

Mental distress in healthcare workers affected by the SARS-CoV-2 pandemic and previous interventions that may be useful in promoting mental health in healthcare workers: A systematic literature review

Psykisk ohälsa hos sjukvårdspersonal som påverkats av SARS-CoV-2 pandemin och tidigare interventioner som kan vara användbara för att främja psykisk hälsa hos sjukvårdspersonal: En systematisk litteraturstudie

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SAMMANFATTNING

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Introduktion: Sjukvårdspersonal runt om i världen har stått på frontlinjen i stressiga arbetsmiljöer och tagit hand om COVID-19-patienter sedan SARS-CoV-2 förklarades som en global pandemi. Under pandemiska förhållanden står sjukvårdspersonal inför specifika utmaningar, där vissa leder till symptom på psykisk ohälsa. Statliga resurser till sjukvårdspersonal har ofta avsatts för kortsiktiga insatser. Långsiktiga investeringar med fokus på främjande av sjukvårdspersonalens psykiska hälsa behövs för att förhindra förvärrade folkhälsoproblem på grund av SARS-CoV-2. **Syfte:** Studiens syfte var att belysa hur sjukvårdspersonal rapporterar att deras psykiska hälsa påverkats av SARS-CoV-2-pandemin och vilka erfarenheter från tidigare interventioner för psykisk hälsa som skulle kunna vara användbara för att förbättra sjukvårdspersonals psykiska hälsa genom att belysa några exempel. **Metod:** En systematisk litteraturöversikt genomfördes, där 20 vetenskapliga artiklar inkluderades och analyserades med tematisk analys. **Resultat:** Totalt nio teman identifierades: psykisk ohälsa hos sjukvårdspersonal, SARS-CoV-2-pandemin, interventioner för psykisk hälsa, vårdkvalitet, säkerhetskultur, arbetsplatsbaserade tillvägagångssätt, mindfulness och konstaktivitetsmetoder, biomarkörbaserade tillvägagångssätt samt tekniska tillvägagångssätt. Viktiga fynd i denna litteraturöversikt är att teman säkerhetskultur och vårdkvalitet är associerade med de andra teman. **Slutsats:** När tillvägagångssätt implementeras i insatser för sjukvårdspersonals psykiska hälsa som främjar säkerhetskultur och vårdkvalitet främjar det också, enligt resultaten i denna översikt, långsiktiga effekter på individuell psykisk hälsa hos sjukvårdspersonal. Detta bör omedelbart beaktas av dem som utvecklar nya program för att främja psykisk hälsa för att stödja sjukvårdspersonal i effekterna av pandemin.

ABSTRACT

Titel: Mental distress in healthcare workers affected by the SARS-CoV-2 pandemic and previous interventions that may be useful in promoting mental health in healthcare workers: A systematic literature review

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Keywords: SARS-CoV-2, COVID-19, Mental distress, Mental health, Healthcare workers, interventions

Introduction: Healthcare workers around the world have stood on the front lines in stressful work-environments, caring for COVID-19 patients since SARS-CoV-2 was declared a global pandemic. Under pandemic conditions healthcare workers face specific challenges, where some lead to symptoms of mental illness. Governmental resources to the healthcare workforce have often been allocated to short-term efforts. Long-term investments focusing on mental health promotion for HCW are needed to prevent worsening public health issues due to SARS-CoV-2. **Aim:** The aim of the study was to illuminate how HCW report that their mental health has been affected by the SARS-CoV-2 pandemic and what experiences from previous mental health interventions that may be useful in promoting HCW mental health by highlighting some examples. **Methods:** A systematic literature review was conducted, including 20 scientific articles analyzed with thematic analysis. **Results:** A total of nine themes were identified: mental distress in HCW, SARS-CoV-2 pandemic, mental health interventions, quality of care, safety culture, workplace-based approaches, mindfulness and art activity approaches, biomarker-based approaches as well as technology approaches. Important findings in this literature review are the themes safety culture and quality of care being associated with the other themes. **Conclusion:** When implementing approaches in mental health interventions for HCW that promote safety culture and quality of care, it also promotes, according to the findings in this review, long-term effects in individual mental health in HCW. This should be urgently taken into consideration by those developing new mental health promotion programs to support HCW in the effects of the pandemic.

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INTRODUCTION

The SARS CoV-2 pandemic

The viral infection, SARS-CoV-2, the cause of COVID-19, was first reported in China in December 2019 and declared a pandemic on March 11, 2020 (World Health Organization [WHO], 2020b). As of May 2021, global statistics show that there have been more than 127 million COVID-19 cases and 2,7 million COVID-19-related deaths (WHO, 2021a). Healthcare workers [HCW] have stood on the front lines during this time, where they work directly with the very sickest COVID-19 patients, primarily in the Intensive Care Unit [ICU]. It is where they are caring for COVID-19 and other patients with acute infectious and chronic diseases in very stressful environments. They put their own, as well as their families', safety on the line to treat patients, deliver fundamental health services and keep the spread of SARS-CoV-2, and subsequently, COVID-19, under control (WHO, 2020a).

HCW are one of the most vulnerable at-risk groups for mental distress and mental illness even before the pandemic, (WHO, 2020a). Especially for those working in the ICU (Colville et al., 2017). Nurses working in COVID-19 clinics report higher levels of stress, exhaustion, and depression; and lower levels of work-related satisfaction in comparison to colleagues working in other clinics according to a survey conducted at the University Hospital in Augsburg, Germany (Zerbini et al., 2020). In Italy, a country that was hit hard by COVID-19, research conducted in April 2020 during the COVID-19 outbreak, already showed immense psychological and physical consequences on HCW. Notable work-related psychological demands and persistent somatic symptoms were reported by HCW who were directly involved in the care of patients with COVID-19 (Barello et al., 2020).

Worsening mental health status of HCW translates into increases in the number of accidents affecting patient safety and suboptimal healthcare outcomes. To deal with the current crisis, strategies that strengthen healthcare systems and provide good conditions for a healthy staff, thereby enhancing patient safety and optimal care, are needed. Deficiencies in healthcare systems were acknowledged before the pandemic, but the pandemic has accentuated this, and this now needs to be dealt with as a crisis situation (WHO, 2020a).

Specific challenges for healthcare workers and gender aspects

HCW face specific challenges under pandemic conditions and often there are gender differences in mental health consequences of these challenges. WHO (2021b) reported that during the SARS-CoV-2 pandemic there was a 23% prevalence of depression and anxiety together with a 29% prevalence of insomnia among HCW. The WHO also conducted a survey in August 2020 in 105 countries. Almost all countries reported major deficiencies in healthcare environments due to, among other things, lack of necessities like personal protective equipment, lack of staff or insufficient competence of the staff. Thus, these factors were all associated with work-related stress for HCW.

Women are more likely to develop mental illness (Gorini et al., 2020) and more women than men are HCW (Statistiska centralbyrån, 2019). The Swedish National Board of Health and Welfare reported that the largest professional workforce in healthcare – nurses – was comprised of 88% women in Sweden in 2018 (Socialstyrelsen, 2020). Globally, that number was 70% according to the WHO (2019). Mental illnesses, such as depression and anxiety, are more prevalent in women than in men and suicide attempts are more often reported by women than men, whereas men more frequently die by suicide than women do (WHO, 2002).

The SARS-CoV-2 pandemic has highlighted the challenge of establishing mental health and well-being of HCW globally, particularly women. Women HCW deal with the

psychosocial impacts of the SARS-CoV-2 pandemic when they are already at risk for symptoms of stress, burnout, and depression. Mental health interventions have been introduced to support well-being in women HCW, but the current needs of these women have not been accentuated. Replicable processes for developing and implementing specific emotional support services for women HCW are not adequately represented in the literature (Sanford et al., 2021).

HCW safety affects patient safety

In 2020, WHO (2020a) created World Patient Safety Day, which aimed to spread knowledge and awareness as well as statutes and reports in this field. A charter was published on September 17, 2020, entitled “Charter. Health worker safety: a priority for patient safety”. It is highlighting the message that a safe staff makes a safe patient. Patient safety is considered a human right, thus a priority for the WHO. Healthcare-related infections, violence, stigma, mental and emotional disorders, illnesses, and deaths are some of the risks to which HCW are exposed. Because safety of HCW affects patient safety, it is of immediate importance to preserve HCW physical and mental health to ensure safe and sustainable patient care. With adequate HCW mental well-being, comes safer healthcare and a lower risk of mistakes. Therefore, HCW mental well-being should be promoted to prevent the spread of SARS-CoV-2 and other infections and reduce the death rate due to COVID-19. While this perspective on health promotion among HCW is advocated by WHO (2020a), WHO’s charter on health care safety also states that less focus and no significant measures have been taken by individual national governments to promote the health of HCW. The need for further knowledge of how to prevent mental illness among HCW is markedly increasing, as well as what measures can be developed in order to promote good mental health (WHO, 2020a). By studying factors associated with mental distress in HCW during the SARS-CoV-2 pandemic, the knowledge gained can contribute to increasing staff and patient safety and preventing the spread of infection and mortality. Thus, there is an urgent need for improved interventions to promote mental health in HCW.

Work-related stress

The Center for Disease Control and Prevention [CDC] (2019) in the United States, declares that the stressful healthcare work environments cause multiple symptoms of stress.

Symptoms of work-related stress include anxiety, fear, pain, insomnia, depression, lack of motivation, impaired concentration, forgetfulness, high staff turnover, sick leave, conflicts, and/or cooperation difficulties (CDC, 2019). Stress is a normal reaction when experiencing demands that exceed or fall below one's ability. Well-being and job satisfaction are achieved when demands and control over work tasks are in balance. However, when demands are higher than the perceived control, negative stress arises according to the Demand-Control-Support model (Weman-Josefsson and Berggren, 2013).

The National Health Service [NHS] (2019) in the United Kingdom points out that stress manifests as physical, mental and psychosomatic disorders. Mental symptoms are often associated with physical symptoms such as sleeping disturbances, difficulty concentrating, mood swings and confusion. Other psychosomatic symptoms of stress can be panic attacks, chest pain, difficulty breathing, fatigue and feeling of weakness (NHS, 2019). The American Institute of Stress [AIS] (n.d.) describes muscle tension and pain as psychosomatic symptoms due to stress. Stress can also affect the endocrine, immune and gastrointestinal systems, which can lead to vulnerability to colds and other infections (AIS, n.d.).

Stress-related mental illness and distress

According to the Swedish Public Health Agency, mental health is an umbrella term that includes mental well-being as well as mental illness (Folkhälsomyndigheten, 2021a).

Mental health is the basis for human functioning, well-being and general health. Mental illness includes milder, transient conditions as well as severe, long-term conditions that

greatly affect one's ability to function. Anxiety, depression, fatigue, and stress are psychiatric conditions that can be transient, as well as chronic and severe. Transient conditions often lead to chronic conditions. Accumulation of chronic conditions in a population or community of HCW, affects society and influences public health perspectives (Folkhälsomyndigheten, 2021a). Furthermore, the Swedish Public Health Agency points out that long-term activation of the stress response system, chronic stress, without sufficient recovery increases the risk for both somatic and psychiatric disorders (Folkhälsomyndigheten, 2021b).

