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## The Effects of COVID-19 on Healthcare Workers: An Exploration of Burnout

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The Effects of COVID-19 on Healthcare Workers: An Exploration of Burnout

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NURS 4500: Nursing Research and Senior Thesis

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### **Abstract**

The healthcare workplace has been challenged with the SARS-CoV-2 corona virus (COVID-19) for majority of the year 2020 and it has posed a number of challenges for healthcare workers (HCWs). Due to the increased workload and demanding work hours, the prevalence of physician burnout has increased amongst this population. The escalation of burnout may lead to negative effects on physical and mental health. This poses a health concern amongst patients because the increase of burnout affects patient care, safety, and quality of care. Various surveys have been sent out to HCWs in order to determine if burnout has increased within this population and the relationship of the contributing factors and outcomes. From the research that has been compiled over the past few months, it has shown that the influx of COVID patients has greatly impacted stress levels within the work environment. Overall, the survey results have shown that HCWs need more accessible resources in order to help decrease their levels of burnout. These resources may alleviate stress levels and provide effective strategies for improving physical and mental health. Resources that have been mentioned includes a digital care package that contains useful information such as mindfulness-based stress reduction techniques. This thesis will include a literature review of research articles regarding the burnout due to the COVID-19 pandemic, as well as a proposal for further research on alleviating healthcare workers' fatigue.

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## Introduction

It is crucial to address the burnout that is occurring amongst a wide variety of health care workers who are currently fighting against the COVID-19 pandemic. This pandemic has resulted in an international public health emergency and has affected populations all across the world. Although this is not the first pandemic to have occurred, past experiences such as the SARS outbreak, have shown frontline healthcare workers reporting a lack of support and lasting psychological symptoms. COVID-19 has proven to be very aggressive and attacks the respiratory system, which places patients into the hospital. This has led to many hospitals and clinics struggling to balance patient occupancy and proper protective equipment (PPE). With a high inflow of patients and an inadequate amount PPE, these circumstances may be correlated with high amounts of stress. Another factor that contributes to their stress is the fear of spreading this disease to many others. Due to this, professionals have reported feeling unprepared and confused when faced with treating COVID patients especially since equipment guidelines and treatments were not established in the beginning (Xiang, 2020). As a consequence, this population reported feelings of helplessness, isolation, and uncertainty.

Burnout is a psychological syndrome that can be described as chronic exhaustion. This phenomenon may result from extremely stressful work conditions where an individual's stress is not properly managed (WHO, 2020). Experiencing burnout may have a very strong impact on a person's psychological and physical well-being and affects various aspects. Burnout can be categorized as feelings of exhaustion, negative feelings towards one's job, and reduced work productivity (WHO, 2020). A study was conducted in order to assess the prevalence of burnout in healthcare professionals working in hospitals within Northern Italy. After analyzing the survey results, it was shown that there were moderate to severe levels of emotional exhaustion and

reduced personal accomplishment in more than 60% of the sample (Guisti, 2020). Professionals experiencing burnout may experience a huge mental strain on themselves while fighting this virus. The study has also shown a prevalence in other mental health disorders such as depression, anxiety, and stress amongst 25% of their sample (Guisti, 2020). Due to the hospitals being unprepared and not well-equipped to face this unprecedented emergency, this has contributed to many healthcare professionals experiencing burnout.

### **Problem Statement**

Addressing physician burnout is important in order to preserve an individual's optimal health. Healthcare professionals who are unable to care for their own physical and mental wellbeing are not fit to treat those in the hospitals. Identifying this issue and providing support may enable HCWs to deliver the best possible care amongst all their patients. Not only is it necessary to take care of those who are working the frontlines, it is also important to examine how it has affected those in the past and to use that knowledge to help treat what they are currently facing now. This fear follows many healthcare workers home due to the uncertainty of spreading COVID-19, and it is crucial to address the factors that are contributing to the stress. A study conducted on nurses working the frontlines in Wuhan have reported that their feelings of burnout were moderately negatively correlated with a lack of social support (Hu, 2020). A lack of social support was one of the important factors correlated to negative psychological outcomes. There must be proper emotional support for those struggling to balance physiological and psychological changes, as well as addressing other contributing work-related factors that can be modified in order to decrease burnout levels.

### **Research Questions**

Is there an increase in burnout amongst critical care workers due to the COVID-19 outbreak?

What kind of interventions can be implemented to alleviate the burnout?

### **Literature Review**

The research literature was explored using several databases through the Dominican University of California's library. The databases that were used were PubMed and Iceberg. Eight research articles have been analyzed in order to summarize the prevalence of burnout due to the COVID-19 pandemic amongst healthcare workers. A combination of keywords that were used for the search of these research articles include: COVID-19, burnout, interventions, healthcare workers, and critical care.

The literature review of this paper will be divided into 3 categories. The first category will include articles discussing the prevalence of burnout during the COVID-19 pandemic and how it has increased before the beginning of the outbreak. The second category will discuss the associated factors and outcomes that are linked to the increase of burnout. The third category will discuss the current interventions that have been implemented during this pandemic. The literature review table may be referenced for further information regarding any of the articles discussed (See Appendix).

### **Prevalence of Burnout during Pandemic**

The healthcare environment places many of its workers at high risk for burnout. A majority of the day consists of a high demand of care for patients. Burnout is incredibly common amongst all HCWs and has a negative impact on all aspects of health. The COVID-19 pandemic has placed an extreme amount of stress on HCWs who have been working the frontlines and they have faced high amounts of patient workload in order to combat this disease. The origin of

COVID-19 was traced back to Wuhan, China, where many thousands of HCWs around the country were sent to assist local healthcare teams to care for these sick patients. It was recorded that burnout was found to be more prevalent in countries where the pandemic was surging at the time of when the data was collected.

