

Factors Affecting Compassion Fatigue Among Nurses During
the Global COVID-19 Pandemic: Through a Socio-Ecological Model

by

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ABSTRACT

Background: During the Coronavirus disease (COVID-19) pandemic, nurses experienced increased workloads which affected their compassion fatigue (CF). High levels of CF affect quality of care. However, little is known about what factors are associated with CF among nurses during the pandemic.

Aim: This study aims to examine the factors associated with CF using the socio-ecological model (SEM).

Methods: This study is a cross-sectional correlational study which targeted nurses who are actively practicing and can speak English, Korean, Japanese, or French. Online websites for the recruitment including the study description and survey link were provided in each country. Survey data were collected from July 1, 2020 to January 25, 2021.

CF, consisting of burnout and secondary traumatic stress (STS), was measured using Professional Quality of Life scale (ProQOL). Factors based on each level of the SEM were measured: intrapersonal factors (demographic factors, resilience), fear of infection, intention to leave their job, care of COVID-19 patients, developing policies, being asked to work at higher acuity levels, received training about COVID-19, and any COVID-19 test results); interpersonal factors (fear of bringing COVID-19 to family); organizational factors (provision of personal protective equipment [PPE] or masks, organizational support to prevent COVID-19, type of organization, and accommodational support); community factors (country of practice and incidence rate); and policy factor (mask policy). These data were analyzed using multiple regression using maximum likelihood estimation with robust standard errors.

Results: Intrapersonal factors (resilience, age, being bedside staff, fear of infection, intention to leave their job, being asked to work at higher acuity levels, and receiving the positive COVID-19 results), organizational factors (provision of PPE, organizational support for COVID-19, and accommodational support), community factors (incidence rate when the mask policy was not in effect, and country of practice), and policy factor (mask policy under a high incidence rate) were the associated factors. The interaction between incidence rate and mask policy was significant.

Conclusion: To prepare for future emerging infectious disease crises, organizational support with proper PPE supplies, continuing education on emerging infectious diseases, and providing interventions to increase resilience are suggested.

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CHAPTER 1

BACKGROUND AND SIGNIFICANCE

On March 11, 2020, the World Health Organization (WHO) declared the Coronavirus disease 2019 (COVID-19) pandemic as a result of the extent of its worldwide spread (WHO, 2020f). COVID-19, which started with a cluster of cases in Wuhan, China in 2019 (WHO, 2020f). Severe acute respiratory syndrome coronavirus 2 virus (SARS-CoV-2), which causes COVID-19, is transmitted by respiratory droplets. About 70% of people who become infected with COVID-19 are symptomatic (Centers for Disease Control and Prevention [CDC], 2021b), however, among symptomatic patients, fever, dry cough, and tiredness are the most common symptoms and muscle pains, sore throat, diarrhea, headache, conjunctivitis, loss of taste or smell, and rash on skin are the less common symptoms (WHO, n.d.-a).

Research is still being conducted to learn about this previously unknown virus, but severe symptoms present as acute respiratory distress syndrome causing shortness of breath and progression to pneumonia (Xu et al., 2020). In addition, COVID-19 infection has serious adverse effect on clinical outcomes. About 14.2% of patients admitted to the hospital required intensive care, 12.2% required invasive mechanical ventilation, and 3.2% needed kidney replacement therapy in New York city in the United States (U.S., Richardson et al., 2020). In Korea, research shows that 21.4% of patients required oxygen therapy, but did not require mechanical ventilation, and 78.5% patients developed pneumonia (E. S. Kim et al., 2020). Globally, the WHO reported there had been 8,525,042 confirmed cases and caused 456,973 death on June 20, 2020 (WHO, 2021). Research has shown that the overall symptomatic case fatality risk is 1.4% (Wu et al.,

2020). This is higher than 2009 influenza H1N1 pandemic, which was 0.026% in United Kingdom and 2.6% in North America (Donaldson et al., 2009; Wong et al., 2015).

Psychological Impact to HCWs

Since the COVID-19 outbreak, the workload of healthcare workers (HCWs) has increased. A qualitative study about understanding roles of emergency nurses in Hong Kong during epidemic event showed that nurses recognized changes in practice for patients more focused on infection compared with the pre-epidemic event (Lam et al., 2019). As a result of the rapid spread of COVID-19, the number of people who were hospitalized increased and impacted the psychological aspects of HCWs. Based on past pandemics and epidemics, it is possible to anticipate the negative psychological impact of COVID-19 on HCWs. In the studies during Middle East Respiratory Syndrome Coronavirus (MERS-CoV) epidemic in Korea, nurses experienced high burnout, fear of infection (J. S. Kim & Choi, 2016), stress, exhaustion, and fear (Y. Kim, 2018). The study by H. J. Kim and Park (2017) found that 7.1 % of nurses who cared for MERS-CoV patients were at high risk for post-traumatic stress (H. J. Kim & Park, 2017). During the global H1N1 pandemic, HCWs experienced anxiety, psychological distress, and concerns about the infection of their families and friends in Greece (Goulia et al., 2010). During the global Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) pandemic, Shiao et al. (2007) pointed out that 25.9% of nurses considered leaving their job due to the risk of infection.

Not surprisingly, recent studies during the COVID-19 pandemic concluded HCWs began suffering from sleep problems (Y. Huang & Zhao, 2020) and high burnout (Sahin et al., 2020). Specifically, 52.8% of front-line nurses in Wuhan had insomnia

(Zhan et al., 2020). The research regarding front-line nurses demonstrated that they experienced fear, anxiety, frustration, empathy, and compassion, and that they were required psychological counselling (Tan et al., 2020).

The effect of work-related negative psychological distress has been studied among HCWs to determine how the negative psychological aspects affects the quality of patient care. Compassion fatigue (CF) is a concept to describe burnout and secondary traumatic stress (STS). CF was originally defined as STS which is “a state of tension and preoccupation with the traumatized patients by re-experiencing the traumatic events, avoidance/numbing of reminders persistent arousal (e.g., anxiety) associated with the patient (Figley, 2002a, p.1435)”. CF has been studied by researchers and the definition has evolved. Stamm (2010) defined CF as a combination of STS and burnout, which is “a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job” (Maslach & Leiter, 2016, p.103). CF has been studied among HCWs. Nurses make up the largest group of HCWs and are constantly tending to patients at the bedside making them vulnerable to CF. Thus, it is important to see how CF affects nurses. Research has supported the theory that nurses are at risk to have CF and examines how CF influences patient care. It has been reported that CF is related to patient care and work engagement (Mason et al., 2014). In addition, a concept analysis of CF’s effect on nursing practice concluded that nurses with CF are more likely to make work errors, deliver poor quality care, and have greater intentions to leave their positions (Peters, 2018). A metasynthesis of qualitative studies discovered that nurses encounter physical and emotional symptoms such as challenging work or lack of energy when they

experience CF (Nolte et al., 2017). Hence, it is essential to know how to prevent CF by controlling factors that contribute to CF.

In the metasythesis, Nolte et al. (2017) found that a poor work environment such as shortage of staff or difficult workloads, and lack of support from their families or nursing managers or peers have been found to trigger CF (2017). During the COVID-19 pandemic, it was reported that many countries experienced shortages of essential supplies such as personal protective equipment (PPE, Dargaville et al., 2020; Ranney et al., 2020). J. S. Kim and Choi (2016) also recognized that during the MERS-CoV epidemic, a lack of hospital resources was associated with burnout among nurses. However, little is known about how the COVID-19 pandemic affected nurses and subsequently influenced CF.

Theoretical Framework

The socio-ecological model (SEM) is a social behavior theory that emphasizes the impact of social aspects on individual behavior. The SEM approaches behavior by considering five factors; (a) intrapersonal factors, (b) interpersonal processes and primary groups, (c) organizational (institutional) factors, (d) community factors, and (e) public policy factor (McLeroy et al., 1988).

Intrapersonal factors represent characteristics of the individual (McLeroy et al., 1988). Demographic factors are included in intrapersonal factors. Interpersonal factors contain social networks such as work groups and these factors influence health behavior (McLeroy et al., 1988). Organizational factors are social institutions and social organizations, and interventions for organizational factors are focused on how organizational characteristics affect behavioral changes, including worksite environments (McLeroy et al., 1988). Community factors include relationships between individuals and

organizations or institutions, and a population associated with a political entity (McLeroy et al., 1988). Policy factors indicate laws and policies (McLeroy et al., 1988). The SEM is useful when developing interventions based on each factor. See Figure 1.

The SEM has been used in many settings including patient care. Phelan and Kirwan (2020) worked to explain factors related to missed nursing care based on the SEM and identified five factors: the immediate clinical area, local unit or ward, the hospital or regional level, as well as the national and global levels. The SEM is also used in infectious disease research. A study examined factors affecting the routine immunization communication initiative in Kyrgyzstan by using the SEM (Schiavo et al., 2020). The outcomes of the immunization communication initiative were explained by individual, interpersonal, community organization, and policy level (Schiavo et al., 2020).

Based on the SEM, it is possible to suggest factors that could affect CF among nurses during the COVID-19 pandemic and identify factors that could prevent future pandemic-related problems. An example of an interpersonal factor could be that nurses may have been worried about infecting their family by bringing the virus home from work. Supply shortages of PPE can play an important role as an organizational factor during the COVID-19 pandemic.

Study Aim, Research Questions, and Hypotheses

Nurses' CF influence patient outcomes, so examining factors that affect CF are meaningful to a larger group of people than just the nurses. The SEM provides a framework for systematically exploring this topic. Therefore, this study aims to examine

the factors associated with CF using the SEM as a framework. The research questions and hypotheses of this study are:

Research question 1. Are intrapersonal factors such as age, gender, educational level, years in practice, position, fear of infection, intentions to leave their jobs, resilience, specialty certification, experience in COVID-19 patient care, involvement in COVID-19 related policy development, were asked to work at higher acuity levels, trained COVID-19 protection courses, or receiving a COVID-19 test associated with CF among nurses?

Research question 2. Is interpersonal factor such as fear of infection of family associated with CF among nurses?

Research question 3. Are organizational factors such as provision of PPE or masks, organizational support to prevent spread of COVID-19, organizational type, or provided accommodation from institution associated with CF among nurses?

Research question 4. Are the community factors such as county of practicing, or COVID-19 incidence rate associated with CF among nurses?

Research question 5. Is the policy factor of lockdowns such as mask policy among the state, or country associated with CF among nurses?

Hypothesis 1. Nurses who report the lower levels of resilience will have the higher levels of CF.

Hypothesis 2. Nurses who have a certain type of position will report higher levels of CF.

Hypothesis 3. Nurses who report higher fear of COVID-19 infection themselves will report higher levels of CF.

Hypothesis 4. Nurses with higher levels of intention to leave their jobs will report higher levels of CF.

Hypothesis 5. Nurses who do not have a specialty will report higher levels of CF.

Hypothesis 6. Nurses who have experienced caring for COVID-19 patients will report higher levels of CF.

Hypothesis 7. Nurses who were not involved in developing policy will report higher levels of CF.

Hypothesis 8. Nurses who have been asked to work at higher acuity levels to care for patients beyond the usual practice will report higher levels of CF.

Hypothesis 9. Nurses who have been not trained on COVID-19 will report higher levels of CF.

Hypothesis 10. Nurses who received a positive COVID-19 result will report higher levels of CF.

Hypothesis 11. Nurses who have higher levels of fear of bringing COVID-19 to their families will report higher levels of CF.

Hypothesis 12. Nurses who work in certain types of institution will report the higher levels of CF.

Hypothesis 13. Nurses who report greater lack of organizational support for COVID-19 will report higher levels of CF.

Hypothesis 14. Nurses who report a greater lack of PPE or masks available to them will report higher levels of CF.

Hypothesis 15. Nurses who were not supported with accommodations from their organizations will report higher levels of CF.

Hypothesis 16. CF will vary according to country of practice.

Hypothesis 17. Nurses in states of countries with higher levels of COVID-19 positivity rates will report higher levels of CF.

Hypothesis 18. Nurses in states or countries with lack of mask policy will report higher levels of CF.

CHAPTER 2

LITERATURE REVIEW

This chapter describes a comprehensive literature review on COVID-19, CF, and the socio-ecological model.

COVID-19

In December 2019, a cluster of cases of unknown etiology of pneumonia were reported from Wuhan City, China (WHO, 2020d). This unknown virus was discovered as a zoonotic virus, that seemingly originated from bats. Researchers revealed this virus as one of the coronavirus family, and its transmission was pervasive. The virus was transmitted globally starting from Thailand (WHO, 2020f). The viral genetics was similar to the SARS-CoV, thus the WHO assigned its name as COVID-19 (WHO, n.d.-b). By July 3, 2020, there were 10,710,005 confirmed cases and 517,877 deaths globally (WHO, 2021).

Research shows that the incubation period of COVID-19 is 5.1 days and most cases will have symptoms within 11.5 days after infection (Lauer et al., 2020). The transmission of the virus was the highest in households with adolescents aged 10 to 19 (Park et al., 2020). To date, COVID-19 causes symptoms such as dry cough, fever, dyspnea, and rarely intestinal symptoms such as diarrhea (C. Huang et al., 2020). In severe cases, they are developed into acute respiratory distress syndrome causing shortness of breath and progression to pneumonia (Xu et al., 2020). Moreover, COVID-19 can damage lungs, which causes the hallmark peripheral ground-glass opacities (C. Huang et al., 2020; Lei et al., 2020).

Patient Care for COVID-19

As COVID-19 is spread via droplet transmission, patients should receive care in negative-pressure rooms, leaving HCWs to wear PPE to protect transmission to not only the HCWs themselves but also other people. Unfortunately, the WHO reported global supply shortages (WHO, 2020e). Consequently, researchers tried to develop special facilities to reduce HCWs contact with COVID-19 patients such as negative pressure procedural tents (Bassin et al., 2020). In addition, governments were forced to develop supplies or new facilities to take care of COVID-19 patients. Despite these changes, there are still warnings of a shortage of supplies or capabilities to take care of COVID-19 patients (Ahn, 2020).

Some COVID-19 patients needed special care such as oxygen or ventilator therapy. In Wuhan, China, all patients had to receive oxygen therapy, and 10% of patients (4 out of 41) had invasive mechanical ventilation (C. Huang et al., 2020). In the U.S., 12.2% to 29.2% of COVID-19 patients required invasive mechanical ventilation (Myers et al., 2020; Richardson et al., 2020). In the U.S., 3.2% of patients had to receive a kidney transplant (Richardson et al., 2020). Pneumonia was reported in 70% of patients in Korea (E. S. Kim et al., 2020). Ultimately, patients with comorbidities were at highest risk of mortality (Roncon et al., 2020), so patients with comorbidities required special care by HCWs.

As the pandemic persisted, the cumulative number of COVID-19 cases and deaths by COVID-19 increased. To compound this problem, the virus mutated by changing its spike protein (Korber et al., 2020). What we began to see was that each country had a different type of management of the outbreak which showed variable outcomes (Sachs et

al., 2020). This accounts for how the report of severity of COVID-19 patients were varied based on the countries and the time of the outbreak. In Wuhan, China, the first place the virus originated, 13 patients out of 41 (32%) were treated in the ICU by January 02, 2020 (C. Huang et al., 2020). In the report from Korea, by February 17, 2020, none of patients had to be in the ICU among 28 patients (E. S. Kim et al., 2020). In the U.S., 113 patients out of 1,299 (8.7%) required ICU care during March 2020 in California (Myers et al., 2020) and 373 patients out of 2,634 (14.2%) had to be in the ICU from March 1 to April 4, 2020 in New York (Richardson et al., 2020).

Negative Psychological Aspects during Pandemic and Epidemic

During an outbreak, nurses may experience negative psychological feelings as a result of the increased workload and the environmental circumstances. A recent systematic review discovered that HCWs experienced post-traumatic stress symptoms, depressive symptoms, insomnia, and anxiety during outbreaks (Preti et al., 2020). During the H1N1 pandemic, HCWs in an emergency department were worried about the low quality of patient care due to the high volume of demand, and nurses in an emergency department showed significantly high levels of stress in Australia (FitzGerald et al., 2010). In Greece, HCWs expressed anxiety, psychological distress, and concerns about the infection of their families and friends (Goulia et al., 2010). During the SARS pandemic, 25.9% of nurses had the intention to leave their jobs due to the risk of infection in Taiwan (Shiao et al., 2007). During the recent COVID-19 pandemic, as well as the previous pandemics, HCWs reported having sleep problems and high burnout (Y. Huang & Zhao, 2020; Sahin et al., 2020). In Saudi Arabia, even if HCWs experienced the MERS-CoV epidemic in the past, they had significantly higher anxiety levels than when

they had outbreaks of MERS-CoV or seasonal influenza (Temsah et al., 2020). From the report of American Nurses Association (ANA), half of the U.S. nurses are overwhelmed and 30% of nurses felt depression during the COVID-19 pandemic (ANA, 2020b).

Additionally, nurses were worried about ongoing staff shortages and 87% of them were afraid to go to work (ANA, 2020a). In China, nurses similarly experienced fear, anxiety, frustration, and insomnia during the COVID-19 pandemic (Tan et al., 2020; Zhan et al., 2020). Some nurses reported they were overworked and needed psychological support due to the workload during the COVID-19 pandemic (Tan et al., 2020).

Stress

Stress is defined as “the nonspecific response of the body to any demand” (Selye, 1975). Demand can refer to the causes of the stress, which can be identified as a stressor, such as war or starvation (Selye, 1975, p.9). The concept of stress was first proposed by Cannon as a name for homeostasis (Cannon, 1939). Cannon (1939) proposed the specific mechanism for maintaining the steady state by using hormones, and he named the process “flight or fight.” When we perceive stress, the human body tries to judge whether to fight or flight, and our body is ready to act based on this judgment. There are some hormone changes in the human body such as adrenocortical enlargement, thymicolymphatic involution, or gastrointestinal ulcers (Selye, 1975).