Often in the literature, the concept of “distress” is used when describing symptoms of mental illness. Distress is also argued to be related to specific stressors that trigger negative emotions which can affect one's abilities to function (Phillips, 2009). For example, chronic fatigue, disturbances in sleep, forgetfulness, mood swings, issues with anger, avoiding social activities or developing obsessive behaviors. These factors can disappear when the individual adapts to the stressors, but they may also lead to chronic conditions (PsychCentral, 2019). In this review, mental illness and mental distress will refer to these symptoms and be used synonymously.

United Nations Sustainable Development Goals

Promoting health in HCW promotes health and healthcare for everyone. The well-being of HCW needs to be discussed from a socially sustainable point of view whereby HCW as well as the population's health is at the center, together with human rights, equality, justice and democracy. The United Nations' Sustainable Development Goals [SDG] (United Nations, n.d.a) include two very relevant areas in this regard: Goal number 3 - good health and well-being (United Nations, n.d.b) and goal number 8 - decent work and economic growth (United Nations, n.d.c).

Important areas covered in goal number 3 that are related to the current situation with increasing mental distress HCW include: Communicable Diseases; Support Research, Development and Universal Access to Affordable Vaccines and Medicines; Improve Early Warning Systems for Global Health Risks; Reduce Mortality from Non-Communicable Diseases and Promote Mental Health; Achieve Universal Health Coverage; Increase Health Financing and Support Health Workforce in Developing Countries (United Nations, n.d.b).

More specifically, goal number 3 contains several targets to ensure healthy lives and promote well-being for all, at all ages. Target 3.c recognizes the need for increasing recruitment, development, training and retention in the health workforce. Financial investment should be set aside toward these factors. Target 3.8 is relevant to the aim of this study as it is targeting a goal to achieve universal access to quality and essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for everyone. This ensures patient safety, which is the desired result when promoting HCW mental health (United Nations, n.d.b).

Goal number 8 also includes several important targets in relation to HCW issues, such as Full Employment and Decent Work with Equal Pay; Increase Aid for Trade Support; Protect Labour Rights; and Promote Safe Working Environments (United Nations, n.d.c). Goal number 8 also indirectly addresses patient safety, as it promotes inclusive and sustainable economic growth, full and productive employment and decent work for all. Specifically, target 8.8 protects labor rights and promotes safe and secure working environments for all workers, including migrant workers, in particular female migrants, and those in precarious employment situations (United Nations, n.d.c). Goal 3 and goal 8 are important background information and set the stage for proceeding with this systematic literature review. The UN promotes global partnerships and compiles and summarizes statistics based on national data collection efforts, as well as the scientific research literature. These are useful components for everyone addressing these goals. In addition, the WHO is launching a campaign during 2021 with the theme – protect, invest, together.

It highlights the urgent need to invest in HCW for shared dividends in health, jobs, economic opportunity, and equity (WHO, 2021c).

Relevance to public health

The definition of health is shifting away from the disease model of health to the social model of health. Health interventions often measure not only ill-health but also the absence of disease like quality of life and well-being. This perspective and definition of health is the social model of health (Bowling, 2014). It is well described with reference to the constitutions of the WHO's definition of health in 1948, that “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2021d). WHO (2020a) published a policy brief including health system recommendations to respond to the SARS-CoV-2 crisis. One of the recommendations addressed the mental health needs of the HCW and highlighted the need for preventing emotional burnout and distress in HCW (WHO, 2020c). To prevent more public health issues due to SARS-CoV-2, health systems need to respond to SARS-CoV-2 in terms of HCW’s mental health needs. Associations between HCW’s mental health and well-functioning health systems are very clear. This makes mental distress in HCW a public health issue (WHO, 2020a; WHO, 2020c).

From a health economics perspective, it is cost-effective to invest in HCW (Ferraz-Nunes & Karlberg, 2012). Investments in education and employment in the health- and social care sectors have been estimated to result in a tripling of improved health results, global security and inclusive economic growth as reported by the UN High Level Commission on Health Employment and Economic Growth (United Nations, n.d.c). However, most resources from governments to the healthcare workforce have been allocated to short-term efforts rather than long-term investments. Long-term investments include investing in health promotion for HCW (WHO, 2021b).

Disaster preparedness requires healthy HCW (Stahel, 2020; WHO, 2020c). One of many consequences due to heavily burdened health systems during the SARS-CoV-2 pandemic are postponed or cancelled healthcare procedures. One of the reasons for this consequence is that the health systems were not prepared to cope with a crisis of the magnitude brought

by SARS-CoV-2, while maintaining the same standard in other areas of healthcare. Cancelled or delayed surgical care causes potential harm to patients, which makes them more vulnerable to COVID-19 infection (Stahel, 2020). By a decrease in the number of people seeking medical attention and access to diagnostic services, cancer diagnoses are delayed causing avoidable deaths as a result of the SARS-CoV-2 crisis (Maringe et al., 2020). This demonstrates a stressful work-environment for HCW as well as the importance of a well-functioning healthcare system. Long-term investments in health promotion for HCW is acute (WHO, 2021b). It contributes to decreased spread of infection and effective response to the crisis (Stahel, 2020).

AIM

Public health problem and research questions

HCW was one of the most vulnerable at-risk groups for mental distress and mental illness even before the pandemic. The need for implementing mental health promotion programs for HCW is urgent (WHO, 2020a). Mental illness includes both transient as well as long-term conditions such as anxiety, depression, fatigue and stress. These symptoms and conditions influence public health perspectives due to its spread amongst many risk groups (Folkhälsomyndigheten, 2021b), and they are often caused by work-related stress (CDC, 2019). This advocates for a public health perspective on the mental health of HCW. For instance, SDG include two very relevant areas in this regard: Goal number 3 - good health and well-being (United Nations, n.d.b) and goal number 8 - decent work and economic growth (United Nations, n.d.c). Health systems need to respond and act to the SARS-CoV-2 pandemic in terms of HCW mental health in order to prevent worsening public health issues (WHO, 2020a; WHO, 2020c). The need of further knowledge about mental health promotion is conspicuous as well as how to develop cost-effective interventions to promote mental health in HCW (WHO, 2021b).

Symptoms of mental distress in HCW during the SARS-CoV-2 need to be identified when developing mental health promotion programs for HCW. It is important information as the programs need to be efficiently implemented toward the effects of the pandemic (WHO, 2020c). Thus, mental health promotion programs as well as HCW mental health due to the pandemic need to be highlighted in the literature. This systematic literature review will review studies addressing this area and contribute to the literature of the public health science field.

Aim of the study

The aim of the study was to illuminate how HCW report that their mental health has been affected by the SARS-CoV-2 pandemic and what experiences from previous mental health interventions that may be useful in promoting HCW mental health by highlighting some examples.

METHODS

Data collection

A systematic literature review was conducted. Systematic literature reviews are often used by healthcare providers and decision-makers to guide patient care, create and re-evaluate clinical and public health and care guidelines, and to plan interventions. Systematic reviews allow clinicians, researchers and decision makers to find and summarize information more efficiently. However, systematic reviews must be assessed in relation to the rigor of the review process, search strategies and key words used, adherence to guidelines, trustworthiness and applicability of the review findings. In this systematic literature review the Preferred Reporting Items for Systematic reviews and Meta-Analyses [PRISMA] was used as guidelines for the research method and reporting (Page et al., 2021). PRISMA is an evidence-based set of steps for reporting in systematic reviews, and enhances the rigor, trustworthiness and applicability of study findings in this review. Using the PRISMA 2020 guidelines also leads to transparent and accurate reporting of the literature, which enhances relevance and acceptance among the greater scientific community, so that others can replicate or update reviews. It was designed for systematic reviews of studies that evaluate the effects of health interventions, which is suitable for the aim of this study (Page et al., 2021).

Original scientific research articles were collected systematically as guided by the PRISMA Checklist (Page et al., 2021). Systematic literature searches were conducted using the PubMed database. PubMed was chosen because it contains articles on the subjects of health and care science, which are relevant to the purpose of the study. This database is accepted by scientific and medical communities and mainly consists of peer-reviewed articles. Boolean logic was applied to combine keywords (AND, NOT, OR). The PubMed 'Advanced search' was used to accomplish this detailed search. Every step was meticulously documented so that it easily can be replicated.

Sample

N=20 studies were included in this review: 10 cross-sectional studies (See Appendix 1) and 10 randomized controlled intervention studies (See Appendix 2). Included studies in this systematic literature review were conducted in Canada (N = 1), Turkey (N = 1), Poland (N = 1), Czech Republic (N = 1), France (N = 2), USA (N = 4), Scotland (N= 1), Germany (N = 1), Italy (N = 2), Spain (N = 5) and Cyprus (N = 1). Articles were collected by doing a total of seven structured literature searches in PubMed. The literature searches needed to differentiate in order to answer to the aim of the review and are therefore presented as two steps. The literature searches for self-reported data of mental distress in HCW are presented in Table 1. The literature searches for mental health interventions for HCW are presented in Table 2. Both literature searches are presented in two tables and explained in two steps.

This is a literature review with N=20 included studies and the records identified before screening was N=340 (See Figure 1). As the search result was great in proportion to the preset number of articles to include, the decision was made to limit the search to the western countries. Also, an age criterion was set to 19-44 years. The reason for the age criterion was to limit the structured literature search, in accordance with PubMed's filter options. This filter contributed to get quality in the data collection process based on the prerequisites of this literature study, since the literature on HCW mental health is very broad. The inclusion criterion for countries was set to limit the large amount of search results but also with reason to include more than just one country. This review is therefore multinational as it involves data from more than one nation. Multinational studies are common in social sciences or in epidemiological studies. As these decisions may have affected the quality of the data collection it will be further acknowledged in the method discussion. Studies where the results for the outcomes of interest were not reported were ineligible and excluded. These reports were ineligible and excluded due to 'irrelevance' presented in Figure 1 flow diagram. Other excluded studies were ongoing studies, studies not in a hospital setting, and study designs other than cross-sectional studies or randomized controlled studies.

Obstacles during the review process need to be explained to clarify the data collection process. The aim of this review was rephrased in the process of the data collection. One search in PubMed was first needed when data for self-reported mental distress was collected. This was due to the fact that the pandemic setting was not an eligible criterion in the first identified aim. At first this review aimed to combine data of mental distress in HCW during and pre-pandemic. Ten cross-sectional studies were first included, whereas eight in a pandemic setting and two pre-pandemic. During the process of analyzing the total of 20 included articles of mental health interventions for HCW as well as self-reported mental distress in HCW, the two pre-pandemic articles were irrelevant as the pandemic setting was a predominant factor of this review. The decision was made to rephrase the aim by excluding the comparing factor between pre-pandemic and during the pandemic. Thereafter, the two pre-pandemic studies were excluded only to replace them with two other studies conducted during the pandemic. This explains the gap in time in the first step between the first and second search for self-reported data of mental distress in HCW. Rephrasing the aim of the study and changing two included studies will be evaluated in the method discussion.