A cross-sectional study was conducted in two hospitals in Wuhan, China, where they focused on frontline nurses who were caring for COVID-19 patients. A total of 2,014 frontline nurses participated in completing an online questionnaire that measured their levels of burnout using the Chinese version of the Maslach Burnout Inventory: Human Services Survey (MBI-HSS) (Hu, et al, 2020). This survey contained 22 items that were measured by a seven-point Likert scale which measured 3 areas such as emotional exhaustion, depersonalization, and personal accomplishment.

Results from this survey showed that 835 (41.5%) frontline nurses reported high levels of emotional exhaustion while 556 (27.6%) nurses marked high depersonalization while working caring for COVID-19 patients (Hu, et al, 2020). A majority of participating nurses also disclosed that they were experiencing moderate (28%) and high (36.2%) levels of fear when delivering care. From conducting this study, the results demonstrate that many of the frontline nurses in Wuhan experienced moderate levels of burnout, which indicates a high prevalence amongst HCWs due to the increase of COVID-19 patients. This increase of patient workload can significantly impact a nurse's likelihood of experiencing burnout. These results portray the prevalence of burnout and how it impacted the nurses working directly with COVID-19 patients in the very beginning of the pandemic.

HCWs are also faced with a significant amount of challenges that may contribute to the increased prevalence of burnout that is occurring worldwide. Safety is an important factor



regarding HCWs and it is crucial for hospitals to ensure this in order to allow their workers to provide the most adequate care for patients. At the beginning of this pandemic, hospitals were struggling to provide adequate safety for its workers, which lead to many HCWs struggling to cope with their workload. A cross-sectional study conducted by the Departments of Onco-Anesthesia and Palliative Medicine in New Dehli, India, created a survey to measure the specific challenges faced while working the frontlines.

The challenges faced by the HCWs were divided into two categories, personal or individual challenges as well as those faced in respective work areas. Out of the 110 participants in this study, 93 (84.54%) felt like there was a risk of infection to themselves as well as their family, and 74 (67.27%) reported that they have experienced disruption of their daily activities (Riniki, et al, 2020). Being a risk of infection forces many HCWs to stay away from family members, ultimately isolating themselves from those who support them. Some may have experienced a change in their home life due to the new demanding work hours from the hospital, where they may be spending more time there rather than home. These personal challenges that impacts how HCWs perceive themselves and now they are unable to carry out their lives as it once was before the pandemic occurred. Some work specific challenges that HCWs faced were, no protocol for patient management (56.36%), less staffing (40%), and a delay in discharging duties for patients (38.18%) (Riniki, et al, 2020). These work conditions may cause more anxiety since employees would be working without formal guidance. Some may refuse to work under these conditions, and this may impact how fast hospitals are able to discharge their patients in a timely manner. These are some examples of the various challenges HCWs must face when coming into the hospitals and providing patient care. Without proper management of these challenges, the prevalence of burnout will continue to increase.

### **Factors and Outcomes due to Burnout**

At the beginning of the pandemic, many hospitals did not have established guidelines or treatment plans in relation to how to care for COVID patients, which also resulted in having a limited availability of personal protective equipment. Many HCWs were faced with feelings of uncertainty and unpreparedness when having to treat these patients. A cross sectional study was conducted in order to specifically measure the outcomes from HCW burnout. The researchers used the Maslach Burnout Inventory (MBI) is a 22-item questionnaire which uses a 5-point Likert scale in order to assess 3 components of burnout syndrome (Maslach et al, 1997). These components are emotional exhaustion, depersonalization, and personal accomplishment. Higher scores within the emotional exhaustion and depersonalization categories may indicate a higher likelihood of experiencing burnout, while higher scores in personal accomplishment indicates less burnout.

An online questionnaire was sent out to HCWs working in the hospitals of Istituto Auxologico Italiano in order to investigate burnout and psychological factors. The results reported that 107 (35.7%) had moderate and 105 (31.9%) had severe levels of emotional exhaustion, moderate (31.9%) and 40 (12.1%) severe levels of depersonalization, and 132 (40.1%) had moderate and 113 (34.3%) had severe levels of reduced personal accomplishment (Giusti, et al, 2020). There was a high prevalence of severe levels of burnout in this sample. The high prevalence has a negative impact on HCWs, and this may affect how they cope with this increased demand of care. The increased workload and constant contact with COVID-19 patients may consume an individual's time and energy, leading to moderate and severe levels of depersonalization. They may become absorbed into their work, and constantly being placed in this high stress environment may affect how they perceive themselves. With this high patient

load, many employees feel powerless when faced with an excessive amount of negative health outcomes. Being dealt with numerous amounts of deaths, HCWs around the world may feel as if they are not doing enough because they are faced with more patient losses than successes.

Healthcare professionals are faced with high stressors while working with patients during the pandemic. The first intercontinental survey was conducted in order to examine the perceptions of HCP across the world regarding the COVID-19 outbreak. Participants from 60 countries responded to a survey that focused on measuring exposure, perception, and workload. Within the survey 51.4% of participants reported emotional exhaustion among 33 countries as a result of their burnout while working during the pandemic (Azoulay, et al, 2020). Across all the countries, the reported burnout was associated with various factors. Among one of the sections from the survey, participants answered “No” regarding what they were not being provided from the hospital. This includes how they felt about being provided adequate PPE (45.2%), available mental health support (52.2%), and being provided COVID-19 specific training (53.1%) (Azoulay, et al, 2020). All these factors impacted work productivity and safety because none of these options were made accessible to HCWs. It placed many workers at risk for contracting the virus, as well as contributing to their anxiety and fear. These components may be taken into consideration in order to decrease the likelihood of HCW burnout.

