

COVID-19 CADTH Health Technology Review

Impact of the COVID-19 Pandemic on the Physical and Mental Well-Being of Health Care Workers

This report was completed on June 8, 2021.

To produce this report, CADTH used a modified approach to the selection, appraisal, and synthesis of the evidence to meet decision-making needs during the COVID-19 pandemic. Care has been taken to ensure the information is accurate and complete, but it should be noted that international scientific evidence about COVID-19 is changing and growing rapidly.

Version: 1.0
Publication Date: June 2021
Report Length: 26 Pages

Cite As: *Impact of the COVID-19 Pandemic on the Physical and Mental Well-Being of Health Care Workers*. Ottawa: CADTH; 2021 June. (CADTH health technology review).

Disclaimer: The information in this document is intended to help Canadian health care decision-makers, health care professionals, health systems leaders, and policy-makers make well-informed decisions and thereby improve the quality of health care services. While patients and others may access this document, the document is made available for informational purposes only and no representations or warranties are made with respect to its fitness for any particular purpose. The information in this document should not be used as a substitute for professional medical advice or as a substitute for the application of clinical judgment in respect of the care of a particular patient or other professional judgment in any decision-making process. The Canadian Agency for Drugs and Technologies in Health (CADTH) does not endorse any information, drugs, therapies, treatments, products, processes, or services.

While care has been taken to ensure that the information prepared by CADTH in this document is accurate, complete, and up-to-date as at the applicable date the material was first published by CADTH, CADTH does not make any guarantees to that effect. CADTH does not guarantee and is not responsible for the quality, currency, propriety, accuracy, or reasonableness of any statements, information, or conclusions contained in any third-party materials used in preparing this document. The views and opinions of third parties published in this document do not necessarily state or reflect those of CADTH.

CADTH is not responsible for any errors, omissions, injury, loss, or damage arising from or relating to the use (or misuse) of any information, statements, or conclusions contained in or implied by the contents of this document or any of the source materials.

This document may contain links to third-party websites. CADTH does not have control over the content of such sites. Use of third-party sites is governed by the third-party website owners' own terms and conditions set out for such sites. CADTH does not make any guarantee with respect to any information contained on such third-party sites and CADTH is not responsible for any injury, loss, or damage suffered as a result of using such third-party sites. CADTH has no responsibility for the collection, use, and disclosure of personal information by third-party sites.

Subject to the aforementioned limitations, the views expressed herein are those of CADTH and do not necessarily represent the views of Canada's federal, provincial, or territorial governments or any third party supplier of information.

This document is prepared and intended for use in the context of the Canadian health care system. The use of this document outside of Canada is done so at the user's own risk.

This disclaimer and any questions or matters of any nature arising from or relating to the content or use (or misuse) of this document will be governed by and interpreted in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein, and all proceedings shall be subject to the exclusive jurisdiction of the courts of the Province of Ontario, Canada.

The copyright and other intellectual property rights in this document are owned by CADTH and its licensors. These rights are protected by the Canadian *Copyright Act* and other national and international laws and agreements. Users are permitted to make copies of this document for non-commercial purposes only, provided it is not modified when reproduced and appropriate credit is given to CADTH and its licensors.

About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

Table of Contents

Key Messages	4
Purpose and Context	4
Process	4
Questions	5
Summary of Findings	5
The Evidence to Date	6
References	22
Appendix 1: Full IMPRESS Search Results	24

Tables

Table 1: Overview of the Types of Documents Identified	7
Table 2: Summary of the Evidence on the Physical Health Impact of the COVID-19 Pandemic on Health Care Workers	8
Table 3: Summary of the Evidence on the Mental Health Impact of the COVID-19 Pandemic on Canadian Health Care Workers	10
Table 4: Summary of the Evidence on the Impact of the COVID-19 Pandemic on the Personal Lives of Canadian Health Care Workers	19

Key Messages

- The COVID-19 pandemic has negatively impacted both the physical and mental health of health care workers (HCWs). During the pandemic, burnout has been a commonly reported physical outcome for HCWs.
- For HCWs, evidence suggests that their risk of infection with the COVID-19 virus is likely higher in non-occupational settings (i.e., outside of work). However, their infections are more severe than infections contracted by people not working in health care, possibly because of the increased levels of stress and exhaustion faced by HCWs.
- Common mental health problems in HCWs include anxiety, depression, stress, post-traumatic distress, and insomnia. Fears of infection and spreading the virus to family, friends, and others are also common and can result in stigmatization and isolation from social support networks. Stigmatization may negatively impact the mental and physical health of HCWs and their ability to carry out care.
- Implementing additional measures to support the physical and mental well-being of HCWs during the pandemic is recommended by multiple sources. This could include proactive measures to help build staff resiliency, well-being assessments, promoted coping strategies, adequate protective equipment, special strategies for front-line HCWs, organized online support services, and rapid-response psychiatric teams.

Purpose and Context

As of December 2020, there have been more than 70 million cases and 1.59 million deaths from COVID-19 worldwide.¹ In Canada, there have been more than 392,000 cases and 13,000 deaths.² With the novelty of the pandemic and the growing number of cases, COVID-19 has put health care systems under immense stress and beyond their resource capacity to care for those affected.³

Health care workers (HCWs) play a vital role in the care of patients both with and without COVID-19 and they have experienced an increase in both work and personal demands during this pandemic. HCWs are at particular risk of developing a variety of physical and mental health problems as a result of working directly or indirectly with COVID-19 patients.⁴ The pandemic has highlighted the importance of protecting the health of HCWs because they play a key role in ensuring the integrity and continuity of the health care system.⁵

The purpose of this report is to provide a summary of the evidence around physical, psychological, and personal impacts of COVID-19 on the health of HCWs. For the purposes of this report, HCWs are defined as those who work within the health care setting and interact with patients.

Process

This report was produced at the request of the Public Health Agency of Canada (PHAC) and was reviewed by a HCW federal organization working group that includes PHAC, Health Canada, Statistics Canada, the Canadian Institute for Health Information, and the Canadian Institute for Health Research.

An information specialist conducted a limited literature search of key resources, including PubMed, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health

technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were health outcomes, COVID-19, and HCWs. No filters were applied to limit the retrieval by study type. When possible, retrieval was limited to the human population. The search was also limited to English-language documents published between January 1, 2018, and November 19, 2020. Internet links were provided if available.

Key sources from scientific evidence, clinical guidelines, recommendations, national standards, and guideline groups identified from the literature search that were directly relevant to the questions were included. Bibliographic searches were not conducted.

Members of CADTH's Implementation Support and Knowledge Mobilization (ISKM) team screened the literature and selected those documents deemed relevant to the questions in this report. Literature was reviewed but not critically appraised to assess the quality of the included studies and resources. CADTH's ISKM team provided a brief interpretation for each source to assist the requestor.

Questions

PHAC asked the following questions:

- What is the impact of COVID-19 on HCWs (anyone working in a health care setting interacting with patients)?
- Is there an increase in stress, mental health impacts, interpersonal violence, substance use, riskier behaviour, worsening health, or sick time?