The filters used when searching for self-reported data of mental distress in HCW, in the first step, were: free full text, in the last 10 years, English, Adult: 19-44 years (See Table 1). However, these searches were not meant to include years before the pandemic. After the aim was rephrased, the filter should have been set for years 2020 - 2021 (years of the pandemic). This will be taken into account when evaluating the method at the end of this review. One of the applied filters, “Free full text”, was found not to be necessary. If an article is “full text” it means that one can read the whole article immediately in PubMed, not just the abstract. The literature search would have been possible without this filter (See the method discussion for further details).

Furthermore, both literature searches in the first step had keywords: nurse AND mental health AND COVID-19 AND cross-sectional. These keywords are relevant to the risk group processed in this review and the pandemic setting, as well as inclusion criteria for the study design. Cross-sectional study designs are applied in studies using surveys and were included because of the outcomes of interest being self-reported data via surveys.

Like the first step of the literature search, the second step also had inclusion criteria of original, peer-reviewed articles. To ensure that articles were peer-reviewed, the database Ulrichsweb was used. All included 20 studies also had hospital setting as an inclusion criterion because it is the largest arena for the risk group HCW. The filters used in the second step when searching for mental health interventions for HCW were: free full text, clinical trial, randomized controlled trial, in the last 10 years, English, Adult: 19-44 years (See Table 2). The filters are explained in the discussion.

Five literature searches were made in the second step with different keyword combinations for each search. The different eligible criteria for the second step compared to the first step were inclusion of randomized controlled trials, because the outcomes of interest being experiences from interventions. This explains the filter “Randomized controlled trial”. The filter “Clinical trial”, however, was not necessary as this study design was an exclusion criterion along with every other study design except for randomized controlled trials. Also, no eligible criteria were set for SARS-CoV-2 pandemic setting in the second step. The outcomes of interest did not need that criterion to answer the aim of this review. This decision also generated more results in the literature searches.

Keywords applied in the first search in the second step (Table 2) were: healthcare worker AND stress AND COVID-19. The keyword COVID-19 was applied because the scientific literature uses the term SARS-CoV-2 less. COVID-19 defines the infection, whilst SARS-CoV-2 refers to the pandemic. COVID-19 was used much more frequently in the literature as a keyword and in titles of the articles. In order to find many relevant articles, the keyword COVID-19 was therefore applied. Keywords applied in the second search in the second step were: work-related stress AND healthcare workers. This defines the risk group HCW in this review and a factor for mental distress being the work-place as an arena. Keywords in the third search were: occupational health AND nurses. “Occupational health” is health related to the work-place. Keywords in the fourth search were: healthcare worker AND workplace

AND stress. Keywords in the fifth search were: promoting mental health AND healthcare workers. “Promoting mental health” was relevant due to the aim of the review being to illuminate experiences from mental health interventions, which often include a promoting perspective on health.

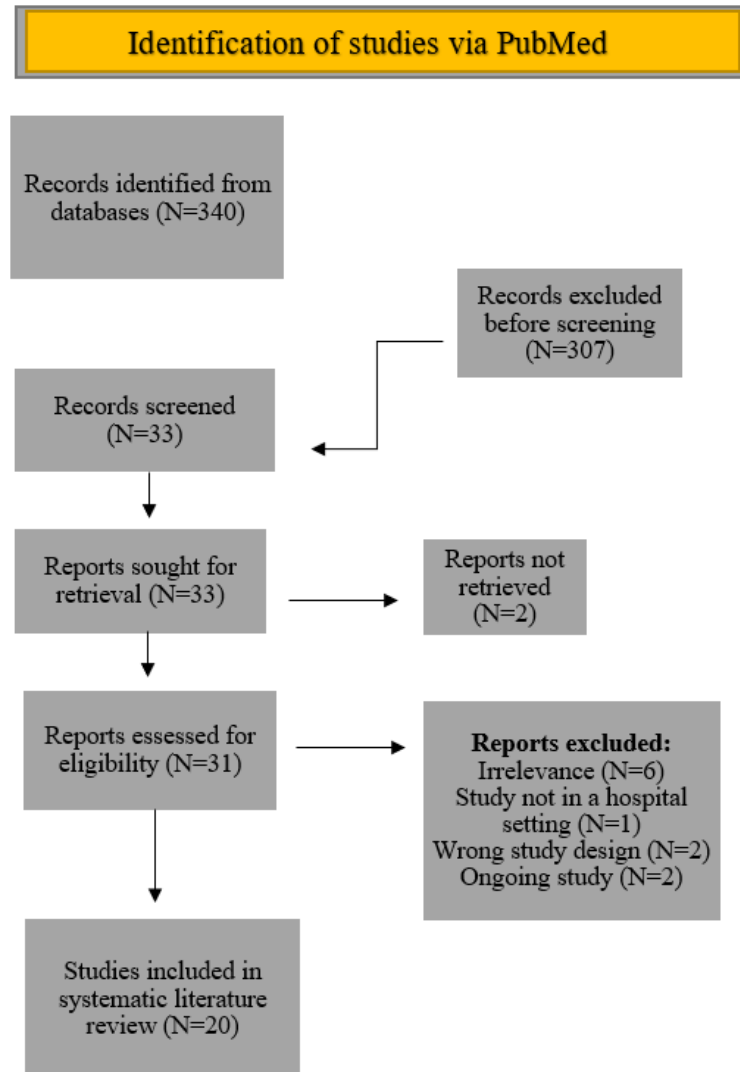
Table 1. First step: Structured literature search

Database	Date	Keywords	Filters	Results	Number of read abstracts	Number of read articles	Number of included articles Total (N=10)
Pubmed	04/19/2021	Nurse AND mental health AND COVID-19 AND cross-sectional	Free full text, in the last 10 years, English, Adult: 19-44 years.	56	27	8	8
Pubmed	08/09/2021	Nurse AND mental health AND COVID-19 AND cross-sectional	In the last 10 years, English, Adult: 19-44 years	101	5	3	2

Table 2. Second step: Structured literature search

Database	Date	Keywords	Filters	Results	Number of read abstracts	Number of read articles	Number of included articles. Total (N=10)
PubMed	04/14/2021	Healthcare workers AND stress AND COVID-19	Free full text, Clinical Trial, Randomized Controlled Trial, in the last 10 years, English, Adult: 19-44 years.	5	3	3	3
PubMed	04/16/2021	Work-related stress AND healthcare workers	Free full text, Clinical Trial, Randomized Controlled Trial, in the last 10 years, English, Adult: 19-44 years.	62	16	14	5
PubMed	04/18/2021	Occupational health AND nurses	Free full text, Clinical Trial, Randomized Controlled Trial, in the last 10 years, English, Adult: 19-44 years.	53	40	2	0
PubMed	04/19/2021	Healthcare workers AND workplace AND stress	Free full text, Clinical Trial, Randomized Controlled Trial, in the last 10 years, English, Adult: 19-44 years.	20	18	2	1
PubMed	04/27/2021	Promoting mental health AND healthcare workers	Free full text, Clinical Trial, Randomized Controlled Trial, in the last 10 years, English, Adult: 19-44 years.	43	30	1	1

Figure 1. Flow diagram of structured literature search strategy following PRISMA guidelines (Page et al., 2021).



Thematic analysis

Systematic literature selection was accomplished using PRISMA 2020 guidelines, which ensures that the literature review process and description of results are sufficient and consistent (Page et al., 2021). When data collection was completed, the material was analyzed using a thematic analysis. To increase validity of this literature review, it was appropriate to follow-up the systematic literature search and data collection with a systematic analysis. The method was carefully selected based on research theory and concepts that assess research quality (Bryman, 2015; Nowell et al., 2020).

Thematic analysis method allows the researcher to find recurring themes in the material. There are six phases of the thematic analysis which identify similarities and differences, variations, features or changes among the themes that are established. Strengths and weaknesses of the material are also examined further. In some cases, material, concepts and theories are the starting point for identifying themes (Nowell et al., 2020; Bryman, 2015). The thematic analysis in this systematic review was directed with the exclusion and inclusion criteria employed to maintain the foundation of the purpose and aim of this study. More themes were subsequently identified, interpreted and analyzed.

To increase the probability of maintaining original themes and identifying new themes, and to enhance the responsible and educated use of credible data, both researchers involved in this systematic review immersed themselves in the data to understand the depth and breadth of the content. Identified were articles that were interesting in relation to the aim of the study as well as eligible criteria. This was the first phase of the thematic analysis. The second phase involved the generation of initial codes. Qualitative coding of both qualitative and quantitative data included in this systematic review was completed. As coding took place, consistent associations and further categorizations were identified. Five different categories of codes were identified during the process and were color-coded. Coding brought specific characteristics of the data into focus and allowed reflection and interaction with the data (Nowell et al., 2020).

When material coding was finished, phases three and four helped further and deeper explore categories of codes that captured important information in relation to the aim of this

systematic review. Phase three consisted of searching for associations and possible themes, while phase four identified them. The five categories of coding were identified as main themes of the study and are presented in the results (See Figure 2). One of the identified themes, mental health interventions, was analyzed consisting of four categories. These were identified as subthemes. These four subthemes were also highlighted in the results. The last two phases consisted of naming the themes as well as producing the report. In this systematic literature review, there are valid arguments for choosing each individual theme, as they address the aim of the study (Nowell et al., 2020).

Quality and concepts

Every step of this systematic review has been documented and can be replicated and updated if considering the limitations of the review process. The mental status of HCW and mental health interventions has been considered, evaluated and deemed of importance. Reliability and validity are some examples of measures for measuring quality as well as criteria for assessing research. Reliability refers to whether results are reproducible across studies (Bryman, 2015). Reliability consists of four sub-criteria, of which credibility is one of the criterion. Higher reliability leads to higher credibility. Validity defines whether you observe, identify or measure what you intend to (Bryman, 2015). It is the coherence of the arguments regarding identified themes in the analysis that influence the analytic credibility. When data was analyzed the main points of the arguments were supported and thoroughly explained, as this influenced the trustworthiness. In the discussion all relevant results were discussed regardless of how well it supports the aim of the study, as this influences credibility (Nowell et al., 2020).

Ethical considerations

Four basic ethical requirements are imposed on researchers, these include those related to secrecy, professional secrecy, anonymity and confidentiality (Hermerén, 2011). When articles were chosen to be included in this review, these ethical requirements were considered. The selected studies have been reviewed to ensure that they comply with the

information requirement where participants are informed regarding the purpose of the study and design of the research as well as their right to drop out whenever they want to. The requirements of confidentiality aim to protect the privacy of all participants. Trust between participants and researchers is important to maintain ethical standards.