The factors contributing to the increased likelihood of experiencing burnout affects the mental health outcomes in HCWs. A meta-analysis was done in order to measure the most frequently reported psychological symptoms. Fear (43.7%) was one of the most common mental health concerns amongst this population. This feeling of fear was associated with a frequency of psychological distress (37.8%) as well (Salazar de Pablo, et al, 2020). This may be due numerous contributing factors of the pandemic such as the increase in demand of longer shifts and hours.

The report also stated a higher frequency of anxiety (29%) and depressive (26.3%) features within HCWs (Salazar de Pablo, et al, 2020). This was compared to the previous population who experienced the SARS/MERs infection. Anxiety and depressive features had an increase of about 10% from COVID-19 pandemic compared to the previous epidemics. HCWs also reported having stigmatization feelings (39.5%) compared to the general population (Salazar de Pablo, et al, 2020). Due to the fact that these HCWs are in contact with COVID-19 patients, some expressed that their family members and friends have avoided them in fear of contracting the virus. This may contribute to HCWs feeling isolated from their support system which ultimately takes a toll on their mental health.

Despite the enormous amounts of challenges these HCWs are facing every day, one systematic review found that there was a great sense of duty and dedication for patient care. From this study, nurses still felt a great sense of professional duty to work during this pandemic, regardless of how dangerous the situation is (Fernandez, et. al, 2020). Many of these nurses took pride in their professionalism and felt like they still had a role to perform regardless of the infection risk, ultimately showing a great commitment to patient care. This commitment creates an ethical and moral dilemma, since many have to choose between exposing themselves to patients or their families. This sacrifice continues to affect the psychological health of healthcare professionals.

### **Interventions to Decrease Burnout**

In the midst of the COVID-19 pandemic, it is crucial to protect the mental health of the HCWs in order to upkeep the working capacity that is required to treat patients. Fear and anxiety are very prevalent amongst this particular population due to the uncertainty of COVID-19 and the increased workload that comes with the sick patients. There must be a greater promotion of

self-care in favor of the HCWs in order to support them in creating healthy coping skills while fighting this disease. There is a huge need for psychosocial support in order to create a safe environment with clear organizational strategies to ensure communication and support among all healthcare team members. Making accessible resources and providing them with support will help create resiliency among all healthcare teams.

One intervention that was created in the United Kingdom (UK) consisted of a digital care package in order to help support the psychological wellbeing of HCWs during and possibly after the COVID-19 pandemic. The digital package was named, “Psychological Wellbeing in Healthcare Workers: Mitigating the Impacts of COVID-19” where the package was accessed over 17,000 times through social media within a week of release (Blake, et al, 2020). This package includes tools to help provide HCWs with resources about topics such as communication, social support, self-care, managing emotions, etc. Upon testing this digital care package, creators decided that the material must be interactive and engaging, such as including phone applications and video materials. In order to test this package, 97 HCWs were divided into three consultation groups. The discussions were held for 3 months and participants discussed their perceptions about the digital platforms and the need for psychological support. Many of them were extremely positive about using this new form of technology in order to help promote psychological health. They felt like using this care package would also address the issues that are occurring in the workplace environment. This intervention has provided strong evidence that there is a high demand for delivering support to HCWs who are experiencing burnout and are in need of resources to promote healthier coping mechanisms.

Another intervention that may be implemented is the Mindfulness-Based Stress Reduction (MSBR) program which works to manage work stress and improve patient outcomes

(Conversano, et. al, 2020). This program may be very effective for HCWs who are struggling to cope with the stress of COVID and this may help teach how to better deliver patient care when faced with challenges. In order to test the results, researchers may use the Mindfulness Attention Awareness Scale (MAAS) in order to evaluate mindfulness levels for burnout (Conversano, et. al, 2020). For example, one program is called, “Mindful Nursing Pilot Study” where 46 nurses participated in a 10-week mindfulness training program. This classe was held once a week for about thirty minutes. After participating in these classes, the nurses reported an improvement in levels of mindfulness, burnout, stress, and patient satisfaction (Conversano, et. al, 2020). MSBR may help address the psychological challenges that the HCWs face and help improve the levels of burnout that has been caused by the pandemic.

An additional method that is used to help combat burnout from the pandemic is based off of the Acceptance and Commitment Therapy (ACT) model. This type of educational model helps create psychological flexibility through acceptance and mindfulness (Cartwright, 2020). Dr. Russ Harris, a psychotherapist, has created a resource to help HCWs manage and cope with the stress from the work environment. He has created an acronym called, “FACE COVID” in order to create awareness about how the current pandemic may impact individuals. This tool may help normalize responses of fear and anxiety by allowing HCWs to take a step back and acknowledge what they may be feeling at the moment (Cartwright, 2020). This acronym is easily accessible, and many workers may be able to use this tool at any moment when working in the hospital.

The acronym is:

F- Focus on what’s in your control

C- Committed action

A- Acknowledge your thoughts and feelings

O- Opening up

C- Come back into your body

V- Values

E- Engage in what you're doing

I- Identify resources

D- Disinfect and distance

This acronym will take an individual through a series of steps in order to help focus on what feelings they may control in order to help manage their psychological response in times of crisis. This pandemic has created an environment that consists of stress and high demanding work, which makes it extremely difficult for an individual to manage their emotions and open up about how they feel about their experiences. It is crucial during this time to help educate about self-compassion and the importance of taking care of those who are working the frontlines.

### **Literature Review Conclusion**

According to the data collected during this literature review, there has been an increase in burnout amongst HCWs during the COVID-19 pandemic. Many factors play a role in this phenomenon and it leaves a significant impact on many of these HCWs' health. Their burnout is influenced by many challenges that are posed in the work environment. All the articles have presented the importance of addressing this burnout and the need for more interventions in order to help decrease the anxieties and fears that are shared amongst this particular population.