Based on Cannon’s homeostasis theory, Selye proposed the General Adaptation Syndrome (Selye, 1993). The human body shows three stages when perceiving stress: the alarm reaction, stage of resistance, and stage of exhaustion (Selye, 1993). First, there is an alarm reaction after the exposure of a noxious agent. The sympathetic nerve system responds during the alarm reaction by having the adrenal cortex release corticoids into

the bloodstream (Selye, 1993). The alarm reaction is short lived. If the alarm reaction continues for a long time, organisms cannot survive (Selye, 1993). When organisms survive during the alarm reaction, the organism goes to the stage of resistance (Selye, 1993). During the state of resistance, the human body tries to adapt to the stressor by focusing on returning to the normal body mechanisms. The third stage is the stage of exhaustion. This stage occurs when the human body fails to adapt due to the severe demand or lengthy period of exposure to the stressor (Selye, 1993). If the body does not adapt, the stress could result in disease or death in this stage (Selye, 1993). Stress reactions apply to everyone, so selecting preferred environments or activities are recommended avoid stress and adverse outcomes (Selye, 1975).

Lazarus proposed the cognitive appraisal process approach of stress reaction, which is more related to psychology aspects (Lazarus, 1999). He emphasized the appraisal and coping with regards to psychological stress. When people receive stress, they determine whether the situation is threatening or manageable. Then they assess the resources to manage the situation. After assessing the resources, the human body tries to balance psychological resources and environmental demands (Lazarus, 1999). When the environmental demands exceed the available resources, a stressful relationship ensues (Lazarus, 1999). Lazarus suggested two aspects of coping: problem-focused coping and emotional-focused coping (Biggs et al., 2017). Problem-focused coping is managing the stressor itself by changing environments while emotional-focused coping refers to controlling emotional arousal that was prompted by the stressful situation (Biggs et al., 2017). As a result of the coping process, a human reappraises the situations to decide if new coping is required (Biggs et al., 2017).

Burnout

Burnout is “a psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with other people in some capacity” (Maslach, Jackson & Leiter 1997, p.192). The three dimensions of burnout are overwhelming depletion, negative feelings related to their job, and professional inefficacy and lack of achievement (Maslach & Leiter, 2016). These three dimensions are viewed as core concepts. Energy depletion refers to the feeling that an individual’s emotional resources are being depleted (Shirom, 2003). The second dimension, negative feelings related to their job, is a cynical response to the people at work that leads to changes in their interpersonal relationships (Shirom, 2003). The last dimension, professional inefficacy, refers to an individual’s reduced capability, productivity, and self-efficacy (Shirom, 2003). Self-efficacy is the people’s conviction of their effectiveness to cope with the situations (Bandura, 1977) and has a strong negative relationship with burnout (Shoji et al., 2016). Burnout emerges as a response to chronic interpersonal stressors on the job (Maslach & Leiter, 2016). It is mediated by ongoing or cumulative job conditions, or non-job-related events, such as layoffs (Brill, 1984). Burnout may occur over a long period of time, because short period stress can be managed by interventions or environmental factors (Brill, 1984).

Shirom (2003) argued the Conservation of Resources (COR) theory by Hobfoll (1989) explains the theoretical relationship between stress and burnout. Based on the COR theory, job-related stress emerges when individuals are threatened by losing resources or not able to regain resources (Hobfoll & Freedy, 1993; Wright & Hobfoll, 2004). Stress appears gradually when individuals experience a repeated lack of resources

(Hobfoll & Freedy, 1993). Across time, individuals may experience the series of lack of resources, and they can replenish or replace resources over time (Hobfoll, 1989; Hobfoll & Freedy, 1993). However, if replenishment fails, individuals are more likely to experience burnout (Hobfoll & Freedy, 1993).

Post-traumatic Stress Disorder

Post-traumatic stress disorder (PTSD) is one of the anxiety disorders that can occur after experiencing a traumatic event (American Psychiatric Association, 2020). People who have PTSD think about their experiences constantly even long after a traumatic event (American Psychiatric Association, 2020). People who have PTSD have negative feelings or reactions when they flashback to the traumatic event or face similar situations, so they try to avoid facing similar situations or people who remind them of the traumatic events (American Psychiatric Association, 2020).

PTSD symptoms includes flashback, nightmares, frightening thoughts, avoiding thoughts or environments remindful of the traumatic event, easily scared, feeling tense, sleep problems, outburst of anger, negative feelings such as guilt or pessimism, loss of interest, and some physical symptoms such as musculoskeletal pain, gastrointestinal problems or poor cardio-respiratory symptoms (National Institute of Mental Health, 2019; Pacella et al., 2013).

PTSD has been shown in HCWs. A meta-analysis reported 14.8% of physicians were diagnosed with PTSD (Jacob Sendler et al., 2016). In terms of nurses, research showed 8.5% to 20.8% have PTSD and their anxiety was mostly related to end-of-life issues and workloads (Schuster & Dwyer, 2020). Considering that the lifetime prevalence of PTSD in the general population is 3.9% and 5.6% among those who have been

traumatized, the prevalence of PTSD in HCWs is higher than the general population (Koenen et al., 2017).

During an infectious disease outbreak, HCWs are at a high risk of stress and experience PTSD. During the MERS-CoV epidemic, 7.1 % of nurses were at a high risk for PTSD (H. J. Kim & Park, 2017). A recent systematic review pointed out that exposure to the patients, longer patient contact, and quarantine experiences are associated with PTSD symptoms of HCWs during disease outbreaks (Carmassi et al., 2020). Nurses are an especially high-risk group of PTSD, because they have longer exposure to patients (Carmassi et al., 2020).

Secondary Traumatic Stress (STS)

Figley defined STS as “a state of tension and preoccupation with the traumatized patients by re-experiencing the traumatic events, avoidance/numbing of reminders persistent arousal (e.g., anxiety) associated with the patient” (Figley, 2002a, p. 1435). STS occurs from being traumatized by other people’s trauma, such as clients’ or clients’ families, rather than personal traumatic events (Figley, 2002b). However, its manifestations are similar to PTSD which is caused by traumatic events actually experienced. In other words, caregivers are traumatized by the trauma experienced by their clients or patients even if caregivers do not directly experience or witness the trauma. Their traumatic stress is secondary to the primary stress of the client or patient. Figley thus described CF as “a secondary traumatic stress reaction resulting from helping or desiring to help a person suffering from traumatic events... when healthcare professionals develop a preoccupation with their patients by re-experiencing their trauma, and may exhibit avoidance of reminders, numbing in response to reminders, anxiety and

persistent arousal” (Figley, 1995, as cited in Abendroth and Figley, 2013, p. 113).

Recently, STS has been called “compassion stress” (Figley & Figley, 2017).

Figley (2002a) developed the CF model and identified 10 variables to contribute to CF: a) empathic ability, b) empathic concern, c) exposure to the client, d) empathic response, e) compassion stress, f) sense of achievement, g) disengagement, h) prolonged exposure, i) traumatic recollections, and j) life disruption. These 10 variables are linear and can explain the extent of reasons resulting in CF. Thus, conversely, these variables can be used as targets of interventions to reduce CF. To prevent STS, it is necessary to a) desensitize the traumatic stressor to the therapist, b) manage exposure dosage, and c) enhance social support (Figley, 2002a).

Compassion Fatigue (CF)

Joinson (1992) introduced the concept of CF as a unique form of burnout which is emotionally devastating and affects caregiving professions. Nurses are susceptible to CF, but it is hard to recognize unless aware of CF. Joinson (1992) attributed CF to empathy and emotional energy that is inherent in professional caring. CF occurs in therapists because they are affected by their involvement with clients or families (Figley, 2002a). According to Figley and Abendroth (2011), “Joinson (1992) used the term in a generic way and not for the purpose of classification... [whereas] Figley (1995) defined the concept more precisely as a secondary traumatic stress reaction that is sufficiently similar to vicarious trauma”. Figley applied the concept of CF to STS, which he defined as “the natural consequent behaviors and emotions resulting from knowing about a traumatizing event experienced by a significant other – the stress resulting from helping or wanting to help a traumatized or suffering person” (Figley, 1993, as cited in Figley, 1995, p. 7).

Figley and others, who had been counseling veterans with PTSD since the 1970s, recognized that counselors themselves often had similar symptoms even though they had not experienced trauma (Figley, 1995). Researchers and clinicians have called this phenomenon vicarious traumatic stress or STS, distinguishing it from the primary stress associated with personally experienced trauma that can lead to PTSD. Eventually, Figley saw burnout and STS as two distinct components of CF. The differences lie in the period of onset and the causes of symptoms. Burnout occurs after a long period of time, on the other hand, STS has short onset after an exposure to another's trauma (Figley 1995). A burnout state is caused by a lack of resources (Hobfoll, & Freedy, 1993), but STS is related to empathic ability rather than a resource deficit (Figley, 1995; Figley, 2002; Joinson, 1992). Burnout among healthcare providers is more common than STS and sometimes not related to a traumatic event (Larsen & Stamm, 2008). Unlike PTSD, which is an anxiety disorder that can occur following a traumatic experience (American Psychiatric Association, 2020), neither burnout nor STS are medical conditions (Stamm, 2010). Figley (2002a) further observed that those who cared for the chronically ill also experienced CF, which "like any other kind of fatigue, reduces one's capacity or interest in bearing the suffering of others" (p. 1434). One critique of Figley's concept of CF is that empathy is not considered as key point of enhancing therapists' outcome (Coetzee & Laschinger, 2018).

There are two concept analysis papers regarding CF in the nursing literature (Coetzee & Klopper, 2010; Peters, 2018). Coetzee and Klopper (2010) described CF as "the final result of a progressive and cumulative process that is caused by prolonged, continuous, and intense contact with patients, the use of self, and exposure to stress" (p.

237). CF is based on the compassion discomfort, and not eliminated by resting (Coetzee & Klopper, 2010). In the CF state, nurses lose their recovery power and show changes in social, emotional, spiritual, physical and intellectual state (Coetzee & Klopper, 2010). CF occurs when someone is exposed to the patients with suffering, using of themselves, difficulty maintaining professional and personal boundaries, stress, and lack of self-care (Coetzee & Klopper, 2010; Peters, 2018). A literature review reported that conducting cardiopulmonary resuscitation and witnessing death, traumatic injuries, or chronic disease of patients are the factors causing traumatic stress among nurses besides the work and personal related factors (Schuster & Dwyer, 2020). As a result of CF, nurses have an increased chance of work errors, decreased quality care, values questioning, and intention to quit their professional jobs (Peters, 2018). These consequences impact the shortage of nurses as well (Peters, 2018).

Professional Quality of Life Model

Joinson (1992), like more recent nursing authors (Kelly et al., 2015), recognized the paradox of positive feelings that also accompany with CF. Stamm (2002) likewise recounted how while working with survivors of violence, she saw that psychotherapists sometimes gained joyful moment by taking care of survivors, and had wondered whether such compassion satisfaction might be a protective factor that the negative questionnaire (Figley, 1995) used to measure CF failed to capture. There was a risk the scales focused survey respondents more on negative symptoms or that respondents without any negative feelings could think they might be wrong, So Stamm and Figley (1996) added “parallel positive” items to the original burnout and CF items in order to identify positive effects of caregiving and thus gain a clearer understanding of the relationship between the

positive and negative aspects of compassion. The result was the 66-item Compassion Satisfaction and Fatigue Test, comprising the new compassion satisfaction scale along with the previous burnout and CF scales (Stamm, & Figley, 1996).

Three revisions over the next decade, informed by the authors and various colleagues' cumulative experience, culminated in a 30-item measure of professional quality of life (ProQOL) that comprised three 10-item scales (Bride et al., 2007; Stamm, 2005). The ProQOL model that is the basis for this measure describes the impact of caring work. Figure 2 shows the portion of the ProQOL model used to operationalize the positive and negative effects of compassion (i.e., satisfaction and fatigue, Stamm, 2010). In this model, compassion satisfaction represents the pleasure of therapist by being able to help and is related to hope and sense of accomplishment and it applies to both volunteers and paid workers such as teachers, police officers, HCWs, or disaster clean-up personnel (Stamm, 2010; Stamm & Figley, 1998). CCF is the combination of STS and burnout. Environments related to work, client, and person are factors that affect both compassion satisfaction and CF. This means the therapist can help other in a poor work environment while experiencing burnout, but can still feel satisfaction from helping clients (Stamm, 2010). This model applies to volunteers and paid workers such as teachers, police officers, HCWs, or disaster clean-up personnel (Stamm, 2010). However, this model has been criticized due to the limited conceptual boundaries of CF by defining CF as the combination of burnout and STS (Coetzee & Laschinger, 2018).

During a crisis, such as a pandemic, HCWs CF can be increased along with workload and other work-related stressors. A study in Italy during the COVID-19 pandemic showed CF of HCWs is affected by their discrimination against the COVID-19

patients, fear of COVID-19 infection from patients, psychological job demands, and self-efficacy (Ramaci et al., 2020).

Resilience

Resilience is the concept of individuals relatively resistant to risk experiences or stress that is expected to result in adversity impact (Rutter, 2006). In detail, the risk experiences or stress needs to be measurable with quantitative methods and the outcome of resilience must cover a variety of adverse impacts (Rutter, 2006).

Initially, resilience was treated as a personal trait (Fletcher & Sarkar, 2013). However, additional studies pointed out resilience is affected by previous experiences, genetic factors, and environments (Kim-Cohen & Turkewitz, 2012; Rutter, 2006). Genetic factors such as monoamine oxidase A (MAOA) gene have an interaction with resilience with the environmental factors (Clukay et al., 2019; Kim-Cohen & Turkewitz, 2012). Sometimes the stressful experiences can strengthen the resistance to the later stressful experiences, which is known as the steeling effect (Rutter, 2006). The example of the steeling effect in clinical setting is that nurses get used to the patients' death after nurses experience patient death a few times.

Researchers use resilience concept in some different ways. Sanders et al. (2008) used the term health resilience as the capacity to maintain healthy status when experiencing a significant adverse event. A literature review about community resilience in health security defines the community resilience is an ability to use social and economic resources from the community after the risky event for the well-being of population (Chandra et al., 2010). In terms of psychological resilience, Fletcher and Sarkar (2013) defined as the mental and behavioral process to promote personal resources

and protect themselves from the negative effects of adverse event. Recently, the environmental factors are emphasized in the research of resilience, so they emphasized the policies or practice that the public can reach out the proper resources (Fletcher & Sarkar, 2013).

The concept analysis about the resilience concluded the adverse event prior to the resilience is not the same as the stressor (Windle, 2011). If the resilience is seen as the stressor, it only produces negative outcomes, instead, resilience emphasizes the positive adaptation as an outcome (Roisman, 2005; Windle, 2011). Besides the positive adaptation, resilience helps to people gain mastery (Earvolino-Ramirez, 2007). As an outcome of resilience, people can develop coping and adaptation which leads to resistance to CF (Figley & Figley, 2017).

Interventions to Relieve Compassion Fatigue

Resilience is considered as a protective factor to resist STS and CF (Figley & Figley, 2017). Research has shown significant relationships among burnout, CF, and resilience. Alharbi et al. (2020) reported significant relationships between resilience and burnout or STS among nurses in critical care settings in Saudi Arabia. Some studies examined the path models among resilience, burnout, and STS, and there are controversial relationship among them. In some studies, resilience had a direct effect on burnout, but not on STS among HCWs in the US and nurses in Korea (Jacobowitz, 2018; S. R. Kim et al., 2019). However, the other studies reported STS had a direct effect on resilience and burnout, and resilience mediates the relationship between STS and burnout among HCWs (Burnett Jr, 2017; Burnett Jr & Wahl, 2015). On the other hand, a previous study showed resilience helps to reduce nurses' post-traumatic stress symptoms (Schuster

& Dwyer, 2020). In this sense, some intervention studies focused on both resilience and CF.

Literature about increasing resilience among nurses suggested mindfulness, exercise, cognitive-behavioral therapy, expressive writings as helpful approaches (Mealer et al., 2017). Potter et al. (2013) conducted a longitudinal study to evaluate a resiliency program to decrease CF among oncology staff nurses. The resiliency program was developed to increase nurses' self-regulation to reduce negative feelings and self-care to restore their energy, and the program emphasizes the importance of their professionalism and integrate their live and work, and increasing social support (Potter et al., 2013). The resiliency intervention significantly decreased STS after six months later, but did not significantly decrease burnout. Noullet et al. (2018) provided pastoral crisis intervention to clergies to enhance their communication, assessment for psychological triage, and intervention tactics for crisis. The intervention significantly decreased CF and increased resilience. Another intervention study decreased burnout and STS by providing a nurse-led intervention including building resilience (Yilmaz et al., 2018). This intervention provided coping skills such as breathing exercises, self-massage, baksi dance, or mandala coloring to increase resilience (Yilmaz et al., 2018). Intervention group reported decreased burnout and STS and increased compassion satisfaction (Yilmaz et al., 2018).

The Socio-ecological Model

The socio-ecological model (SEM) is a social behavior theory that emphasizes the impact of social, psychological, environmental, and policy aspects on individual behavior (Sallis et al., 2008). The SEM assumes individuals are influenced by factors at multiple levels, so it can guide comprehensive interventions by using it (Sallis et al., 2008). The

multiple levels in the SEM are intrapersonal, interpersonal, organizational, community, and policy levels, and the influences of each level are interacting each other (Sallis et al., 2008).