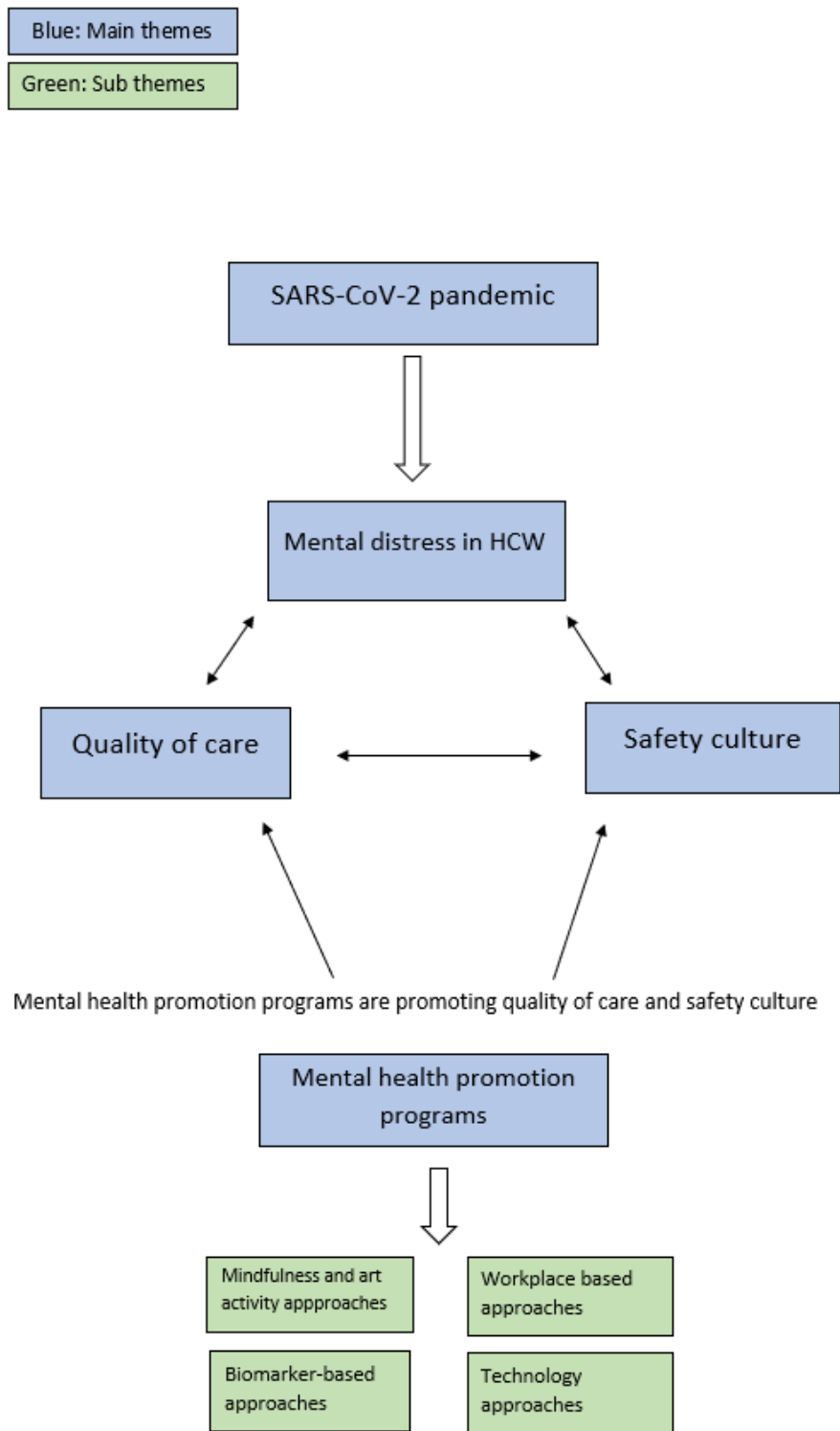
An inclusion criterion for the selected articles was peer-review. This means that the authors' published work was examined by their peers and deemed of acceptable validity and suitability for publication. Peers are defined as experts in the same or similar fields of research. This is an important ethical and scientific aspect, as it ensures that the articles are of high quality. To ensure that journals were peer-reviewed, the database Ulrichsweb was used. The strengths and limitations of this process will be further elucidated in the discussion. Discussions of the method are thoroughly and transparently evaluated due to the limitations of this review. It is ethical to be transparent about this when writing reports of studies.

RESULTS

The included 20 studies are presented in Appendix 1 and Appendix 2. Appendix 1 describes the included cross-sectional studies, and Appendix 2 describes the included randomized, controlled intervention studies. These studies are subsequently summarized herein.

The five main themes in this systematic review were the SARS-CoV-2 pandemic, mental distress in HCW, quality of care, safety culture and mental health promotion programs. Ten cross-sectional studies included in this review (see Appendix 1) provide a glimpse of how the SARS-CoV-2 pandemic has affected HCW in terms of self-reported symptoms of mental distress. Thus, the main theme SARS-CoV-2 pandemic is present in main themes mental distress, quality of care and safety culture. Mental health promotion programs were assessed from the 10 included randomized controlled intervention studies (See Appendix 2). Four subthemes were then identified in the main theme of mental health promotion programs as: workplace-based approaches, mindfulness and art activity approaches, biomarker-based approaches as well as technology approaches. Figures 2 present associations of themes.

Figure 2: Associations of identified themes



Mental distress in HCW

Indicators most screened at different times during the pandemic were symptoms of anxiety, burn-out, depression, post-traumatic stress, and perceived stress. In relation to COVID-19 studies, overall, factors associated with more self-reported symptoms of mental distress were perceived risk and fear of infection related to COVID-19, lack of coping strategies, lower resilience, poorer working conditions (Chatzittofis et al., 2021; Lorente et al., 2020; Torrente et al., 2021) and lack of safety culture (Pozo-Herce et al., 2021; Stocchetti et al., 2021). Longer work experience also significantly decreased the risk for mental distress in terms of coping strategies, resilience and working conditions and safety culture (Pozo-Herce et al., 2021; Stocchetti et al., 2021). See Figure 2 for overview of associations that are further explained in the results.

The work of nurses is increasingly complicated and leads to physical, cognitive and an emotional strain (Gorini et al., 2020). Serious occupational stressors include time pressures, reduced social support, excessive workloads, miscommunication, poor supervision, conflicts, high job demands, and moral as well as spiritual distress related to end-of-life issues. To cope with rigorous assessing, monitoring and responding effectively to the patients' needs, it is required that nurses working in the ICU maintain their expertise and proficiencies (Azoulay et al., 2020; Mira et al., 2020).

In a study assessing the prevalence of post-traumatic stress and symptoms of depression in HCW during the SARS-CoV-2 pandemic, 19% of participants screened positive for clinical depressive symptoms and 15% for post-traumatic stress symptoms (Chatzittofis et al., 2021). In another large study conducted in the United States including (N=33,083) HCW, prevalence of self-reported symptoms of anxiety, depression and burn-out were measured in relation to self-reported SARS-CoV-2 infection. HCW with infection were at higher risk for all three mental distress outcomes compared to HCW not infected with SARS-CoV-2 (Firew et al., 2020).

Symptoms of burn-out syndrome during the SARS-CoV-2 pandemic were assessed in another study with an observed prevalence of 43.3%. Risk factors associated with burn-out syndrome were working on the COVID-19 front lines, being a woman, age younger than

30 years old and being a physician (Torrente et al., 2021). High levels of depressive symptoms were found as a factor significantly associated with burn-out, as well as anxiety and insomnia (Stocchetti et al., 2021).

Another cross-sectional study found and documented that prevalence of adverse mental health was significantly more frequent among healthcare workers with prior mental disorders. In a representative sample, one in seven healthcare professionals screened positive for a disabling mental disorder during the first wave of the pandemic. The results contribute to knowledge of risk groups among HCW that should be monitored to prevent mental distress during crises such as a pandemic. Other groups that should be monitored are HCW exposed to patients infected with COVID-19, HCW infected or that have been isolated, female workers as well as auxiliary nurses (Alonso et al., 2020).

Safety culture and quality of care

Patient safety and HCW safety interact together in a concept defined as ‘safety culture’ (see Figure 2). A positive safety culture is primarily endorsed by organizational factors such as teamwork within and across hospital or clinical units as well as overall perceptions and education of patient safety and are associated with HCW mental health. However, psychological and mental safety for HCW is also fundamental for maintaining safety culture (Lorente et al., 2020; Pozo-Herce et al., 2021). The workload on nurses working in the ICU is very high and was accumulating even before the SARS-Cov-2 pandemic. The ICU work environment is becoming more and more technical, which by itself translates to an augmented responsibility for those who must also provide humane care to patients. This situation makes it challenging to maintain and promote a positive safety culture (Gorini et al., 2020).

Cross-sectionally, there have been associations reported between mental distress in HCW and quality of care in terms of patient safety. Improved safety culture leads to improved quality of care for patients (Lorente et al., 2020; Pozo-Herce et al., 2021). Attitudes among HCW toward self-infection, risk of infecting their family, the pandemic going on for too

long, patient outcomes, as well as HCW personal job performance, are some indicators that influenced quality of care during the pandemic (Pozo-Herce et al., 2021). These associations were further highlighted in the results that emerged when reviewing the intervention studies.

The result of this review also shows that coping strategies and resilience are associated with mental distress. The person's ability to process and overcome stressful events leads to improved mental well-being whilst preventing mental distress (Lorente et al., 2020; Stocchetti et al., 2021). These mental health factors can make HCW overcome a lacking safety culture and stressful events (Lorente et al., 2020; Pozo-Herce et al., 2021).

Problem-focused coping [PFC] and emotion-focused coping [EFC] are two different coping strategies based on the transactional model of stress and coping. These were compared in a study in relation to the potential risk factors: fear of infection, death and dying of patients as well as work overload. Fear of infection, death and dying of patients, as well as work overload were positively associated with mental distress during the pandemic. PFC was associated with less mental distress. EFC was associated with lower mental distress and higher resilience. Therefore, the outcome of the study showed that both of these coping strategies, PFC and EFC, together with resources for resilience, are potentially important to promote and positively influence HCW mental health. Resilience was protective ($OR < 1.0$) for nurses in disasters, in this case the SARS-CoV-2 pandemic (Lorente et al., 2020). On the contrary, another study explored the prevalence and extent of distress, burnout syndrome and resilience in ICU workers. Participants with the highest levels of resilience also had high levels of burn-out symptoms. These results suggest that high levels of resilience were not always enough to prevent symptoms of burn-out during the SARS-CoV-2 (Stocchetti et al., 2021).

Mental health promotion programs

The mental health promotion programs are promoting safety culture, quality of care and mental health in HCW. Therefore, these are associated with main themes of safety culture,

quality of care and mental distress in HCW. All mental health promotion programs included in the randomized controlled intervention studies had different approaches. Four sub themes were identified as: workplace-based approaches, mindfulness and art activity approaches, biomarker-based approaches as well as technology approaches (See Figure 2). How every sub theme is associated with the main themes will be presented under each following heading.

