

5-2022

An Exploration of COVID-19 Impact on Healthcare Workers' Mental Health in China

Jenny Yang
Dominican University of California

<https://doi.org/10.33015/dominican.edu/2022.NURS.ST.04>

Survey: Let us know how this paper benefits you.

Recommended Citation

Yang, Jenny, "An Exploration of COVID-19 Impact on Healthcare Workers' Mental Health in China" (2022). *Nursing | Senior Theses*. 48.
<https://doi.org/10.33015/dominican.edu/2022.NURS.ST.04>

This Senior Thesis is brought to you for free and open access by the Department of Nursing at Dominican Scholar. It has been accepted for inclusion in Nursing | Senior Theses by an authorized administrator of Dominican Scholar. For more information, please contact michael.pujals@dominican.edu.

An Exploration of COVID-19 Impact on Healthcare Workers' Mental Health in China

Jenny Yang

Department of Nursing, Dominican University of California

NURS 4500: Nursing Research and Senior Thesis

Dr. Patricia Harris

December 1, 2021

Abstract

Background

In December 2019, the first confirmed human case of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or COVID-19 occurred in Wuhan, China. By March 2020, the World Health Organization (WHO) had classified the COVID-19 outbreak as a pandemic due to the rapid spread of the virus to other countries. Many people have been affected by the COVID-19 pandemic in various aspects, especially front-line healthcare workers. Hospital working conditions are constantly changing to cope with the problems that arise from the pandemic. These problems can result in an unsafe patient-to-nurse ratio, understaffed healthcare workers in hospitals, equipment shortage, and increased death rates throughout the world. Encounters with these working conditions leave many healthcare workers feeling overwhelmed and experiencing burnout at the expense of their mental well-being. As the pandemic continues, many healthcare workers struggle with their mental stability as they are the front-line witnesses to the hardships.

Objective

This thesis will explore the COVID-19 impact on healthcare workers' mental health and various interventions to relieve mental stress from December 2019 to the present day.

Methods

A literature review will be conducted, including research articles that discuss different psychiatric conditions from healthcare workers related to COVID-19, healthcare workers' mental state in two specialized units, and various interventions to improve mental health. Additionally, a proposal for further research will be mentioned on what best methods to help alleviate healthcare workers' symptoms of depression and anxiety?

Keywords: COVID-19 pandemic, Healthcare workers, Mental health, China

Acknowledgment

My thesis would not have been possible without my Nursing Research and Senior Thesis professor, Dr. Patricia Harris. Thank you for your patience and guidance throughout this challenging but rewarding journey. I am inspired and grateful for your knowledge and wisdom in the nursing research field. Additionally, thank you to my friends and family for the unconditional support I received in nursing school. My grandparents serve as my inspiration to focus my topic on China, where they raised me when I was three months old to four years old. Lastly, thank you to the strong and brave healthcare workers out there in the world, fighting the virus to protect people in the community. No words can describe how appreciative I am for everyone who played important roles in the COVID-19 pandemic, many thanks.

Table of Contents

Abstract	2
Background	2
Objective	2
Methods	2
Acknowledgment	3
Table of Contents	4
Introduction	5
Problem Statement	5
Research Questions	6
Literature Review	6
Relevancy of Depression and Anxiety in Healthcare Workers	7
Comparison of Healthcare Workers' Mental Health in the ED and ICU	11
Interventions to Improve Healthcare Workers' Mental Well-Being	15
Literature Review Conclusion	19
Theoretical Framework	19
Proposal for Further Study	20
Primary Research Aim	20
Ethical Considerations	21
Research Methodology	21
Study Design	21
Population and Recruitment	21
Study Procedure	22
First Step	22
Second Step	22
Third Step	23
Statistical Analysis	23
Conclusion	24
References	26
Appendix	28
Literature Review Table	28

Introduction

According to Liu et al. (2020), the COVID-19 pandemic has caused tremendous psychological pressure on healthcare workers in China. The main reason is the high rates of COVID-19 hospital admission and death. The virus leaves a huge impact on many people's lives and opens the reality of how vulnerable the healthcare system is. The availability of hospital beds and equipment becomes scarce as the COVID-19 cases continue to increase. As a result, healthcare workers feel several common psychiatric conditions, such as depression, anxiety, and post-traumatic stress disorder (PTSD). Additionally, family relationships are severed because of prolonged lockdown and long-term home isolation. Based on Cai et al. (2021), after two months of lockdown in China, family violence and divorce rates increased significantly. However, there are not enough studies done to confirm that the main reason for high family violence and divorce rates is correlated with the increased mental stress of healthcare workers.

Before the pandemic, there was a shortage of healthcare workers in China. Due to COVID-19, the shortage and demand for healthcare workers had grown. It is important to preserve the mental health of healthcare workers because they save people's lives with their critical thinking and medical knowledge. Without healthcare workers, many lives will be at risk and eventually lead to more challenging outcomes. Therefore, it is vital to distinguish those healthcare workers who are struggling with their mental health early on and provide beneficial resources to overcome the difficult stressors encountered from the pandemic.

Problem Statement

Mental health is defined as a person's emotional, psychological, and social well-being (CDC and Prevention, 2021). From the beginning of the COVID-19 pandemic, news broadcasts have addressed the novel virus and how details are developing each day. As a result, healthcare

workers' mentality is drastically affected. For instance, many healthcare workers are left to deal with personal protective equipment (PPE) shortage, high transmissibility of COVID-19 to friends and loved ones, uncertainty due to lack of treatment guidelines, increased work responsibilities, and physical isolation (Stein, 2020). Due to the pandemic, many healthcare workers fear bringing home the virus to their loved ones, resulting in mental stress from work.

Healthcare workers are expected to face the virus daily due to them being in constant close contact with sick patients. Even with the PPE, it is not guaranteed that one will not contract the virus and spread it to others. Some healthcare workers are brave enough to speak on the behalf of most workers about the mental burden they experience from work. Some have verbalized the feelings of helplessness, worthlessness, and guiltiness related to poor patient outcomes. In today's society, there is only so much one can do to lessen the spread of COVID-19, such as the importance of practicing hand hygiene, social distancing, staying at home when one is sick, and getting vaccinated.