Historically, the SEM has evolved in many ways. Bronfenbrenner (1977) is one of the researchers who have tried to explain behavior based and created the ecological model. Bronfenbrenner (1977) suggested four environmental levels: (a) microsystem, (b) mesosystem, (c) exosystem, and (d) macrosystem. According to Bronfenbrenner (1977), microsystem refers to the relationship between individual and immediate environment containing the individual and mesosystem refers to interrelationship with the major environmental settings at a particular point of individuals' life, such as families or schools. Exosystem includes the institutions of the society such as neighborhood or government, and macrosystem refers to all-embracing context of culture (Bronfenbrenner, 1977). However, this model is based on the majority population and does not consider minority populations (Griffen et al., 2018). Moreover, this model focused on understanding of individuals' behavior, not providing precise problems or appropriate interventions (McLeroy et al., 1988).

McLeroy et al. (1988) created the social-ecological model by addressing the limitations of the Bronfenbrenner (1977)'s model. In the McLeroy's model, there are five environmental factors: (a) intrapersonal factors, (b) interpersonal processes and primary groups, (c) Organizational (institutional) factors, (d) community factors, and (e) public policy factor (McLeroy et al., 1988). This framework has been used for many health-related interventions since it explains well the importance of each level and how it influences to individual's behavior.

Nichols et al. (2015) reviewed benefits of African American parental interventions for their children's obesity based on the SEM and concluded parents involved in interpersonal and organizational levels resulted in better physical activity and food consumption outcomes in adolescents. In their review, Nichols et al. (2015) identified analyzing interventions based on the SEM allowed to see which levels has to be focused for the future interventions. Another literature review identified factors affecting a transition of new graduate nurses using the SEM (Dwyer & Revell, 2016). By drawing on the conclusion, Dwyer and Revell (2016) mentioned factors in intrapersonal, interpersonal, and organizational levels have complex interaction, so the authors suggested the necessity of intervention targeting all three levels. Therefore, it is necessary to see which levels are affecting CF among nurses during the COVID-19 pandemic for the future development of interventions.

Nursing Policies by Countries

Nursing policies are varied by the countries. This section describes the nursing policies in the U.S., Republic of Korea, Japan, Turkey, and Republic of Guinea as this study will be surveyed in these countries.

In the U.S., registered nurse (RN) refers to the licensed individuals who are able to practice registered nursing and distinguished from Licensed Practical/Vocational Nurse (National Council of State Boards of Nursing, 2014). Nursing role is defined by National Council of State Boards of Nursing. There are two educational programs to be a nurse: Bachelor's of science degree and Associates degree in nursing. After completing the degrees, individuals who pass the National Council Licensure Examination will be an RN. In 2018, the total number of RNs in the U.S. were 3,059,800 and expected to

increase by about 12% until 2028 (Bureau of Labor Statistics, 2020). Sixty percent of nurses in the U.S. are working in the hospitals (Bureau of Labor Statistics, 2020). There were 11.9 nurses per 1,000 people in 2018 and 14.480 nurses and midwives per 1,000 in 2017 (Organisation for Economic Cooperation and Development [OECD], 2020b; WHO, 2020b). In 2019, the U.S. population spent 11,072 US dollars per person on health, the highest among the OECD countries (OECD, 2020a).

Japanese nursing professionals are public health nurses, midwives, and nurses (Japanese Nursing Association, n.d.). Individuals who graduated with a 4-year college degree are eligible to take nursing license exam, which is available once a year (Japanese Nursing Association, n.d.). Nurses who have an additional year of training can become public health nurses or midwives (Japanese Nursing Association, n.d.). In 2016, there were 1,660,071 nurses in Japan, and 81% are working in hospitals and clinics (Japanese Nursing Association, 2015). There were 11.8 nurses and 12.1531 nurse and midwives per 1,000 in 2018 (OECD, 2020b; WHO, 2020b). Japanese population spend 4,823 US dollars per person in 2019 (OECD, 2020a).

In Korea, the Bachelor's degree in nursing education at college or universities are required to take nursing license exam to be a nurse (Korean Nurses Association, n.d.). There are 355,772 nurses and accounts for 29% of total health care providers in 2016 (Ministry of Health and Welfare, n.d.). The number of nurses per 1,000 are 7.2 and the nurses and midwives are 7.3009 per 1,000 in 2018 (OECD, 2020b; WHO, 2020b). Koreans spend 3,384 US dollars per person (OECD, 2020a).

In Turkey, there are three types of educational programs to be a nurse: diploma, associate degree, and Bachelor's degree (Dal & Kitis, 2008). Diploma-based program is an

educational program at the high school level and provide 4-year education since 1985 (Dal & Kitis, 2008). Associate degree in nursing program is 2-year program, but majority of this program is closed and converted to 4-year Bachelor's program (Dal & Kitis, 2008). Majority of nurses in Turkey have associate degree (Dal & Kitis, 2008). The number of nurses per 1,000 are 2.34 in 2018 and the number of nurses and midwives are 2.7107 per 1,000 in 2017 (OECD, 2020b; WHO, 2020b). Turkish spend 1,340 US dollars per person (OECD, 2020a). The amount of health expenditures is lower than the U.S., Japan, or Korea.

Guinea has a HCWs shortage (WHO, 2020c). There are about 5,000 nurses in Guinea (J. A. Bennett, personal communication, March 28, 2021). HCWs in Guinea include physicians, nurses, midwives, nursing assistants, and community health workers, dentist, pharmacist, traditional practitioners, and physical therapists, but none are licensed. Seventy percent of the population reside in rural area, and they are cared for by technical nurses or community health workers, not by physicians or professional nurses (World Bank Group, 2018). Guinea has experienced numerous epidemics including cholera, malaria, Human Immunodeficiency Viruses (HIV) infections and Ebola virus infection since 2004 (Camara et al., 2015).

CHAPTER 3

RESEARCH METHODS

This chapter describes the methodological approaches to answering the research questions and testing the hypotheses. It includes study design, study sample, recruitment strategies, instruments, and data analysis.

Research Design

This study used a cross-sectional correlational design. This study utilized the SEM as a framework to examine the factors associated with CF among nurses during the COVID-19 pandemic. This is part of a larger research project that was exempt by the Institutional Review Board (IRB no: STUDY00012060).

Sample and Inclusion Criteria

This international study targeted nurses residing in the U.S., Republic of Korea, Japan, Turkey, and Guinea. Specific inclusion criteria is actively practicing nurses who are over 18 and can read either English, Korean, Japanese, Turkish, or French. Nurses are not excluded by whether or not they cared for COVID-19 patients. Data was collected between July 1, 2020 and January 25, 2021.

Recruitment Strategies

Recruitment was conducted through a website. On the website, a study description, including the purpose of the study, estimated time spent on the survey, IRB information, contact information, and a survey link was posted. When nurses click the provided survey link or scan a QR code, they are directed to the online survey. The recruitment webpage is developed using Google Sites and the online survey is developed

using Research Electronic Data Capture (REDCap). The recruitment webpage was sent to nursing-related social media, nursing associations, or local hospitals in each country.

Instruments

Compassion Fatigue (CF)

CF was measured using 2 subscales of the Professional Quality of Life scale version 5 (Stamm, 2010). The Professional Quality of Life scale consists of two subscales: compassion satisfaction and CF. CF in the Professional Quality of Life scale breaks into two subscales: burnout and STS. This study used the two subscales that represent CF: burnout and STS. Each part has 10 items respectively. It was measured using a 5-Likert scale (1: never, 2: rarely, 3: sometimes, 4: often, 5: very often). Five items were reverse-scored before summation of the scores, and the total score was calculated.

The burnout scale reflects work-related negative feelings such as hopelessness and overwhelming difficulty. A higher score indicates having a higher risk of having burnout. The range of the scale score is from 10 to 50. Scores over 41 indicate feelings of not being effective in the position. Cronbach's alpha was .75 according to the manual (Stamm, 2010) and .869 on HCWs in Wuhan during the COVID-19 pandemic (Zhou et al., 2020). In this study, Cronbach's alpha was .81.

STS reflects exposure to traumatic stressful events. The range of the scale score is from 10 to 50. Scores over 41 mean there were some frightening events affecting the score, but it does not indicate individuals are having a problem or disease. Cronbach's alpha was .81 according to the manual (Stamm, 2010) and .756 on HCWs in Wuhan

during the COVID-19 pandemic (Zhou et al., 2020). In this study, Cronbach's alpha was .81.

Resilience

Resilience was measured using the 10-item Connor-Davidson Resilience Scale (CD-RISC, Davidson, 2020). CD-RISC was originally developed with 25 items and labeled CD-RISC 25 (Connor & Davidson, 2003), but there are two briefer versions containing 10 items and 2 items, respectively. In this study CD-RISC 10 containing 10 items was used. The CD-RISC 10 has exhibited validity comparable to the CD-RISC 25 in many studies (Davidson, 2020). It uses a 5-point Likert scale (0: not true at all, 1: rarely true, 2: sometimes true, 3: often true, 4: true nearly all the time). The total score is calculated by summing the ten items' scores: therefore, the possible score range is from 0 to 40. A higher score means greater resilience. Cronbach's alpha was .85 (Campbell-Sills & Stein, 2007) and .91 in this study.

Organizational Support for COVID-19

Organizational support for COVID-19 management was adapted from the study of J. S. Kim and Choi (2016). There are three items including: "My hospital is equipped with facilities sufficient for preventing the spread of COVID-19", "My hospital applies the best infection control guideline for preventing the spread of COVID-19", and "My hospital discusses how to prevent COVID-19 regularly." All answers were measured using a 4-Likert scale (1: strongly disagree to 4: strongly agree). Cronbach's alpha was .95 in the previous study (J. S. Kim & Choi, 2016) and .89 in this study. The responses were summed to calculate the total scores. A higher score means more organizational support for COVID-19 management.

Fear of Infection of COVID-19

Fear of infecting themselves and their family was utilized from the study of J. S. Kim and Choi (2016). The items are: “I am afraid of being infected with COVID -19 at work” and “I am afraid of bringing COVID -19 home from work to my family”. It was measured using a 10-point Visual Facial Scale presented by (Cao et al., 2017). A higher score means a higher fear of infection.

Intention to Leave Their Job

Intention to leave their job was collected by asking “Have you considered leaving nursing because of the workload, stress, and fear of infection from COVID 19?” It was measured using a 10-point Visual Facial Scale presented by (Cao et al., 2017). A higher score means greater intention to leave their job.

Incidence Rate

The incidence rate of COVID-19 by nations and states (in terms of the U.S.) was calculated by utilizing WHO (2021), CDC (2021a), United Nations (UN) Global Population Report (2019), and United States Census Bureau (2020). In this study, it was based on the day prior to a participant completing the survey, because confirmed cases are usually reported the day after. The Redcap survey response time was based on Coordinated Universal Time. So, the response time was converted based on its location. The incidence rate is calculated as the number of confirmed cases per 100,000 in the population.

$$\frac{\text{the number of confirmed cases} \times 100,000}{\text{total number of population}}$$

In terms of paper-based survey responses, the mean number of incidence cases during the survey collecting period was calculated (Japan: August 27-29, Guinea: December 13-26. Regarding Kansas State in the U.S., the number of COVID-19 cases was reported every two to three days. The day prior to the survey responses (July 26, 2020) was reported as 0, and the cases were reported on July 24 and 27. Thus, for Kansas, the number of cases reported on July 27 divided by 3 was used.

Lockdown Policy

As a lockdown policy, mask policy was collected from state or national government websites and news, with the variable was coded as yes or no. If there was an executive order or a law, it was coded yes, and if there was not an executive order, and just a recommendation to wear a mask, it was coded no. The mask policy is based on the actual date of the survey responses.

Other lockdown policies such as curfews were collected as a narrative description. Any lockdown policies in each state or nations were collected based on the date of the survey responses and summarized in a table.

Demographic Characteristics

Demographic characteristics include age, gender, higher educational level, years in practice, and country of practice. Being a bedside staff was collected. Type of organization was categorized as inpatient, outpatient or non-acute organization, or advanced nursing. Having a certification specialty, having cared for COVID-19 patients, having been asked to work at higher acuity levels to care for patients beyond their usual previous practice, PPE or mask provision, were involved in policy development, were trained to care COVID-19, or provided accommodation during the pandemic were

collected and coded yes or no. COVID-19 testing was collected as negative, positive, or never tested.

Data Collection and Analysis

Data collection was from a REDCap online survey tool. When participants wanted to use the paper-based survey, their paper-based answers were collected and coded for the data analysis by a researcher. The survey from Japan and Guinea was collected by paper-based surveys.

Screening frequencies of data was conducted to identify implausible values. Means, standard deviation, and range were used to describe continuous variables. Frequencies and percentage were used to describe categorical variables.

Group differences on burnout and STS for categorical variables were assessed with *t*-tests and analysis of variance (ANOVA). When the assumption of equal group variances was violated, Welch's *F* test was used instead of Fisher's *F* test. The Pearson correlation was used to describe the bivariate association between each continuous variables and burnout and STS. Descriptive statistics, *t*-tests, ANOVAs, correlation analysis, and Cronbach's alpha were obtained with SAS software, version 9.4.

To examine the unique association between the set of independent variables and dependent variables, burnout and STS, multiple regression was used with all independent variables entered simultaneously. Independent variables included: age, gender, years of practice, specialty, country of practice, type of organizations, educational level, bedside staff, cared for COVID-19 patients, were provided PPE or mask, were involved in policy development, were trained to care COVID-19, were asked to work at higher acuity levels, were provided accommodation, were taken the COVID-19 test, mask policy, incidence

rate, resilience, fear of infection to them, fear of bringing COVID-19 to family, intention to leave their job, and organizational support to prevent spread of COVID-19. Country of practice, type of organization, and were taken the COVID-19 test were dummy-coded. A product variable of incidence rate by mask policy was entered to assess their interaction. To estimate parameters, maximum likelihood estimation with robust standard errors (MLR) was used with Mplus software, version 8.5 (Muthén & Muthén, 1998–2017). By using this estimation procedure, optimal parameter estimates in the presence of incomplete predictor or outcome data was obtained (Enders & Bandalos, 2001), provided data are missing at random. With MLR estimation, no cases were excluded, whereas 19.76% of the cases would have been removed if listwise deletion had been used. The z test was used in Mplus to test regression coefficients as well as the proportion of outcome variation due to the predictors. Standardized regression coefficients were calculated for each variable. A Cohen's d type effect size was calculated for dummy-coded predictors, by dividing the unstandardized coefficient by its maximum likelihood estimate of the outcome standard deviation. To test the interaction between mask policy and incidence rate, the increase in the proportion of variance due to the interaction was examined, as well as the accompanying z test. All statistical tests used an alpha level of .05. The conceptual model of the analysis is described in Figure 3.

CHAPTER 4

RESULTS

This chapter describes mask policy and lockdown policies and reports of statistical analysis.

Mask Policy

Most nations and the U.S. states had a mask policy. However, only some policies included enforcement of their policies. Most U.S. states used the word ‘face cover’ instead of ‘mask’ while other countries used the word ‘mask’.

Turkey

In Turkey, the government made a policy to wear a mask in crowded public spaces (Gall, 2020). The government gave free masks to the public to promote COVID-19 prevention. Some provinces in Turkey had a mask policy enforced by fines and the Turkish government made a nationwide mask policy enforced by a fine of 900 Turkish Lira (131 US dollars) from June 22, 2020 (Daily Sabah with Agencies, 2020).

Japan

In Japan, the government recommended wearing a mask when individuals have COVID-19 even if there are no symptoms. In addition, the government suggested wearing a mask in crowded places such as indoors and public transportation when ventilation is not sufficient as a protective measure against COVID-19 (Ministry of Health and Ministry of Economy, 2020). The Japanese government is conducting educational campaigns focusing on hygiene such as handwashing and wearing masks. No fines have been enforced for not wearing a mask, except in very malicious cases.

Korea

In Korea, wearing a mask was recommended from the beginning of the pandemic based on experiences from the previous MERS epidemic. The public began wearing masks even without government recommendations. In February 2020, the government suggested that employees at places such as theatres or department stores wear a mask due to the large number of people gathered and restricted the number of mask individuals can purchase through their national ID number (Ministry of Health and Welfare, 2020a). From May 26, 2020, all passengers on public transportation were required to wear a mask (Chang, 2020), but the enforcement was delegated to individual provinces and cities. From November 13, 2020, the government started to impose a fine of 100,000 Korean won (about 90 US dollars) on individuals who violate the mask policy in public (W.-J. Choi, 2020). The policy requires wearing masks indoors and outdoors when social distancing (2 meters) is not possible.

Guinea

In Guinea, the mask mandate was settled from April 2020 (Agence France Presse, 2020). If people did not wear a mask outdoors, traffic police can stop and fine them. The amount of the fine is 30,000 Guinean francs (3.16 US dollars).

U.S.

The U.S. has various mask policies at the state, city, and county levels. In this section, state-level mask policies are described. At the national level, the U.S. started from February 2, 2021 to mandate wearing a mask on public transportation. However, at the time of data analysis (January 28, 2020), there was not a nation-wide level of executive order of mask policy. All states recommended wear a mask, but executive

orders on mask wearing differed by states. All states used the word ‘face coverings’ rather than ‘masks’ and some states offered a definition of face coverings and how to make them. All state-level mask policies are described in Table 1. The start date of executive orders varied, but most states started between April and August 2020. Most orders require wearing a mask in public indoor settings regardless of social distancing, and outdoor settings when social distancing is not possible with non-household members. A total of nine states (Alaska, Arizona, Idaho, Missouri, Nebraska, Oklahoma, South Dakota, and Tennessee) did not issue mask executive orders. Texas has an executive order to wear a mask for counties that have more than 21 COVID-19 cases while other states had statewide executive orders. Arizona made masks mandatory in schools for children as well as for parents, but did not mandate masks in other indoor or outdoor public settings. Some states indicated the amount of a fine, but most states did not specify amounts. In Connecticut, the governor said it is common sense to follow the executive order in the press, but clearly indicated the fines in a later executive order.