Workplace-based approaches

An intervention program among ICU nurses that included education, role-play, and debriefing resulted in a lower prevalence of job strain which led to better coping with stressful situations. This ICU-based program was a five-day course and included evaluations of work-related stress and outcomes. The general training objectives were two-fold. The first objective was to progress in the management of potentially iatrogenic situations or techniques. The second objective was related to clinical emergency management. As part of this, participants developed the skills expected in ICU nursing practice, analyzed the effect of stress and the emotions felt by nurses dealing with a difficult situation, defined strategies that allowed him or her to ignore emotional responses, got to know his or her team, and managed the quality of team relationships. The training consisted of simulation scenarios focusing on different conditions in patients, as well as nursing theory. At six months follow-up, nurses in the intervention group showed lower prevalence of job strain compared with nurses who did not take part in the intervention (El Khamali et al., 2018).

Work conditions in primary care are associated with physician burnout and lower quality of care. Clinician stress and burnout were assessed in a study consisting of various interventions including improvements in work conditions. The program was named Healthy Work Place and work conditions were measured as time pressure, workplace chaos and work control. The interventions were mainly organizational and grouped into three categories when the study was completed. These three categories were: workflow redesign; improved communication, especially among clinicians and staff; and quality

improvements projects directed at clinicians' concerns. These types of interventions improved outcomes in HCW, including burnout, job dissatisfaction, and retention. The investigators concluded that improved working conditions were beneficial for both HCW and patients, as they were associated with quality of care (Linzer et al., 2015).

Physical and psychosocial overload can be reduced by strengthening resources at work. A workplace intervention with this aim consisted of interviews and workshops. The workshops lasted for three hours. In each participating organization, “initiatives circles” were implemented in which the intervention measures proposed in the workshops were appraised regarding their feasibility. The primary outcomes were the workers’ physical and mental work abilities. The secondary outcome was patient satisfaction with care. The results showed no differences between the intervention and control groups regarding the main outcomes of the study. However, higher scores of effort-reward imbalances and overcommitment were associated with lower scores of physical and mental work abilities among HCW. The results did not suggest any association between perceived effort-reward imbalance and overcommitment of healthcare workers and patients’ satisfaction with care. In conclusion, improved mental work ability was associated with quality of care (Montano et al., 2020).

Two programs named Beyond Silence and The Mental Health First Aid [MHFA] were implemented in one study evaluating whether the contact-based workplace education program (Beyond Silence) was more effective than standard mental health literacy training MHFA in preventing mental illness and supporting HCW with mental distress. However, disappointingly, results of this intervention did not reveal any significant changes in behavior among HCW to prevent mental distress, nor was there a difference between the programs. However, both interventions improved mental health literacy, improved attitudes toward seeking treatment and decreased stigmatized beliefs (Moll et al., 2018). Components of each intervention are described below.

Beyond Silence is a program based on principles of contact-based education and designed to promote early intervention and support for workers who suffer from mental health issues. Beyond Silence consisted of six in-person sessions of two hours each, and five online sessions, lasting a total of five months. The program was designed for HCW and each session built on each other to provide skill building in identifying and reaching out for help, as well as reviewing potential available resources. The online session complemented and extended the in-person sessions and allowed participants to explore and comment on web-based resources. The sessions were co-led by HCW who had personal experience with mental health problems and were trained to deliver the program. As aforementioned, this program improved mental health literacy, improved attitudes toward seeking treatment and decreased stigmatized beliefs (Moll et al., 2018).

The MHFA program was led by a certified MHFA trainer, who did not share personal experiences with mental health issues. The MHFA curriculum is a standardized, module-based program designed to teach participants how to recognize the early warning signs of common mental illnesses, how to provide initial help to someone in a mental health crisis, and how to support people who are developing mental health problems. There were two full-day sessions that were scheduled one week apart, and participants were required to attend both sessions. Adherence to program principles was monitored by Mental Health First Aid Canada, as part of their requirement for implementation. Similar to the Beyond Silence program, the MHFA program improved mental health literacy, improved attitudes toward seeking treatment and decreased stigmatized beliefs (Moll et al., 2018).

Mindfulness and art activities

A mindfulness-based self-care [MBSC] program aimed to reduce stress during work hours among HCW was evaluated. The program consisted of five weekly 1.5-hour in-class

mindfulness practice sessions. There was one MBSC intervention group and one control group. Mindfulness practices included mindful breathing, mindful walking, mindful movements, mindful eating and meditation. The in-class session themes were introduction to mindfulness, enhancing awareness and focused attention, awareness of pleasant and unpleasant experiences, transformation of difficult emotions through mindfulness, and compassion. At-home mindfulness was encouraged, and participants were provided with reading material and at-home practice plans. This intervention had promising effects on HCW. Stress levels and anxiety levels were significantly reduced in those receiving the intervention, compared to the life-as-usual control group that received no intervention. This is not only a success for the HCW, but the whole organization and patient outcomes. When the organization promotes safety for staff and patients, it promotes safety culture (Ameli et al., 2020).

Art activities have been found to be effective in promoting nursing staff health and well-being at work. Occupational stress management and strengthening organizational well-being have also been found to be promoted with implementation of art activities. An intervention using silk painting as “arts for health” had a positive impact on many indicators related to nurses’ mental well-being and created a positive work environment. Compared to a no intervention control group, positive impacts of the intervention were: reduced work-related stress, improved general health and well-being, improved sense of happiness, reduced work-related fatigue, increased productivity and community building. More than half of the participants wanted to attend more art events. No adverse experiences were observed in the intervention group (Karpavičiūtė et al., 2016).

Biomarker-based approaches

Another indicator for stress in HCW is self-esteem. Self-esteem is related to quality of care as it affects decision-making in patient care. A high self-esteem is also related to mental well-being. However, stress and self-esteem are not always related. A ‘sensory’ self-care intervention mediated by touch, smell, sight, or hearing was used to moderate stress levels,

self-esteem and well-being of health professionals in a hospital environment. While this self-care method did not reduce stress, it did improve participants' self-esteem. Compared to other studies included in this review, study investigators also measured salivary cortisol levels as a biomarker of stress. Salivary cortisol levels increase with higher levels of stress. This is mediated by the central nervous system. Salivary cortisol is reduced when feelings of tension, anxiety and stress are replaced by feelings of well-being and relaxation. Massage and self-massage, for example, may facilitate this and affect emotions. Measurements included both cortisol levels and questionnaire-based assessments of stress, self-esteem, and well-being. At baseline, half of the participants reported low self-esteem as well as irregular sleep, poor nutrition and low levels of physical activities, which increased risk for stress and mental illness. The intervention group experiencing self-care mediated only by touch showed improvement in self-esteem and reduced cortisol after twenty days. The control group, who did not receive the sensory intervention, did not show changes in these mental health or cortisol outcomes (Leão et al., 2017).

Another study that included biomarker measurements evaluated whether animal-assisted therapy [AAT] with the presence of a dog, affected the stress level of nurses. The measurements were retrospective assessment of perceived stress, and like the sensory method intervention, this intervention used salivary cortisol levels to determine the effect of the AAT. The results demonstrated a reduction in cortisol levels when AAT was included among nurses who were recruited from two clinical departments, Rehabilitation and Physical Medicine, as well as the Department of Internal Medicine and Long-Term Care (Machová et al., 2019). The reduction in cortisol was in comparison to nurses who did not receive the intervention.

Technology approaches

The accessibility to many intervention programs has been found to be limited and costly. However, interventions that use technology could overcome these obstacles and increase efficacy in treatments and prevention. The Med-Stress Program was a self-guided internet

intervention. The efficacy of the support program was evaluated as an intervention to improve well-being among medical professionals. Outcomes measured included job stress, burnout, depression, and job-related stress as well as increasing work engagement. Two psychological modules in the intervention were perceived social support and self-efficacy. Both psychological modules had 4 components: relaxation, mindfulness, cognitive restructuring and lifestyle. Each module had three exercises consisting of psychoeducational animated clips as well as both web-based and offline activities. Compared to a control group, the intervention resulted in improvements of some indicators, primarily a reduction in job stress, when activities were completed in a specific sequence. The program showed promising results in reducing stress and increasing well-being in healthcare professionals. Due to its broad accessibility and promising results, it may be efficacious as a cost-effective, easily accessible intervention among those with internet access (Smoktunowicz et al., 2021).

Risk factors for mental distress and mental illness that have been evaluated in HCW during the pandemic have been similar in both intervention studies and the cross-sectional studies. Symptoms of anxiety, burnout, depression, stress and post-traumatic stress symptoms have been targeted and highlighted the most in the published literature. Online psychological assistance services have been implemented during the SARS-Cov-2 pandemic. The intervention called Emotional Freedom, investigated the efficacy of a brief online form of Emotional Freedom Techniques [EFT] to prevent stress, anxiety, and burnout among nurses involved in the front lines treatment of COVID-19 patients. A single 20-minute online form of EFT treatment was effective in reducing stress, anxiety, and burnout in nurses working with COVID-19 patients. The study was a great example of an effective intervention during a global disaster. The EFT group treatment has been investigated among several efficacy studies, and 98% show statistically significant improvements in the management of mental distress (Dincer & Inangil, 2020). Another program based on technology was Beyond Silence, which was aforementioned. It showed that programs can be both online and in-person administration and complement each other. The program improved mental health literacy, improved attitudes toward seeking treatment and decreased stigmatized beliefs (Moll et al., 2018).

DISCUSSION

The aim of the study was to illuminate how HCW report that their mental health has been affected by the SARS-CoV-2 pandemic and what experiences from previous mental health interventions that may be useful in promoting HCW mental health by highlighting some examples. Societies are facing major restructuring of healthcare systems that require more research to balance those systems, given a new baseline of the ongoing world crisis due to SARS-CoV-2. This limitation does not make this review less credible, but it does take place at an unusual point in time. The effects of the SARS-CoV-2 pandemic on HCW mental health have been presented. Based on the results of this review, symptoms of anxiety, burn-out, depression, post-traumatic stress and perceived stress were most often screened during the pandemic. Promising evidence-based components to include in mental health promotion programs for HCW have been highlighted based on ten included randomized controlled intervention studies. The need for long-term investments in HCW, including mental health promotion, is urgent as the situation for HCW was troubled even pre-pandemic. Findings from these results are mainly the associations between all nine themes. How these are associated will be discussed further below. The themes are associated in several ways which allows them to explain some examples of experiences from mental health interventions that could promote mental health in HCW, as they are affected by the pandemic.

HCW mental distress associated with safety culture and quality of care

HCW mental distress was one out of five main themes in this systematic review, and it is defined in all contexts of the study. Safety culture and quality of care were themes that were identified in association with HCW mental distress. WHO (2020a) stated that it is of immediate importance to preserve HCW physical and mental health to ensure safe and sustainable patient care and patient safety. The association between their mental well-being and lower risk for mistakes taking care of patients was confirmed in the results of this systematic review. A strong safety culture leads to a better sense of coherence in the workplace and increased coping skills for stress. As described in the introduction, stress can

cause many psychosomatic symptoms such as muscle tension and pain. Stress can also affect the immune system, which increases vulnerability to colds and other infections (AIS, n.d.). Every aspect of mental distress is related to quality of care as it affects decision-making in care of patients.