Research Questions

How does the COVID-19 pandemic affect healthcare workers' mental health in China? What interventions to reduce mental stress learned in other countries can be applied to healthcare workers in China?

Literature Review

The main purpose of the six literature review articles is to explore and improve healthcare workers' mental health in China, along with discovering interventions to cope with difficult stressors throughout the COVID-19 pandemic. The research questions will be thoroughly answered based on the literature reviews that are separated into three categories, such as the relevancy of depression and anxiety in healthcare workers, comparison of healthcare workers'

mental health in the emergency department (ED) and intensive care unit (ICU), and interventions to improve healthcare workers' mental well-being.

The databases used were PubMed, PubMed Central, Dominican University's Iceberg and Up-To-Date. The search terms were the COVID-19 pandemic, healthcare workers, mental health, and China. The six articles were selected based on the two research questions and three categories were identified to discuss the articles' findings.

Relevancy of Depression and Anxiety in Healthcare Workers

Depression and anxiety remain two of the most common psychological conditions in China. Many of the stressful events are out of healthcare workers' control, such as the virus transmissibility, and the only solution is to prevent the COVID-19 spread by using infection control policies. Healthcare workers try their best to fight against the virus, but in exchange, mental stress and deaths occur. Two research articles describe depression and anxiety surrounding healthcare workers and include information about the relevancy of these findings.

The first research article, "Risk factors for depression and anxiety in healthcare workers deployed during the COVID-19 outbreak in China," by Jie Chen and other colleagues, examined the presence of depression and anxiety in healthcare workers, along with exploring the risk factors during the COVID-19 outbreak in China (Chen et al., 2021). A cross-sectional study was used along with convenience sampling to get healthcare workers' perspectives. Between February 9, 2020 and February 11, 2020, a total of 902 questionnaires were received. The questionnaires had information about basic characteristics, workload, and health conditions.

Multiple scales were used to collect information about healthcare workers' experiences. Based on Chen et al. (2021), the scales of job burnout, coping style, anxiety, and depression had high reliability and validity in the Chinese population. The study started with questionnaires that

involved a subjective and an objective assessment. The subjective assessment imposed the question, “How do you evaluate your workload in recent days?” It had a scale from one (significantly lower than before) to five (significantly higher than before). In contrast, the objective assessment examined the working hours per week. Additionally, a 15-item Chinese version of the Maslach Burnout Inventory (CMBI) was used to assess job burnout. The scale had three dimensions of burnout, such as emotional exhaustion (five items), depersonalization (four items), and personal accomplishment (six items). The scoring was from one (never) to seven (every day). The personal accomplishment scoring was reverse-scored.

As for the coping style, the 20-item Trait Coping Style Questionnaire (TCSQ) was used to screen for positive coping (PC) or negative coping (NC) in healthcare workers. A total of ten items for each coping style was included and each item scored from one to five. About the Generalized Anxiety Disorder seven-item scale (GAD-7), it was applied to check for anxiety symptoms in the last two weeks. Each item was scored from zero to three, and the total score of GAD-7 could be divided into four severity levels, consisting of severe is greater than 14, moderate is 10 to 14, mild is 5 to 9, and no anxiety is less than or equal to 4. Lastly, the Nine-item Patient Health Questionnaire (PHQ-9) was used to assess depression symptoms in the last two weeks. The scores ranged from zero to three, and the total score results were severe is greater than 20, moderate to severe is 15 to 20, moderate is 10 to 14, mild is 5 to 9, and no depression is less than or equal to 4 (Chen et al., 2021).

According to Chen et al. (2021), it was found that 543 (60.20%) doctors, 311 (34.48%) nurses, and 48 (5.32%) other occupations like administration staff of the hospital were included in the study. The percentage of male and female participants was 283 (31.37%) and 619 (68.63%) respectively. Healthcare workers who demonstrated no or mild anxiety and depression

resulted in 681 (75.50%) and those who had moderate or severe anxiety and depression resulted in 221 (24.50%). Based on the GAD-7 scores, 274 (30.38%) healthcare workers experienced mild anxiety, whereas 150 (16.63%) experienced moderate or severe anxiety. In comparison, the PHQ-9 scale showed that 274 (30.38%) healthcare workers felt mild depression, and 165 (18.29%) felt moderate or severe depression. Healthcare workers who had depression and anxiety together resulted in 291 (32.26%). The remaining 330 (36.59%) healthcare workers did not experience any symptoms of depression and anxiety (Chen et al., 2021). This study shows that depression and anxiety were relevant in healthcare workers' mental status. The independent risk factors for both depression and anxiety were having respiratory symptoms, digestive symptoms, negative coping style, and job burnout.

The second article, "Different prevalence trend of depression and anxiety among healthcare workers and the general public before and after the peak of COVID-19 occurred in China: A meta-analysis," by Yongyang Deng and other peers, examined the prevalence of depression and anxiety among healthcare workers and the public during the pandemic in China (Deng et al., 2021). A systematic review and meta-analysis were used, including 34 studies to evaluate the article results. The article set restrictions for studies to be included in the systematic review and meta-analysis.

For instance, four qualifications were required to be included in the research article. The first one is that the participants needed to be healthcare workers, the public, or both. The second one is that the prevalence of depression and anxiety needed to be examined in the different studies. The third one is that the studies had to be a cross-sectional study, cohort study, case-control study, or some type of observational study. The fourth one is that the studies had to have symptomatic evaluation data available, and the location had to reside in China. The quality of all

studies was categorized into high to moderate, resulting in sixteen high-quality studies and eighteen moderate-quality studies.

Regarding the article's findings, before the peak of COVID-19, 40% experienced depression and 38% experienced anxiety among healthcare workers, whereas 33% experienced depression and 24% experienced anxiety among the public (Deng et al., 2021). During COVID-19, the prevalence of depression was 31% and anxiety was 40% among healthcare workers, and 26% suffered from depression and 22% suffered from anxiety among the public. After the peak of COVID-19, 22% experienced depression and 22% experienced anxiety among healthcare workers. In contrast, 62% experienced depression and 44% experienced anxiety among the public (Deng et al., 2021).