There are various strengths in the articles that have been found in this literature review. There have been various surveys conducted in numerous parts of the world in order to measure the levels of burnout. The articles have been able to provide a more complete picture on how the impact of this pandemic has affected mental health and the wellbeing of many. The samples that have been chosen in numerous studies have a diversity in many of the HCWs which provides a valid representation of how many feel will working in this strenuous and high tension environment. Some of these articles have also provided a first view on how the pandemic

affected HCWs in the very beginning and has been able to navigate and pinpoint the associated factors that are related to burnout.

There are a few limitations across the articles that have been chosen in this literature review. Heterogeneity is a big factor amongst all the sample groups, which may have an effect on how the results turned out among all the surveys conducted. The timing of the surveys may also be a weakness and it may generalize the HCW population as a whole, when some may not be reporting levels of burnout at that time. Some of the studies that may have been conducted early in the pandemic before problems became severe may not be reporting a complete picture of the level of burnout. There are not a sufficient number of reliable scales developed in order to measure fear, so some results may be skewed when trying to measure specific emotions reported by the samples. There is also a lack of follow-up from the surveys collected in this literature review, and it is difficult to track their mental health statuses over time, especially once the pandemic is over. All the articles that were chosen specifically looked for English speaking participants, which may have excluded various other resources from providing additional information about burnout. All these limitations may be taken into consideration in order to further investigate how to combat the increase of burnout during the COVID-19 pandemic.

### **Theoretical Framework**

Healthcare workers experience an enormous amount of stress while working in the high demanding conditions of the work environment. The Neuman Systems Model is a theoretical framework that revolves around the structure of stressors, the emotional response to these stressors, and the corresponding interventions. This framework establishes a holistic approach which incorporates five major factors which include, physiological, psychological, socio-cultural, spiritual, and developmental (Kerime, 2017). With these factors, the goal is to organize



intra-, inter-, and extra-personal stressors. With organizing how these stressors affect an individual, it may then help identify and analyze the main source of where the stress may be coming from. Whether it is internally or externally, using this model allows the individual to assess what the problem is, how they perceive it, and what can be done for relief. With the use of a digital care package and using MBSR techniques, this may help HCWs identify what causes stress in the work environment. This can help measure the level of burnout they are experiencing and determine the specific interventions to decrease their stress. This model emphasizes the importance of incorporating the patient's needs as well as maintaining optimal wellness within ones' self. With implementing interventions that will help healthcare workers cope with stress related to burnout, it will lead to healthier coping mechanisms and a decrease in reporting high levels of burnout due to the pandemic.

### **Proposal for Further Study**

The COVID-19 pandemic has called for an urgency of effective and active interventions in order to treat physician burnout. This paper has determined the increase of physician burnout has been influenced by the pandemic and affected physical and emotional health. From the interventions that have been shared amongst this population, many of these studies share the same limitations. Since the pandemic has started, there have been no long-term studies providing lasting and effective support to those struggling to cope with their burnout. In order to determine the long-term effects, longitudinal studies must be conducted to accurately measure the strengths and success of these various interventions. Further studies are also essential in order to evaluate HCW's perceptions about the interventions due to the fact that many were limited. These results were limited due to the timing of the research studies. Many were conducted early in the pandemic. More research should also look at an equal distribution of men and women, since a

majority of the sample groups were primarily female. The research articles that are provided within this literature review has provided resourceful data in order to determine the future need on how to follow up with a lot of these studies, which will then strengthen the existing burnout interventions.

The research question that is being studied is, what are the long-term effects of these COVID-19 burnout interventions. With the sources that were included within the literature review table, these mentioned interventions are useful to help aid and manage the burnout that is felt from this population. A majority of the studies that were analyzed in this paper had a cross-sectional design study, and the major weakness associated with this design is the lack of follow-up with the participants. The timing of the surveys within these studies were completed during the peak of the pandemic and may limit the generalization of the participants when answering their perceptions of burnout. For the interventions that were mentioned in the literature review, it would be necessary to follow up with how the participants are currently doing and how effective these resources were in order to help treat burnout.

In order to conduct a fair and unbiased study, it is important to maintain respect and neutrality towards the participants. The participants will be provided with sufficient information about why it is important to investigate further with these cross-sectional studies and how these future results will help distinguish what has been effective for treating burnout and what is not. These future results will in turn help those who are struggling with burnout and will be beneficial in order to help promote the health of thousands of healthcare workers. The information will help develop additional ways to improve the digital care package accordingly to help treat the burnout that has been caused from this pandemic. The participants will remain confidential while the research is being conducted and they will not need to provide any personal or identifying

information. The participants will be informed that the survey will be confidential regarding any of the answers they choose to share. They will also be informed that they have full rights to withdraw involvement from this study at any moment. All information gathered from the survey will not be shared and will stay confidential.

Recruitment for this study would require identifying hospital employees that will meet the inclusion criteria and are currently working within the hospitals that are identified within the Santa Clara county limits. In order to recruit these participants, snowball sampling will be used where healthcare workers may receive information about this study through email and word of mouth. Inclusion criteria involves the employee must be a practicing physician or nurse, they have experienced working with COVID-19 patients, and they must have access to online resources through digital devices such as a laptop or phone. Once the participants have been identified for the study, the research team who will be conducting the project will explain the purpose of the study, which will include the informed consent, requirements of the individual, and the possible benefits and risks of participating.

### **Primary Research Aim**

- To identify long-term effects of the COVID-19 pandemic on healthcare workers who experience burnout as well as the success of interventions designed to mitigate the impact.