Lockdown Policies

Lockdown during the COVID-19 pandemic was defined as “a set of measures aimed at reducing transmission of COVID-19 that are mandatory, applied indiscriminately to a general population and involve some restrictions on the established pattern of social and economic life” (Haider et al., 2020). Lockdown policies by countries and states are investigated based on the survey response dates.

Turkey

Surveys from Turkey were collected from September 18 to December 9. The Turkish government had a curfew in April and did not have any lockdown policies after

April. However, the government started to have a curfew during the weekend of the first week from December 4th, due to the surge of the COVID-19 cases ahead of the New Year. Grocery stores closed at 5 pm and restaurants closed at 8 pm. The curfew did not apply to the healthcare, manufacturing, logistics, and agriculture facilities (Usul, 2020).

Japan

During the survey response dates (From August 3 to 29), there were no lockdown policies in Japan.

Korea

Korean survey responses were obtained from July 14 to December 15. The Korean government created 3 levels of lockdown policies called ‘the social distancing alert statuses’ based on the incidence rate in June 2020. Level one is defined as social distancing in daily life, level two is when the COVID-19 case surge is in manageable capacity, and level three is when a number of clusters are reported (Y. S. Choi, 2020). Each level covered school closures, social gathering for each facility, religious services, public entertainment venues, workplaces, mask mandate, and the rule of the public transportation (Ministry of Health and Welfare, 2020b). The government maintained the first level, being socially distancing in the daily life, from the beginning and applied the second level from August 15 in Seoul metropolitan area, due to a second wave. From September 27, the second level was expanded to the whole nation (Yonhap news, 2020). The main ideas of the second level are to limit the number of gatherings in general and at schools, to close stores at 9 pm, and to recommend employees work at home. From November, the government expanded the levels from 3 to 5 by adding a level 1.5 and 2.5 (Ock, 2020).

Guinea

In Guinea, the government declared a curfew in April 2020. It originally limited the hours from 9 pm to 6 am, but during the date of responses (December 2020) the curfew was from 12 am to 5 am. There was never a stay-at-home order besides the curfew. Restaurants, mosques, churches, schools, social gatherings, and international travel, which had been suspended from April through September, were allowed during the period of the survey and people could gather in groups up to 20.

U.S.

Lockdown policies in the U.S. were identified for this study based on the survey response dates. Table 2 summarizes the policies from each state accordingly.

Alabama had a stay-at-home order, but the state changed to safe-at-home order from May 11, 2020. At the time of survey response (August 6), safe-at-home order was maintained. Safe-at-home order provides that retailers, entertainment venues, and gyms can open with 50% of occupancy. Restaurants, bars, and beaches have to maintain 6 feet social distancing. Schools opened from June 1.

There were survey responses from Alaska on July 24, but there were not lockdown policies at this moment.

In Arizona, survey responses were collected from July 7 to September 23. During this time, entertainment venues, gyms, bars, and schools were closed. Beginning September 25, entertainment venues, bars, and gyms were permitted to have up to 50% of occupancy based on the incidence rate of their counties.

In Arkansas, survey responses were completed from August 6 to August 27. During that time, Arkansas made phase 2 policies that allowed restaurants, bars, and businesses to open at 66% of regular occupancy.

In California, during the survey response date (July 14 to September 11), a modified stay-at-home order had been maintained since May 4, 2020. Restaurants and offices could open with social distancing. Opening of shopping mall depends on the county's incidence rate, death rate, COVID-19 test positivity rate, or hospital capacity.

In Colorado, during September 2 to 11, retailers and shops could reopen after the stay-at-home order based on five levels, which are determined by the incidence rate and hospital capacities. Counties can decide to reopen schools, bars, or restaurants based on the levels.

In District of Columbia, the surveys were completed from August 7 to 10. The mayor extended the state of emergency, which was set to end on July 24. They continued phase 2: open restaurants, with social distancing and disinfection, and open entertainment venues at up to 25% of occupancy.

In Florida, the surveys were completed from August 6 to 25. During this time, restaurants and bars could open at 50% occupancy, but night clubs were closed. Schools, gyms, and beaches were open. There was no social distancing or restrictions on beaches.

In Idaho, the surveys were completed from July 16 to September 6. During that time, Idaho was on phase 4 with a focus on resuming businesses operation. The governor said all businesses can fully reopen and non-essential travel is possible.

In Indiana, the surveys were completed from August 10 to September 1. Indiana maintained stage 4.5 from July 30: gyms can open at full capacity, and other venues such

as restaurants or entertainment venues are open at 50% capacity. School openings varied by county.

In Iowa, the surveys were completed from July 17 to September 3. The governor allowed gyms, restaurants, malls, retails, salons, racetracks, libraries, entertainment venues, and public places to open at 50% capacity from June 26. Schools were closed, but could open based on the COVID-19 the incidence rate from July 31.

In Kansas, one response was completed on July 27. Schools were closed from July 21. From June 8, Kansas was in phase 3. Phase 3 allowed up to 45 people to gather, businesses can fully open, and travel is possible.

In Kentucky, one response was completed at August 6. From July 20, up to 10 people could gather. Bars were closed from July 28 and restaurants could open at 25% of capacity.

In Maryland, the surveys were completed from July 16 to September 1. Schools reopened beginning August 3. From June 12, restaurants, gyms, and outdoor amusement facilities can open at 50% of capacity.

In Michigan, the surveys were completed from July 10 to August 26. Beginning July 1, Michigan started at phase 4: restaurants can open 50% of capacity, but gyms, casinos, and hair salons are closed. School remained closed.

In Missouri, survey responses were completed from July 16 to August 26. During this time, Missouri had no statewide health order or restrictions.

In Nevada, survey responses were completed from August 28 to September 3. Beginning July 31, all businesses could open at 50% of capacity.

In New Jersey, survey responses were completed from July 10 to 31. New Jersey allowed up to 250 people to gather beginning July 22. The state was in phase two. Entertainment businesses could open at 35% of capacity or admit maximum 150 people. Outdoor amusements can open from 5% to 50% of capacity. Casinos and other businesses can open 50% of capacity. Indoor swimming pools can open 25%, and outdoor pools can open 50% of capacity.

In New York, survey responses were completed from July 10 to September 1. New York state had policies based on New York city and outside New York city. Regions outside New York city were in phase 4 from July 1. Gyms were open, casinos were open 25% of occupancy, and other businesses were open. However, theaters and concert venues were closed.

In North Carolina, survey responses were completed from August 6 to September 21. Beginning August 5, North Carolina entered phase 2, restaurants and retail stores were open at 50% of occupancy. However, gyms, bars, and entertainment venues were closed. From September 4, phase 2.5 started. People could gather in groups up to 25 indoors and 50 outdoors. Theaters, bars, and amusement parks remained closed, but museums and aquariums could open at 50% of capacity.

In Ohio, one survey response was completed on August 7. Ohio had begun lockdown policies in March. They resumed full operation of restaurants, gyms, and camp beginning July 31.

In Oregon, one survey response was completed on July 14. During this time, the state allowed up to 50 people indoors and 100 people outdoors to gather. Bars and

restaurants can be open until midnight. Indoor activities such as gyms and bowling could be open.

In Pennsylvania, one survey response was completed on August 7. Pennsylvania issued an order to limit the number of people that can gather to no more than 25 indoors and 250 outdoors from July 16. Gyms could open with social distancing. Restaurants and bars were allowed to open at 25% of capacity and only provide table services, but nightclubs were closed.

In South Carolina, two survey responses were completed on July 16. Restaurants and bars were required to close at 11pm from July 11 at South Carolina. From May 22, attractions such as zoos, or parks were open without capacity restriction. Gyms, salons, and pools could open beginning May 18.

In Tennessee, survey responses were completed from July 9 to 16. In June 29, Tennessee extended the emergency situation to August. The order includes working at home if possible, limiting gatherings to no more than 50 people, and allowing gyms and restaurants to open with social distancing.

In Texas, survey responses were completed from July 10 to December 13. From June 26, all bars had to stop sales of alcohols at 12 pm even if they remained open for deliveries or takeout. Restaurants could open at 50% of its occupancy. No more than 100 people were allowed to gather. From December 3, some North Texas counties again limited restaurants, gyms, and office buildings to 50% of capacity based on the state executive order.

In Virginia, survey responses were completed August 6 to 8. Beginning July 1, Virginia went to phase 3. Up to 250 people could gather. Outdoor attractions could open

at 50% of its capacity. Swimming pools and gyms can open at 75% of capacity.

Restaurants can fully open but need social distancing.

In Washington, survey responses were completed from July 16 to 23. On July 9, Washington prohibited bar-style dine-in services. Indoor businesses can have 25% of capacity or a maximum of 200 people.

In Wisconsin, survey responses were completed from July 22 to September 1. On June 22, Wisconsin announced school opening plans as a mix of in-person and online learning. The state had to open all businesses such as restaurants, salons, and gyms when the Supreme Court ordered them to open immediately in May.

Sample Characteristics

In total, there were 921 responses. Table 3 and 5 shows the distribution of sample characteristics. The largest number of respondents were from the U.S. (405), Turkey (245), Japan (182), Korea (76), and Guinea (5). The remaining participants (8) were from Azerbaijan, Canada, China, Germany, Lebanon, Marshall Islands, United Arab Emirates, and United Kingdom.

The mean age of participants was 37.86 (± 11.94) and most were female (835, 91.16%). Mean years of practice was 13.23 (± 11.36). Three hundred thirty-seven nurses are certified in a specialty (36.63%). Most respondents worked inpatient (624, 67.97%), followed by outpatient or non-acute (229, 24.95%), and advanced nursing practice (65, 7.08%). Most nurses had a basic educational background such as diploma, Associate degree, or Bachelor of Science (707, 77.02%). Almost two-thirds of the respondents (548, 61.30%) came from bedside staff and almost half (370, 40.39%) reported that they had experience caring for COVID-19 patients. Most respondents (708, 77.29%) indicated

that they were provided adequate PPE or masks at their workplace. A third (301, 33.08%) were involved in policy development to prepare for COVID-19, and more than half (598, 65.21%) reported they had completed training about caring for COVID-19 patients or protecting themselves. Almost half of the respondents (383, 41.95%) were asked to work at higher acuity levels than their usual practice. Some (212, 23.50%) were offered accommodational support from their organizations. Half of the respondents (414, 45.05%) tested negative for COVID-19, 58 were positive (6.31%) and 447 (48.64%) had never been tested. Most respondents lived in a jurisdiction with a mandatory face cover policy at the time of survey responses (826, 89.69%). The incidence rate of the locations where the survey participants are varied from 0.00 to 58.71 cases per 100,000 with the mean of 10.34 (± 11.99).

The mean burnout score was 24.58 (± 6.21) and for STS was 24.87 (± 6.23), each of which are in the moderate level for burnout and STS (Stamm, 2010). The mean resilience score was 26.49 (± 7.01). The mean score for fear of infecting themselves was 5.31 (± 3.16) and for fear of bringing COVID-19 to their families was 6.67 (± 3.33). The mean score for intention to leave their job was 3.05 (± 3.54) and the organizational support to prevent spread of COVID-19 was 8.41 (± 2.45).

Group Differences on Compassion Fatigue (CF)

Table 4 shows group mean differences on burnout and STS. Greater burnout was reported by nurses who did not have a specialty ($p < .001$), had only a basic nursing education ($p < .001$), were not provided with PPE ($p < .001$), were not involved in the policy development ($p < .001$), did not complete training for COVID-19 ($p < .001$), were asked to work at higher acuity levels ($p < .001$), and were not provided accommodations

($p < .01$). The result of ANOVA shows group mean differences on burnout for country of practice ($p < .001$) and type of organization ($p < .001$). Greater STS was reported by non-specialty nurses ($p = .04$), nurses not provided with PPE ($p < .001$), and those who were asked to work at higher acuity levels ($p < .001$). Group mean differences on STS were present for country of practice ($p < .001$).

Correlation Results

Pearson correlation analysis was conducted for the continuous independent variables and subscales of CF: burnout and STS (Table 5). Burnout, STS, resilience, fear of infecting themselves, fear of bringing COVID-19 to family, intention to leave their job, organizational support to prevent spread of COVID-19, age, years of practice, and the incidence rate were included. All variables were significantly correlated except for the correlation between incidence rate and years of practice. Burnout and STS were positively correlated ($r = .58$), and each was positively correlated with fear of infecting themselves and their families and intention to leave their job, and each was negatively correlated with resilience, organizational support to prevent spread of COVID-19, age, years in practice, and the incidence rate.

Variables Uniquely Associated with Burnout and Secondary Traumatic Stress

Table 6 summarizes the results of the multiple regression model. The regression model accounted for 51.2% of the variance in burnout ($p < .001$) and 27.2% of variance in STS ($p < .001$).

Intrapersonal Level (Research Question 1)

At the intrapersonal level, burnout was positively associated with non-bedside staff ($B = .92, p = .046$), intention to leave their job ($B = .43, p < .001$), being asked to

work at higher acuity levels ($B = 1.46, p < .001$), and testing positive for COVID-19 [$B = 1.48, p = .046$, (compared to those who tested negative for COVID-19)], and negatively associated with resilience ($B = -.33, p < .01$). STS was positively associated with non-bedside staff ($B = 1.59, p < .01$), fear of infection ($B = .32, p < .01$), intention to leave their job ($B = .38, p < .001$), being asked to work at higher acuity levels ($B = 1.01, p = .024$), and negatively associated with age ($B = -.09, p = .017$) and resilience ($B = -.13, p < .001$).

Interpersonal Level (Research Question 2)

At the intrapersonal level, fear of bringing COVID-19 to one's family was not significantly associated with burnout or STS.

Organizational Level (Research Question 3)

At the organizational level, none of variables were significantly associated with STS. However, provision of PPE or mask ($B = -.87, p = .029$), organizational support to prevent spread of COVID-19 ($B = -.26, p < .01$), and accommodational support ($B = -.88, p = .026$) were negatively associated with burnout.

Community and Policy Level (Research Question 4 and 5)

At the community level, participants who practice in Turkey ($B = -2.35, p < .001$) and Guinea ($B = -4.39, p = .010$) reported lower burnout compared to those who practice in the U.S. However, nurses who practice in Japan ($B = 2.25, p < .01$) and Korea ($B = 2.42, p < .01$), reported greater burnout compared to those who practice in the U.S. In terms of STS, participants who practice in Korea reported greater STS ($B = 2.94, p < .01$) compared to respondents who practice in the U.S.

There was significant interaction between incidence rate and mask policy for burnout ($B = .08, p = .030, \Delta R^2 = .003$) and STS ($B = .09, p = .038, \Delta R^2 = .003$). Figure 4 and Figure 5 show the interaction between incidence rate and mask policy for burnout and STS. When a mask policy was in effect, burnout and incidence rate had a positive relationship, but it was not significant ($B = .02, p = .338$). In contrast, when a mask policy was not in effect, burnout and incidence rate had a significant negative relationship ($B = -.06, p = .046$). In terms of STS, when a mask policy was in effect, STS and incidence rate had a positive but not statistically significant relationship ($B = .03, p = .335$), whereas this association was negative and borderline significant ($B = -.06, p = .051$) when a mask policy is not in effect. In terms of mask policy, when the incidence rate was at high level, burnout and STS were greater for nurses working in locations with a mask policy than for nurses who were working in locations where a mask policy was not in place. Specifically, when the incidence rate is considered as 0, the mask policy was not statistically significant on burnout or STS ($B = -1.87, p = .30$ on burnout and $B = -1.80, p = .29$ on STS). When the incidence rate is considered as 30, the mask policy was not statistically significant on burnout or STS as well as ($B = .57, p = .40$ on burnout and $B = .81, p = .25$ on STS). However, when the incidence rate is considered as 60, the mask policy had a positive borderline significant relationship with burnout ($B = 3.01, p = .058$) and significant relationship with STS ($B = 3.41, p = .04$).

CHAPTER 5

DISCUSSION

This study examined factors associated with CF among nurses during the COVID-19 pandemic based on each level of the SEM (Figure 6). CF was measured by using burnout and STS. At the intrapersonal level, age, and resilience had a negative association with burnout or STS. Fear of infecting themselves, being a non-bedside staff, intention to leave their job, being asked to work at higher acuity level, and being infected for COVID-19, compared with the not-infected group, had positive associations with burnout or STS. At the organizational level, provision of PPE or masks, organizational support to prevent spread of COVID-19, and accommodational support from the organization had a negative association with burnout. At the community and policy level, country of practice was a significant factor of burnout or STS. Nurses who practice in Turkey and Guinea had lower burnout while Japan and Korea had greater burnout compared to those who practice in the U.S. Nurses in Korea had greater STS compared with the nurses in the U.S. There was an interaction between mask policy and incidence rate. There was a negative relationship between incidence rate and burnout or STS when the mask policy was not in effect. On the other hand, when the incidence rate was at high level, mask policy had a positive relationship with burnout or STS. Besides the quantitative results, lockdown policies were narratively explored. Most policies implemented concerned curfew, social distancing, limiting the number of people gathering, limiting the capacity in the public places such as restaurants or gyms, closure of the entertainment venues, and closure of schools.