A meta-analysis portion evaluated the prevalence of depression and anxiety during the COVID-19 outbreak in China, and the results were that the prevalence of depression and anxiety among healthcare workers was higher than the public. Some contributions to the high prevalence of depression and anxiety among healthcare workers were the uncertainty of the virus and the transmission to loved ones, whereas the public was overwhelmed with misinformation reports about COVID-19 on social media. Healthcare workers have the medical knowledge to understand certain aspects of the virus, but new information develops each day.

The two articles provided information about the presence of depression and anxiety in healthcare workers due to pandemic. Some of the similarities were the bigger sample sizes and cross-sectional studies usage. Both articles stated that depression and anxiety exist in healthcare workers related to the high stress and workload caused by COVID-19. Also, the two articles shared weaknesses in using cross-sectional studies to evaluate the depression and anxiety findings in healthcare workers and showed limitations in the studies. Nevertheless, the two

articles did a great job explaining the relevance of depression and anxiety in healthcare workers and how early actions should be done to prevent negative effects on healthcare workers' mental status (See Appendix for additional information about the articles' strengths and weaknesses).

Comparison of Healthcare Workers' Mental Health in the ED and ICU

Two of the biggest hospital units are the emergency department (ED) and intensive care unit (ICU). The ED is the unit where patients are first admitted and determined where they will be transferred in the hospital if the patients continue to deteriorate. The unit comes across many diagnoses, and the main priority is to make sure the patients are stable enough to be transported from the ED to the appropriate unit. In contrast, the ICU is responsible for the continuous care of critically ill patients. ICU patients often have multiple body system failures, so the ICU team must monitor carefully and act appropriately. Because of COVID-19, many EDs and ICUs were filled with the maximum capacity of patients. As COVID-19 cases increased, so were hospital admissions and deaths. Two articles will talk about healthcare workers' mental health from two significant hospital unit perspectives.

The first article, "Mental health status of medical staff in emergency departments during the Coronavirus disease 2019 epidemic in China," by Xingyue Song and other colleagues, evaluated healthcare workers' mental health in the ED (Song et al., 2020). A cross-sectional study was used, and electronic questionnaires were sent to ED medical staff from February 28, 2020, to March 18, 2020. A total of 14,825 doctors and nurses in 31 provinces of Mainland China responded to the questionnaire through convenience sampling. The questionnaires had information about general demographic characteristics, work-related information, and mental health status. In addition, three scales were used to assess social support, depressive symptoms, and PTSD of ED medical staff.

The first scale is the Perceived Social Support Scale (PSSS) that was used to assess social support, and it had 12 items with response options ranging from one (very strongly disagree) and seven (very strongly agree) (Song et al., 2020). The total score was from 12 to 84, and higher scores indicated a greater level of social support. The scale ranged from a low score is less than or equal to 36, a moderate score is less than or equal to 60, and a high score is greater or equal to 61. The second scale is the Center for Epidemiologic Studies Depression Scale (CES-D) that was used to assess depressive symptoms, including a 20-item self-report inventory. Each item was scored on a four-point scale ranging from zero (rarely or none of the time, less than one day) to three (all the time, five to seven days) (Song et al., 2020). The cutoff score was 15 or 16, but those who scored 16 or higher presented with depressive symptoms. The last scale is the PTSD Checklist for DSM-5 (PCL-5) with a 20-item self-report scale to assess PTSD symptoms in healthcare workers. The scale ranged from zero (not at all) to four (extremely). The final result was calculated by the total score of PTSD.

Based on the article's findings, the prevalence rate of depressive symptoms was 25.5% and PTSD was 9.1% (Song et al., 2020). People who were males, middle-aged, worked for fewer years, had longer daily work hours, and had lower levels of social support were at higher risk of having depressive symptoms and PTSD. Social support has a big impact on healthcare workers' mental health because those who received higher social support had less risk of developing depressive symptoms and PTSD. Additionally, nurses were at greater risk of PTSD than physicians as they had more contact with patients (Song et al., 2020).

Compared to previous studies, healthcare workers had a lower prevalence rate of depressive symptoms and PTSD in the ED most likely related to the timing of the study. Healthcare workers' mental status tended to gradually improve over time. In short, the article

demonstrated that middle-aged, unmarried, divorced, or widowed healthcare workers were at higher risk of developing these symptoms because of a lack of social support. A big strength of the article is that it is considered the largest survey about the mental health of ED healthcare workers.

The second article, “Depressive and Anxiety Symptoms of Healthcare Workers in Intensive Care Unit Under the COVID-19 Epidemic: An Online Cross-Sectional Study in China,” by Xiaofan Peng and other colleagues, examined the mental impact of COVID-19 on ICU healthcare workers in China (Peng et al., 2021). A cross-sectional study was used, along with an online survey given from April 1, 2020, to April 8, 2020. The survey was distributed through an app called, Wenjuanxing. This article included 731 ICU healthcare workers that were split between front-line and second-line. The demographics of the participants were 303 (41.5%) male, 383 (52.4%) doctors, and 617 (84.4%) aged 26-45 years old (Peng et al., 2021).

Two scales were used to assess depression and anxiety, such as the Nine-item Patient Health Questionnaire (PHQ-9) and the Seven-item General Anxiety Disorder questionnaire (GAD-7). The PHQ-9 had nine questions scored from zero to three: no depression is 0 to 4, mild depression is 5 to 9, moderate depression is 10 to 14, and severe depression is 15 to 27. Regarding the GAD-7 scale, it consisted of seven questions ranging from zero to three: no anxiety is 0 to 4, mild anxiety is 5 to 9, moderate anxiety is 10 to 14, and severe anxiety is 15 to 21. The four factors associated with depressive symptoms were being female, ICU work time greater than five years, vacation days greater or equal to seven, and night duty shifts greater or equal to ten. In contrast, anxiety-associated risk factors were being female, ICU work time greater than five years, vacation days greater or equal to seven, night duty shifts greater or equal to ten, labor increase, and income loss. The main two contributing factors of moderate to severe

depressive and anxiety symptoms were ICU work time greater than five years and night duty shifts greater or equal to ten (Peng et al., 2021).