In order to conduct a comprehensive literature search, these questions were further subdivided into 3 separate questions:

1. What are the physical health issues that have affected Canadian health care providers (e.g., doctors, nurses, personal support workers), and other people working in health care settings who interact with patients, as a result of their employment during the COVID-19 pandemic?
2. What are the mental health impacts of the COVID-19 pandemic on Canadian HCWs?
3. What are the impacts of the COVID-19 pandemic related to substance use, interpersonal violence, behaviour, and quality of life on Canadian HCWs?

Summary of Findings

The COVID-19 pandemic has had an adverse impact on both the physical and mental health of HCWs. Burnout is a commonly reported physical outcome for HCWs during the pandemic. Risk factors for burnout include increased workload and sleep deprivation. HCWs working on the front line or in emergency departments seem to cope better with burnout compared with HCWs working in regular departments. A potential reason for this is the ability of front-line or emergency HCWs to handle unexpected and uncertain situations due to the nature of their work. For HCWs with COVID-19, evidence suggests that the risk of infection is likely higher in non-occupational settings (i.e., outside of work); however, infections among HCWs are more severe than infections contracted by people not working in health care, possibly because of the increased levels of stress and exhaustion faced by HCWs.

The most commonly reported physical symptoms reported by HCWs with COVID-19 include fever, cough, and fatigue.

Commonly reported mental health problems during the pandemic include anxiety, depression, stress, post-traumatic distress, and insomnia. Risk factors for mental health problems include younger age, female sex, high-risk work environment, lower levels of specialized training and/or job experience, low socioeconomic status, close contact with COVID-19 patients, lack of employer support, lack of social supports, insufficient staffing, and lack of access to personal protective equipment (PPE). According to the literature, mental health issues seem to be more prevalent among nurses, and most severe among women. Fears of infection and spreading the virus to family, friends, and others are common and can result in stigmatization and isolation from social support networks. Stigmatization may negatively impact the mental and physical health of HCWs and their ability to carry out care. Stigmatization has also contributed to the prevalence of attacks against HCWs, which involve “any verbal or physical act of violence, obstruction, or threat that interferes with the availability, access, and delivery of health care.”³ Furthermore, the novel pandemic and evolving guidance are difficult to predict and control, and this uncertainty may contribute to mental health issues.

Overall, multiple sources summarized here recommend implementing additional measures to support the physical and mental well-being of HCWs during the pandemic. Proactive measures may help build HCW resiliency, which may mitigate later and more severe psychological outcomes. These measures include the assessment of well-being, promotion of coping strategies and resilience, special attention to front-line HCWs, adequate protective supplies and staffing, organization of online support services, and rapid-response psychiatric teams.

The Evidence to Date

A total of 51 citations were retrieved through the literature search (Appendix A). After the initial screening of abstracts and titles, 47 potentially relevant documents were identified for full-text review. Of these potentially relevant documents, 40 documents were relevant to the questions posed and are summarized in the subsequent tables. Two Canadian publications were included in these 40 documents.^{6,7} An overview of the types of documents identified can be found in Table 1.

Key findings for each question are noted and summarized. Details on all the included studies as well as a high-level summary from each source are included in Table 2, Table 3, and Table 4.

Table 1: Overview of the Types of Documents Identified

Type of document	Number of studies identified (N = 40)
Systematic review with meta analysis ^{4,8-17}	11
Systematic review ^{18-26,43}	10
Rapid review ^{6,7,27-31}	7
General review (including scoping review) ³²⁻⁴⁰	9
Guidance document ^{3,41}	2
Commentary ⁴²	1

Key Findings for Question 1: What are the physical health issues that have affected Canadian HCWs, both providers (doctors, nurses, personal support workers) and other people working in health care settings who interact with patients, as a result of their employment during the COVID-19 pandemic?

- Physician burnout during the pandemic was commonly associated with factors such as not working on the front line, female sex, unmarried trainees, increased workload, and sleep deprivation.³²
- COVID-19 was the most common cause of death among general practitioners and emergency department physicians in 2020.⁴
- The most common physical symptoms of COVID-19 among HCWs were fever, cough, and fatigue.^{4,33}
- There is mixed evidence regarding the risk of infection. Some studies suggest that HCWs' exposure to the virus that causes COVID-19 is more common in non-occupational settings,⁶ and that risk of infection is higher among non-health care occupations.⁶ However, other studies suggest that the severity of illness is higher among HCWs.²⁷
- Common risk factors for infection among HCWs included working in high-risk departments, long daily shifts, unprotected exposure, contact with infected patients, having a diagnosed family member, inadequate hand hygiene, and improper use of PPE.³³
- Evidence suggests that use of PPE, especially masks, within health care settings reduces the risk of infection with the COVID-19 virus.^{6,27}

Table 2: Summary of the Evidence on the Physical Health Impact of the COVID-19 Pandemic on Health Care Workers

Type of evidence	Summary of relevant evidence	Reference
General review ³²	Based on limited evidence, HCW burnout during the pandemic was higher among those working in hospital wards that were not front line, women, and unmarried trainees, and it was associated with increased workload and sleep deprivation. The authors noted that more research is needed to validate these findings. Recommendations to mitigate physician burnout during the pandemic were explored.	Amanullah S, Shankar RR. The impact of COVID-19 on physician burnout globally: a review. <i>Healthcare</i> . 2020,8(4):421. https://www.mdpi.com/2227-9032/8/4/421/htm
Systematic review with meta-analysis ⁴	The 10 most commonly reported symptoms among HCWs with COVID-19 (most to least reported) included fever, cough, fatigue, headache, sore throat, myalgia, dyspnea, diarrhea, nausea and vomiting, and chills. It was reported that COVID-19 was the most common cause of death among GPs and ED physicians during the outbreak (January 1, 2020 to April 15, 2020 was the time frame for the literature included in the systematic review). The authors also discussed the differences in physical outcomes between infected members of the general population and infected HCWs and potential factors for these differences were discussed.	Salazar de Pablo G, Vauquerizo-Serrano J, Catalan A, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. <i>J Affect Disord</i> . 2020;275:48–57. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7314697/
Scoping review ³³	A variety of infection risk factors were identified among HCWs, including a high-risk work department, an infected family member, inadequate hand hygiene before and after contact with patients, improper PPE, close contact with patients (> 12 times per day), long daily shifts (≥ 15 hours), and unprotected exposure. The most common physical outcomes among infected front-line HCWs were fever, cough, and weakness. Prolonged use of PPE was associated with skin damage (most commonly on the nasal bridge). Recommendations to support front-line HCWs were outlined, including reduced shifts, strict infection control practices, and adequate training and provision of PPE.	Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on health care workers: a scoping review. <i>Int J Emerg Med</i> . 2020;13:40. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7370263/
Rapid review ⁶	This review identified 16 articles related to the risk of transmission of the COVID-19 virus among HCWs and their family members. The results indicated that HCWs were more likely to have been infected with the COVID-19 virus through non-occupational exposures than occupational exposures. Moreover, as of May 2020, non-occupational risk of infection was higher than HCW's occupational risk. Recommendations were made to develop the use of a common metric that would allow for standardized tracking of incidence and outcomes of occupational infections.	COVID-19 Scientific Advisory Group. Key Research Questions: 1) Among countries who are past their initial peak of COVID-19 cases, what proportion of total cases were in health care workers (HCW), and what is the estimated proportion of the total number of HCWs who developed COVID-19 from presumed occupational exposure? 2) Is there any evidence that household members of HCWs are at elevated risk of COVID-19 disease, and if so, are there guidelines for mitigating that risk? Edmonton (AB): Alberta Health Services; 2020: https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-hcw-risk-rapid-review.pdf