This proposal consists of creating a longitudinal quantitative study that will be conducted within a five-year timeline. The population the sample will be representing are hospital employees who are working in hospitals that belong to the Santa Clara County in Northern California. The Santa Clara county was among one of the first counties during March of 2020 in Northern California that began the shelter in place order to minimize the spread of COVID-19.

The surge of COVID-19 cases began to overwhelm various parts of California, where many hospitals began to struggle finding spaces to treat and house these COVID-19 patients. Many of the Santa Clara hospitals began treating these patients during the first few weeks of shelter in place and this population would be valuable to follow since they have been working the frontlines for many months now. The sample size that would be used for this study is 300 hospital employees, one half being male while the other is female. One shared limitation that was prevalent was that females were predominantly part of the sample sizes used in the studies. It would be beneficial to have an equal representation of men and women in order to evaluate how both genders handle stress. Therefore, an effort will be made to recruit male healthcare workers as well as female.

In order to collect the data, this study will be using the same Digital Learning Package Scale that was used for the UK sample group for the new survey results. This is a Likert scale which rates the participant's responses from 1-10, and also includes 2 yes or no questions. Some of the questions that were used for collecting data were if there were financial challenges, were there a lack of required technical skills, time challenges, their perceived usefulness of the package, etc. (Blake, et al, 2020). The survey will be distributed monthly to the participant's email where they can complete the questions on their own personal device. The survey results will then be compiled after five years and this will allow researchers to compare answers to the UK sample group as well as to evaluate if there are trends among the answers.

Inferential statistics will be used to analyze the data and researchers will use a dependent T test. This will allow for comparison of the survey results from the original UK sample who had first access with the digital care package. The UK answers will be compared with the Santa Clara county healthcare workers once all the data has been collected. This will allow for more insight

on the long-term effects of the digital care package. Researchers will be able to determine what components and resources were successful to HCWs and what has not been favored by the participants. By being able to determine what components were successful, this will help modify any needed changes for the digital care package. Having these survey results may also help future HCWs when trying to determine what stress-relieving interventions may be useful to alleviate the high burnout levels.

### **Conclusion**

The COVID-19 pandemic has created a variety of challenges throughout the nation and has impacted the health of many healthcare workers. The uncertainty of the pandemic has brought up feelings of anxiety and fear as many adapt to the adjustment of being at home. The dangers of being in contact with COVID-19 patients places healthcare workers in a difficult position when treating patients. This comes with the risk of bringing the virus home and potentially exposing it their own families. Many have expressed their concerns and fears about being an infection risk when they go home, and this ultimately affects how they feel emotionally. It is clear through numerous studies that the level of burnout has increased due to the new challenges COVID-19 has imposed on HCWs and their work environment. There have been a handful number of interventions that have been implemented in order to help with the increased levels of burnout. The need for these interventions has positively affected the lives of those who have been feeling the effects of high stress levels. Since the pandemic is still extremely prevalent in many countries, especially the United States, it is still important to measure how effect these interventions will be for the present and the future.

The current research has presented that many physicians and nurses have been working extremely long shifts which leaves many of them experiencing physical and mental exhaustion.

With the stress and anxiety that is created within the hospital work environment, it is crucial to implement stress-reducing techniques to HCWs to promote their health. HCWs would not be capable to provide adequate patient care if they are struggling to take care of their own health. As physicians and nurses continue to provide care to COVID-19 patients, it is important to provide available resources and emotional outlets to alleviate their stressors and to gain support during this unprecedented time. Upcoming and practicing physicians and nurses must be able to relieve their stress by using beneficial techniques such as meditation and participating in MSBR programs that will educate them on various coping styles.

The limitations of these studies show that there is still a need for follow-up on these HCWs about their perceptions about their levels of burnout and the effectiveness on the interventions. Conducting a study that will follow the same sample over a period of time will be able to provide more data on how effective these interventions were and if it did continue to alleviate burnout levels. Since many of these interventions were done during the beginning of the pandemic, it is hard to determine whether or not many of these will have long-term effects. There must be interventions that can sustain a long period of time, especially since it is uncertain on how long COVID-19 will be globally prevalent. Conducting research on MSBR may also be able to determine how effective these techniques may be for high stress situations such as a pandemic. If burnout levels may be managed, this may lead to the promotion of the physical and mental well-being of many physicians and nurses. The success of these resources will be able to promote a high functioning work environment, which may be able to lighten the heavy patient workload. The staff should be able to access these resources at any time in order to mitigate their stress and be able to work without fear or anxiety.

Since the pandemic has been on-going for several months now, there must be research following HCWs in order to evaluate the digital care package. It is also crucial to be able to compare this data from the United States with other countries where the pandemic is not as rampant. This will be able to allow researchers to investigate what works in aiding the physical and mental health of these workers. There has been a large amount of positive feedback regarding the digital care package, and this may prove to have potential in helping future HCWs who may need it if another pandemic were to occur. If the digital care package proves it has massive impact on decreasing burnout levels and promoting physical and mental health over a longer period of time, this will aid many physicians and nurses who are struggling with maintaining self-care during highly intense periods in healthcare.