According to the article's findings, ICU healthcare workers who reported symptoms of depression resulted in 482 (65.9%), and those who reported anxiety were 429 (58.7%). There was no significant difference between front-line and second-line healthcare workers who experienced depression and anxiety symptoms. It was found that a female, ICU work time greater than five years, and night duties of greater or equal to ten were at risk for developing depressive and anxiety symptoms. Income reduction also impacted healthcare workers being at risk for anxiety (Peng et al., 2021).

In summary, ICU healthcare workers had depressive and anxiety symptoms during the COVID-19 pandemic, but the virus did not cause the symptoms to increase. One possible factor was the timing of the study from April 1, 2020, to April 8, 2020. By then, healthcare workers had enough medical supplies and obtained enough COVID-19 knowledge in China. Some interventions included managing night shift duties amount, vacation time, increased income to help relieve mental stress in healthcare workers. ICU healthcare workers who worked long years should be carefully observed as they are at higher risk of developing depressive and anxiety symptoms. A notable strength is that the study is considered the first mental health study that examined the psychological impact of ICU healthcare workers during the COVID-19 pandemic.

Additionally, the two articles shared some similarities, such as having the same strength of being the first research articles to examine the specialized hospital units of the ED and ICU. They both used cross-sectional studies to examine the psychological impacts of the COVID-19 pandemic on healthcare workers in the two units. Online surveys and similar scales were also used to assess the symptoms of depression and anxiety. However, both articles had common

weaknesses, such as utilizing convenience sampling to gather results from healthcare workers and using cross-sectional studies that caused limitations (See Appendix for additional information about the articles' strengths and weaknesses).

Interventions to Improve Healthcare Workers' Mental Well-Being

The COVID-19 pandemic has negatively impacted both the society and economy, causing major psychological problems. To have better control of the pandemic, healthcare workers should be taken care of and preserve their mental well-being while fighting against the virus. Two research articles will explore various interventions used in other countries to improve healthcare workers' mental health in China.

The first article, "Mental health problems and social supports in the COVID-19 healthcare workers: a Chinese explanatory study," by Xue-Hui Fang and other peers, evaluated different methods to alleviate psychological pressure on healthcare workers (Fang et al., 2021). A cross-sectional study was used, including two designated TB medical institutions in Anhui Province. An online questionnaire was distributed and a total of 540 healthcare workers were randomly selected.

Three scales were used to assess social support, depression, and loneliness. The Perceived Social Support Scale (PSSS) was used for social support, consisting of 12 items that ranged from one to seven. The scale was divided into three dimensions: family support, friend support, and other support. The total score was the sum of the three dimensions, meaning that the higher the score, the higher the perceived social support. The specific grading was less than 52 points is severe, 52 to 62 is poor, 63 to 73 is moderate, 74 to 78 is good, and greater than 78 is great (Fang et al., 2021). In addition, the Self-rating Depression Scale (SDS) was used to assess depression, including four groups: psycho-emotional symptoms, somatic disorders, psychomotor

disorders, and psychological disorders of depression. The scores ranged from one to four, resulting in the higher the score, the more serious the depression was. The scoring range from 41 to 47 is mild, 48 to 55 is moderate, and greater or equal to 56 is severe. Lastly, the UCLA loneliness scale was used to screen for loneliness. The higher the score, the higher the degree of loneliness a person experiences. A total of 20 to 80 points was available, resulting in the division of three groups: low, moderate, and high (Fang et al., 2021).

The major findings included that the three top psychological needs that healthcare workers were willing to receive one-to-one psychological counseling (29.75%), psychological lectures (27.20%), and interactive groups (18.59%). As for the top three psychological services needed, they were crisis event management (24.07%), emotional management (21.33%), and stress and frustration coping (21.13%) (Fang et al., 2021). Counseling services and peer support were considered the best supportive forms to reduce psychological problems. Additionally, healthcare workers who were women, nurses with low educational background, low professional titles, and staff in the epidemic prevention and control positions had higher psychological problems.

The second article, “Interventions to address mental health issues in healthcare workers during infectious disease outbreaks: A systematic review,” by D. Zaçe and other colleagues, evaluated the different interventions to deal with mental health problems of healthcare workers. A systematic review was used to determine the 24 studies’ results in the article.

Four interventions were used to alleviate mental stress in healthcare workers that were implemented from various places around the world. The first method is psychoeducation and training. Occupational therapists from a Canadian hospital created a pamphlet with information about signs and symptoms of anxiety. The pamphlet served as an educational tool for healthcare

workers who had patients with SARS. Additionally, computer-assisted resilience training involved mixed teaching modalities, such as information about coping approaches, normal stress response, psychological first aid, relaxation skills, active listening, and personal resilience. These topics were addressed in audio and video lectures, hard-copy fact sheets, and digital notes. Additionally, a resilience plan was created to help healthcare workers be aware of the psychological impact caused by stressors. Posters with wellness tips and positive self-affirmation training were used to strengthen the self-affirmation of healthcare workers during the pandemic in China (Zaçe et al., 2021).

The second intervention is a mental health support team, peer support, and counseling. Mental health teams include psychiatrists, social workers, psychological counselors, and psychiatric nurses as they offer advice and support to healthcare workers. Peer-group psychological support has enabled healthcare workers to share their emotions and experiences. A similar method used in China is the weekly Balint group activity, which is led by a psychiatrist. This activity allowed healthcare workers to talk about their emotions and share solutions. Mental health support groups and counseling are the two commonly used methods in China (Zaçe et al., 2021).

The third intervention is therapy and rehabilitation. Cognitive-behavioral therapy is used to assist people to understand and change the difficult emotions that could negatively impact their behavior. For instance, musical therapy was used in Italy and separated into three playlists: breathing playlist (relaxation and reduces anxiety and stress), energy playlist (recover energy and support concentration), and serenity playlist (release tension and produce calmness) (Zace et al., 2021). Music therapy could be useful to implement for healthcare workers in China as music tends to help relax people's minds.