Scores of Measured Scales

In terms of the levels of burnout and STS, the results of this study indicated that nurses had moderate levels. Stamm (2010) interpreted scores of burnout and STS between 23 and 41 as a moderate level, and over 42 as a high level. The mean burnout score in this sample (24.58) was higher than HCWs in another study conducted during the COVID-19 pandemic in China (19.42). However, the mean STS score was similar in both studies (24.87 and 24.76, Zhou et al., 2020). Compared with a study conducted in India during the COVID-19 pandemic, the mean scores of burnout and STS in this study were similar. In India, during the COVID-19 pandemic, HCWs' burnout was 30.41 and STS was 25.88 (Nathiya et al., 2021).

In terms of resilience, the mean score of this study, 26.49, was somewhat lower than healthy populations in the previous studies, which can be considered in the lowest quartile (Davidson, 2020). However, in the previous studies on nurses, mean resilience scores were 29.71 in New Zealand (Tabakakis et al., 2019) and 25.9 in Singapore (Ang et al., 2018). Thus, it can be considered that nurses' resilience is lower than the healthy population, and the result of this study is also reflecting it. Based on the Conservation of resources theory, burnout is related to a resource deficit (Hobfoll & Freedy, 1993). Family status, lower social relationships and support, poor health condition, poor coping skills, and time pressure are examples to increase burnout among nurses (Prapanjaroensin et al., 2017). The different level of burnout of this study compared with the others may reflect the resources of nurses at the time of the survey during the COVID-19 pandemic.

Intrapersonal Level

In this study, majority of the statistically significant variables were at the intrapersonal level. Intention to leave their job, resilience, being a bedside staff, and being asked to work at higher acuity levels each had a significant association (hypotheses 1, 2, 4, 8) with both burnout and STS. On the other hand, age and fear of infection (hypothesis 3) had a significant association with STS and nurses who received positive COVID-19 test results (hypothesis 10) had greater burnout compared with those with negative results of COVID-19. Therefore, hypotheses 1, 2, 3, 4, 8, and 10 were supported.

The significance of resilience was the same as described in the literature. Previous literature focused on resilience as a mean of improving post-traumatic symptoms (Schuster & Dwyer, 2020), and found that resilience has a direct effect on burnout (Jacobowitz, 2018; S. R. Kim et al., 2019). It is hard to discover the causal relationship between resilience and CF in this study. However, based on the literature, it is shown that increasing resilience help to reduce CF (Mealer et al., 2017; Noullet et al., 2018; Potter et al., 2013; Yılmaz et al., 2018). Thus, the finding that nurses with greater resilience had lower burnout and STS make sense. Future studies are suggested to examine the causal relationships between resilience and CF and the details of intervention to increase resilience during the pandemic crisis.

The results of this study indicated being a non-bedside staff had positive associations with burnout and STS. This might be interpreted as nurses who are at bedside being more knowledgeable about COVID-19, so their burnout and STS was lower during the pandemic. On the other hand, nurses not at bedside may be not familiar

with COVID-19, so they had greater burnout and STS. COVID-19 is transmitted by droplets, and there were many other droplet-transmitted infectious diseases even before the pandemic. Nurses at bedside may be more experienced in taking care of patients with droplet infectious disease. Aligning with the results that PPE or masks provided from their organization had a negative association with burnout, bedside staff might be the group who are most supported by their hospitals with PPE provision. Therefore, bedside staff might have knowledge and be prepared on managing droplet-transmitted infectious diseases and this might be the reason of the study finding.

Moreover, caring for COVID-19 patients (hypothesis 6) was not significantly related to either burnout or STS. This result aligns with a study conducted in Spain during the COVID-19 pandemic (Dosil et al., 2020). A study of emergency department nurses during the MERS epidemic also found that having experience of caring for MERS patients or suspected patients was not associated with burnout (J. S. Kim & Choi, 2016). However, being asked to work at higher acuity levels had a positive association with both burnout and STS. The possible reason for this might be that nurses who are not working in the higher acuity level are not comfortable with assigned acuity level role. This could be because they lack knowledge or not familiar with COVID-19 patient care or there could be stigmatization towards nurses who work for COVID-19 patients. The previous study about nurses' experience of caring for MERS patients during the epidemic in Korea reported nurses were stigmatized even from staff in different units of their hospitals (Y. Kim, 2018). Thus, nurses might be afraid of being stigmatized when they were asked to work at higher acuity levels and their beliefs could influence their CF.

Another finding is that fear of infecting themselves is not significantly associated with burnout but is significantly associated with STS. The previous study that examined factors of burnout during the MERS epidemic reported fear of infecting themselves was not a significant factor (J. S. Kim & Choi, 2016). Hence, fear of infection may be not related to the resource deficit, which is the cause of burnout. Rather, this fear might be related to the nurses' experiences and contact with patients, which can cause STS.

The positive association of intention to leave their job with both burnout and STS was the same as reported in previous literature. A concept analysis of CF in nursing concluded nurses have intention to quit due to CF (Peters, 2018). It is difficult to know if the relationship between intention to quit and CF is a causal one based on this study. Thus, further study is needed to determine if a causal relationship is present between intention to leave their job and CF.

Age was also significantly associated with STS, but years in practice was not a significant factor. A study during the COVID-19 pandemic in Japan reported age was significantly associated with depression (Awano et al., 2020). In addition, a study about acute care nurses found that the levels of burnout and STS of younger Millennials were higher than older Boomers or Generation X (Kelly et al., 2015). A 2019 study from Korea reported 45.5% of new graduate nurses quit within one year of being hired (Hospital Nurses Association, 2020). Therefore, this result may indicate younger nurses are more vulnerable to traumatic stress compared with older nurse no matter the number of years in practice. Further study is suggested to examine CF by age groups and intervene to prevent traumatic stress to new graduates.

Interpersonal Level

Hypothesis 11, fear of bringing COVID-19 to their family was not significantly associated with burnout or STS even though the mean score was higher than fear of contracting COVID-19 themselves. Previous literature about the SARS outbreak reported worry about family's SARS infection is different by the countries: Finland and Netherland (Vartti et al., 2009). The international sample of this study suggested that the fear of spreading COVID-19 to others is not a significant factor.

Organizational Level

At the organizational level, organizational support to prevent spread of COVID-19 (hypothesis 13), PPE provision (hypothesis 14), and accommodational support (hypothesis 15) were negatively associated with burnout. This aligns with previous literature during the MERS epidemic in Korea reporting organizational support was negatively associated with burnout (J. S. Kim & Choi, 2016). Hence, organizational supports such as accommodations or efforts to prevent spread of COVID-19 could be considered as resources to prevent burnout and CF among nurses.

Community and Policy Level

At the community level, countries in this survey had shown significantly different levels of burnout compared with the U.S. (hypothesis 16). Nurses who practice in Turkey and Guinea had lower levels and Japan and Korea had greater levels of burnout. In addition, nurses practicing in Korea had greater levels of STS compared with the U.S. Aligning with the previous result that nurses being asked to work at higher acuity levels and being a bedside staff were the significant factor for both burnout and STS, nurses in Korea and Japan might have greater burnout and/or STS since they are not familiar with

COVID-19 due to the lower incidence rate. The incidence rate in Korea and Japan is much lower than the U.S. or Turkey. The number of cumulative cases is 27,433,718 in the U.S., 2,602,034 in Turkey, 419,015 in Japan, 84,946 in Korea, and 15,020 in Guinea as of February 17, 2021 (WHO, 2021). The cumulative incidence rate per 100,000 is 8,288.07 in the U.S., 3,085.21 in Turkey, 331.3 in Japan, 165.69 in Korea, and 114.37 in Guinea as of February 17, 2021. In the lower incidence rate situation, nurses have fewer chances to care for COVID-19 patients. In addition, as previous described, nurses may stigmatize other nurses who care of COVID-19 (Y. Kim, 2018), so they might have preconceptions of COVID-19 and be more worried about the COVID-19. In addition, well-controlled COVID-19 cases by the governments would give more pressure on the public and nurses that they have to follow the governments' restrictions, because they would be criticized or blamed by the others that they did not follow the rule in their community. The results from the survey of two Korean media and Seoul National University reported 86.0% of people do not want to harm others, so they followed government social distancing (lockdown) policies even if they were stressed by the social distancing situations during the COVID-19 pandemic (Lee et al., 2020). In this sense, in the situation with the lower incidence rate in Korea and Japan, nurses would be more stressed because they do not want to be the first COVID-19 case in their communities or organizations because they would be in the limelight. Therefore, the future studies about the compliance of social distancing of the population and its effect on nurses would be suggested.

Furthermore, the lower levels of burnout in Turkish nurses compared with the U.S. nurses may be because of the government's effort to reduce stress of HCWs. The

Turkish government developed a mobile application called RUHSAD (Ruh Sagligi Destek Sistemi, translated as Mental Health Support System), which can connect HCWs with a psychiatrist. Research on this application reported 2,688 HCWs in Turkey downloaded the application and 40% of them requested to make a virtual appointment with psychiatrists for themselves or their children (Dursun et al., 2020). This finding suggests that the effort of the Turkish government may have influence on nurses' burnout.

The hypothesis 17, which is about the positive relationship between incidence rate and CF was rejected. Nurses located in areas with higher incidence rate had lower burnout when the mask policy is in effect. The survey responses of not being under a mask policy were mostly from the nurses of the U.S., and only 10.31% of the whole survey responses. The circumstances of legislating the mask policy are usually due to the sharp increases of COVID-19 cases and lack of hospital capacity. It is possible that the nurses without the mask policy executive order may feel less stressed because their hospital capacity is ready for COVID-19 patients, and the community circumstances are serious, so nurses can easily access their community resources.

The hypothesis 18, the positive relationship between mask policy and CF was partially supported under the high incidence rate. It is discovered that mask policy and burnout or STS had a positive relationship under the high incidence rate. This indicate that mask policy is necessary to manage not only the incidence rate but also the nurses' psychological aspects. A study reported that if the U.S. had a mask policy for employees in public businesses at the early stage of COVID-19 pandemic, it would have reduced the COVID-19 confirmed cases and deaths (Chernozhukov et al., 2021). The results of this

study highlighted the effect of mask policy in the clinical setting by addressing nurses' CF in relation to the incidence rate in the community. Therefore, the mask policy has to be in effect in the future pandemics or epidemics.

Limitation

This study has some limitations. First, lockdown policies could not be summarized as quantitative variables and added in the model based on the SEM except by the mask policy. Each nation and state set COVID-19 related policies based on their environments and circumstances, so they had a different rule for different locations or situations. For example, Alabama and Florida had a policy for beaches, but other states did not. Even if they had policies for the same types of locations, most states implemented policies at the county level. For example, Texas's executive order on face cover policy was different by each county based on the number of COVID-19 cases, while other states' governors made state-wide executive orders. Furthermore, most governments only uploaded the latest policies and deleted the previous policies, making it challenging to investigate the timeline of lockdown policies in order to know what policies had been in place at the time (or before) a respondent was completing the survey. Hence, more than two people would be needed to verify the timeline of lockdown and the accuracy of its context by comparing their investigation. Additionally, the enforcement of policies was not clearly indicated by each state. In this study, mask policy was operationalized to include policies with or without enforcement. Having enforcement with the policy might be influential to the public and community, and community environments impact on nurses' CF. Future study including policy details could consider how to quantify the enforcement of the policies.

Second, the COVID-19 pandemic has now lasted for more than a year. Nurses' emotions could change compared with the beginning of the pandemic. Longitudinal data on nurses would be necessary to explore causal relationships and how nurses respond as the pandemic progresses. If a longitudinal design is used, it might be possible to infer a causal relationship between the factors and CF and learn how the prolonged pandemic affects nurses across over time.

Next, this international study examined nurses from different countries as a whole and did not investigate relationships of the study variables within each subsample. Variables of community and policy levels were used to reflect each country's circumstances. However, other levels such as intrapersonal, interpersonal, or organizational levels would also be different and influenced by countries. Results from analyzing as a whole limit the generalization. As mentioned in the chapter 2, each country included in this study has different nursing policies. The nurse-population ratio is different and the requirements to be a nurse are different. Therefore, future study is needed to examine how the intrapersonal, interpersonal, or organizational factors affects nurses' CF in each country and compare the results by countries so each country can implement research results or policies found to be effective in their country.

There are limitations in terms of the theoretical aspects. By using the SEM in this study, the factors related to CF were able to be found. However, the usage of theory does not suggest specific variables within each type of factor that affected CF and the information about the causal relationships. In addition, using the results based on the SEM gives insight for the future interventions by providing associated factors on each level. However, some factors are hard to apply to the interventions. For example,

incidence rate was significantly associated with burnout from this study, but it is hard to manage the incidence rate. Controlling the incidence is varied by complex factors such as the availability of epidemic professionals and public health workers in each regions, the government's policy, or cultural aspects. Moreover, the SEM does not provide the specific factors, rather it provides the categories. Therefore, it is possible to not include the significant factors in the model of this research.

Conclusion

This study examined factors associated with CF among nurses during the COVID-19 pandemic and posed 5 research questions and 18 hypotheses. As the COVID-19 pandemic continues for a second year, the findings provide some important insight to prepare for future public health crises and ways to enhance patient care by relieving CF among nurses.

First, organizational support is essential to prevent nurses' CF. Organizational support such as provision of PPE, efforts to reduce the transmission of COVID-19, and accommodational support helps to reduce the chance of getting infection and may result in reducing CF. At the beginning of the pandemic, many countries had a shortage of PPE (Dargaville et al., 2020; Ranney et al., 2020). To support nurses in their practice, adequate supplies of PPE and masks should be available by their organizations. The governments of countries had an effort to secure enough PPE at the beginning of the COVID-19 pandemic. Therefore, governments should prepare an adequate supply chain of providing PPE mainly to hospitals as well as the public to prepare for future infectious disease crises.

Second, although caring for COVID-19 patients was not a significant factor contributing to CF, however, working as non-bedside staff, fear of infecting themselves, and being asked to work at higher acuity level were positively associated with CF. Even if it is not known if these variables are causally associated, this finding may indicate that nurses who are familiar with COVID-19 have less CF or experience less stigmatization from caring for COVID-19 patients. Therefore, continuing education on nursing practice and information regarding emerging infectious diseases would be helpful to reduce CF, so nurses have accurate information and do not have a preconception of the emerging infectious diseases.

Third, different CF levels by country of practice, the negative association between burnout and incidence rate when a mask policy is not in effect, and the effect of mask policy when the incidence rate is high might indicate that nurses are affected by other community and public circumstances. Further investigations are suggested on how other community circumstances and the public's behavior affect nurses' CF. In addition, legislating the mask policy in the future is suggested by providing the continuing education or campaign to the public of advantages of wearing mask in the emerging respiratory infectious disease crises would be helpful as well.

Lastly, higher level of resilience was related to a lower level of CF among nurses. Future studies about the causal relationships between resilience and CF is suggested to fill this gap in the literature. In addition, exploration of specific programs to increase resilience to address nurses' CF is suggested in the future.

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APPENDIX A
TABLES AND FIGURES

Table 1*Mask Policy in the U.S. by States*

	Effective date	When to wear a mask	Enforcement	References
Alabama	July 16-present	“When within six feet of a person from another household in any of the following places: an indoor space open to the general public, a vehicle operated by a transportation service, or an outdoor public space where ten or more people are gathered.”	\$500	https://www.alabamapublichealth.gov/legal/assets/soe-covid19-071520.pdf
Alaska	No state level order			
Arizona	November 19-present	In schools including parents		https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/novel-coronavirus/emergency-measure-2020-04.pdf https://azgovernor.gov/governor/news/2020/11/arizona-department-health-services-strengthens-mask-wearing-requirement https://governor.arkansas.gov/images/uploads/executiveOrders/EO_20-43.pdf
Arkansas	July 20-present	“All indoor environments where they are exposed to non-household members and distancing of six feet or more cannot be assured AND in all outdoor settings where there is exposure to non-household members, unless there exists ample space of six feet or more to practice physical distancing.”	\$100-\$500	https://governor.arkansas.gov/images/uploads/executiveOrders/EO_20-43.pdf
California	June 18-November 15	Indoor public spaces. When waiting or riding on public transportation. Working space. “While outdoors in public spaces when maintaining a physical distance of 6 feet from persons who are not members of the same household or residence is not feasible.”	“Despite a statewide order to wear masks, there’s no statewide penalty for not doing so. Local governments have instituted their own fines for violations”	https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/COVID-19/Guidance-for-Face-Coverings_06-18-2020.pdf https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/guidance-for-face-coverings.aspx https://abc7.com/masks-face-coverings-order-statewide/6254439/