Type of evidence	Summary of relevant evidence	Reference
Rapid review ²⁷	The authors found that HCWs accounted for a significant proportion of COVID-19 cases. Incidence of infection may be particularly high during unprotected exposures or during certain types of exposures, such as patient intubations, direct patient contact, or contact with bodily secretions. The severity of illness was higher among HCWs compared with non-HCWs. PPE use, especially the use of masks, and infection control training were associated with decreased risk of COVID-19 infection.	Chou R, Dana T, Buckley DI, et al. Epidemiology of and risk factors for Coronavirus infection in health care workers: a living rapid review. <i>Ann Intern Med.</i> 2020:M20-1632. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7240841/

ED = emergency department; GP = general practitioner; HCW = health care worker; PPE = personal protective equipment.

Key Findings for Question 2: What are the mental health impacts of the COVID-19 pandemic on Canadian HCWs and other people working in health care settings?

- Front-line HCWs are more severely affected by mental health impacts, such as depression, anxiety, distress, insomnia, and indirect traumatization, than other occupational groups. Indirect traumatization is the level of damage that exceeds psychological abnormalities such as obsessive-compulsive traces and somatization (experiencing and communicating psychological distress in the form of physical symptoms and seeking medical care for them). Female nurses were reported to have more severe symptoms of mental disorders. Being female and living in a rural area were the most common risk factors identified for insomnia, anxiety, obsessive-compulsive disorder, and depression.¹³
- A few studies noted that although the reasons for psychological distress among HCWs and non-HCWs may be different, both groups were affected equally, with the exception of insomnia which was reported more frequently in HCWs.^{12,15}
- Health care teams that work more directly with infected patients showed a higher prevalence of symptoms found in mental disorders.¹³ Front-line HCWs and HCWs with low social support and fewer years of work experience reported worse outcomes.²⁶
- Risk factors for symptoms of mental disorder included being a woman, younger, in a junior position, a parent of dependent children, having an infected family member, longer quarantine times, lack of practical support, social isolation and stigma contributed to negative psychological effects. Clear communication, adequate PPE, rest, and practical and psychological support was associated with reduced psychological effects from the psychological impact of increased workload, the need for personal protection, and fears of possible infection of themselves and their families.¹⁴
- Cognitive behavioural therapy, motivational interviewing, and/or crisis intervention were noted as useful strategies to manage health outcomes. Possible actions to mitigate the impacts of mental health issues are improving infrastructures of the workplace, adoption of correct and shared preventive measures, improvement of social support networks, and implementation of resilience training programs for workers in leadership roles.³⁶
- Providing resting places and time for breaks and sleep lessened the impact of physical and emotional exhaustion from fear of infection and transmitting the disease to others. Women were more prone to worse physical and mental health. It was also noted that HCWs may be reluctant to ask for help if it was needed.¹⁸

Table 3: Summary of the Evidence on the Mental Health Impact of the COVID-19 Pandemic on Canadian Health Care Workers

Type of evidence	Summary of relevant evidence	Reference
General review ³⁴	Factors influencing the mental health of HCWs in different countries during the pandemic included insufficient PPE, feelings of fear and stigma, the need for psychological and psychiatric support, and the possibility of post-traumatic mental disorders. There is a need for strategies that minimize the emotional burnout of workers.	Paiano M, Jaques AE, Bezerra Nacamura PA, Salci MA, Radovanovic CAT, Carreira L. Mental health of health care professionals in China during the new coronavirus pandemic: an integrative review. <i>Rev Bras Enferm.</i> 2020;73(Suppl. 2), e20200338. https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672020001400304&lng=en
General review ³⁵	HCWs have been identified as one of the groups who are at risk for suicide during the COVID-19 pandemic. Interventions to prevent suicide include the use of online platforms and apps to stay socially connected and evidence-based management of psychiatric symptoms. Early detection and timely intervention for individuals with psychiatric symptoms and suicide behaviours can reduce the number of suicides.	Que J, Yuan K, Gong Y, Meng S, Bao Y, Lu L. Raising awareness of suicide prevention during the COVID-19 pandemic. <i>Neuropsychopharmacol Rep.</i> 2020;40(4):392-395. https://pubmed.ncbi.nlm.nih.gov/33022901/
General review ³⁶	This article included 37 studies to provide a qualitative synthesis and overview of various psychological and social implications linked to work-related factors since the start of the COVID-19 pandemic. The pandemic has caused sleep disturbances and suicidal thoughts in HCWs. Higher perceived stress was noted primarily among younger people, medical staff, and all medical and emergency workers. Work-related stress, poor social supports, and prolonged working time increased mental health issues, whereas secure procedures to manage the risk of getting COVID-19 and PPE moderated the risk of developing mental health issues. Cognitive behavioural therapy, motivational interviewing, and/or crisis intervention were noted as useful strategies to manage mental health outcomes. Possible actions to mitigate the impacts of mental health issues are improving the infrastructure of the workplace, adopting correct and shared preventive measures, and implementing resilience training programs for workers in leadership roles.	Giorgi G, Lecca LI, Alessio F, et al. COVID-19-related mental health effects in the workplace: a narrative review. <i>Int J Environ Res Public Health.</i> 2020;17(21):7857. https://pubmed.ncbi.nlm.nih.gov/33120930/
General review ³⁷	This review found that there are significant and consistent mental health issues, such as stress, anxiety, depression, and insomnia, among HCWs caring for patients with COVID-19. Mental health impacts are further exacerbated by widespread media coverage and global connectivity. Coping measures used by HCWs include strict psychological impact and coping measures, knowledge of viral transmission, social isolation measures, positive self-attitude, and social support. Those with higher levels of mental health issues sought out assistance from professionals	Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by health care workers due to the COVID-19 pandemic—a review. <i>Asian J Psychiatr.</i> 2020;51:102119. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7175897/