The fourth intervention is an online platform and tele-support that help healthcare workers' mental well-being and prevent additional psychological harm. The digital platform was called "Be + against COVID," and it was available in three different languages, such as English, Spanish, and Portuguese. It had information on how to reduce stress reactions through resources, documents, infographics, and videos. For instance, a mental health hotline was accessible, and a Ten-item questionnaire was used to assess acute stress. In the United Kingdom, they developed a digital learning package that included the psychological impacts of COVID-19, psychological supportive teams, communication, social support, self-care, emotions management, and coping mechanisms. Also, the United States offered mental health counseling by a "24/7 Mental Health COVID-19 Hotline" for healthcare workers and a "Centralized Support Helpline" for healthcare workers' families. Lastly, Canada used tele-education programs that offered mindfulness exercises, COVID-19 information resources, management skills, and reflection exercises (Zaçe et al., 2021). These various methods could be possible ideas to assist with healthcare workers' mental health or the general population.

In summary, the two articles share their similarities and differences. One similarity is that they both explained different interventions used to assist healthcare workers' mental health. The first article examined various methods to alleviate the psychological pressure placed on healthcare workers, whereas the second article explored multiple interventions to deal with the mental health issues of workers. Additionally, one difference between the two articles is that the first article used a cross-sectional study approach, and the second article used a systematic review approach. In short, early recognition and actions could help healthcare workers' mental status in the long run (See Appendix for additional information about the articles' strengths and weaknesses).

Literature Review Conclusion

Based on the six research articles, it is evident that COVID-19 impacted healthcare workers' psychological well-being. All the articles included more than 100 participants, making them valid and reliable studies. In addition, multiple articles were cross-sectional studies and two articles were systematic reviews. Online questionnaires and mood scales were used to obtain results from healthcare workers at their convenience. In short, all the articles shared their strengths and weaknesses (see the Literature Review Table in the Appendix for a summary).

Several articles identified the presence of depressive and anxiety symptoms in healthcare workers. After everything healthcare workers have faced during the pandemic, it is reasonable for them to feel this way. As for the ED and ICU healthcare workers, they both shared similarities and differences as the two units are specialized in a hospital, serving as significant and fast-paced units in the healthcare field. Finally, various interventions were used in other countries to assist with healthcare workers' mental health, such as support groups and counseling. However, more research studies need to be done to confirm these findings from the literature review articles. To determine the reliability and validity of the research articles, they must answer the research questions: what impact does the COVID-19 pandemic have on healthcare workers' mental status, and what are the best methods to protect them from mental stress learned in other countries that can be applied in China?

Theoretical Framework

The theoretical framework that aligns with the research questions is Neuman's System Model. This model was created by Betty Neuman and it "provides a comprehensive holistic and system-based approach to nursing that contains an element of flexibility" (Petiprin, 2016). The main purpose of this model is to protect the patient from harm and environmental stressors by

using primary, secondary, and tertiary nursing prevention. This model can also be applied to healthcare workers in China.

For example, primary prevention is by educating healthcare workers on mental health and when to seek treatment as mental health is not commonly spoken about in Chinese culture. Instead, it can be seen as a taboo sometimes. Furthermore, resources should be accessible and presented to them. Secondary prevention is by using screening tools, such as specific mood scales (depression and anxiety). Tertiary prevention is by applying positive approaches to prevent healthcare workers' mental health from worsening. The model relates to the thesis because healthcare workers often need to take preventative measures by seeking treatment when they are struggling mentally to avoid severe consequences.

Healthcare workers play an important role in society since they care for and nurture sick people around the world. They are trained for multiple years to have medical and equipment knowledge to save those in need. The COVID-19 pandemic has significantly impacted many people and created a heavy burden to carry. However, screening tools and resources are available to prevent negative outcomes from occurring. Neuman's System Model can be used to explain the nursing theoretical framework and how preventive measures should be taken to achieve safety outcomes for both patients and healthcare workers.

Proposal for Further Study

Primary Research Aim

- 1) To what extent the COVID-19 pandemic effects have impacted healthcare workers' levels of depression and anxiety before and at the peak of the pandemic, and currently.
- 2) To identify potentially useful methods to help healthcare workers alleviate depression and anxiety related to the COVID-19 pandemic.

Ethical Considerations

All participants will be advised that their participation is voluntary and that they can stop answering questions at any time. No personally identifiable data, such as names or contact information, will be collected. Before submission of the survey, potential participants will be informed that submission of the survey will serve as an acknowledgment of their consent to participate. Additionally, the purpose of the study, benefits, risks, and goals will be stated to the participants before the study begins. All information received will be confidential and data collection will not start until the study is reviewed and approved by an institutional review board.

Research Methodology

Study Design

A quantitative, cross-sectional study will be used to help determine the best interventions to be implemented for Chinese healthcare workers on reducing symptoms of depression and anxiety. With increased knowledge about appropriate interventions, the negative effects of depression and anxiety can be potentially minimized.

To address Aim #1, two scales used will be used, the Patient Health Questionnaire-9 (PHQ-9) that screens for depression created by Janet B. W. Williams and her colleagues, and the General Anxiety Disorder-7 (GAD-7) that screens for anxiety created by Robert L. Spitzer and his colleagues. Additionally, to address Aim #2, a questionnaire, using the Likert Scale, or summative scale will be created to assess various interventions used to alleviate depression and anxiety in healthcare workers.

Population and Recruitment

The population to be studied is healthcare workers who are at least 22-years of age and who have worked in a Chinese hospital for at least one year. Healthcare workers are eligible to

participate in the study if they have started in the profession before the COVID-19 pandemic and they have continued to work as healthcare workers during the pandemic in a hospital. Study participation will be solicited through the social media site, WeChat, which is a popular platform in China. WeChat works much like FaceBook in the United States, and participants can respond to the questionnaire if they meet all the criteria. The sample size will include at least 250 healthcare workers in China.

Study Procedure

The study will use a quantitative approach to examine different methods used to reduce depression and anxiety symptoms in healthcare workers. The questionnaire will be administered for a week, from February 1, 2022 to February 8, 2022 on WeChat. Additionally, the online questionnaire will contain three sections.

First Step

The first section will ask demographic questions, such as gender, age, living situation (alone or with others), marital status (single or married), income level, number of years of experience in working as a healthcare worker overall, and the hospital unit on which the healthcare worker currently works, and how many years of experience in the unit one is currently employed.