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**Appendix  
Literature Review Table**

Purpose	Investigator	N	Sample	Design/ Methods	Major Finding	Strengths	Weaknesses
Understand the global impact of COVID-19 on HCWs who are working during the pandemic	Azoulay, E., De Waele, J., Ferrer, R., Staudinger, T., Borkowska, M., Pova, P., Iliopoulou, K., Artigas, A., Schaller, S. J., Hari, M. S., Pellegrini, M., Darmon, M., Kesecioglu, J., Cecconi, M., & ESICM (2020). Symptoms of burnout in intensive care unit specialists facing the COVID-19 outbreak. <i>Annals of intensive care</i> , 10(1), 110. <a href="https://doi.org/10.1186/s13613-020-00722-3">https://doi.org/10.1186/s13613-020-00722-3</a>	2,707	HCPs who had access to social media platforms	Cross-sectional survey	<ul style="list-style-type: none"> <li>• Principal stressors: the lack of PPE and the stress of work has affected completing household activities and social interactions</li> <li>• Main outcome in HCP-perceived burnout is emotional exhaustion</li> <li>• 51.4% of respondents from 33 countries reported emotional exhaustion</li> <li>• U.S. had the highest reported burnout among all countries at a rate of 62.8%</li> <li>• Common sources of anxiety: access to adequate PPE, bringing the infection home, and lack of access to up-to-date info and communication</li> </ul>	<ul style="list-style-type: none"> <li>• First intercontinental survey conducted</li> </ul>	<ul style="list-style-type: none"> <li>• This study did not initially provide the definition of burnout to participants</li> <li>• Minimal demographic data collection</li> <li>• There is potential selection bias. This may result in overrepresentation of HCWs who more active on social media forums since this was given through the internet.</li> </ul>

					<ul style="list-style-type: none"> <li>• Burnout was a predictor for conditions like musculoskeletal pain, prolonged fatigue, headaches, GI and respiratory issues</li> </ul>		
<p>To incorporate evidence-based info to rapidly develop and evaluate a digital learning package. Studying the success of the digital package will help support psychological wellbeing for HCWs</p>	<p>Blake, H., Bermingham, F., Johnson, G., &amp; Tabner, A. (2020). Mitigating the Psychological Impact of COVID-19 on Healthcare Workers: A Digital Learning Package. <i>International journal of environmental research and public health</i>, 17(9), 2997. <a href="https://doi.org/10.3390/ijerph17092997">https://doi.org/10.3390/ijerph17092997</a></p>	97	<p>Group 1: healthcare students (35)</p> <p>Group 2: RNs (25)</p> <p>Group 3: HCW from nursing and allied health professions (32) Kanban methodology</p>	Kanban methodology	<ul style="list-style-type: none"> <li>• Stakeholders were content about opportunity to use technology in order to promote health and wellbeing.</li> <li>• One requirement was to have the content be interactive and engaging. Some content examples were external reports, meditation guidance, apps, and video material.</li> <li>• A small part of the stakeholders expressed some concerns about the personal lack of technical skills among HCWs the accessibility for technical support.</li> </ul>	<ul style="list-style-type: none"> <li>• This package was very highly accessed within one week of the release.</li> <li>• There was a massive level of interest related to the positive feedback for the package in order to be used for psychological support.</li> </ul>	<ul style="list-style-type: none"> <li>• Some of the materials included in this package only were UK specific.</li> <li>• The package evaluation was limited to only a small sample of UK HCWs.</li> <li>• There is a need for further evaluation in order to investigate future perceptions about the use of the package and any potential changes that may be needed.</li> </ul>

<p>The systematic review summarizes the evidence about mindfulness and compassion-related qualities and the potential effects of MBSR on professionals' psychological health.</p>	<p>Conversano, C., Ciacchini, R., Orrù, G., Di Giuseppe, M., Gemignani, A., &amp; Poli, A. (2020). Mindfulness, Compassion, and Self-Compassion Among Health Care Professionals: What's New? A Systematic Review. <i>Frontiers in psychology, 11</i>, 1683. <a href="https://doi.org/10.3389/fpsyg.2020.01683">https://doi.org/10.3389/fpsyg.2020.01683</a></p>	<p>58</p>	<p>Search first identified 603 articles and were then screened for eligibility</p> <p>58 studies were included in quality analysis</p>	<p>Systematic Review. This conducted according to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA)</p>	<ul style="list-style-type: none"> <li>• 25 HCWs completed an 8-week MBSR program. Those who completed the program improved on mindfulness, burnout, depression, anxiety, stress, and satisfaction with life.</li> <li>• A group of 95 novice nurses used the app Headspace (audio-guided mindfulness meditation program). After using the app, the nurses began exhibiting more “awareness” and reported more compassion satisfaction and less burnout.</li> <li>• Online mindfulness training (3 1-hour modules) were completed by 178 HCPs. In conclusion, there were significant improvements in mindfulness scores and showed</li> </ul>	<ul style="list-style-type: none"> <li>• It combines mindfulness and compassion characteristics of healthcare workers.</li> <li>• There are various findings demonstrated the positive effects of MSBR for improving healthcare workers' mindfulness, self-compassion, and their quality of life.</li> </ul>	<ul style="list-style-type: none"> <li>• The search strategy only limited the inclusion criteria for the English or Italian language.</li> <li>• The search strategy limited the research for only peer-reviewed articles only.</li> </ul>
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					improvement in relaxation, resilience, stress levels, affect, and work levels.		
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<p>Incorporates and analyzes the current evidence around nurses' handling and caring for patients during pandemics. It will discuss about the current and future COVID-19 responses.</p>	<p>Fernandez, P. R., Lord, H., Halcomb, P. E., Moxham, P. L., Middleton, D. R., Alananzeh, D. I., &amp; Ellwood, L. (2020). Implications for COVID-19: a systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic. <i>International Journal of Nursing Studies</i>, 103637. Advance online publication. <a href="https://doi.org/10.1016/j.ijnurstu.2020.103637">https://doi.org/10.1016/j.ijnurstu.2020.103637</a></p>	<p>348</p>	<p>348 nurses that were chosen from 13 qualitative studies</p> <p>Most nurses were female and aged between 20-50 years</p> <p>Years of experience ranged from 3 months-43 years</p> <p>116 study findings</p>	<p>Systematic review. This study used Joanna Briggs Institute guidelines and the PRISMA systematic review reporting checklist.</p>	<ul style="list-style-type: none"> <li>• There is an ethical and moral dilemma for nurses during the pandemic. Many have to decide between treating their patients or attending to family responsibilities. Making these types of decisions may lead to social isolation as a result of having to separate from their family and friends.</li> <li>• Nurses have experienced heightened anxiety about their own health. This is associated with the risk of contracting COVID-10 and the possibility of death.</li> <li>• Many feel a sense of powerlessness while working and this is associated with the feeling of being overwhelmed. This places many of the HCWs under extreme</li> </ul>	<ul style="list-style-type: none"> <li>• This study used the standardized JBI critical appraisal instrument.</li> <li>• The potential bias was reduced through involving more than one reviewer during quality assessment, data extraction, and data analysis.</li> </ul>	<ul style="list-style-type: none"> <li>• The publications that were not indexed in these data bases had the potential to be excluded.</li> <li>• This review only included studies that were published in the English language. Female nurses were largely represented with the samples of the included studies.</li> </ul>
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					<p>pressure due to the high work demands and fear that comes from treating COVID-19 patients.</p> <ul style="list-style-type: none"> <li>• There is a lack of resources and consensus among hospitals when addressing appropriate infection control. This also adds stress on HCWs due to not being provided adequate protection while working. HCWs have expressed inadequate training about caring for patients affected by COVID-19. This has left many feeling confused and this may increase their risk for anxiety.</li> </ul>		
<p>Aims at assessing the prevalence of burnout and psychopathological conditions HCWs during the early phases of</p>	<p>Giusti EM, Pedroli E, D'Aniello GE, Stramba Badiale C, Pietrabissa G, Manna C, Stramba Badiale M, Riva G, Castelnuovo G and Molinari E (2020) The Psychological Impact of the COVID-</p>	<p>330</p>	<p>Health care professionals working at the Hospital of Istituto Auxologico Italiano</p>	<p>Cross-sectional study</p>	<ul style="list-style-type: none"> <li>• Factors such as an increased workload, constant contact with COVID-19 patients, and the psychological aspects that are related to patient</li> </ul>	<ul style="list-style-type: none"> <li>• This study included HCWs who were not directly working the frontlines.</li> <li>• The study specifically chose to include only doctors to</li> </ul>	<ul style="list-style-type: none"> <li>• The sample only consisted of doctors.</li> <li>• The target population only consisted of physicians and lacked diversity of other healthcare professionals who are also treating COVID-19 patients.</li> </ul>