This intervention had promising effects on HCW. Stress levels and anxiety levels were significantly reduced in those receiving the intervention, compared to the life-as-usual control group that received no intervention. This is not only a success for the HCW, but the whole organization and patient outcomes. When the organization promotes safety for staff and patients, it promotes safety culture (Ameli et al., 2020).

A promising finding from this intervention study was that stress levels and anxiety levels were significantly reduced in those receiving the intervention. This is not only a success for the HCW, but the whole organization and patient outcomes. When the organization promotes safety for staff and patients, it promotes safety culture (Ameli et al., 2020). This may therefore confirm the association between improved safety culture when the stress-levels in HCW decreased. Because safety of HCW affects patient safety, it is of immediate importance to preserve HCW physical and mental health to ensure safe and sustainable patient care. HCW mental well-being should be promoted to prevent the spread of SARS-CoV-2 and other infections and reduce the death rate due to COVID-19. This perspective on health promotion among HCW is also advocated by WHO (2020a).

HCW mental distress and workplace-based approaches

Intervention studies in relation to HCW mental distress were also a main theme through this systematic review. All interventions involved HCW participants who worked in hospitals and included measurements of mental health outcomes. Successful interventions provide more than only positive outcomes for the individual, but for the occupational group and for the organization. Organizational outcomes for health promotion were highlighted in the results, but as potential sequelae of successful interventions. When a healthcare

organization invests resources in a specific occupational group in a specific arena, the chances of an efficient and successful program increase (WHO, n.d.). Effective interventions require a well-defined purpose and aim, hence underscoring the need for a specific target group. Decisions regarding type, duration and outcomes of an intervention should be evidence-based and based on organizational goals and the target group (Jarlbro, 2010). More efficient use of healthcare resources will achieve increased quality of care (The Organisation for Economic Co-operation and Development [OECD], 2010).

The result of this systematic review shows associations in coping strategies and mental distress. The individual coping strategies, one's ability to process and overcome stressful events, leads to improved mental well-being. The combination of coping strategies and resilience are factors that prevent mental distress during stressful events (Lorente et al., 2020; Stocchetti et al., 2021). The personal experience of stressful situations depends on personal and environmental coping resources as well as previous resources (Bowling, 2014). In relation to the work-related stress for HCW during the pandemic, they are exposed to a lot of risks (WHO, 2020a). The environmental coping resources are alarming, as well as the personal coping resources might be affected due to mental distress. The pandemic is a crisis situation for HCW, which makes the crisis theory relevant. Three types of coping skills were identified when crisis theory was applied to coping abilities: appraisal-focused coping, problem-focused coping [PFC] and emotion-focused coping [EFC] (Bowling, 2014). PFC and EFC were compared in a cross-sectional study in relation to the potential risk factors to mental distress. The outcome of that study was that both of these coping strategies, together with resources for resilience, are potentially important to promote and positively influence HCW mental health. PFC and EFC are also based on the transactional model of stress and coping (Lorente et al., 2020).

A positive safety culture is associated with organizational factors such as teamwork as well as overall perceptions and education of patient safety. These were all linked to symptoms of mental distress. Work-related stressors include time pressures, reduced social support, excessive workloads, miscommunication, poor supervision, conflicts, high job demands and

morale (Azoulay et al., 2020; Mira et al., 2020). Workplace-based approaches are therefore important to consider in mental health promotion programs when aiming on effects linked to more than the individual healthcare worker. Interventions with these approaches had improved outcomes in HCW, including burnout, job dissatisfaction, and retention (Linzer et al., 2015). A lower prevalence of job strain and better coping with stressful situations were also an outcome from a program (El Khamali et al., 2018). Another program improved mental health literacy, improved attitudes toward seeking treatment and decreased stigmatized beliefs (Moll et al., 2018).

Improved working conditions lead to improved mental work ability (Linzer et al., 2015). Improved mental work ability leads to improved self-esteem, which affects decision-making in patient care (Montano et al., 2020). All of these factors improve quality of care and are therefore beneficial for both HCW and patients. Furthermore, self-efficacy is a term in health care measurement scales when referring to self-esteem or confidence. The definition and theory of self-efficacy is one's competency and capability to succeed and cope with problems and preserve internal control. It is a common application on health promotion programs. Theoretically, self-efficacy leads to greater self-esteem, coping and well-being. These factors of health are in alignment with the social model of health (Bowling, 2014). It is well described with reference to the constitutions of the WHO's definition of health in 1948, that "health is a state of complete physical, mental and social well-being and not merely the absence of disease" (WHO, 2021d). Therefore, positive protective factors of mental health like self-esteem, coping skills, resilience and self-efficacy are often used as health care measurement scales (Bowling, 2014).

Mindfulness-, art activity- and biomarker-based approaches

Some of the reviewed interventions were not originally designed to be applicable in the work environment, while other programs were designed for work environment situations. Stress and anxiety levels were reduced via art, mindfulness (Ameli et al., 2020; Karpavičiūtė et al., 2016) and sensory self-care interventions (Leão et al., 2017). These programs, in contrast to

other employee mental health programs, were ancillary to the daily work environment. In contrast, the health literacy training intervention improved HCW workplace mental health literacy and consisted of work-related simulation scenarios focusing on different conditions in patients, as well as nursing theory to decrease work-related stress. Increasing health literacy provides a long-term solution to stress, leads to better work performance, and empowers HCW (El Khamali et al., 2018).

Employee assistance programs not located in the work setting are also effective in promoting health in HCW (Ameli et al., 2020; Karpavičiūtė et al., 2016; Leão et al., 2017). While employee assistance programs located outside the workplace may not be as effective for the organization as a whole, different approaches can complement each other and allow employee flexibility by allowing HCW to choose when and where they participate in such programs. Having a choice can also be a positive experience for the employee. This does not, however, imply that the employee assistance programs not located in the work setting are less effective in promoting health in HCW. Though, it might imply that health promotion programs do not reach organizational outcomes as effectively.

These approaches in programs might be great complements to various investments in HCW mental health. For instance, the assisted dog therapy intervention was used to moderate stress levels in HCW, and the intervention took place during HCW breaks during the workday (Machová et al., 2019). The presence of an animal could make the breaks more efficient, in terms of a positive mental rest in the working environment. Thus, psychological and mental safety for HCW is also fundamental for maintaining patient safety. As stated before in this review, mental distress in HCW and quality of care in terms of patient safety are associated. Improved safety culture leads to improved quality of care for patients (Lorente et al., 2020; Pozo-Herce et al., 2021).

With the findings from this systematic literature review, comes new questions. The programs are effective in promoting mental health for the individual healthcare worker. However, some studies show that a stressful work-environment during the SARS-CoV-2 pandemic may predominate over the positive long-term effects for HCW mental health. Organizational

interventions might reach more long-term effects as the organization is affected as a whole, while other programs might be suitable for short-term effects. Approaches like the assisted dog therapy, mindfulness approaches or art activities with short-term effects in coping strategies might be an effective complement to other long-term approaches. A finding from the first research question was the association between coping strategies, resilience and mental distress during the SARS-CoV-2 pandemic. Programs that promote coping strategies and resilience are therefore promising when developing future mental health promotion programs. This can prevent mental distress during stressful events, for example stressful work-environments during the pandemic. However, according to a cross-sectional study, high levels of resilience was not always enough to prevent symptoms of burn-out during the SARS-CoV-2 (Stocchetti et al., 2021). The work-related stress might therefore predominate over the positive effects from some mental health promotion programs.

If resilience in stressful situations is not enough, it is important to consider different approaches when implementing mental health promotion programs during the pandemic. As a suggestion, approaches that promote coping skills can be beneficial for this purpose. The coping strategies, PFC and EFC, together with resources for resilience, are potentially important to promote and positively influence HCW mental health (Lorente et al., 2020). As previously stated, the combination of coping strategies and resilience are factors that prevent mental distress during stressful events (Lorente et al., 2020; Stocchetti et al., 2021). Follow-up and tailored interventions are important to adapt results to the fast changes in work-environment during the pandemic.

HCW mental distress, SARS-CoV-2 pandemic and the need for long-term investments

Multi-modal interventions are critical to address the myriad of ways in which people work and live, particularly in pandemic conditions when there are severe changes in daily life. While accessibility to many traditional, hands-on intervention programs may be limited and costly, interventions that use technology allow flexibility to overcome practical obstacles and increase efficacy in treatments and prevention. A high prevalence of mental distress among HCW increases the risk of long-term sick leave. Persistent work-related stress

reduces individual job satisfaction and enhances the risk of stress reactions, long-term absence and burnout (El Khamali et al., 2018). In a global disaster like the SARS-CoV-2 pandemic, technology solutions that are available at home or other remote locations, might be cost-effective options and contribute to broader accessibility. One of the interventions investigated the efficacy of a brief online form of EFT which showed promising outcomes in psychological distress. It was conducted during the SARS-CoV-2, but the EFT treatment has also been investigated before the pandemic (Dincer & Inangil, 2020). These complementary approaches are often preferred, cost-effective, and efficacious. Using healthcare resources more efficiently, translates to more equal and higher quality of care (OECD, 2010).

WHO is launching a campaign during 2021, with the theme – protect, invest, together. “Protect our health care workers”, “Invest in the people who invest in us” and “Together we can make it happen”. It highlights the urgent need to invest in HCW for shared dividends in health, jobs, economic opportunities, and equity (WHO, 2021c). Long-term effects due to the SARS-CoV-2 pandemic require lasting results from health promotion programs in order to reach global goals and global partnerships. Questions unanswered in several of the programs are how durable intervention effects are over time. For instance, one of the interventions reviewed lasted for only five days and the job strain factor was evaluated after six months. Prevalence of job strain remained decreased (El Khamali et al., 2018). Nevertheless, other factors independent of the intervention, might have influenced the decreased job strain. Interventions that are more frequent for a longer period of time, with more frequent follow-ups, might lead to more durable effects and could therefore promote more well-functioning healthcare systems.

Well-functioning healthcare systems are needed for long-term investments in health promotion for HCW (WHO, 2021b). Well-functioning healthcare systems also contribute to decreased spread of infection and effective response to crises (Stahel, 2020). To prevent more public health issues due to SARS-CoV-2, health systems need to respond to and act on SARS-CoV-2 in terms of HCW mental health needs (WHO, 2020a; WHO, 2020c). The International Year of Health and Care Workers was established in appreciation and gratitude for HCW’s unwavering dedication in the fight against the SARS-CoV-2 pandemic. It is a

call for support and action for investment in HCW, not only during the pandemic but at all times.