Colorado	November 16-present July 2020-present	Required at all times when outside of the home, with some exceptions. When entering or within any public indoor space. While using or waiting to use public (buses, light-rail) or non-personal (taxis, car services, ride-shares) transportation services.	“If you refuse to wear a mask as required in the executive order, you are violating a Colorado law and may be subject to civil or criminal penalties. “	https://calmatters.org/health/2020/08/california-mask-order-fines/ https://covid19.colorado.gov/mask-guidance
Connecticut	April 20-present	“Cloth Face Coverings or Higher Level of Protection Required in Public Wherever Close Contact is Unavoidable”	“Lamont has said the order is mostly “common sense” and that he expects residents to self-enforce the rule.” From September 14: \$100-\$500	https://portal.ct.gov/-/media/Office-of-the-Governor/Executive-Orders/Lamont-Executive-Orders/Executive-Order-No-7BB.pdf?la=en https://www.courant.com/coronavirus/hc-news-coronavirus-clb-face-mask-executive-order-connecticut-20200420-a7yfuio5nzebl13xwrg2ys3fb-story.html https://ctmirror.org/2020/09/14/lamont-orders-fines-for-those-who-flout-rules-on-mask-wearing-and-large-party-limits/ https://attorneygeneral.delaware.gov/public/covid-19-faqs-delawares-stay-at-home-orders/
Delaware	April 28-present	“In public settings (schools, grocery stores, pharmacies, doctor’s offices and public transportation) and outdoor public spaces (parks and golf courses) if you cannot maintain social distancing of six (6) feet between yourself and people who do not live with you.”	“People who violate an emergency order can be fined up to \$500 or subject to imprisonment for up to six (6) months for each violation.”	https://attorneygeneral.delaware.gov/public/covid-19-faqs-delawares-stay-at-home-orders/
District of Columbia	July 22-present	Indoor and outdoor (when contact with another person within six feet, in public transportation including taxi or shuttles)	Not indicated	https://coronavirus.dc.gov/maskorder
Florida	June 20-present	In any setting where social distancing is not possible.	Penalties depend on counties and cities	https://floridahealthcovid19.gov/wp-content/uploads/2020/06/20200622-SOF-DOH-Public-Health-Advisory.pdf
Georgia	August 16-present	“That all residents and visitors of the State of Georgia are strongly encouraged to wear face coverings as practicable While outside their homes or place of residence, except when eating, drinking, or exercising outdoors.”	None	https://www.documentcloud.org/documents/7036922-08-15-20-01-0.html
Hawaii	April 17-present	“Everyone is now required to wear a face mask in most public settings, including on	Not more than \$5,000, or imprisoned not more than one year, or both.	https://www.hawaiinewsnow.com/2020/04/20/under-new-rule-youre-now-required-wear-face-mask-most-public-settings-oahu/

		the city bus, when visiting businesses or ordering from the drive-thru.” “All persons are encouraged to wear a cloth face covering as described and recommended by the CDC... This section shall not apply to persons who are engaged in permissible outdoor exercise activities so long as social distancing requirements are maintained.”		https://governor.hawaii.gov/wp-content/uploads/2020/04/2004088-ATG_Fifth-Supplementary-Proclamation-for-COVID-19-distribution-signed.pdf
Idaho	No state level order			
Illinois	May 1 - present	“Executive Order 2020-32 also mandates that employers provide employees with appropriate face coverings and require that employees wear face coverings when they cannot maintain a six-foot social distance at all times.”	Not indicated	https://www.jacksonlewis.com/publication/new-illinois-covid-19-executive-orders-extend-stay-home-impose-added-requirements-employers
Indiana	July 27-present	“Inside a business, public building, or other indoor place open to the public.” “outdoor public space wherever it is not feasible to maintain six feet of social distancing from another person not in the same household” “using public transportation or while in a taxi, private car service, or ride-sharing vehicle”	Not indicated	
Iowa	November 10-present	In all business places: indoor (any person working alone or working in a space where six feet of physical distance can be maintained.) “I continue to strongly encourage all Iowans two or older to wear a mask or other face covering when in public settings, especially in circumstances when it is not possible to remain six feet away from others outside their household, unless it is unsafe to do so because of health or disability”	“up to \$650 and up to 30 days in jail,”	https://www.weareiowa.com/article/news/health/coronavirus/iowa-coronavirus-mitigation-efforts-implemented-again-for-indoor-outdoor-gatherings-governor-kim-reynolds/524-24651563-ba72-40f6-8c68-8f342fb8ddbc https://governor.iowa.gov/sites/default/files/document/s/Public%20Health%20Proclamation%20-%202021.01.07.pdf https://www.desmoinesregister.com/story/news/politics/2020/11/17/iowa-gov-kim-reynolds-news-conference-after-covid-mask-mandate-bars-restaurants/6321012002/

Kansas	July 3-present	<p>“Inside, or in line to enter, any indoor public space.”</p> <p>“While outdoors in public spaces and unable to maintain a 6-foot distance between individuals with only infrequent or incidental moments of close proximity.”</p>	By counties and cities	<p>https://governor.kansas.gov/wp-content/uploads/2020/07/20200702093130003.pdf</p> <p>https://www.kansas.com/news/politics-government/article243931352.html</p>
Kentucky	July 10-present	<p>“While inside any retail and public settings, waiting for or riding on transportation, and outdoor public spaces in which the person cannot maintain a physical distance of six feet from all individuals who are not members of the person’s household and is not otherwise covered by previously issued guidance.”</p>	Up to 12 months in jail or a \$500 fine.	<p>https://russellvilleky.org/index.php/covid-19-information/governor-executive-orders/707-governor-executive-order-2020-586-face-masks</p> <p>https://www.dbllaw.com/11350-2/</p>
Louisiana	July 13-present	<p>“When inside a commercial establishment or any other building or space open to the public, whether indoor or outdoor including public or commercial modes of transportation.”</p>	If local business owners choose not to follow the new mandate it can result in a \$500 fine and or six months in jail.	<p>https://gov.louisiana.gov/index.cfm/newsroom/detail/2591</p> <p>https://www.wafb.com/2020/07/11/how-new-statewide-mask-mandate-is-affecting-public/</p>
Maine	May 31-present	<p>From May 31, mask mandate in public spaces.</p> <p>From June 1, including restaurants.</p> <p>From November, including all indoor and outdoor public spaces regardless of social distancing ability.</p>	Not indicated	<p>https://www.maine.gov/covid19/sites/maine.gov.covid19/files/inline-files/Mask-FAQs-110620.pdf</p> <p>https://www.maine.gov/governor/mills/news/following-record-covid-19-cases-governor-mills-announces-new-face-covering-executive-order</p>
Maryland	April 15 - present	<p>In any public transportation. Indoors at any locations. “Outdoors and unable to consistently maintain at least six feet of distance from individuals who are not members of their household.”</p>	not exceeding one year or a fine not exceeding \$5,000 or both	<p>https://governor.maryland.gov/wp-content/uploads/2020/07/Gatherings-10th-AMENDED-7.29.20.pdf</p>
Massachusetts	May 6-November 4	<p>“Required face-coverings in public places where social distancing is not possible and at all times on public transit and in retail settings”</p>	Up to \$300 per violation	<p>https://www.mass.gov/info-details/covid-19-state-of-emergency</p>
	November 6-present	<p>“All persons to wear face-coverings in all public places, even where they are able to maintain 6 feet of distance from others.”</p>		

Michigan	June 18 - present	“Individual who leaves their home or place of residence must wear a face covering over their nose and mouth.”	\$500	https://www.michigan.gov/whitmer/0,9309,7-387-90499_90705---,00.html https://wsbt.com/news/local/michigan-governor-signs-mandatory-mask-executive-order https://www.health.state.mn.us/diseases/coronavirus/facecover.html
Minnesota	July 25 - present	“All indoor businesses and public indoor spaces, unless alone.” From December 18: in additional places and situations, including at all times when in a gym or fitness center—including when exercising.	Up to \$100.	
Mississippi	July 9 – September 30	Mask mandate in 13 counties From August 5: expand to all state	Anyone violating the mandate could face a fine of up \$500 or spend six months in jail.	https://thehill.com/homenews/state-watch/506643-mississippi-governor-to-require-masks-in-13-counties-put-limits-on https://www.wtok.com/2020/08/04/watch-live-governor-tate-reeves-covid-19-press-conference/ https://www.sunherald.com/news/coronavirus/article244254177.html#storylink=cpy https://www.forbes.com/sites/nicholasreimann/2020/09/30/mississippi-becomes-first-state-to-lift-mask-mandate/?sh=4ec4b58b7f13 https://mcusercontent.com/08cb3e52aa1308600f84d49ea/files/1ec8180f-1a44-4bdf-865f-4e9c423672ab/Executive_Order_No._1527.pdf
Missouri	October 19-present	Started again in some counties		
Montana	No state level order			
Montana	July 15-present	All times in indoor spaces open to the public (The directive does not require face coverings in counties with three or fewer active cases).	Not indicated	https://dphhs.mt.gov/aboutus/news/2020/directiverequiringfacecoverings
Nebraska	No state level order			
Nevada	June 24-present	“Anyone in any public space throughout the State, including visitors, will need to wear a mask. This includes using public transportation, public facing work environments, when patronizing businesses, or interacting with others in any generally publicly accessible space.”	Not indicated	https://nvhealthresponse.nv.gov/wp-content/uploads/2020/06/Directive-024-Master-Document.pdf https://gov.nv.gov/News/Press/2020/Gov__Sisolak_announces_mandatory_face_covering_policy_in_public/
New Hampshire	August 11-	Face covering when scheduled gatherings of 100 people or more	Not indicated	https://www.governor.nh.gov/news-and-media/emergency-orders-2020

	November 19				
	November 20	“Any time in public spaces, indoors or outdoors, where they are unable to or do not consistently maintain a physical distance of at least six feet from person outside their own households.”			
New jersey	April 10- July 7	In all essential retail, manufacturing, warehousing businesses.			https://www.nj.gov/governor/news/news/562020/20200408e.shtml
	July 8-present	“Requiring individuals to wear masks in outdoor public spaces when they cannot social distance.”	\$50 and \$500		https://www.nj.gov/governor/news/news/562020/approved/20200708a.shtml https://www.njleg.state.nj.us/2020/Bills/A4500/4453_R1.HTM
New Mexico	May 15-present	“In public, with exceptions for eating, drinking and exercise.”	\$100		https://cv.nmhealth.org/2020/05/15/governor-signs-modified-extended-public-health-order-easing-some-restrictions-and-requiring-face-coverings/ https://www.usnews.com/news/best-states/new-mexico/articles/2020-07-01/new-mexico-announces-100-fines-for-flouting-face-mask-rule
New York	April 17-present	When in a public place and unable to maintain, or when not maintaining, social distance.	Varied by cities and counties		https://www.governor.ny.gov/news/no-20217-continuing-temporary-suspension-and-modification-laws-relating-disaster-emergency https://www.cnbc.com/2020/04/15/new-york-gov-cuomo-to-order-all-people-to-wear-masks-or-face-coverings-in-public.html https://governor.nc.gov/documents/executive-order-no-147
North Carolina	June 26 – November 22	“In indoor public spaces and outdoors when they are or may be within six feet of another person.”			
	November 23-present	“Any place outside the home” including but not limited to businesses, schools, and other establishments and spaces “if anyone else is in that space who is not a member of the same household” indoors and “if it’s not possible to consistently be physically distant by more than six feet from non-household members” at outdoors.	Up to \$1,000 or active punishment.		https://covid19.ncdhhs.gov/information/individuals-families-and-communities/face-coverings-and-masks
North Dakota	November 14 – December 8	“In an indoor business or public indoor space, including when waiting outdoors to enter an indoor business or public indoor space.”	Up to \$1000.		https://www.health.nd.gov/diseases-conditions/coronavirus/state-health-officer-orders

	December 9- January 18	“Face coverings must also be worn in outdoor business and public settings when it is not possible to maintain physical distancing.”			
Ohio	July 23-present	Indoor and outdoor when social distancing is not available	Varied by cities		https://www.wtol.com/article/news/health/coronavirus/ohio-statewide-mask-mandate-starts/512-561242b0-bc34-4d2d-a8da-c7da3dea5fb0
Oklahoma	No state level order				
Oregon	July 1- July 23	In a public indoor space (in 7 counties)	Not indicated		https://www.kgw.com/article/news/health/coronavirus/face-masks-required-in-public-places-throughout-oregon/283-23ffc78-341d-4222-a122-bac16e1050a4 https://www.oregon.gov/oha/ERD/Pages/OHA-Announces-New-Mask-Requirements-Website.aspx
	July 24- October 18	“In all indoor public spaces and outdoors when physical distancing isn’t possible.”			
	October 19-present	“Expand when and where people must wear masks, to include all workplaces, even if workers can maintain a social distance.”			https://www.oregonlive.com/coronavirus/2020/10/coronavirus-in-oregon-new-state-mask-mandates-8-new-deaths-and-266-new-cases.html
Pennsylvania	July 1-present	Outdoors and unable to consistently maintain a distance of six feet from individuals who are not members of their household. And In any indoor location where members of the public are generally permitted	Law enforcement officers are authorized to issue warnings or citations to anyone who does not comply with the Order. The Department of Health can also issue warnings and citations to businesses, persons, facilities, and organizations that do not comply.		https://www.governor.pa.gov/wp-content/uploads/2020/07/20200701-SOH-Universal-Face-Coverings-Order.pdf https://www.health.pa.gov/topics/disease/coronavirus/Pages/Guidance/Universal-Masking-FAQ.aspx
Puerto Rico	July 1-present	“Extends curfew through July 22, 2020, orders anyone suspected of being exposed to COVID-19 to quarantine for 14 days; reopening of businesses continue at 75% occupancy while maintaining strict compliance with social distancing and wearing masks”	Not indicated		https://www.washingtonpost.com/world/the_americas/puerto-rico-rolls-back-openings-amid-spike-in-covid-19-cases/2020/07/16/d3e8fe5c-c7b1-11ea-a825-8722004e4150_story.html https://assets.documentcloud.org/documents/20419156/puerto-rico-vaccine-info.pdf https://www.faegredrinker.com/en/insights/topics/coronavirus-covid-19-resource-center/government-actions-covid-19/puerto-rico-covid-resources#!#tab-Overview

Rhode Island	May 8-present	Whether indoors or outdoors place open to the public	\$100-\$500	https://governor.ri.gov/newsroom/orders/ https://covid.ri.gov/public/citations-non-compliance
South Carolina	August 3-present	The rules require masks in restaurants and government buildings.	Not indicated	https://www.wltx.com/article/news/health/coronavirus/sc-governor-orders-masks-wearing-in-public-situations/101-e2caa544-89fc-4adc-9999-4ac630c50f5f
South Dakota	No state level order			
Tennessee	No state level order			
Texas	July 3-present	“When inside a commercial entity or other buildings or space open to the public, or when in an outdoor public space, wherever it is not feasible to maintain six feet of social distancing from another person not in the same household.” (counties with less than 21 COVID-19 cases can choose to be exempted)	Up to \$250	https://open.texas.gov/uploads/files/organization/open-texas/EO-GA-29-use-of-face-coverings-during-COVID-19-IMAGE-07-02-2020.pdf
Utah	October 13-November 8	“For live events, movie theater showings, sports games, weddings and other recreation and entertainment events.” Based on the three categories, counties with high and moderate transmission: “in stores and other public indoor settings and outside when physical distancing isn’t possible.”		https://www.sltrib.com/news/2020/10/13/what-states-new-covid/
	November 9-present	“While within six feet of any individual from a separate household”	Up to \$10,000 (who organize a social event)	https://coronavirus-download.utah.gov/Governor/EO-2020-74-Temporary_Statewide_COVID-19_Restrictions.pdf https://www.npr.org/sections/coronavirus-live-updates/2020/11/09/933055781/utah-gov-announces-statewide-mask-mandate-citing-steep-spike-in-covid-19-cases
Vermont	August 1-present	“In public spaces, indoors or outdoors, where they come in contact with others from outside their households” and “where it is not possible to maintain a physical distance of at least six feet.”	None	https://governor.vermont.gov/content/addendum-2-amended-and-restated-executive-order-no-01-20
Virginia	December 14 - present	Indoors including transportations and outdoors when “unable to maintain at least	Indicated violators may be enforced by Code of Virginia.	https://www.governor.virginia.gov/media/governorvirginiagov/executive-actions/EO-72-and-Order-of-Public-Health-Emergency-Nine-Common-Sense-

Washington	June 25-present	six feet of physical distance from other individuals who are not Family members” “In indoor public setting and outdoor public settings when six feet of physical distancing cannot be maintained between individuals who do not share a household.”	“Violators may be subject to enforcement pursuant to RCW 43.70.130(7), RCW 70.05.120(4), and WAC 246-100-070(3).”	Surge-Restrictions-Certain-Temporary-Restrictions-Due-to-Novel-Coronavirus-(COVID-19).pdf https://www.doh.wa.gov/Emergencies/COVID19/FrequentlyAskedQuestions
West Virginia	July 7-November 13 November 14 - present	“At all indoor public places where six feet of social distancing cannot be maintained.” “At all times in all public indoor spaces where other individuals may be present, regardless of the social distance from other individuals.”	Not indicated	https://governor.wv.gov/News/press-releases/2020/Pages/COVID-19-UPDATE-Gov.-Justice-announces-statewide-indoor-face-covering-requirement.aspx https://governor.wv.gov/Pages/Statewide-Indoor-Face-Covering-Requirement.aspx
Wisconsin	August 1 - present	“Indoors when another person who are not members of individual’s household or living unit are present in the same room. All other settings including outdoors when it is not possible to maintain physical distancing.”	Up to \$200	https://www.ruderware.com/covid-19-focus-team/wisconsin-face-covering-mandate-to-begin-august-1st/
Wyoming	December 9 -present	Indoor and public transportation places		https://www.sweetwaternow.com/governor-gordon-announces-statewide-mask-mandate-for-wyoming/ https://covid19.wyo.gov/governors-orders

Table 2

Policies Conducted to Prevent COVID-19 Transmission by States in the U.S.