<p>COVID-19. It also assesses the demographic, psychological, and work-related predictors of burnout.</p>	<p>19 Outbreak on Health Professionals: A Cross-Sectional Study. <i>Front. Psychol.</i> 11:1684. doi: 10.3389/fpsyg.2020.01684</p>				<p>care have been associated with affecting the levels of burnout.</p> <ul style="list-style-type: none"> <li>• There has been a lack of preparation for dealing with emergencies such as a pandemic. This may trigger traumatizing experiences for HCWs due to the uncertainty and stress of delivering patient care.</li> <li>• Coping with an increased demand of care creates a negative impact on the high prevalence of burnout. This may worsen and reduce the capacity of healthcare systems and the employees.</li> <li>• Within this study, there were moderate to severe levels of emotional exhaustion and reduced accomplishment within more than</li> </ul>	<p>try and maintain homogeneity within the responses.</p>	
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					<p>60% of the sample.</p> <ul style="list-style-type: none"> <li>The prevalence of clinical levels of depression, anxiety, stress were higher than 25% within the sample.</li> </ul>		
Examines mental health (burnout, anxiety, depression, and fear) and its associated factors among frontline nurses who were caring for COVID-19 patients in Wuhan, China	<p>Hu, D., Kong, Y., Li, W., Han, Q., Zhang, X., Zhu, L. X., Wan, S. W., Liu, Z., Shen, Q., Yang, J., He, H. G., &amp; Zhu, J. (2020). Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. <i>EClinicalMedicine</i>, 24, 100424. <a href="https://doi.org/10.1016/j.eclinm.2020.100424">https://doi.org/10.1016/j.eclinm.2020.100424</a></p>	2,014	<p>2,014 frontline nurses were included in the study</p> <p>Mean age of frontline: 30.99 (SD=6.17) years old</p> <p>Mean working duration as frontline nurse: 20.72 (SD=12.9) days / average working hours: 6.57 (SD=1.90) hrs per shift</p> <p>1,324 nurses originally worked in Wuhan</p> <p>690 nurses were sent to</p>	Cross-sectional design	<ul style="list-style-type: none"> <li>654 nurses received prior training before the pandemic began, however, 1,229 nurses held no prior experiences of caring for patients with infectious diseases.</li> <li>Majority of the frontline nurses believed that their families, colleagues, and hospitals were ready to cope with the COVID-19 outbreak and its' effects.</li> <li>The study reported that nurses stated they were experiencing moderate levels of burnout.</li> <li>Many nurses have reported</li> </ul>	<ul style="list-style-type: none"> <li>The study contains a diverse geographic background amongst its nurses. This provides a good representation of nurses from China.</li> <li>This was the first study that examined frontline nurses' mental health and the associated factors during the COVID-19 pandemic by using a large-scale cross-sectional design.</li> <li>The study used a multi-centered sampling and the big sample size.</li> </ul>	<ul style="list-style-type: none"> <li>The timing of the survey may create a generalization about frontline nurses who were working in other parts of China where the pandemic was not that severe.</li> <li>The development of the fear scale was rushed. In the future, there must be an approved scale in order to measure the thresholds of fear.</li> <li>There was a lack of follow data about the nurses' mental health. The researchers would not be able to know their mental health statuses over time when the pandemic is over.</li> </ul>