As mentioned in the introduction, The Swedish Public Health Agency points out that long-term activation of the stress response system, without sufficient recovery, increases the risk for both somatic and psychiatric disorders. Chronic stress conditions affect society in public health perspectives (Folkhälsomyndigheten, 2021a). Transient conditions that were self-reported (identified in the first research question) during the pandemic could therefore lead to both somatic and psychiatric disorders. Global partnerships are required to ensure that HCW are supported, protected, motivated and equipped to deliver safe health care at all times (WHO, 2021c). The prevalence of self-reported symptoms of mental distress in HCW during SARS-Cov-2 is well-represented in the cross-sectional studies reviewed in this systematic literature review. The results from the interventions promoting HCW mental health are promising overall and should be implemented and/or inspire other programs. The situation for HCW is acute in terms of the burden on HCW mental health and health systems.

Methods discussion

Strengths and limitations

The literature that was systematically reviewed for this report was carefully selected and critically reviewed based on the topic and aim. Due to the effects that the SARS-CoV-2 pandemic has had on health systems, current research and knowledge, including articles in this report, may differ in applicability on health systems and HCW in the near future. The included articles are of high validity as they measured what they intended to measure, namely markers for mental distress in HCW, approaches to promote mental health, and evaluation of these approaches in relation to HCW mental status that were also applicable during the SARS-CoV-2 pandemic. However, there is always the risk for validity problems with self-reported data (Bowling, 2014). The respondents might exaggerate or minimize their health status. Moreover, with mental illness comes symptoms of forgetfulness

(PsychCentral, 2019), which could have affected the respondents' answers, if forgetting useful information.

Every step of the review process has been documented in this report, even when facing obstacles. Discussions of the method are transparently evaluated. As mentioned earlier in this report, this literature review had a different aim at the starting point which affected which articles to include. The literature search made before rephrasing the aim included articles pre-pandemic. When rephrasing the aim and replacing two cross-sectional studies, the filter "last 10 years" was supposed to be changed to "years 2020 - 2021", but was not. This was a disadvantage in the search process as the number of records identified before screening would have decreased if the filter had been changed. Eight to nine years of articles were therefore irrelevant.

The second search from the first step of the literature search generated more articles compared to the previous search, due to the time gap and the increasing interest of the topic during this time, as it took place during a global pandemic. There is also the possibility of biased reporting, as with any review that does not evaluate all published literature (Nowell et al., 2020). The outcomes of the included articles could be different from excluded articles, which could have affected the result of this review relative to the population. The validity in this review is high, though the outcomes of the included articles could be different from excluded articles.

The decision to change the aim of the review and changing two of the included articles by conducting another literature search, was made to increase the quality of this review. However, the changes have been avoided if the aim of the review would have been on-point from start. Using the PRISMA 2020 guidelines (Page et al., 2021) leads to transparent and accurate reporting of the literature, which enhances relevance and acceptance among the greater scientific communities, so that others can replicate or update reviews. The search strategy of this review was not in complete adherence with the PRISMA guidelines due to the mentioned limitations in the review process. The trustworthiness of this review therefore has its limitations. Avoiding rephrasing of the aim and inaccurate order of the literature search, could have made this review easier replicable. Updating this review could however be done and is recommended.

The keywords are relevant to the aim of this review. Though, some of the applied keywords could be in increased adherence and more accurate to the aim of the review. The choices are explained in Methods. Nevertheless, other keywords could have been applied as well. An example of such a keyword is “Nurses” which by definition are HCW, but that choice of keyword means that all other HCW were excluded. Though, “nurse” is relevant to the inclusion criteria of a hospital setting, why it helped to narrow the results of articles in PubMed. The keyword “Occupational health” is health related to the work-place. It could have been defined as “occupational mental health” instead, to avoid articles aiming on general health. The work-place was chosen as a keyword as the hospital setting is a work-place for HCW.

Another factor that could have affected the literature search was the filter “Full text” that was applied in the search in PubMed. That decision might have led to different articles being found, which might have affected the results in this review. However, this limitation does not mean that the results in this review are of less quality or less valid. The included articles are of high quality as the quality was assessed with PRISMA guidelines and articles were peer-reviewed as well as ethically approved. The filter “Clinical trial” was not necessary either as that study design was an exclusion criterion along with every study design except for randomized controlled trials. Clinical trials are often used in medical studies and experiments, which is not the outcome of interest in this review. Randomized controlled trials are often used for prevention and promotion in the health sector. The filter “Clinical trial” did not affect the results of this review regarding that no clinical trials were included. Though, it affected the results of the literature search in PubMed. The filters and keywords should be accurate to the aim and eligible criteria for an effective data collection. An effective data collection, and review process overall, decreases the risk for validity problems. Validity defines whether you observe, identify or measure what you intend to (Bryman, 2015).

The reason for the age criterion in the structured literature search was to achieve quality in the data collection process based on the prerequisites of this literature review, since the literature on HCW mental health is very broad. Though, this meant that HCW above age 44 were excluded. It also resulted in inclusion criteria for countries which were set to limit the

search to a few included western countries. This review is multinational as it involves data from more than one country. Multinational studies are common in social sciences or in epidemiological studies. HCW in the chosen age group are also vulnerable to mental illness and are important to consider in mental health promotion programs. The included articles in this review could have shown different results if included HCW in all age groups or a different number of countries. Further studies including other age groups on HCW are therefore recommended to include the age groups excluded from this review. The results in this systematic review are valid for HCW in the included age group, as well as the place and field of this public health issue.

Thematic analysis was a method carefully chosen for analyzing the data in this systematic review. Choice of method was discussed with a primary advisor who also conducts research on this topic. Yet, a common limitation in this method needs to be considered, that is the difficult decision of knowing where to stop developing themes (Nowell et al., 2020). Analyzing the material was a process of high magnitude due to much relevant information and the difficult decision of when to stop developing themes. In this process, a strength was that the aim of the study was rephrased and well-defined. This made the process of developing themes structured and systematic. Therefore, the rephrasing process was both a limitation and strength.

Conclusion

The pandemic has had a psychological impact on HCW in terms of many symptoms of mental distress that are reviewed in this systematic review. The results also illuminate findings from mental health interventions for HCW, including promotion programs with different approaches. The approaches were: workplace-based approaches, mindfulness and art activity approaches, biomarker-based approaches as well as technology approaches. Important findings in this literature review are the themes safety culture and quality of care being associated with the other themes.

Current research and knowledge, including articles in this review, may differ in applicability on health systems and HCW in the near future due to the pandemic. Therefore, future

research is recommended on HCW mental health in order to tailor and implement approaches most suitable for the situation. Due to the pandemic's effect on HCW mental health, it is urgent to implement, evaluate and follow-up interventions as well as conducting further research.

In conclusion, when implementing approaches in mental health interventions for HCW that promotes safety culture and quality of care it also promotes, according to the findings in this review, long-term effects in individual mental health in HCW. Furthermore, complementing different approaches will enhance the effects when using resources efficiently. Findings from this systematic review may benefit future research and development of new mental health promotion programs for HCW as it contributes with perspectives and awareness in this particular public health science field. Follow-up and tailored interventions are important to adapt results to the fast changes in work-environment during the SARS-CoV-2 pandemic. Longitudinal studies of mental distress in HCW including all age groups are therefore recommended, as well as updated reviews on this public health topic.

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APPENDICES

Appendix 1. Cross-sectional studies (N=10)

References	Aim of study	Measures	Demographics	Outcomes
Firew et al. (2020) USA	To assess factors contributing to HCW infection and psychological distress during the COVID-19 pandemic in the USA.	Self-reported COVID-19 infection, burn-out, depression, and anxiety symptoms.	N=3083 respondents accessed the survey and 2040 participants completed at least 80% of the survey.	HCWs have experienced significant physical and psychological risk while working during the COVID-19 pandemic. HCW with self-reported COVID-19 infection reported higher levels of depressive symptoms (mean diff.=0.31), anxiety symptoms (mean diff.=0.34) and burn-out (mean dif.=0.54) compared to HCW not infected with COVID-19.
Protecting the front line: a cross-sectional survey analysis of the occupational factors contributing to healthcare workers' infection and psychological distress during the COVID-19 pandemic in the USA				

<p>Azoulay et al. (2020) France</p>	<p>To assess the prevalence of symptoms of anxiety, depression, and peritraumatic dissociation in HCPs.</p>	<p>The prevalence of symptoms of anxiety, depression, and peritraumatic dissociation.</p>	<p>N=1058 Frontline healthcare providers (HCPs) (median age 33 years; 71% women; 68% nursing staff).</p>	<p>Ability to rest is a protective factor (OR<1.0) for anxiety (OR, 0.29), depression (OR, 0.14) and peritraumatic dissociation (OR, 0.4). HCPs experience high levels of psychological burden during the COVID-19 pandemic</p>
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Symptoms of Anxiety, Depression, and Peritraumatic Dissociation in Critical Care Clinicians Managing Patients with COVID-19

<p>Gorini et al. (2020) Italy</p>	<p>To evaluate mental health outcomes among different categories of Italian healthcare workers during the second month of the COVID-19 outbreak.</p>	<p>Perceived risk and fear of infection related to COVID-19, anxiety- and depressive symptoms.</p>	<p>N=650 Italian healthcare workers during the COVID-19 outbreak.</p>	<p>Nurses suffered the impact of the pandemic more than both physicians ($\beta = - 0.66$; $p \leq 0.0001$) and other health professionals ($\beta = - 0.52$; $p = 0.0007$). Main risk factors for mental health disturbances: Female sex, nursing profession, fear of being infected, as well as the length of exposure to the COVID-19 spread and the risk of directly interacting with infected patients.</p>
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Mental health and risk perception among Italian healthcare workers during the second month of the Covid-19 pandemic

Mira et al. (2020) Spain	To determine the volume of health professionals who suffered distress due to their care of patients with COVID-19	Acute stress during the outbreak evolution.	N=685 professionals (physicians, nurses and other health staff). Primary care and hospitals in Spain	Feeling emotionally blocked (p=0.37) or having difficulties in empathising with the patients' suffering (p=0.93). The pandemic has affected the mental health of health professionals which may reduce their resilience in the face of future waves of COVID-19.
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Acute stress of the healthcare workforce during the COVID-19 pandemic evolution: a cross-sectional study in Spain

Chatzittofis et al. (2021) Cyprus	To assess the mental distress of HCWs during the COVID-19 pandemic in the RC, particularly the presence of post-traumatic stress, depressive	Depressive, PTSD and Stress Symptoms	N=424 HCWs completed the questionnaire :248 (58.5%) female and 176 (41.5%) male; mean age 38.78 years.	A considerable number of HCWs reported clinical depressive and PTSD symptoms 79 (19%) screened positive for clinically-relevant depressive symptoms (PHQ9 score≥10) and 62 (15%) for PTSD symptoms (IES-R score>33).
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	and anxiety symptoms.			
Impact of the COVID-19 Pandemic on the Mental Health of Healthcare Workers				
Torrente et al. (2021) Spain	To assess the prevalence of burn-out syndrome in healthcare workers working on the front line in Spain during COVID-19.	Burn-out syndrome. Self-assessment: six questions rated from 1 to 5 to evaluate participant's attitude towards (1) psychological impact, (2) self-infection, (3) risk of infecting their family, (4) this pandemic going for too long, (5) patients outcome, and (6) their performance and quality of care.	N=674 healthcare professionals. Most participants were women (472 (73.4%)), aged 31–40 years (163 (25.3%)) and worked in tertiary hospitals (>600 beds) (260 (40.4%))	High prevalence of burn-out syndrome: 43.4%. Prevalence was higher in COVID-19 front line workers compared to non front line workers Risk factors associated with high risk for burn-out syndrome are working on COVID-19 front line (p<0.001), being a woman, (p=0.022), being under 30 years (p=0.028) and being a physician (p=0.011).
To burn-out or not to burn-out: a cross-sectional study in healthcare professionals in Spain during COVID-19 pandemic				
Pozo-Herce et al. (2021)	to measure the psychologic	Stressors, perceived	N=605 health professionals	The COVID-19 pandemic has had a significant psychological impact on health professionals

