work of health care personnel, etc.

2. Mental health conditions from crisis can be in many conditions. More studies may be needed to determine the conditions or other mental health effects. In addition to stress, depression and suicide risk in this study.

3. Long-term follow-up studies are needed. to study how mental health problems occur Is there a trend or change?

4. Selection of samples in the study, there may be selections or randomization in more diverse groups for more coverage, in order to be able to generalizability.

For policy making

Because health care personnel are important in managing and caring for patients. Especially in times of crisis management and care for the physical and mental health of those personnel. Therefore, it is very necessary so that they can use their potential and perform their duties to the fullest.

1. Develop and implement the effective intervention to reduce stress, depression and suicidal risk for health care personnel, which are urgently needed to prevent severe impact from mental health crises.

2. Develop in the promotion and prevention of stress, depression and suicidal risk among health care personnel.

The examples intervention as below :

- individual-focused : emotion regulation, self-care workshop, mindfulness, meditation, stress management skills, communication skills training, yoga and massage.
- structural or organizational : workload or schedule-rotation, stress management training program, group face-to-face delivery.
- combine interventions : stress management workshop and resiliency training.



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APPENDIX

Mental Health Check-in Questionnaires

Instructions

MENTAL HEALTH CHECK IN is a basic mental health assessment tool. And screening the risks of mental health conditions from the COVID-19 situation. Developed to help health care personnel / village health volunteers / other volunteers to assess mental health of people and themselves. To find the risk groups for give them early intervention. As well as people and vulnerable groups of mental health conditions can quickly self-assess and access services. The assessment consisted of 6 parts : general information, the resilience quotient (RQ), burnout, stress, depression and suicide risk. Which is a free assessment. Please read the question carefully and answer all questions.

The participants can receive immediate assessment results and have instructions on how to act. With online expert consultation channels

However, if your assessment results show that there are risk of mental health conditions. Consent will be re-supplied with personal information. For monitoring by health care personnel. If you do not agree you may still have the right to use other online psychological care services. And evaluation of academic work development on mental rehabilitation care and empowering people who are mentally affected by the COVID-19 pandemic situation. And will be kept confidential according to professional ethics. According to the Personal Information Protection Act (PDPA) 2019.

Do you accept the terms or not?

accept

Do not accept

Part 1.1 General data

1. Type of participants
 - General people
 - Village health volunteers
 - Health care personnel
 - Educational personnel
 - Other government personnel
2. Gender Male Female
3. Age.....years
4. Address.....
Province.....

Part 1.2 Vulnerable data (can answers more than 1)

- Patient with COVID-19
- Home quarantine
- Have family member with patient with COVID-19 / home quarantine
- Unemployed / laid off
- The business has a problem / failure
- Low income / debt
- Have chronic underlying diseases
- Physical disability
- Mental disability
- Have elderly / newborn in family
- Have family member with physical / mental disability in family
- Have patient with bed ridden in family
- No conditions of vulnerable above

Part 2 Resilience quotient (RQ)

In the past 2 weeks, Do you have confidence in these issues below?

"1 means less confident and 10 means very confident "

Issues	1	2	3	4	5	6	7	8	9	10
1. I can overcome obstacles and problems in life.										
2. I am encouraged and supported by those around me.										
3. I can deal with my problems and stress.										
Total score										

Part 3 Burnout assessment

	rarely	sometime	often	always
During the past 1 week You have emotional exhaustion. Feeling depleted, desperate, wasted energy Psychologically or not.				

Part 4 Stress assessment by ST5

	Symptoms or feelings that occur in period of 2-4 weeks.	rarely	sometime	often	always
1	Have sleep problems. Can't sleep or sleep too much				
2	Decrease in concentration				
3	Aggressive/anxiety/irritable				
4	Boring				
5	Don't want to meet any people				
Total scores					

Footnote : Rarely means There are no symptoms or symptom occurs only 1 time.

Sometimes means Symptom occurs more than 1 time, but not often.

Often means Symptoms occur almost every day.

Always means Symptoms occurs every day.