			<p>support Wuhan from other Chinese provinces</p>		<p>high levels of fear.</p> <ul style="list-style-type: none"> <li>• A majority of nurses (1,910) had one or more skin lesions caused by the use of PPE.</li> <li>• Each additional patient added to a nurse’s workload was associated with a 23% increase in the likelihood of experiencing burnout.</li> <li>• Some nurses have reported being fearful getting sick with COVID-19, dying, and being contamination risk when returning home to their loved ones.</li> </ul>		
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<p>Investigates the concerns and challenges of HCWs who are managing patients and the coping strategies they are currently using.</p>	<p>Riniki Sarma, Saurabh Vig, Puneet Rathore, Deepam Pushpam, Seema Mishra, Nishkarsh Gupta, Rakesh Garg, Vinod Kumar, Sachidanand Jee Bharati, &amp; Sushma Bhatnagar. (2020). Concerns of health care professionals managing non-COVID patients during the COVID-19 pandemic: A descriptive cross-sectional study. <i>Indian Journal of Palliative Care</i>, 26(5), 21–26. <a href="https://doi-org.dominican.idm.oclc.org/10.4103/IJPC.IJPC_155_20">https://doi-org.dominican.idm.oclc.org/10.4103/IJPC.IJPC_155_20</a></p>	<p>110</p>	<p>22.72% belonged to the department of onco-anesthesia  10.90% belonged to various health centers  2.72% belonged to orthodontics, pathology, and physical medicine and the rehabilitation department  62.72% were ages 30-40 years  60% were male  44.45% were senior residents</p>	<p>Descriptive cross-sectional study</p>	<ul style="list-style-type: none"> <li>• 93 participants reported that they felt like they were a risk of infection to themselves and their family.</li> <li>• 62 participants were concerned about the lack of concrete protocol regarding patient management, especially with COVID-19 patients.</li> <li>• Fear and stigma of discrimination was listed as major concerns. HCWs felt as if they were being prejudiced against by labeling them as “modern-day plague spreaders”. This may isolate HCWs from the general public due to the fear of spreading the disease.</li> <li>• Many HCWs were not aware of the proper sequence of use, disposal, and replacement of PPE. This is evidenced by lack of training that was provided at</li> </ul>	<ul style="list-style-type: none"> <li>• This study included HCWs who were not directly working the frontlines.</li> <li>• The study specifically chose to include only doctors to try and maintain homogeneity within the responses.</li> </ul>	<ul style="list-style-type: none"> <li>• The sample only consisted of doctors.</li> <li>• The target population only consisted of physicians and lacked diversity of other healthcare professionals who are also treating COVID-19 patients.</li> </ul>
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					<p>the beginning of the pandemic.</p> <ul style="list-style-type: none"> <li>• More than 2/3 of participants feel like their current quality of life is more stressed compared to pre-COVID times.</li> </ul>		
<p>To provide the first quantitative evidence synthesis of the impact of SARS/MERS/COVID-19 on physical and mental health outcomes of HCWs</p>	<p>Salazar de Pablo, G., Vaquerizo-Serrano, J., Catalan, A., Arango, C., Moreno, C., Ferre, F., Shin, J. I., Sullivan, S., Brondino, N., Solmi, M., &amp; Fusar-Poli, P. (2020). Impact of coronavirus syndromes on physical and mental health of health care workers: Systematic review and meta-analysis. <i>Journal of affective disorders</i>, 275, 48–57. <a href="https://doi.org/10.1016/j.jad.2020.06.022">https://doi.org/10.1016/j.jad.2020.06.022</a></p>	<p>Systematic review: 115 Meta-analysis: 40</p>	<p>115 studies Mean age of sample was 36.1 +/- 7.1 years ranging from 23 to 69.4 77.1% were female 90 (78.3%) studies included HCW from Asia 18 (15.7%) HCW from America 4 (3.5%) from Europe</p>	<p>Meta-Analysis</p>	<ul style="list-style-type: none"> <li>• 62.5% of HCWs that were exposed to SARS/MERS/COVID virus reported general health concerns such as fear and insomnia</li> <li>• HCWs experiencing psychological distress were associated with characteristics such as sex, gender (female) younger age, profession (nursing).</li> <li>• Fatigue appeared more frequent during the SARS</li> </ul>	<ul style="list-style-type: none"> <li>• This was the first meta-analysis that specifically addressed mental health outcomes in HCW exposed to SARS/MERS/COVID-19 pandemics.</li> <li>• The most frequent outcomes that were reported may represent realistic advantages within this sample.</li> </ul>	<ul style="list-style-type: none"> <li>• There was a limited amount of evidence for to provide results for the proportion of stigma and general health concern</li> <li>• Heterogeneity was substantial</li> <li>• Unable to quantify the impact of ethnic, clinical and treatment factors or healthcare system differences</li> <li>• Some HCW may have been asymptomatic &gt; infection status may have gone unnoticed</li> <li>• Excluded studies not published in English</li> </ul>

			3% (2.6%) from more than 1 continent		<p>outbreak (60-70%) compared to COVID-19.</p> <ul style="list-style-type: none"> <li>• The impact of infection on HCW's physical health was identified as the most common cause of death for physicians during the outbreak.</li> <li>• Fear (43.7%) was the 2nd most frequent mental health issue in COVID. This was reported less common during SARS epidemic.</li> <li>• There was a frequency of poor sleep amongst HCWs during the COVID-19 pandemic (18.2%)</li> <li>• Levels of burnout peaked to 34.4% particularly in nurses working long hours in the hospitals.</li> <li>• Female HCWs were more frequently displaying myalgia and sore throats. Females and nurses were</li> </ul>		
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					particularly vulnerable to experiencing psychological stress when faced with /MERS/COVID-19 outbreak. This can be used to develop gender/age sensitive guidelines.		
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