Type of evidence	Summary of relevant evidence	Reference
	such as psychotherapists or psychiatrists directly. The review also found that nurses had higher anxiety and depressive symptoms compared with doctors and that HCWs in the emergency department were at higher risk for developing PTSD than HCWs in the psychiatric unit.	
General review ³⁸	Sixty-five papers were reviewed and summarized to note the clinical and psychological effects resulting from the COVID-19 pandemic. Medical staff and affiliated HCWs are under physical and psychological pressure. HCWs noted that they needed more rest and more PPEs versus psychological support.	Kontoangelos K, Economou M, Papageorgiou C. Mental health effects of COVID-19 pandemic: a review of clinical and psychological traits. <i>Psychiatry Investig.</i> 2020;17(6):491-505. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7324731/
Systematic review with meta-analysis ⁸	The systematic review found that during the COVID-19 pandemic, the prevalence of anxiety and depression in HCWs was similar to that of the general public. Common risk factors included being female, being a nurse, having lower socioeconomic status, having a high risk of contracting COVID-19, and being socially isolated. Protective factors included the availability of medical resources for the containment of COVID-19 and the treatment of patients with COVID-19, access to up-to-date and accurate information, and the use of precautionary measures. There is an urgent need for psychological interventions targeting high-risk populations such as HCWs.	Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-analysis. <i>Psychiatry Res.</i> 2020;291:113190. https://pubmed.ncbi.nlm.nih.gov/32563745/
Systematic review with meta-analysis ⁹	The study reported higher scores for depression and anxiety in health care teams during the pandemic compared to before the pandemic. Teams working more directly with infected patients showed higher prevalence of mental disorders.	da Silva Neto RM, Rodrigues Benjamin CJ, de Medeiros Carvalho PM, Rolim Neto ML. Psychological effects caused by the COVID-19 pandemic in health professionals: A systematic review with meta-analysis. <i>Prog Neuropsychopharmacol Biol Psychiatry.</i> 2021;104:110062. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7409979/
Systematic review with meta-analysis ¹⁰	This review focused on the mental health of Chinese HCWs during the COVID-19 pandemic and found that the anxiety levels of HCWs have increased significantly during the pandemic. Factors influencing this increase include the sudden emergence of the virus and its highly contagious nature, a lack of timely psychological interventions for staff in hospitals, the intensity of health care work and its psychological pressures, and a sense that the risk involved in providing care outweighs the benefits to HCWs. The review highlighted the need for institutions to pay more attention to the physical and mental health issues of front-line HCWs.	Pan R, Zhang L, Pan J. The anxiety status of Chinese medical workers during the epidemic of COVID-19: a meta-analysis. <i>Psychiatry Investig.</i> 2020;17(5):475-480. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7265026/

Type of evidence	Summary of relevant evidence	Reference
Systematic review and meta-analysis ¹¹	<p>The objective of this study was to examine the impact of providing health care during health emergencies caused by viral epidemic outbreaks on the mental health of HCWs, to identify factors associated with worse impact, and to assess the available evidence base regarding interventions to reduce such impact. Results found that HCWs are at greater risk of mental health problems during viral pandemics. The study identified the following risk factors for HCWs developing mental health problems: sociodemographic (younger age and female gender), social (lack of social support, stigmatization), and occupational (working in a high-risk environment, specific occupational roles, and lower levels of specialized training and job experience) factors. There was very limited evidence regarding the impact of interventions to tackle mental health problems in HCWs. The study concluded that the risk factors identified represent important targets for future interventions.</p>	<p>Serrano-Ripoll MJ, Meneses-Echavez JF, Ricci-Cabello I, et al. Impact of viral epidemic outbreaks on mental health of health care workers: a rapid systematic review and meta-analysis. <i>J Affect Disord.</i> 2020;277:347–357. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7443314/</p>
Systematic review with meta-analysis (abstract only) ¹²	<p>A systematic review and meta-analysis were conducted to examine the overall prevalence of psychological health outcomes during the COVID-19 pandemic. Seven databases were used to collect data for pooled estimates of prevalence. The pooled prevalence of primary psychological outcomes was 26% (95% CI, 21% to 37%), symptoms of PTSD was 33% (95% CI, 0% to 86%), anxiety was 28% (95% CI, 21% to 36%), stress was 27% (95% CI, 14% to 43%), and depression was 22% (95% CI, 13% to 33%). The prevalence of psychological outcomes was similar in HCWs and those in the general population. More than 20% of the population had at least 1 psychological outcome, showing the significance of ensuring adequate provision of mental health resources.</p>	<p>Arora T, Grey I, Ostlundh L, et al. The prevalence of psychological consequences of COVID-19: a systematic review and meta-analysis of observational studies. <i>J Health Psychol.</i> 2020;1359105320966639. https://pubmed.ncbi.nlm.nih.gov/33118376/</p>
Systematic review with meta-analysis ¹³	<p>Eight studies were included from articles published in 4 databases between December 2019 and April 2020. In comparison with other professionals, health care professionals were more severely affected by psychiatric disorders associated with depression, anxiety, distress, insomnia, stress, and indirect traumatization, noted as the level of damage which exceeds psychological abnormalities such as obsessive-compulsive traces and somatization (experiencing and communicating psychological distress in form of physical symptoms and seeking medical care for them). Female nurses reported significantly more severe levels of mental disorders. Female gender and living in a rural area were the most common risk factors for insomnia, anxiety, obsessive-compulsive disorder, and depression.</p>	<p>da Silva FCT, Rolim Neto ML. Psychiatric symptomatology associated with depression, anxiety, distress, and insomnia in health professionals working in patients affected by COVID-19: a systematic review with meta-analysis. <i>Prog Neuropsychopharmacol Biol Psychiatry.</i> 2021;104:110057. https://pubmed.ncbi.nlm.nih.gov/32777327/</p>

Type of evidence	Summary of relevant evidence	Reference
Rapid systematic review with meta-analysis ¹⁴	A total of 59 papers were included for qualitative synthesis and 25 for quantitative meta-analysis. Staff in contact with affected patients had greater levels of both acute or post-traumatic stress (OR = 1.71; 95% CI, 1.28 to 2.29) and psychological stress (OR = 1.74; 95% CI, 1.50 to 2.03). Risk factors such as being a woman, younger, in a junior position, a parent of dependent children, having an infected family member, longer quarantine times, lack of practical support, and stigma contributed to psychological effects. Clear communication, adequate PPE, rest, and practical and psychological support were associated with reduced psychological effects.	Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on health care workers: rapid review and meta-analysis. <i>BMJ</i> . 2020;369:m1642. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7199468/
Systematic review with meta-analysis ⁴	This systematic review and meta-analysis included studies on all HCWs and includes studies of different outbreaks (SARS, MERS). The meta-analysis reported the following frequencies of mental health concerns for HCWs: <ul style="list-style-type: none"> • general health concerns (62.5%) • fear (43.7%) • poor sleep (37.9%) • burnout (34.4%) • anxiety (29.0%) • depression (26.3%) • PTSD (20.7%) (although given the later onset of PTSD, this rate may be premature in the context of COVID-19) • stigmatization (14.0%). Mental health issues appear to be related to high-pressure work environments, lack of PPE, and insufficient training. Younger HCWs, women, and nurses may be at higher risk of distress. The authors suggest that preventive approaches to monitoring and educating HCWs about mental health status should be considered.	Salazar de Pablo G, Vauquerizo-Serrano J, Catalan A, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. <i>J Affect Disord</i> . 2020;275:48–57. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7314697/
Systematic review with meta-analysis ¹⁵	Both HCWs and non-HCWs have suffered psychological effects during the COVID-19 pandemic. HCWs showed higher rates of insomnia than non-HCWs during this review, but other psychological outcomes, such as anxiety, depression, PTSD, and occupational stress, were similar between groups.	Sheraton M, Deo N, Dutt T, et al. Psychological effects of the COVID 19 pandemic on health care workers globally: a systematic review. <i>Psychiatry Res</i> . 2020;292:113360. https://www.sciencedirect.com/science/article/pii/S0165178120324987?via%3Dihub
Systematic review with meta-analysis ¹⁶	Thirteen studies were identified regarding the prevalence of depression, anxiety, and insomnia in HCWs during the COVID-19 pandemic. The authors found that high rates of anxiety (23.1%), depression (22.8%), and insomnia (34.3%) were reported by HCWs during the COVID-19 pandemic. In particular, female health care professionals and nurses reported more mental health issues compared with male HCWs and other medical staff.	Pappa S, Ntella V, Giannakas T, et al. Prevalence of depression, anxiety, and insomnia among health care workers during the COVID-19 pandemic: a systematic review and meta-analysis. <i>Brain Behav Immun</i> . 2020;88:901–907. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7206431/