State	Dates of the survey	Maximum number of social gathering	Retailer*	Entertainment venues, athletics*	Gym*	Restaurants (dine-in)*	Bas*	Beaches*	School	Non-essential travel	references
Alabama	Aug 06-07		50%	50%	50%	Open (social distancing)	Open (social distancing)	Open (social distancing)	Open (June 1-)		https://www.alabamapublichealth.gov/legal/orders.html
Alaska	Jul 24										
Arizona	Jul 13-Sep 24			50% (Jul 27-)	50% (Aug-)	50%	Closed →50% (Jul 267-)		Closed		https://www.azdhs.gov/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/index.php#novel-coronavirus-community
Arkansas	Aug 6-27		66%			66% (Jun 15-)	66%				https://www.thv11.com/article/news/health/coronavirus/coronavirus-updates-covid-19-arkansas/91-b1f8b035-a2ee-4b5e-9872-9ab1904fa0eb https://arkansasready.com/results/?resource_industry=1089&resource_audience=1&resource_topic=8&resource_language=&submit=1 https://covid19.ca.gov/stay-home-except-for-essential-needs/ https://abc7.com/newsom-press-conference-today-can-restaurants-reopen-in-california-governor-update-when-do-gyms/6175312/
California	Jul 14-Sep 11		Open based on the situation			Open					https://covid19.colorado.gov/guidance-by-sector https://www.denverpost.com/2020/09/02/colorado-covid-reopening-color-code-framework/ https://www.acainternational.org/news/dc-mayor-announces-extended-state-of-emergency
Colorado	Sep 2-11				50%	50%	50%				https://covid19.colorado.gov/guidance-by-sector https://www.denverpost.com/2020/09/02/colorado-covid-reopening-color-code-framework/ https://www.acainternational.org/news/dc-mayor-announces-extended-state-of-emergency
District				25%		With social distancing and					

of Columbia					disinfect							
Florida	Aug 6-25			Open (social distancing)	Open (social distancing)	Open	50%	50% (close for night clubs)	Fully open	Open		https://www.miamidade.gov/global/initiatives/coronavirus/emergency-orders/declaration-extension-08.05.20.page http://www.myfloridalicense.com/dbpr/os/documents/EO%2020_192.pdf https://floridahealthcovid19.gov/plan-for-floridas-recovery/
Idaho	Jul 16-Sep 6			100%	100%	100%	100%	100%		Open (Jul 10-)	Available	https://gov.idaho.gov/pressrelease/gov-little-pushes-for-in-person-instruction-in-idaho-schools-this-fall/ https://www.nwpb.org/2020/06/11/idaho-moves-statewide-into-its-phase-4-meaning-100-of-businesses-can-reopen-governor-says/ https://rebound.idaho.gov/stage-4-stay-healthy-guidelines/
Indiana	Aug 10-Sep 1	250			50%	100%	50%	50%		Difference by cities and counties		https://www.wthitv.com/content/news/Holcomb-announces-Indiana-will-remain-in-Stage-45-until-at-least-August-27-571945981.html https://www.wthitv.com/content/news/What-does-Indianas-stage-45-of-reopening-mean-571604111.html
Iowa	Jul 17-Sep 3			50%	50%	50%	50%	50%		Closed → open with social distancing (Jul 31-)		https://governor.iowa.gov/press-release/gov-reynolds-signs-new-proclamation-continuing-the-state-public-health-emergency-4 https://www.desmoinesregister.com/story/news/politics/2020/07/30/iowa-schools-return-fall-online-classes-coronavirus-covid-kim-reynolds-students-teachers-classroom/5518509002/
Kansas	Jul 27	45								Closed	Available	https://governor.kansas.gov/governor-kelly-signs-executive-orders-delaying-schools-implementing-mitigation-procedures/ https://www.coronavirus.kdheks.gov/255/Plan-to-Reopen-FAQs
Kentucky	Aug 21	10				25%	Closed			Closed		https://kentucky.gov/Pages/Activity-stream.aspx?n=GovernorBeshear&prId=283 https://www.wlky.com/article/beshear-rolls-back-informal-gatherings-to-10-people-or-less/33371264#

	Maryland	Jul 16-Sep 1			50% (including swimming pool)	50%	50%		Open	https://www.nbcwashington.com/news/local/maryland-private-schools-can-reopen-governor-says-in-block-of-montgomery-mandate/2380270/ https://governor.maryland.gov/2020/06/10/governor-hogan-announces-next-stage-two-reopenings-including-indoor-dining-and-outdoor-amusements/
	Michigan	Jul 10-Aug 26	100		Closed	Closed	50%	50%		https://www.michigan.gov/whitmer/0,9309,7-387-90499_90705-533435--,00.html https://www.wxyz.com/news/coronavirus/michigan-enters-phase-4-of-mi-safe-start-plan
	Missouri	Jul 16-Aug 26		Open	Open	Open	Open	Open	Open	https://governor.mo.gov/press-releases/archive/governor-parson-announces-missouri-will-fully-reopen-enter-phase-2-recovery https://www.ky3.com/content/news/Missouri-to-fully-reopen-enter-Phase-2-of-recovery-plan-on-June-16-571194331.html
	Nevada	Aug 28-Sep 3	50			50%	50%	50%		https://thenevadaindependent.com/article/sisolak-public-gatherings-to-remain-at-50-person-limit-for-now
∞	New Jersey	Jul 10-31	250	Full	50% (Pool: 50% outdoor 25% indoor)					https://covid19.nj.gov/faqs/nj-information/reopening-guidance-and-restrictions/when-and-how-is-new-jersey-lifting-restrictions-what-does-a-responsible-and-strategic-restart-of-new-jerseys-economy-look-like#direct-link
	New York	Jul 10-Sep 1	50		Open but not the theaters, concert, and amusement parks. 25% for casinos.	Open				https://www.nytimes.com/article/new-york-phase-reopening.html
	North Carolina	Aug 6-Sep 21	10 indoor. 25	50%	closed →50% (Sep 4-	closed →30%	50%	Closed		https://www.npr.org/sections/coronavirus-live-updates/2020/08/05/899597881/north-carolina-will-pause-further-reopening-until-september-to-start-the-

			out- door → 20 in- door 50 out- door (Sep4 -)		Except theaters)	(Sep 4-)					school-?utm_medium=RSS&utm_campaign=new s https://www.nc.gov/covid-19/staying-ahead-curve/phase-25-faqs#what-does-this-order-change
	Ohio	Aug 21			Open includ- ing camp sites	Open	Open			Closed	https://www.aol.com/ohio-governor-orders-children-grades-183634710.html https://www.cleveland.com/open/2020/06/gov-mike-dewine-is-extending-public-health-orders-that-were-due-to-expire-here-is-a-list.html
	Ore- gon	Jul 21-	50 in- door 100 out- door	Open	Open	Open (social dis- tanc- ing)	Open (social distanc- ing)	Open (social distanc- ing)			https://www.opb.org/news/article/oregon-reopen-phase-2-faq/
	Penn- sylva- nia	Aug 21	25 in- door 250 out- door			Open (social dis- tanc- ing)	25% ta- ble ser- vice only	Table service only. Night- club: closed			https://www.governor.pa.gov/newsroom/wolf-administration-announces-targeted-mitigation-efforts-in-response-to-recent-covid-case-increases/
	South Caro- lina	Jul 21			Open	Open	Closed at 11pm	Closed at 11pm			https://www.greenvilleonline.com/story/news/local/south-carolina/2020/07/10/sc-bars-restaurants-prohibited-selling-alcohol-amid-coronavirus/5412782002/ https://www.thestate.com/news/coronavirus/article242862696.html https://www.thestate.com/news/coronavirus/article242651811.html
	Ten- nesse e	July 9-16	50			Open (social dis- tanc- ing)	Open (social distanc- ing)				https://www.tennessean.com/story/news/politics/2020/06/29/new-coronavirus-cases-mount-gov-lee-extends-emergency-order/3280466001/ https://www.tn.gov/governor/news/2020/5/20/tennessee-s-economic-recovery-group-issues-updated-guidance-for-restaurants-and-retail--allows-for-large-attractions-to-open.html

	Texas	Jul 10-Dec 13	100 outdoor	50%→ 75% (July 17-) →50% (Dec 3-)		50%→ 75% (July 17-) →50% (Dec 3-)	50%→ 75% (July 17-) →50% (Dec 3-)	Closed to sell alcohol at 12pm →50% (Aug 25-)	open	https://www.cnn.com/2020/06/26/texas-rolls-back-its-reopening-a-day-after-pausing-plans-as-coronavirus-cases-rise.html https://austin.eater.com/2020/8/25/21401398/texas-bars-reopen-serving-rule-food-trucks https://www.texastribune.org/2020/09/17/greg-abbott-texas-coronavirus/ https://communityimpact.com/dallas-fort-worth/lewisville-flower-mound-highland-village/coronavirus/2020/12/03/bar-closures-tighter-business-restrictions-triggered-in-north-texas-by-covid-19-hospitalizations https://www.washingtonpost.com/dc-md-va/2020/05/08/virginia-reopen-coronavirus-faq/ https://www.nbc12.com/2020/07/01/virginia-is-now-phase-three-gov-northams-reopening-plan-here-are-guidelines/ https://www.governor.wa.gov/news-media/inslee-extends-safe-start-proclamation-issues-facial-coverings-guidance https://www.governor.wa.gov/news-media/inslee-announces-updated-religious-and-faith-based-services-guidance https://www.jsonline.com/story/news/2020/05/14/wisconsin-bars-hair-salons-dine-restaurants-open-after-supreme-court-ruling-stay-home-order-overs/5194195002/
	Vir- ginia	Aug 6-8	250	Open (social distancing)	Swim- ming pool: 75%	50%	Open (social distancing)			
	Washi- ngton	Jul 16-23	200	25%		25%	25%			
06	Wis- con- sin	Jul 22- Sep 1		Open		Open	Open			

*Note: the percentages mean the maximum capacity based on each state's different criteria

Table 3*Sample Characteristics*

Variable	<i>N</i>	%
Gender		
Female	835	91.16
Male	81	8.84
Certified in a specialty		
Yes	337	36.63
No	583	63.37
Country of practice		
United States	405	43.97
Turkey	245	26.60
Japan	182	19.76
Korea	76	8.25
Guinea	5	0.54
Azerbaijan	1	0.11
Canada	1	0.11
China	1	0.11
Germany	1	0.11
Lebanon	1	0.11
Marshall Islands	1	0.11
United Arab Emirates	1	0.11
United Kingdom	1	0.11
Types of organizations		
Inpatient	624	67.97
Outpatient or non-acute	229	24.95
Advanced nursing	65	7.08
Education		
Basic education (Diploma, Associate degree, BSN)	707	77.02
Higher education (MSN, DNP, PhD)	211	22.98
Position		
Bedside staffs	548	61.30
Non-bedside	346	38.70
Have experience of COVID-19 patient care		
Yes	370	40.39
No	546	59.61
Provision of PPE or mask from workplace		
Yes	708	77.29
No	208	22.71
Involved with developing policies procedures to prepare for COVID-19		
Yes	301	33.08

No	609	66.92
Had taken any training/course about to care COVID-19 or protect self		
Yes	598	65.21
No	319	34.79
Had asked to work at higher acuity levels to care for patients beyond the usual practice		
Yes	383	41.95
No	530	58.05
Offered accommodation from institution		
Yes	212	23.50
No	690	76.50
COVID-19 test		
Tested and received negative results	414	45.05
Tested and received positive results	58	6.31
Never been tested	447	48.64
Mask policy		
Yes	826	89.69
No	95	10.31

Note. Sample characteristics are based on pairwise deletion

Table 4*Group Differences on Burnout and Secondary Traumatic Stress*

Variable	Burnout					Secondary Traumatic Stress				
	<i>n</i>	<i>M (±SD)</i>	<i>Range</i>	<i>t/F</i>	<i>p-value</i>	<i>n</i>	<i>M (±SD)</i>	<i>Range</i>	<i>t/F</i>	<i>p-value</i>
Gender										
Female	817	24.50(±6.26)	10-43	1.55	.12 ^a	809	24.86(±6.27)	10-48	0.27	.79 ^a
Male	80	25.63(±5.62)	13-39			79	25.06(±5.91)	11-42		
Certified in a specialty										
Yes	323	23.28(±5.82)	10-42	4.79	<.001^a	320	24.30(±6.03)	11-42	2.04	.04^a
No	578	25.32(±6.30)	10-43			572	25.18(±6.32)	10-48		
Country of practice										
United States	397	22.45(±6.11)	10-42	56.45	<.001^c	395	23.56(±6.29)	20-31	9.89	<.001^b
Turkey	235	23.48(±5.36)	10-38			228	25.04(±5.69)	10-45		
Japan	182	29.69(±4.47)	18-43			182	26.07(±5.86)	14-42		
Korea	75	27.47(±4.66)	14-38			76	28.26(±6.63)	11-41		
Guinea	4	19.50(±4.43)	15-25			4	26.00(±7.62)	13-48		
Other	8	22.50(±6.26)	12-32			8	24.38(±3.89)	19-34		
Types of organizations										
Inpatient	611	24.52(±6.02)	10-43	6.18	<.01^b	600	24.97(±6.16)	11-48	2.12	.12 ^b
Outpatient or non-acute	224	25.45(±6.50)	10-43			227	25.00(±6.21)	10-42		
Advanced nursing	63	22.40(±6.41)	10-41			63	23.30(±6.80)	14-45		
Education										
Basic education (Diploma, Associate degree, BSN)	693	25.08(±6.09)	10-43	4.36	<.001^a	688	25.07(±6.13)	10-48	1.95	.05 ^a
Higher education (MSN, DNP, PhD)	205	22.94(±6.36)	10-42			202	24.10(±6.47)	11-45		
Position										
Bedside staffs	535	24.77(±6.19)	10-43	0.72	.47 ^a	533	25.00(±6.33)	10-48	0.45	.65 ^a
Non-bedside	340	24.46(±6.26)	10-41			333	24.80(±6.11)	11-45		

Have experience of COVID-19 patient care										
Yes	359	24.10(±6.05)	10-42	1.94	.05 ^a	355	25.21(±6.30)	11-44	-1.41	.16 ^a
No	537	24.92(±6.31)	10-43			534	24.61(±6.18)	10-48		
Provision of PPE or mask from workplace										
Yes	689	23.75(±6.05)	10-42	7.71	<.001 ^a	685	24.34(±6.10)	10-48	4.56	<.001 ^a
No	207	27.43(±5.92)	14-43			204	26.58(±6.33)	12-44		
Involved with developing policies procedures to prepare for COVID-19										
Yes	292	23.52(±5.83)	10-41	3.54	<.001 ^a	291	24.43(±6.12)	11-44	1.35	.18 ^a
No	599	25.09(±6.36)	10-43			592	25.04(±6.28)	11-44		
Had taken any training/course about to care COVID-19 or protect self										
Yes	583	23.76(±6.13)	10-43	5.51	<.001 ^a	576	24.68(±6.33)	10-48	1.18	.24 ^a
No	315	26.11(±6.08)	11-43			314	25.20(±6.02)	11-43		
Had asked to work at higher acuity levels to care for patients beyond the usual practice										
Yes	376	26.96(±5.50)	11-43	-10.47	<.001 ^a	374	26.48(±6.13)	11-43	-6.84	<.001 ^a
No	518	22.85(±6.16)	10-42			512	23.66(±6.01)	10-48		
Offered accommodation from institution										
Yes	208	23.39(±6.21)	10-39	3.28	<.01 ^a	198	24.69(±6.50)	11-45	0.43	.66 ^a
No	675	25.00(±6.20)	10-43			678	24.91(±6.16)	10-48		
COVID-19 test										
Tested and received negative results	403	24.38(±6.29)	10-43	0.65	.52 ^b	400	24.97(±6.26)	10-43	0.30	.74 ^b
Tested and received positive results	56	25.32(±6.48)	10-42			53	25.25(±6.48)	13-42		
Never been tested	441	24.67(±6.11)	10-42			438	24.71(±6.17)	11-48		
Mask policy										
Yes	808	24.71(±6.15)	10-43	-1.83	.07 ^a	801	24.92(±6.17)	10-48	-0.74	.46 ^a
No	93	23.47(±6.59)	10-40			92	24.41(±6.71)	12-43		

Note. Analysis based on the pairwise deletion of missing data.

^a is the p-value obtained from the independent samples *t*-test, ^b is the p-value obtained from the one-way ANOVA *F* test, and ^c is the p-value obtained from the Welch's ANOVA *F* test

Table 5*Correlations of Continuous Variables and Burnout and Secondary Traumatic Stress*

	<i>N</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Burnout	901	24.58	6.21	—									
2. Secondary traumatic stress	893	24.87	6.23	.58**	—								
3. Resilience	896	26.49	7.01	-.58**	-.28**	—							
4. Fear of infection themselves	917	5.31	3.16	.40**	.39**	-.40**	—						
5. Fear of bringing COVID-19 to family	917	6.67	3.33	.24**	.31**	-.23**	.69**	—					
6. Intention to leave their job	916	3.05	3.54	.47**	.41**	-.29**	.46**	.38**	—				
7. Organizational support to prevent spread of COVID-19	894	8.41	2.45	-.37**	-.18**	.39**	-.36**	-.32**	-.29**	—			
8. Age	860	37.86	11.94	-.17**	-.20**	.19**	-.18**	-.27**	-.16**	.11*	—		
9. Years of practice	896	13.23	11.36	-.15**	-.18**	.14**	-.13**	-.23**	-.14**	.11*	.88**	—	
10. Incidence rate	921	10.34	11.99	-.31**	-.16**	.43**	-.26**	-.18**	-.16**	.28**	.12**	.06	—

Note. Analysis based on the pairwise deletion of missing data.