Second Step

The second section will evaluate healthcare workers' before and at the peak of the pandemic, and current levels of depression and anxiety with the PHQ-9 (9 questions) and GAD-7 (7 questions) scales. All questions about depression and anxiety before and at the peak of the pandemic will be answered based on the participants' memory. For additional information about

these two reliable and validated scales, see the descriptions provided in the Literature Review sections, “Relevancy of Depression and Anxiety in Healthcare Workers” (Chen et al., 2021) and “Comparison of Healthcare Workers’ Mental Health in the ED and ICU” (Peng et al., 2021).

Third Step

The third section will include closed-ended questions with the Likert Scale, which can be answered yes (1), no (2), or uncertain (3). The Likert Scale will include numbers one (1) to three (3). Some example questions are:

- Did you use any psychoeducation services during the pandemic?
 - If so, was it helpful?
- Did you use any mental health support groups during the pandemic?
 - If so, was it helpful?
- Did you use any counseling services during the pandemic?
 - If so, was it helpful?
- Did you reach out to any mental health hotlines during the pandemic?
 - If so, was it helpful?

Statistical Analysis

In this proposal, inferential statistics will be used to make generalizations about healthcare workers’ level of depression and anxiety, along with what best methods to use to reduce these two symptoms? A correlation method will be useful to determine the relationship between two variables. The parametric statistical test, Pearson Product-Moment Correlation or Pearson r , will be utilized to look at the relationship between the two variables, healthcare workers and their depression and anxiety levels. In addition, multiple methods to alleviate depression and anxiety, and the effectiveness of these methods will be explored using a

numerical scale. The Pearson r will show whether or not there is a correlation between the two variables and can influence further research and interventions.

Conclusion

According to the six literature review articles, healthcare workers' mental health has been affected because of the COVID-19 pandemic. Many healthcare workers experienced an increased rate of stress and workload because of the virus' negative effects. The effects include risk for depression and anxiety, and some healthcare workers may have these symptoms continuously. Also, in the ED and ICU, healthcare workers were exposed to many sick patients and the exposure left a heavy burden due to healthcare workers' inability to save some patients' lives. Regarding the best interventions to assist healthcare workers' mental health, support groups and counseling remain two of the best explored methods. However, more research needs to be done to confirm the effectiveness of the findings. Ultimately, the original questions were partially answered from the six literature review articles.

The information provided from the literature review articles allows future researchers to fill in the gaps, such as to what extent did the pandemic affect healthcare workers' mental status, and what methods were used to reduce mental stress learned in other countries that can be applied to healthcare workers in China? Researchers can use the available information and resources mentioned in the literature review articles to confirm future studies. This way, people will have a better understanding of the impact of the COVID-19 pandemic and future mental health strategies to implement for healthcare workers around the world.

The proposed research will help advance the nursing profession by knowing what methods to use to reduce symptoms of depression and anxiety commonly found among Chinese healthcare workers. One limitation of the proposed study is that the depression and anxiety scales

usage to recall experiences before and at the peak of the pandemic will require participants to rely on their memory. Additionally, nursing remains one of the most stressful jobs in the world. Therefore, it is important to apply early interventions to prevent high amounts of stress and burnout, preserving healthcare workers' mental status.

The next steps are for future researchers to study the beneficial methods to implement to improve healthcare workers' mental well-being. Several studies about mental well-being interventions used were done in other countries that can be possibly applied in China. However, minimal studies were done to support the methods that help alleviate depression and anxiety in healthcare workers related to COVID-19. By furthering this research topic, healthcare workers can be protected and prevented from leaving the healthcare profession, along with maintaining a positive mentality.

References

- Cai, C. Z., Lin, Y. L., Hu, Z. J., & Wong, L. P. (2021). Psychological and mental health impacts of COVID-19 pandemic on healthcare workers in China: A review. *World Journal of Psychiatry, 11*(7), 337–346. <https://doi.org/10.5498/wjp.v11.i7.337>
- Centers for Disease Control and Prevention. (2021). *About Mental Health*. Centers for Disease Control and Prevention. Retrieved October 17, 2021, from <https://www.cdc.gov/mentalhealth/learn/index.htm>.
- Chen, J., Liu, X., Wang, D., Jin, Y., He, M., Ma, Y., Zhao, X., Song, S., Zhang, L., Xiang, X., Yang, L., Song, J., Bai, T., & Hou, X. (2021). Risk factors for depression and anxiety in healthcare workers deployed during the COVID-19 outbreak in China. *Social Psychiatry and Psychiatric Epidemiology, 56*(1), 47–55. <https://doi.org/10.1007/s00127-020-01954-1>
- Deng, Y., Chen, Y., & Zhang, B. (2021). Different prevalence trend of depression and anxiety among healthcare workers and general public before and after the peak of COVID-19 occurred in China: A meta-analysis. *Asian Journal of Psychiatry, 56*, 102547. <https://doi.org/10.1016/j.ajp.2021.102547>
- Fang, X.-H., Wu, L., Lu, L.-S., Kan, X.-H., Wang, H., Xiong, Y.-J., Ma, D.-C., & Wu, G.-C. (2021). *Mental Health Problems and Social Supports in the COVID-19 Healthcare Workers: A Chinese Explanatory Study*. BMC Psychiatry. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7802988/>.
- Liu, Z., Wu, J., Shi, X., Ma, Y., Ma, X., Teng, Z., You, X., Zhang, Y., Zhang, W., Feng, Z., Long, Q., Ma, X., Wang, L., & Zeng, Y. (2020). Mental Health Status of Healthcare

Workers in China for COVID-19 Epidemic. *Annals of Global Health*, 86(1), 128.

<https://doi.org/10.5334/aogh.3005>

Peng, X., Meng, X., Li, L., Hu, C., Liu, W., Liu, Z., Ma, X., Xu, D., Xing, Z., Zhu, Z., Liu, B., Zhang, L., & Peng, M. (2021). Depressive and Anxiety Symptoms of Healthcare Workers in Intensive Care Unit Under the COVID-19 Epidemic: An Online Cross-Sectional Study in China. *Frontiers in Public Health*, 9, 603273.