Type of evidence	Summary of relevant evidence	Reference
Systematic review with meta-analysis ¹⁷	Databases were searched until April 2020; 50 studies were included to provide pooled estimates of effect sizes and 95% CIs for the prevalence of psychological morbidities among HCWs. Five studies reported the prevalence of stress among HCWs, with a pooled estimate of 33% (95% CI, 19% to 50%). Depression and anxiety were noted in 16 studies with a pooled prevalence of 25% (95% CI, 19% to 32%) and 24% (95% CI, 16% to 32%), respectively. Psychological distress was noted in 4 studies, with a pooled prevalence of 41% (95% CI, 19% to 65%). PTSD symptoms were noted in 2 studies, with a pooled prevalence of 13% (95% CI, 11% to 16%). Poor sleep quality was reported in 5 studies, with a pooled prevalence of 43% (95% CI, 28% to 59%), and insomnia was reported in 4 studies with a pooled prevalence of 37% (95% CI, 32% to 42%). Worry that adequate PPE and intensive training for handling COVID-19 patients would not be enough to prevent the disease as well as worry about the safety of loved ones, death of colleagues, excess working hours, availability of domestic supplies, and rationing of ventilators all contributed to increased psychological impacts.	Krishnamoorthy Y, Nagarajan R, Saya GK, Menon V. Prevalence of psychological morbidities among general population, health care workers and COVID-19 patients amidst the COVID-19 pandemic: a systematic review and meta-analysis. <i>Psychiatry Res.</i> 2020;293:113382. https://pubmed.ncbi.nlm.nih.gov/32829073/
Rapid review ²⁸	The aim of this review was to provide quantitative evidence of the psychological impact on HCWs due to epidemics and pandemics (SARS, MERS, COVID-19, Ebola, and influenza A). The following mental health disorders were identified: PTSD, insomnia, depression, and severe anxiety. Personality characteristics, level of exposure to affected patients, and organizational support were identified as protective factors or risk factors. There is a need for assessment and promotion of coping strategies and resilience, special attention to front-line HCWs, provision of adequate protective supplies, and organization of online support services.	Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on health care workers: rapid review of the evidence. <i>Curr Psychiatry Rep.</i> 2020;22(8):43. https://pubmed.ncbi.nlm.nih.gov/32651717/
Rapid review ²⁹	This rapid review addressed questions related to the types of psychological distress experienced by HCWs during pandemics (SARS, MERS, Ebola, and H1N1) and best practices to address the mental health needs of HCWs. Stress and anxiety were the most common types of psychological distress experienced; however, some studies reported insomnia, burnout, and post-traumatic distress in a subset of individuals up to 3 years after the disease outbreak. There is an urgent need for evidence-based interventions to meet the needs of HCWs with psychological distress. The needs of most workers can be met through system-level interventions and psychotherapeutic support. Referrals to specialty	Magill E, Siegel Z, Pike KM. The mental health of frontline health care providers during pandemics: a rapid review of the literature. <i>Psychiatr Serv.</i> 2020;1;71(12):1260-1269. https://pubmed.ncbi.nlm.nih.gov/33019857/

Type of evidence	Summary of relevant evidence	Reference
	care should be available to workers with severe adverse psychological outcomes.	
Rapid review ³⁰	The review showed that HCWs are at high risk for a variety of mental health issues as they care for patients during the pandemic. The mental health impacts of COVID-19 included psychological distress, insomnia, substance misuse, symptoms of PTSD, depression, anxiety, burnout, anger, and higher perceived stress. Organizational, personal, social, and psychological predictors, as well as mental health supports, were explored. There are very few, if any, early interventions known to lessen the negative mental health impacts to date.	Stuijzand S, Deforges C, Sandoz V, et al. Psychological impact of an epidemic/pandemic on the mental health of health care professionals: a rapid review. <i>BMC Public Health</i> . 2020;20:1230. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7422454/
Systematic review ¹⁸	Systematic review of studies in MEDLINE between December 2019 and May 2020, which included 30 original research articles and clinical reports. The studies reported a high prevalence of anxiety (ranging from 30% to 70%) and depressive symptoms (20% to 40%) as well as insomnia, burnout, emotional exhaustion, and somatic symptoms (physical symptoms such as pain, weakness, and shortness of breath, leading to problems functioning). Health care professionals in the first line of care have a higher prevalence of anxiety and depressive symptoms, especially the fear of infection (themselves, families, colleagues) and lack of PPE. Providing resting places and time for breaks and sleep lessened the impact of physical and emotional exhaustion. Women were more prone to worse physical and mental health. It was also noted that health care professionals may be reluctant to ask for help if needed.	Braquehais MD, Vargas-Caceres S, Gomex-Duran E, et al. The impact of the COVID-19 pandemic on the mental health of health care professionals. <i>QJM</i> . 2020;hcaa207. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7337807/
Systematic review ¹⁹	This study found that due to the current COVID-19 pandemic and work demands, there is a higher prevalence of sleep disturbances and anxiety in nurses and physicians. The prevalence of sleep disturbances in nurses was approximated to be 34.8% (95% CI, 24.8% to 46.4%). The prevalence of sleep disturbances in physicians caring for the COVID-19 patients was reported to be 41.6% (95% CI, 27.7% to 57%).	Salari N, Khazaie H, Hosseini-Far A, et al. The prevalence of sleep disturbances among physicians and nurses facing the COVID-19 patients: a systematic review and meta-analysis. <i>Global Health</i> . 2020;16:92. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7522913/
Systematic review ²⁰	This review included 24 studies to inform on PTSD symptoms in HCWs during the 3 coronavirus outbreaks (SARS, MERS, and COVID-19 to date). Risk factors and resilience factors for PTSD and post-traumatic stress symptoms included exposure levels, working role, years of experience, social and work support, job organization, quarantine, age, gender, marital status, and coping styles. The highest risk for PTSD was seen among emergency HCWs. The presence of support, training, prompt work organization (e.g., clear communication about	Carmassi C, Foghi C, Dell'Oste V, et al. PTSD symptoms in health care workers facing the three coronavirus outbreaks: what can we expect after the COVID-19 pandemic. <i>Psychiatry Res</i> . 2020;292:113312. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7370915/