Part 5 Depression assessment with 9 questions (9Q)

	In the past 2 weeks include today, How often do you have these symptoms?	Never	Sometimes (1-7days)	Often (>7days)	Always (Everyday)
1	Boring, not interested in doing anything.				
2	Uneasy, depressed, discouraged.				
3	Difficulty sleep or sleep too much.				
4	Being tired easily or not having energy.				
5	Loss of appetite or overeating.				
6	Feel bad about yourself. Thinking that you are a failure or have caused frustrated self or family.				
7	Poor concentration when doing things such as watching television, listening to the radio, or doing work that requires attention.				
8	Speak slowly, do something slower Until others notice or become restless unable to remain as still as it used to be.				
9	Thinking of harming self or think that if death would be good.				
Total scores					

Part 6 Suicide assessment with 8 questions (8Q)

	Questions	No	Yes
1	In the past month Including today, thinking of wanting to die or thinking that it would be better to die.		
2	From the last month until today, want to hurt yourself or injure yourself.		
3	From the last month until today, thinking about suicide.		
4	From the last month until today, have a suicidal plan.		
5	From the last month until today, prepare to harm yourself or to commit suicide by really decided that.		
6	From the last month until today, harmed yourself but did not intend to death.		
7	From the last month until today, attempted suicide, expecting / intending to die		
8	In past whole life, ever attempted suicide.		
Total score			



AL 03.1

หนังสือรับรองเอกสารที่เกี่ยวข้องกับโครงการวิจัย

เลขที่หนังสือรับรอง	DMH.IRB.COA 019/2564	
ชื่อโครงการ	ปัจจัยที่สัมพันธ์กับความเครียด ซึมเศร้า และความเสี่ยงฆ่าตัวตายของบุคลากรทางการแพทย์ ช่วงสถานการณ์การระบาดของโรคโควิด-19 ระลอก 2 ในประเทศไทย Association between factors related and stress, depression and suicidal risk among health care personnel during covid -19 second outbreak in Thailand	
รหัสโครงการวิจัย	DMH.IRB 023/2564 BRm_Exp	
ผู้วิจัยหลัก	นางสาวอภิษฎา พลรักษ์	
สังกัดหน่วยงาน	วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย	
ผู้สนับสนุนทุนวิจัย	-	
ประเภทการทบทวน	การพิจารณาโครงการวิจัยแบบเร็ว	
เอกสารที่รับรอง		
1. แบบเสนอโครงการวิจัยเพื่อขอรับการพิจารณาจาก คณะกรรมการพิจารณาจริยธรรมการวิจัยในคนฯ	ฉบับวันที่ 28 พฤษภาคม 2564	
2. โครงการวิจัย	ฉบับแก้ไขครั้งที่ 2 วันที่ 22 กรกฎาคม 2564	
3. เอกสารชี้แจงผู้เข้าร่วมการวิจัย / อาสาสมัคร	ฉบับวันที่ 28 พฤษภาคม 2564	
4. หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย	ฉบับวันที่ 28 พฤษภาคม 2564	
5. เครื่องมือที่ใช้ในการเก็บข้อมูล	ฉบับวันที่ 28 พฤษภาคม 2564	
6. ประวัติผู้วิจัย	ฉบับวันที่ 28 พฤษภาคม 2564	
วันที่รับรอง 30 เดือน กรกฎาคม พ.ศ. 2564	วันที่หมดอายุการรับรอง 29 เดือน กรกฎาคม พ.ศ. 2565	
กำหนดการส่งรายงานความก้าวหน้าทุก 12 เดือน (ส่งรายงานความก้าวหน้าภายใน 30 วัน ก่อนวันหมดอายุ)		
คณะกรรมการพิจารณาจริยธรรมการวิจัยในคนด้านสุขภาพจิตและจิตเวช กรมสุขภาพจิต กระทรวงสาธารณสุข ดำเนินการให้ การรับรองเอกสารที่เกี่ยวข้องกับโครงการวิจัยตามแนวทางหลักจริยธรรมการวิจัยในคนที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice (ICH-GCP)		
ลงนาม.....  (นายดุสิต ลิขนะพิชิตกุล) ประธานคณะกรรมการพิจารณาจริยธรรมการวิจัยในคน ด้านสุขภาพจิตและจิตเวช กรมสุขภาพจิต		
ทั้งนี้ การรับรองมีเงื่อนไขตั้งที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)		

VITA

NAME	Aphichaya Polrak
DATE OF BIRTH	5 Oct 1989
PLACE OF BIRTH	Ubonratchathani Province
INSTITUTIONS ATTENDED	Department of Mental health, Ministry of public health, Thailand