Spain	al impact of the SARS-CoV-2 virus on the nursing professionals	emotions, and coping strategies.	participated in a survey study; 91.9% were women	in terms of stress, emotional well-being, and the use of coping strategies
Psychological Impact on the Nursing Professionals of the Rioja Health Service (Spain) Due to the SARS-CoV-2 Virus				
Lorente et al. (2020) Spain	Which is the effect of sources of stress during the COVID-19 pandemic on nurses' psychological distress, identifying the mediating role of both problem-focused and emotion-focused coping strategies	Stressors, coping strategies, resilience, psychological distress,	N=421 Nurses. 93.6% women, 6.4% Men; mean age, 36 years	The highest score among the stressors was: Fear of infection, (mean: 3.10), fear of death (mean: 2.45) and lack of support (mean: 1.43) All measured stressors have a significant, direct, and negative relationship with nurses' psychological distress. Emotion-focused strategies are inversely related to nurses' psychological distress

	and resilience?			Problem-focused strategies are positively related to nurses' psychological distress
Nurses' stressors and psychological distress during the COVID-19 pandemic: The mediating role of coping and resilience				
Stocchetti et al. (2021) Italy	To investigate the psychological impact of the pandemic on front-line staff working at the new COVID-19 ward at Milano Fiera, Lombardy during the second pandemic wave	Distress, burnout syndrome, and resilience	N=136 Nurses and doctors	<p>Factors associated with burnout were: anxiety, depression, and insomnia symptoms (High levels of depressive symptoms were also found as a factor significantly associated with burnout (OR 4.88, 95% C.I. 1.54–15.48, $p < 0.01$).</p> <p>High levels of resilience were associated with high emotional exhaustion, high depersonalization, and lower levels of personal accomplishment.</p> <p>High levels of burnout (high EE/ low PA) were reported in those who did not feel protected when working.</p>

Burnout in Intensive Care Unit Workers during the Second Wave of the COVID-19 Pandemic: A Single Center Cross-Sectional Italian Study

<p>Alonso et al. (2020) Spain</p>	<p>To estimate the prevalence of clinically significant mental disorders among Spanish healthcare professionals during the first wave of the COVID-19 pandemic (March-July, 2020) using a representative sample and well-validated screeners of common mental disorders.</p>	<p>Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD): Panic attacks, Posttraumatic Stress Disorder (PTSD), Substance Use Disorder (SUD), Disabling mental disorder, Prior lifetime mental disorders</p>	<p>N=9138 healthcare workers</p>	<p>One in seven Spanish healthcare workers screened positive for a disabling mental disorder during the first wave of the COVID-19 pandemic. Workers reporting pre-pandemic lifetime mental disorders, those frequently exposed to COVID-19 patients, infected or quarantined/isolated, female workers, and auxiliary nurses should be considered groups in need of mental health monitoring and support.</p>
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Mental health impact of the first wave of COVID-19 pandemic on Spanish healthcare workers: A large cross-sectional survey

Appendix 2. Randomized Controlled Intervention Studies (N=10)

References	Aim of study	Measures	Demographics	Outcomes
Moll et al. (2018) Canada	To evaluate whether a contact-based workplace education program was more effective than standard mental health literacy training in promoting early intervention and support for healthcare employees with mental health issues	Mental health knowledge, stigmatized beliefs, and help-seeking/help-outreach behaviors.	N=192 170 women; 22 men	Help-outreach behaviors: (P=0.85). Help-seeking behaviors: at 3 mo follow-up (p=0.834) at 6 mo follow-up (p=0.624). The Beyond Silence program was not superior to Mental Health First Aid training. No significant change in mental health help-seeking or outreach behaviors.
Beyond Silence: A Randomized, Parallel-Group Trial Exploring the Impact of Workplace Mental Health Literacy Training with Healthcare Employees				
Dincer & Inangil. (2020) Turkey	To investigate the efficacy of a brief online form of	Stress, anxiety, burnout	N=72 64 women; 8 men	A single 20-minute online group treatment was effective in reducing stress, anxiety, and burnout in

	<p>Emotional Freedom Techniques (EFT) in the prevention of stress, anxiety, and burnout in nurses involved in the treatment of COVID-19 patients.</p>		<p>Mean age 33.5+/- 9.6 years</p>	<p>nurses working with COVID-19 patients.</p> <p>All three hypotheses were supported. In the intervention group there was a reduction in stress ($p < 0.001$), anxiety ($p < 0.001$), and burnout ($p < 0.001$). There were no changes in the control group ($p > 0.05$) on these measures.</p>
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The effect of Emotional Freedom Techniques on nurses' stress, anxiety, and burnout levels during the COVID-19 pandemic: A randomized controlled trial

<p>Smoktunowicz et al. (2021) Poland.</p>	<p>To compare the efficacy of 4 variants of Med-Stress, a self-guided internet intervention that aims to improve the multifaceted well-being of medical professionals.</p>	<p>Job stress, job burnout, work engagement, depression, job-related traumatic stress</p>	<p>N=1240 1074 women; 166 men Mean age 36.2 years</p>	<p>The Med-Stress internet intervention improved some components of well-being, most notably job stress, when activities were completed in a specific sequence.</p>
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Original Paper Resource-Based Internet Intervention (Med-Stress) to Improve Well-Being Among Medical Professionals: Randomized Controlled Trial

<p>Machová et al. (2019) Czech Republic.</p>	<p>To evaluate whether animal-assisted therapy (AAT) with the presence of a dog affects the stress level of nurses.</p>	<p>3 intervention groups: Condition A—no work break; Condition B—with a work break of their choice; Condition C—a work break with AAT</p>	<p>N=20 Nurses All women Mean age 30 years</p>	<p>Reduction of cortisol levels were observed in Condition C, where AAT was included (p=0.02)</p> <p>AAT could be a strategy to reduce significant stress as a part of stress prevention programs for nurses.</p>
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Canine-Assisted Therapy Improves Well-Being in Nurses

<p>El Khamali et al. (2018) France</p>	<p>To evaluate the effects of a program including simulation in reducing work-related stress and work-related outcomes among ICU nurses</p>	<p>Job strain, isostrain, high psychological demand, low social support, low decision latitude, absenteeism, left ICU.</p>	<p>N=198 ICU nurses</p>	<p>Lower prevalence of job strain at 6 months in the intervention group was observed compared with nurses who did not participate in this program.</p> <p>At end of intervention, compared to the control group, those receiving the intervention had: Lower prevalence of: job strain (P</p>
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				<0.001), isostrain (P <0.001), high psychological demand (P <0.001), low social support (P <0.001), low decision latitude (P <0.001).
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Effects of a Multimodal Program Including Simulation on Job Strain Among Nurses Working in Intensive Care Units A Randomized Clinical Trial

Linzer et al. (2015) USA	To assess if improvements in work conditions improved clinician stress and burnout.	Work conditions, clinician reactions and patient care, burnout, stress, satisfaction and intention to leave were measured at baseline and at 12–18 months.	N=166 Primary care clinicians	Organizations may be able to improve burnout, dissatisfaction and retention by addressing communication and workflow, and initiating Quality Improvement projects targeting clinician concerns. Improvement in burnout, stress, satisfaction and intention to leave was observed in the intervention versus control clinics (p<0.05)
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A Cluster Randomized Trial of Interventions to Improve Work Conditions and Clinician Burnout in Primary Care: Results from the Healthy Work Place (HWP) Study

<p>Ameli et al. (2020) USA</p>	<p>To determine the efficacy and feasibility of a brief mindfulness-based program to reduce stress during work hours among health care professionals.</p>	<p>Stress, anxiety, trait mindfulness, state of mindfulness.</p>	<p>N=78 Full-time health care professionals. 65 women; 13 men Mean age 32 years</p>	<p>Engaging both individual and organizational involvement toward reducing stress and enhancing mindfulness may have far-reaching effects on employee health, patient outcomes, and organizational success.</p> <p>At the end of intervention, compared to the control group, those receiving the intervention had: Reduced levels of: stress (P<0.001) and anxiety (P<0.001), and increased levels of trait mindfulness (P<0.001), state of mindfulness (P<0.001).</p>
<p>Effect of a Brief Mindfulness-Based Program on Stress in Health Care Professionals at a US Biomedical Research Hospital A Randomized Clinical Trial</p>				
<p>Karpavičiūtė et al. (2016) Scotland</p>	<p>To investigate the impact of an arts activity on the well-being of nursing staff working in a hospital.</p>	<p>Self-assessed health, vitality/energy, emotional well-being</p>	<p>N=115 Nurses. All women Mean age not stated.</p>	<p>The study findings suggest that an arts activity as a workplace intervention, can be used to promote nursing staff health and well-being at work, manage occupational stress and health risks at work, and</p>

				strengthen organizational well-being. Self-assessed health (P<0.001). vitality/energy (P<0.001)., and emotional well-being (P<0.001).
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The Impact of Arts Activity on Nursing Staff Well-Being: An Intervention in the Workplace

Montano et al. (2020). Germany	To reduce physical and psychosocial loads, and strengthen resources at work, by propositions of measures made by employees.	Physical and mental work ability.	N = 174 healthcare workers	Higher scores of effort-reward imbalance and overcommitment are associated with lower scores of physical and mental work ability.
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Working conditions of healthcare workers and clients' satisfaction with care: study protocol and baseline results of a cluster-randomized workplace intervention

Leão et al. (2017) USA	To evaluate the impact of a self-care intervention mediated by the senses on levels of stress, self-esteem and	Stress (Stress inventory and cortisol collection), self-esteem (Self-esteem scale) and	N=93 female health professionals	The self-care method (mediated by touch, smell, sight and hearing) does not reduce stress. However, it improved participants' self-esteem. Self-esteem and stress are not always related.
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	<p>well-being among female health professionals working in a hospital setting</p>	<p>well-being (Scales of subjective well-being).</p>		<p>A simple measure, such as daily body moisturizing mediated by touch and smell can reduce stress-related symptoms.</p>
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Stress, self-esteem and well-being among female health professionals: A randomized clinical trial on the impact of a self-care intervention mediated by the senses.