Type of evidence	Summary of relevant evidence	Reference
	directives, and disease information), and good coping strategies were noted as resilience factors. Females were generally noted to be more affected than other populations in one study while involving 1,257 HCWs affected by SARS found an increased risk of PTSD among males.	
Systematic review ²¹	This review found that HCWs had increased psychological issues, such as depression, depressive symptoms, anxiety, distress, and poor sleep quality, during the pandemic compared to before the pandemic. The review noted that the 2 studies investigating COVID-19 patients found a high level of post-traumatic stress symptoms (96.2%) and significantly higher level of depressive symptoms (P = 0.016). Risk factors for psychiatric symptoms and low mental well-being included female gender, poor self-rated health, and relatives with COVID-19. The authors concluded that more studies are needed to evaluate the direct neuropsychiatric consequences and the indirect effects on mental health in order to assist with planning and strengthening mental health care.	Vindegard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. <i>Brain Behav Immun</i> . 2020;89:531–542. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7260522/
Systematic review ⁴³	This review identified 11 studies on the mental health of HCWs. Based on this evidence, HCWs face significant mental health issues. The reported prevalence of anxiety ranged from 24.1% to 67.55%, the reported prevalence of depression ranged from 12.1% to 55.89%, and the reported prevalence of stress as measured by tools such as the IE-22 ranged from 29.8% to 62.99% among HCWs. More severe psychological symptoms were reported among nurses, female HCWs, and front-line HCWs compared with other HCWs.	Vizheh M, Qorbani M, Arzaghi SM, et al. The mental health of health care workers in the COVID-19 pandemic: a systematic review. <i>J Diabetes Metab Disord</i> . 2020;19(2):1967-1978. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7586202/
Systematic review of reviews ²²	Eight reviews were included and summarized. There is a high burden of mental health problems, such as depression, anxiety, mood disorders, psychological distress, PTSD, insomnia, fear, stigmatization, low self-esteem, and perceived lack of control for health care providers who experienced quarantine and physical isolation. The authors noted the need for health service organizations to revisit protocols and resources for providing mental health care during quarantine and isolation.	Hossain MM, Sultana A, Purohit N. Mental health outcomes of quarantine and isolation for infection prevention: a systematic umbrella review of the global evidence. <i>Epidemiol Health</i> . 2020;42:e2020038. https://www.e-epih.org/journal/view.php?doi=10.4178/epih.e2020038
Rapid systematic review ²³	This rapid systematic review included studies on all HCWs and studies on outbreaks similar to COVID-19 (i.e., SARS, MERS, H1N1). It is important to note that nonclinical workers were largely excluded from these studies, including administrators, clerks, and logistics and maintenance staff. Using the systematic review evidence, the authors identified 3 distinct categories for the range of interventions identified:	Barello S, Falco-Pegueroles A, Rosa D, et al. The psychosocial impact of flu influenza pandemics on health care workers and lessons learnt for the COVID-19 emergency: a rapid review. <i>Int J Public Health</i> . 2020;65(7):1205–1216. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7472941/

Type of evidence	Summary of relevant evidence	Reference
	<p>policy related, organizational related, and person directed. Fear for personal health and worry about infecting others (family, friends, co-workers) was widely reported, as were high levels of anxiety, depression, and stress. Social isolation and worry about stigmatization were also common themes. The organizational culture was noted to impact the psychological well-being of HCWs, including the role of communication within an organization, support from colleagues, and other support systems and resources available (e.g., employee assistance programs, insurance). Mental health impacts on HCWs were also found to be related to both professional and personality characteristics. Based on these categories, the authors noted that the health system should develop preventive strategies and strategic planning for future pandemics. This includes planning to have psychological supports in place and being prepared for staff requirements. The importance of the pre-pandemic time frame was noted, particularly with respect to logistics that can offset the psychological effects that HCWs report (i.e., adequate staffing, training in infection, prevention, and control, adequate PPE readily available). Access to psychological support should be available to HCWs; those working in high-risk settings may need more support. The importance of team support was noted because many HCWs are isolated from the support of their family and friends during pandemics.</p>	
Systematic review ²⁶	<p>The SARS-CoV-2 pandemic has significantly impacted the mental health of HCWs, especially front-line staff in hospital settings. Direct exposure to SARS-CoV-2–infected patients was identified as the most common factor for all mental health outcomes looked at in this study, except occupational burnout. This review aimed to determine the impact of SARS-CoV-2 on mental health outcomes of hospital-based HCWs and formulate recommendations for future action. Prevalence ranges of 6 mental health outcomes were identified: depression (13.5% to 44.7%), anxiety (12.3% to 35.6%), acute stress reaction (5.2% to 32.9%), PTSD (7.4% to 37.4%), insomnia (33.8% to 36.1%), and occupational burnout (3.1% to 43.0%). Front-line HCWs and HCWs with low social support and fewer years of work experience reported the worst outcomes. The review concluded that hospitals should be staffed to meet service needs and to mitigate the impact on mental health. Rapid-response psychiatric teams should be used and a monitoring system put in place throughout the pandemic.</p>	<p>Sanghera, J., Pattani, N., Hashmi, Y., Varley, K. F., Cheruvu, M. S., Bradley, A., & Burke, J. R. (2020). The impact of SARS-CoV-2 on the mental health of healthcare workers in a hospital setting-A Systematic Review. <i>Journal of Occupational Health</i>, 62(1), e12175. https://doi.org/10.1002/1348-9585.12175</p> <p>Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7603426/ (accessed November 24, 2020)</p>

Type of evidence	Summary of relevant evidence	Reference
Rapid systematic review ²⁴	<p>This rapid systematic review includes only COVID-19 studies evaluating the mental health impact of the COVID-19 pandemic on HCWs and includes studies on all HCWs including those who are not front-line workers. HCWs reported anxiety, depression, stress, and insomnia. There was significant heterogeneity between studies. More HCWs expressed interest in social support than formal psychological support, which demonstrates a mismatch between organizational sources of distress and the mental health interventions being implemented. Several mental health interventions were described; however, the effects of the interventions were not reported.</p> <ul style="list-style-type: none"> • The HCWs were mandated to spend 2 weeks of isolation at a vocational resort following 2- to 3-week shift rotations at health care facilities. This was intended to alleviate the commonly reported fear of transmitting COVID-19 to family members. • A telephone hotline for psychosocial support and access to group-based activities were introduced. Uptake was low and HCWs instead indicated a need for PPE, rest, and training in managing patient distress (versus a need for psychological support). Training in PPE and patient distress was provided, and a rest space created. 	<p>Muller AE, Hafstad EV, Himmels JPW, et al. The mental health impact of the covid-19 pandemic on health care workers, and interventions to help them: a rapid systematic review. <i>Psychiatry Res.</i> 2020;293:113441. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7462563/</p>
Rapid systematic review ²⁵	<p>This rapid systematic review focused on front-line HCWs and included studies of outbreaks similar to COVID-19 (i.e., SARS, MERS, H1N1). The most commonly reported mental health issues were the fear of infection and the fear of spreading the virus, resulting in stigmatization and isolation from social support networks. HCWs reported PTSD, anxiety, depression, stress, and insomnia. More mental health issues were seen in nurses and female HCWs. Common personal coping strategies included exercise, accessing counselling, and support from administration and co-workers. The authors noted that organizations can provide and promote access and availability to counselling support through employee assistance programs, insurance, and compensation. Proactive measures can be used to support mental health. These include education and training for HCWs, education for families and the public to reduce the stigma, and building resiliency through positive work culture and stress prevention programs.</p>	<p>Cabarkapa S, Nadjidai SE, Murgier J, Ng CH. The psychological impact of COVID-19 and other viral epidemics on frontline health care workers and ways to address it: a rapid systematic review. <i>Brain Behav Immun Health.</i> 2020;8:100144. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7494453/</p>
Commentary/ review ⁴²	<p>A general overview of psychological impacts on all populations but contains 1 section on HCWs. HCWs have reported experiencing anxiety, stress, depression, and insomnia during pandemics, including the COVID-19 pandemic.</p>	<p>Dubey S, Biswas P, Ghosh R, et al. Psychosocial impact of COVID-19. <i>Diabetes Metab Syndr.</i> 2020;14(5):779–788. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7255207/</p>