<https://doi.org/10.3389/fpubh.2021.603273>

Petiprin, A. (2016). *Neuman's systems model*. Nursing Theory. <https://nursing-theory.org/theories-and-models/neuman-systems-model.php>.

Song, X., Fu, W., Liu, X., Luo, Z., Wang, R., Zhou, N., Yan, S., & Lv, C. (2020). Mental health status of medical staff in emergency departments during the Coronavirus disease 2019 epidemic in China. *Brain, Behavior, and Immunity*, 88, 60–65.

<https://doi.org/10.1016/j.bbi.2020.06.002>

Stein, M. B. (2020). *COVID-19: Psychiatric illness*. *UpToDate*. <https://www-uptodate-com>

Zaçe, D., Hoxhaj, I., Orfino, A., Viteritti, A. M., Janiri, L., & Di Pietro, M. L. (2021).

Interventions to address mental health issues in healthcare workers during infectious disease outbreaks: A systematic review. *Journal of Psychiatric Research*, 136, 319–333.

<https://doi.org/10.1016/j.jpsychires.2021.02.019>

Appendix

Literature Review Table

<u>Article</u>	<u>Purpose</u>	<u>Sample</u>	<u>Study Method(s)</u>	<u>Major Findings</u>	<u>Strengths</u>	<u>Weaknesses</u>
Chen, J., Liu, X., Wang, D., Jin, Y., He, M., Ma, Y., Zhao, X., Song, S., Zhang, L., Xiang, X., Yang, L., Song, J., Bai, T., & Hou, X. (2021). Risk factors for depression and anxiety in healthcare workers deployed during the COVID-19 outbreak in China. <i>Social psychiatry and psychiatric epidemiology</i> , 56(1), 47–55. https://doi.org/10.1007/s00127-020-01954-1	To examine healthcare workers' depression and anxiety levels, and to investigate the risk factors during the COVID-19 outbreak in China.	902 Chinese healthcare workers with access to the WeChat platform.	Cross-sectional study survey; A structured questionnaire was used to collect information on general characteristics, workload, and health conditions.	681 (75.50%) healthcare workers had none or mild depression and anxiety. 221 (24.50%) had moderate or severe depression and anxiety.	A nationwide and observational study was conducted during the peak of the COVID-19 outbreak (February 9, 2020 to February 11, 2020). Four self-rated psychological scales were used. Only one response to the questionnaire per person was permitted, preventing duplicate results. Online informed consent was provided before the	Selection bias related to convenience sampling through the online questionnaire. Lack of knowledge about the prevalence of depression and anxiety levels in healthcare workers before the COVID-19 outbreak.

					start of the online questionnaire.	
Deng, Y., Chen, Y., & Zhang, B. (2021). Different prevalence trend of depression and anxiety among healthcare workers and general public before and after the peak of COVID-19 occurred in China: A meta-analysis. <i>Asian journal of psychiatry</i> , 56, 102547. https://doi.org/10.1016/j.ajp.2021.102547	To evaluate the prevalence of depression and anxiety levels among healthcare workers and the public, and to examine the changes of prevalence before and after the peak of the COVID-19 outbreak.	29,996 total participants, including both healthcare workers and the public from 34 studies.	Systematic review and meta-analysis based on the PRISMA statement.	Healthcare workers had a higher percentage of having depression and anxiety than the public. 26% of the public suffered from depression and 22% experienced anxiety. 31% of healthcare workers suffered from depression and 40% experienced anxiety.	Case reports, systemic reviews, meta-analyses, and other secondhand studies were excluded. Comparative analysis was used to examine the changes in prevalence before and after the peak of the COVID-19 outbreak among both populations (healthcare workers and the public). Five qualifications were utilized to distinguish the relevant studies for the systematic review and meta-analysis article.	Cross-sectional and observational studies were used, indicating a limited time frame. Focus only on China limited generalizability. Inconsistent scales were used to evaluate prevalence.

<p>Fang, X.-H., Wu, L., Lu, L.-S., Kan, X.-H., Wang, H., Xiong, Y.-J., Ma, D.-C., & Wu, G.-C. (2021). Mental health problems and social supports in the COVID-19 healthcare workers: A Chinese Explanatory study. <i>BMC Psychiatry</i>. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7802988/.</p>	<p>To comprehend the mental health status and needs of healthcare workers and to find ways to alleviate the psychological pressure.</p>	<p>540 healthcare workers were randomly selected from two designated TB medical institutions in Anhui Province.</p>	<p>Cross-sectional study; A questionnaire about COVID-19 related knowledge, perceived social support, depression and loneliness levels was used.</p>	<p>Depression — people in the isolation ward, fever clinic, and pre-check triage were at mild to moderate depression levels. Females were higher than males; the nurses were higher than the doctors; middle and junior job titles were higher than senior titles; junior colleges or below were higher than bachelor's degrees and above.</p> <p>Loneliness — doctors were higher than medical technicians; isolation ward, fever clinic, and pre-check triage were higher than those of other medical departments.</p> <p>Social support — doctors were lower than medical technicians;</p>	<p>Random sampling was used to reduce sampling error.</p> <p>Two provincial TB-designated medical institutions in Anhui Province were used to make the survey results more real and reliable.</p> <p>Extensive follow-up with the survey to avoid repetition and possible negligence was made.</p> <p>People with a history of psychiatric illnesses were excluded from the study to prevent bias.</p>	<p>The study only investigated the mental health status of healthcare workers in two designated TB medical institutions during the epidemic, limiting the generalizability of other healthcare workers in China.</p> <p>The cross-sectional study only reflected psychological information at a certain point in time.</p> <p>Baseline depression status</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