* $p < .01$. ** $p < .001$

Table 6*Regression Results for Burnout and Secondary Traumatic Stress by Characteristics*

Predictor	Burnout			Secondary Traumatic Stress		
	<i>B</i> ^a	<i>SE</i>	β ^b	<i>B</i> ^a	<i>SE</i>	β ^b
Age	-0.05	0.03	-0.09	-0.09*	0.04	-0.16
Female vs. Male	-0.24	0.53	-0.04	0.26	0.68	0.04
Higher education vs. Basic education	-0.12	0.46	-0.02	-0.16	0.58	-0.03
Years of practice	0.02	0.03	0.03	0.03	0.04	0.06
Non-bedside vs. Bedside staffs	0.92*	0.39	0.15	1.59**	0.48	0.26
Fear of infection themselves	0.11	0.08	0.06	0.32**	0.10	0.16
Intention to leave their job	0.43***	0.05	0.25	0.38***	0.07	0.22
Resilience	-0.33***	0.03	-0.37	-0.13***	0.04	-0.15
Certified in a specialty	0.68	0.38	0.11	0.22	0.44	0.03
Have experience of COVID-19 patient care	0.59	0.35	0.09	0.73	0.42	0.12
Involved with developing policies procedures to prepare for COVID-19	-0.11	0.35	-0.02	-0.29	0.45	-0.05
Had asked to work at higher acuity levels to care for patients beyond the usual practice	1.46***	0.35	0.24	1.01*	0.45	0.16
Had taken any training/course about to care COVID-19 or protect self COVID-19 test	-0.17	0.33	-0.03	0.21	0.42	0.03
Positive results vs. Negative result	1.48*	0.74	0.24	0.16	0.89	0.03
Never been tested vs. Negative result	0.26	0.31	0.04	0.10	0.38	0.02
Fear of bringing COVID-19 to family	-0.02	0.08	-0.01	0.16	0.09	0.08
Provision of PPE or masks from workplace	-0.87*	0.40	-0.14	-0.67	0.49	-0.11
Had support to prevent spread of COVID- 19 from organization	-0.26**	0.08	-0.10	-0.03	0.10	-0.01
Types of organizations						
Outpatient or non-acute vs Inpatient	-0.71	0.38	-0.11	-0.17	0.48	-0.03
Advanced nursing vs Inpatient	-0.74	0.68	-0.12	-0.26	0.86	-0.04
Offered accommodation from institution	-0.88*	0.40	-0.14	-0.02	0.53	0.00
Country of practice						
Turkey vs. US	-2.35***	0.65	-0.38	-1.23	0.85	-0.20
Japan vs. US	2.25**	0.82	0.36	-0.50	1.00	-0.08
Korea vs. US	2.42**	0.80	0.39	2.94**	1.13	0.47
Guinea vs. US	-4.39*	1.69	-0.71	1.67	2.54	0.27
Other countries vs. US	-2.46	1.27	-0.40	-1.60	1.36	-0.26
Incidence rate	-0.06*	0.03	-0.12	-0.06	0.03	-0.12
Mask policy	-1.87	0.97	-0.30	-1.80	1.12	-0.29
Incidence rate×Mask policy	0.08*	0.04		0.09*	0.04	

Note. *N* = 921.

^a *B* is an unstandardized regression coefficient. ^b β is a standardized regression coefficient. For the dummy-coded predictors, $\beta = B/sdy$. For the numeric predictors, $\beta = (B*sdx)/sdy$. * *p* < .05. ** *p* < .01. *** *p* < .001.

Figure 1

The Socio-ecological Model based on McLeroy et al., 1988

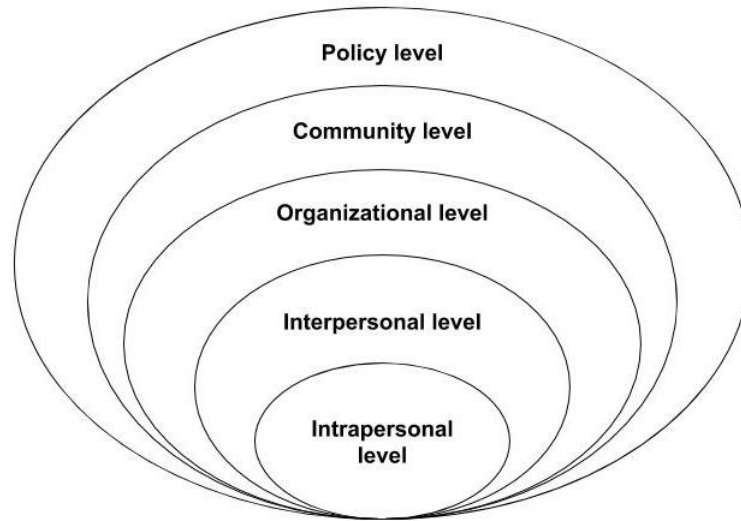


Figure 2

The Professional Quality of Life Model (Stamm, 2010)

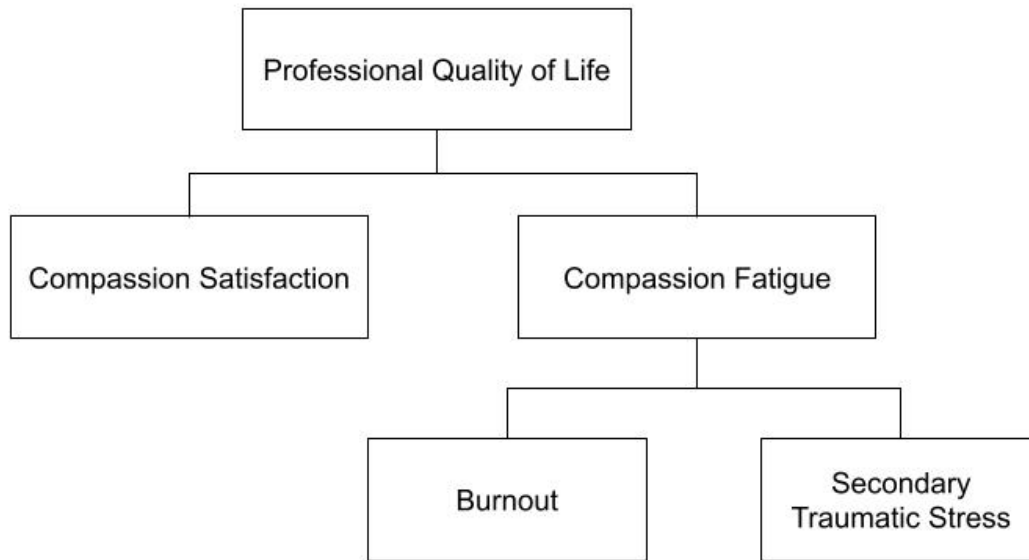


Figure 3

The Proposed Conceptual Model of This Study

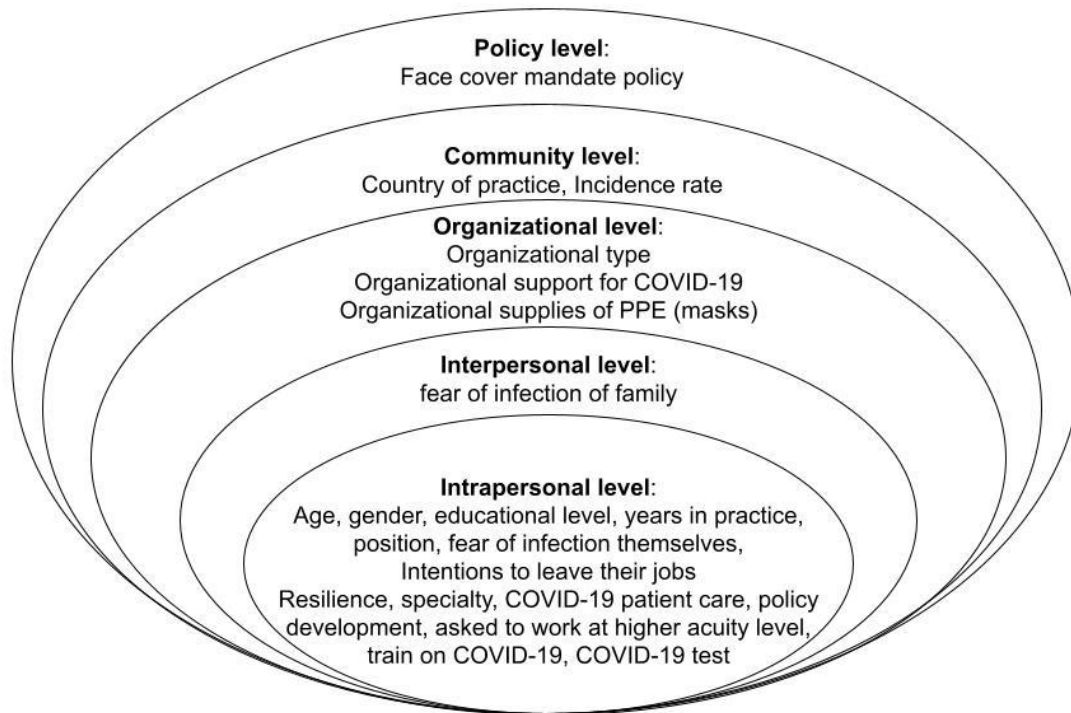


Figure 4

Predicted Burnout by Mask Policy and Incidence Rate

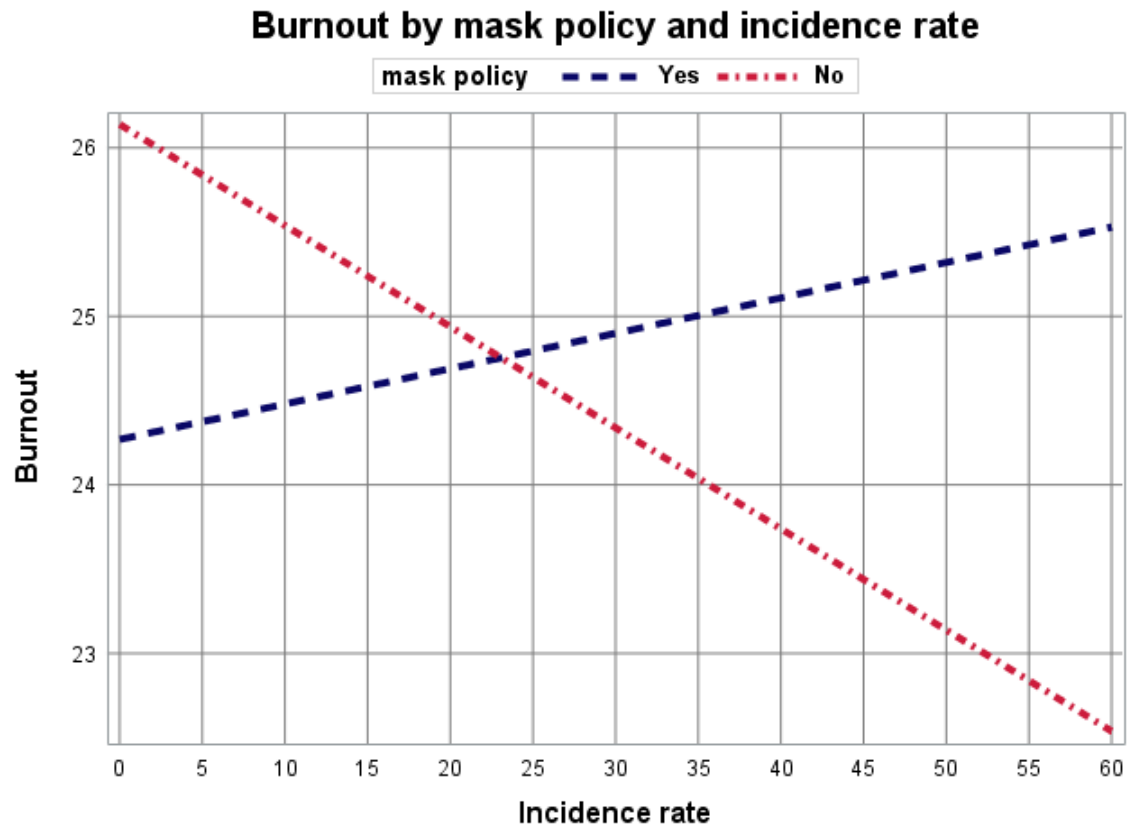


Figure 5

Predicted Secondary Traumatic Stress by Mask Policy and Incidence Rate

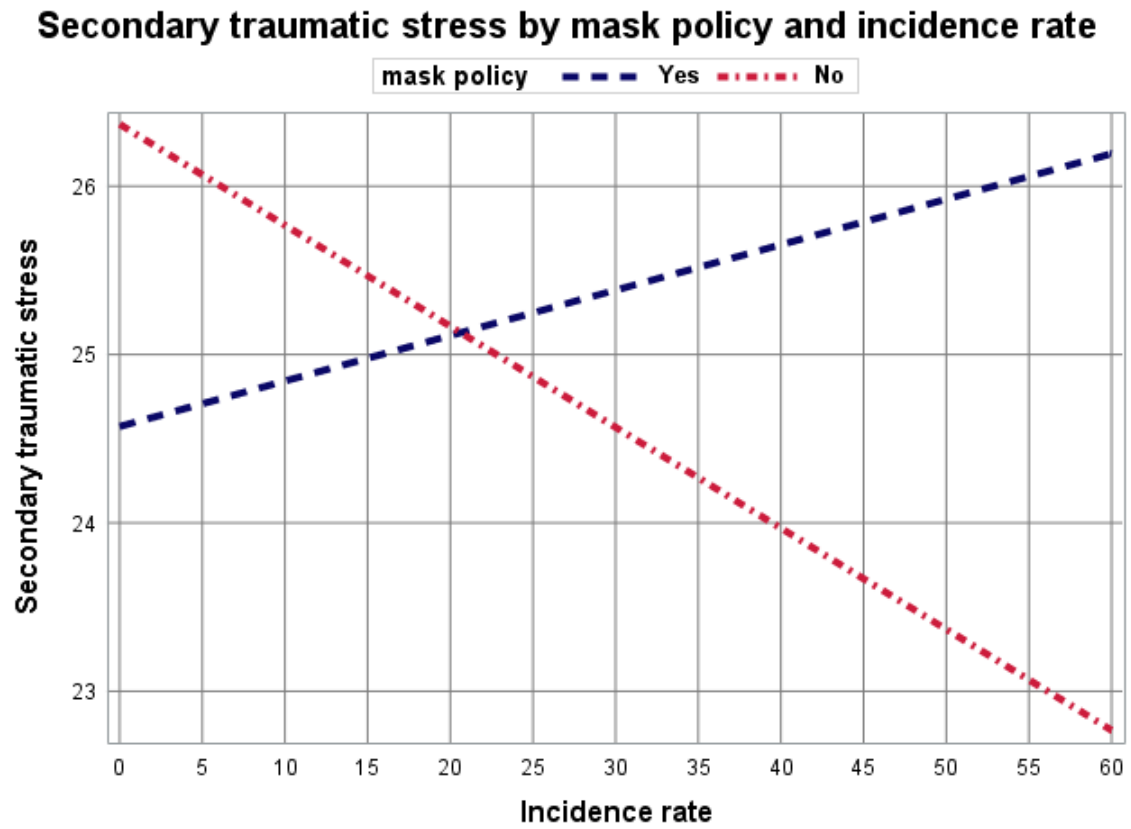
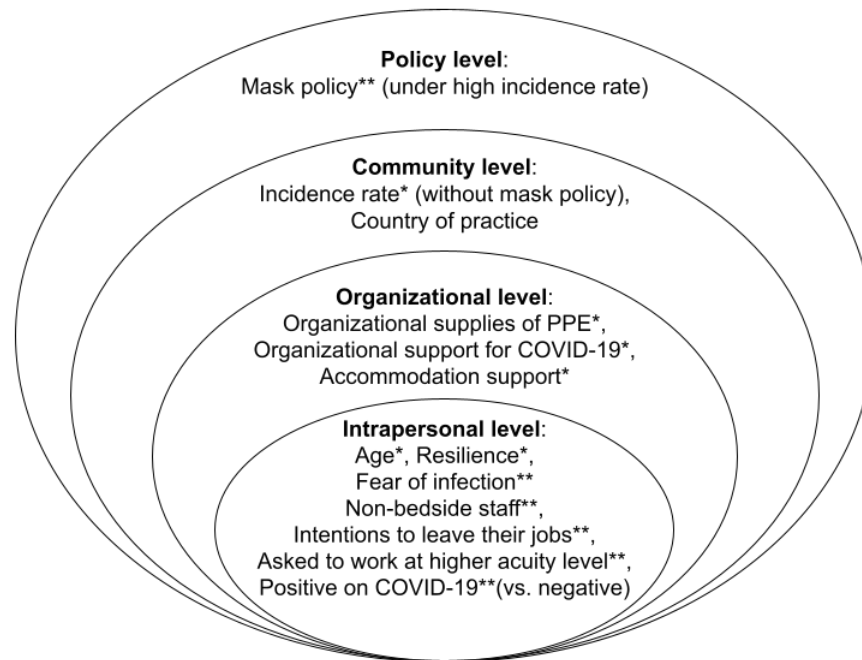


Figure 6

Conceptual Framework of Factors Associated with Burnout or Secondary Traumatic Stress



Note. *: negative relationship. **: positive relationship

APPENDIX B
UNIVERSITY HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
APPROVAL DOCUMENT



EXEMPTION GRANTED

[Elizabeth Reifsnider](#)
[EDSON: Administration](#)
602/496-1394
Elizabeth.Reifsnider@asu.edu

Dear [Elizabeth Reifsnider](#):

On 7/23/2020 the ASU IRB reviewed the following protocol:

Type of Review:	Modification / Update
Title:	Coronavirus (COVID-19): How can Nurses Prepare for Patient Care and Protect Their Own Health?
Investigator:	Elizabeth Reifsnider
IRB ID:	STUDY00012060
Funding:	Name: ISSR - Research Support Team
Grant Title:	None
Grant ID:	None
Documents Reviewed:	None

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 on 7/23/2020.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrator

cc:

Keenan Pituch
Elizabeth Reifsnider
Soo Jung Jo