Type of evidence	Summary of relevant evidence	Reference
	<p>Fear of transmitting the disease to family members can result in increased anxiety and isolation.</p> <p>These impacts seem to be compounded by many factors: inadequate staffing resources, limited access to PPE, lack of training in proper infection control procedures, and lack of confidence in how to manage the psychological impacts on their patients.</p> <p>Performance pressure was also noted as a contributor to poor mental health of HCWs. The unpredictability of the course of the disease required long work hours and generated feelings of providing inadequate care to suffering patients. It was noted that HCWs may experience increased anxiety if caring for colleagues with COVID-19.</p>	
Scoping review ³³	<p>This scoping review included studies specific to COVID-19 and the mental health impacts on clinical staff. Anxiety, depression, stress, and insomnia were commonly reported among HCWs. Female staff and nurses reported more mental health issues versus males and physicians. HCWs providing care to COVID-19 patients reported higher rates of psychological distress (anxiety, depression, stress, and insomnia).</p>	<p>Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on health care workers: a scoping review. <i>Int J Emerg Med.</i> 2020;13:40. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7370263/</p>

CI = confidence interval; HCW = health care worker; MERS = Middle Eastern respiratory syndrome; OR = odds ratio; PPE = personal protective equipment; PTSD = post-traumatic stress disorder; SARS = severe acute respiratory syndrome; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

Key Findings for Question 3: What are the impacts of the COVID-19 pandemic related to substance use, interpersonal violence, riskier behaviour, sick leave, and quality of life on Canadian HCWs?

- Stigma related to the COVID-19 pandemic has contributed to the prevalence of attacks, both physical and verbal, toward HCWs.³
- Stigma toward HCWs has negatively impacted their work and their mental and physical well-being.³¹
- Increased work demands during the pandemic have led to a higher prevalence of sleep disturbance and anxiety in HCWs.¹⁹
- Coping mechanisms that were reported to be useful to HCWs included personal coping methods, such as seeking social support, problem-solving, and positive thinking, as well as workplace measures such as infection control, safety, clear communication, and staff recognition and support.³¹
- Recommendations for HCWs to cope with stress included physical activity, rest, social connection, eating well, and avoiding substance use.⁵

Table 4: Summary of the Evidence on the Impact of the COVID-19 Pandemic on the Personal Lives of Canadian Health Care Workers

Type of evidence	Summary of relevant evidence	Reference
Guideline ⁴¹	<p>This guideline provides a list of symptoms to recognize anxiety and stress in front-line workers as well as various recommendations and strategies to support the psychological well-being of HCWs in care settings. Recommendations include avoiding substance use, such as tobacco, alcohol, or other drugs, to cope with stress.</p> <p>See: Psychosocial Considerations (p. 29–30)</p>	<p>COVID-19 guidelines: version 3. Camberwell (AZ): Australian and New Zealand Intensive Care Society; 2020: https://www.anzics.com.au/wp-content/uploads/2020/10/ANZICS-COVID-19-Guidelines_V3.pdf</p>
Rapid review ³¹	<p>This review identified personal coping methods that were reported to be helpful among HCWs during COVID-19. These coping mechanisms included personal coping, such as problem-solving, seeking social support, and positive thinking, as well as workplace measures such as infection control, safety, support and recognition, and clear communication. The findings suggest that stigma may negatively impact HCW outcomes in the workplace.</p>	<p>Chew QH, Wei KC, Vasoo S, Sim K. Psychological and coping responses of health care workers toward emerging infectious disease outbreaks: a rapid review and practical implications for the COVID-19 pandemic. <i>J Clin Psychiatry</i>. 2020;81(6):20r13450. https://pubmed.ncbi.nlm.nih.gov/33084255/</p>
Rapid review ⁷	<p>This review identified 1 cross-sectional study of Italian HCWs that found that stigma (e.g., discriminatory attitudes or fear) toward HCWs was associated with higher burnout, higher compassion fatigue, and lower satisfaction in the ability of HCWs to provide care.</p>	<p>National Collaborating Centre for Methods and Tools. Rapid review: what is known about stigmatization related to COVID-19 in Canada? 2020. https://www.nccmt.ca/uploads/media/media/00/01/02/e8ea5243f373ea981ae35366197fca44e16aa1ef.pdf</p>
General review ³⁹	<p>The authors found that stigma toward HCWs leads to higher rates of distress, stress, and burnout. Recommendations to prevent stigma were provided, including providing psychological support, counselling, and public education; acknowledging the presence of stigma in the workplace; developing community campaigns to discourage stigmatizing behaviours and convey key messages regarding stigma; and holding the media accountable for spreading misinformation.</p>	<p>Muhidin S, Vizheh M, Moghadam ZB. Anticipating COVID-19-related stigma in survivors and health-care workers: lessons from previous infectious diseases - an integrative literature review. <i>Psychiatry Clin Neurosci</i>. 2020;74(11):617-618. https://pubmed.ncbi.nlm.nih.gov/32889754/</p>
General review ⁴⁰	<p>This review offers tips and recommended behaviours for HCWs to help manage psychological distress, such as the use of self-care. Examples of self-care include physical activity, rest, social connection, and eating well. It was recommended that HCWs avoid using substances such as tobacco, alcohol, or drugs as coping methods for stress.</p>	<p>World Health Organization. Mental health and psychosocial considerations during the COVID-19 outbreak; 2020. https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf</p>
Other ³	<p>This article explored attacks against HCWs in relation to the COVID-19 pandemic. The type of attacks varied from physical assault to the denial of services. It was also noted that entire families have been evicted from their homes and that reports of attacks on medical vehicles carrying COVID-19 samples, on-duty COVID-19 drivers of medical</p>	<p>World Health Organization. Attacks on health care in the context of COVID-19; 2020. https://www.who.int/news-room/feature-stories/detail/attacks-on-health-care-in-the-context-of-covid-19</p>

Type of evidence	Summary of relevant evidence	Reference
	vehicles, and patients are accumulating causing rising concerns around the world. Stigma and media misinformation play a key role in attacks against HCWs. The article briefly explored ways to mitigate the impact of attacks and stigma toward HCWs.	

HCW = health care worker.