			<p>isolation ward, fever clinical, and pre-check triage were significantly lower than other departments.</p> <p>Top three psychological needs that healthcare workers were willing to accept: one-to-one psychological counseling (29.75%), psychological lectures (27.20%), and interactive groups (18.59%).</p> <p>Top three psychological services needed: crisis event management (24.07%), emotional management (21.33%), and stress and frustration coping (21.13%).</p> <p>Most healthcare workers were willing to have psychological</p>		<p>and socioeconomic status variation were not investigated.</p>
--	--	--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	------------------------------------------------------------------

				counseling during normal working hours (61.84%).		
<p>Peng, X., Meng, X., Li, L., Hu, C., Liu, W., Liu, Z., Ma, X., Xu, D., Xing, Z., Zhu, Z., Liu, B., Zhang, L., & Peng, M. (2021). Depressive and Anxiety Symptoms of Healthcare Workers in Intensive Care Unit Under the COVID-19 Epidemic: An Online Cross-Sectional Study in China. <i>Frontiers in public health</i>, 9, 603273. https://doi.org/10.3389/fpubh.2021.603273</p>	<p>To examine the psychological impact of COVID-19 on ICU healthcare workers in China.</p>	<p>731 ICU healthcare workers. 303 males, 383 doctors, and 617 participants aged 25-45 years old.</p>	<p>Cross-sectional study; A Nine-item Patient Health Questionnaire (PHQ-9) and Seven-item General Anxiety Disorder Questionnaire (GAD-7) were used.</p>	<p>482 (65.9%) ICU healthcare workers reported symptoms of depression and 429 (58.7%) reported anxiety.</p> <p>No significant difference between front-line and second-line respondents in depression and anxiety severity.</p> <p>Female, ICU work time > five years, and night duty number \geq ten were risk factors of depression and anxiety symptoms development.</p> <p>ICU work time > five years was also identified as a risk of moderate-</p>	<p>First mental health study that examined the psychological impact of COVID-19 pandemic on ICU healthcare workers in China.</p> <p>Results were obtained from April 1, 2020 to April 8, 2020, where medical workers received enough knowledge about COVID-19 and enough medical supplies (PPE) in China.</p>	<p>Self-reported online questionnaires were used.</p> <p>Selection bias was indicated related to the small sample size.</p> <p>The risk of COVID-19 related symptoms of depression and anxiety may be influenced by occupational burnout among ICU healthcare workers.</p> <p>Mental health status</p>

				several depressive and anxiety symptoms development.		information was collected during the short survey time.
<p>Song, X., Fu, W., Liu, X., Luo, Z., Wang, R., Zhou, N., Yan, S., & Lv, C. (2020). Mental health status of medical staff in emergency departments during the Coronavirus disease 2019 epidemic in China. <i>Brain, behavior, and immunity</i>, 88, 60–65. https://doi.org/10.1016/j.bbi.2020.06.002</p>	<p>To examine the mental health of emergency department healthcare workers during the epidemic in China.</p>	<p>14,825 doctors and nurses in 31 provinces of Mainland China.</p>	<p>Cross-sectional study; An electronic questionnaire was sent to ED medical staff.</p>	<p>Prevalence rates of depressive symptoms and PTSD were 25.2% and 9.1%.</p> <p>Men were more likely to experience depressive symptoms compared to women.</p> <p>Middle-aged, worked for fewer years, had longer daily work time, and had lower levels of social support were at higher risk of depressive symptoms and PTSD development.</p> <p>Working in Hubei province was associated with a higher risk of depressive symptoms compared to people in</p>	<p>Questionnaires included general demographic characteristics (age, gender, marital status, occupation, education level, technical title, location, and the department worked during the outbreak).</p> <p>31 provinces in Mainland China were examined and 14,825 ED medical staff were included in this study.</p> <p>The largest survey on the mental health of ED medical staff during the COVID-19 epidemic in</p>	<p>Limited time frame to gather data as the epidemic changed and the mental health of healthcare workers may also change.</p> <p>Participants were only from the emergency department.</p> <p>Convenience sampling was used.</p>

				<p>another province.</p> <p>Being a nurse was associated with a higher risk of PTSD.</p>	<p>China.</p> <p>The valuable findings could provide important reference points for preventing mental health problems of medical staff in other areas of China and other countries.</p>	
<p>Zaçe, D., Hoxhaj, I., Orfino, A., Viteritti, A. M., Janiri, L., & Di Pietro, M. L. (2021). Interventions to address mental health issues in healthcare workers during infectious disease outbreaks: A systematic review. <i>Journal of psychiatric research</i>, 136, 319–333.</p>	<p>To explore various interventions to deal with mental health issues of healthcare workers during the COVID-19 pandemic and to examine the effectiveness of each intervention.</p>	<p>24 articles referring to SARS, Ebola, Influenza, AH1N1, and COVID-19 were included. Participants were healthcare workers in China.</p>	<p>Systematic review; Four main categories (informational support, instrumental support, organizational support, and emotional and psychological interventions) were included.</p>	<p>37.5% of included articles reported data on the effectiveness of implemented interventions.</p> <p>Creating feelings of safety, providing reliable and timely information, and organizational support were ways to improve the resilience and well-being of healthcare workers.</p> <p>Promoting leadership and teamwork and</p>	<p>Search strategy aimed to be as comprehensive as possible, using six databases.</p> <p>Broad inclusion criteria for healthcare workers and different infectious disease outbreaks were used.</p> <p>Qualitative studies reported experiences and described implementation</p>	<p>With the limited number of articles on the effectiveness of all interventions, it was not possible to quantitatively analyze them.</p> <p>Not possible to identify the single intervention that was successful in preventing or reducing mental</p>

<p>https://doi.org/10.1016/j.jpsychires.2021.02.019</p>				<p>adjusting working hours were ways to provide safer and healthier environments. It helped staff feel better and calmer.</p> <p>Providing sufficient PPEs to healthcare workers reduced levels of depression and anxiety, and improved sleep quality. It also reduced the worries about healthcare workers' health and their families' health.</p> <p>Resilience workshops, group problem solving, cognitive-behavioral training, and mindfulness training developed resilience among healthcare workers.</p>	<p>interventions targeting healthcare workers' mental health.</p> <p>Quantitative studies reported the effectiveness of interventions of healthcare workers' mental health.</p>	<p>health problems among healthcare workers.</p> <p>Only considered China's economic, social, and cultural background (not generalized).</p> <p>Sample bias related to convenience sampling.</p> <p>Only considered peer-reviewed articles published in English.</p>
------------------------------------------------------------------------------------------------------------------------	--	--	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------