References

1. Johns Hopkins University & Medicine. COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University & Medicine. 2020; <https://coronavirus.jhu.edu/map.html>. Accessed 2020 Dec 14.
2. Government of Canada. Coronavirus disease 2019 (COVID-19): epidemiology update. 2020; <https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html#a3>. Accessed 2020 Dec 14.
3. World Health Organization. Attacks on health care in the context of COVID-19. 2020; <https://www.who.int/news-room/feature-stories/detail/attacks-on-health-care-in-the-context-of-covid-19>. Accessed 2020 Dec 14.
4. Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. *J Affect Disord.* 2020;275:48-57.
5. World Health Organization. Keep health workers safe to keep patients safe: WHO. 2020; <https://www.who.int/news/item/17-09-2020-keep-health-workers-safe-to-keep-patients-safe-who>. Accessed 2020 Dec 14.
6. COVID-19 Scientific Advisory Group. Key Research Questions: 1) Among countries who are past their initial peak of COVID-19 cases, what proportion of total cases were in healthcare workers (HCW), and what is the estimated proportion of the total number of HCWs who developed COVID-19 from presumed occupational exposure? 2) Is there any evidence that household members of HCWs are at elevated risk of COVID-19 disease, and if so, are there guidelines for mitigating that risk? Edmonton (AB): Alberta Health Services; 2020: <https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-hcw-risk-rapid-review.pdf>. Accessed 2020 Dec 14.
7. National Collaborating Centre for Methods and Tools. Rapid review: what is known about stigmatization related to COVID-19 in Canada? 2020: <https://www.nccmt.ca/knowledge-repositories/covid19-rapid-evidence-service>. Accessed 2021 Apr 22.
8. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - a systematic review and meta-analysis. *Psychiatry Res.* 2020;291:113190.
9. da Silva FCT, Neto MLR. Psychological effects caused by the COVID-19 pandemic in health professionals: a systematic review with meta-analysis. *Prog Neuropsychopharmacol Biol Psychiatry.* 2021;104:110062.
10. Pan R, Zhang L, Pan J. The anxiety status of Chinese medical workers during the epidemic of COVID-19: a meta-analysis. *Psychiatry Investig.* 2020;17(5):475-480.
11. Serrano-Ripoll MJ, Meneses-Echavez JF, Ricci-Cabello I, et al. Impact of viral epidemic outbreaks on mental health of healthcare workers: a rapid systematic review and meta-analysis. *J Affect Disord.* 2020;277:347-357.
12. Arora T, Grey I, Östlundh L, Lam KBH, Omar OM, Arnone D. The prevalence of psychological consequences of COVID-19: a systematic review and meta-analysis of observational studies. *J Health Psychol.* 2020:1359105320966639.
13. da Silva FCT, Neto MLR. Psychiatric symptomatology associated with depression, anxiety, distress, and insomnia in health professionals working in patients affected by COVID-19: a systematic review with meta-analysis. *Prog Neuropsychopharmacol Biol Psychiatry.* 2021;104:110057.
14. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. *BMJ.* 2020;369:m1642.
15. Sheraton M, Deo N, Dutt T, Surani S, Hall-Flavin D, Kashyap R. Psychological effects of the COVID 19 pandemic on healthcare workers globally: a systematic review. *Psychiatry Res.* 2020;292:113360.
16. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun.* 2020;88:901-907.
17. Krishnamoorthy Y, Nagarajan R, Saya GK, Menon V. Prevalence of psychological morbidities among general population, healthcare workers and COVID-19 patients amidst the COVID-19 pandemic: a systematic review and meta-analysis. *Psychiatry Res.* 2020;293:113382.
18. Braquehais MD, Vargas-Cáceres S, Gómez-Durán E, et al. The impact of the COVID-19 pandemic on the mental health of healthcare professionals. *QJM.* 2020.
19. Salari N, Khazaie H, Hosseini-Far A, et al. The prevalence of sleep disturbances among physicians and nurses facing the COVID-19 patients: a systematic review and meta-analysis. *Global Health.* 2020;16(1):92.
20. Carmassi C, Foghi C, Dell'Oste V, et al. PTSD symptoms in healthcare workers facing the three coronavirus outbreaks: what can we expect after the COVID-19 pandemic. *Psychiatry Res.* 2020;292:113312.
21. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. *Brain Behav Immun.* 2020;89:531-542.
22. Hossain MM SA, Purohit N. . Mental health outcomes of quarantine and isolation for infection prevention: a systematic umbrella review of the global evidence. *Epidemiol Health.* 2020;42(e2020038).
23. Bareillo S, Falcó-Pegueroles A, Rosa D, Tolotti A, Graffigna G, Bonetti L. The psychosocial impact of flu influenza pandemics on healthcare workers and lessons learnt for the COVID-19 emergency: a rapid review. *Int J Public Health.* 2020;65(7):1205-1216.

24. Muller AE, Hafstad EV, Himmels JPW, et al. The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: a rapid systematic review. *Psychiatry Res.* 2020;293:113441.
25. Cabarkapa S, Nadjidai SE, Murgier J, Ng CH. The psychological impact of COVID-19 and other viral epidemics on frontline healthcare workers and ways to address it: a rapid systematic review. *Brain Behav Immun Health.* 2020;8:100144.
26. Sanghera J, Pattani N, Hashmi Y, et al. The impact of SARS-CoV-2 on the mental health of healthcare workers in a hospital setting-a systematic review. *J Occup Health.* 2020;62(1):e12175.
27. Chou R, Dana T, Buckley DI, Selph S, Fu R, Totten AM. Epidemiology of and risk factors for Coronavirus infection in health care workers: a living rapid review. *Ann Intern Med.* 2020;173(2):120-136.
28. Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep.* 2020;22(8):43.
29. Magill E, Siegel Z, Pike KM. The mental health of frontline health care providers during pandemics: a rapid review of the literature. *Psychiatr Serv.* 2020:appips202000274.
30. Stuijzand S, Deforges C, Sandoz V, et al. Psychological impact of an epidemic/pandemic on the mental health of healthcare professionals: a rapid review. *BMC public health.* 2020;20(1):1230.
31. Chew QH, Wei KC, Vasoo S, Sim K. Psychological and coping responses of health care workers toward emerging infectious disease outbreaks: a rapid review and practical implications for the COVID-19 pandemic. *J Clin Psychiatry.* 2020;81(6).
32. Amanullah S, Shankar R. The impact of COVID-19 on physician burnout globally: a review. *Healthcare.* 2020;8(4).
33. Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on healthcare workers: a scoping review. *Int J Emerg Med.* 2020;13(1):40.
34. Paiano M, Jaques AE, Nacamura PAB, Salci MA, Radovanovic CAT, Carreira L. Mental health of healthcare professionals in China during the new coronavirus pandemic: an integrative review. *Rev Bras Enferm.* 2020;73.
35. Que J, Yuan K, Gong Y, Meng S, Bao Y, Lu L. Raising awareness of suicide prevention during the COVID-19 pandemic. *Neuropsychopharmacol Rep.* 2020.
36. Giorgi G, Lecca LI, Alessio F, et al. COVID-19-related mental health effects in the workplace: a narrative review. *Int J Environ Res Public Health.* 2020;17(21).
37. Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by healthcare workers due to the COVID-19 pandemic-a review. *Asian J Psychiatr.* 2020;51:102119.
38. Kontoangelos K, Economou M, Papageorgiou C. Mental health effects of COVID-19 pandemic: a review of clinical and psychological traits. *Psychiatry Investig.* 2020;17(6):491-505.
39. Muhidin S, Vizheh M, Moghadam ZB. Anticipating COVID-19-related stigma in survivors and health-care workers: lessons from previous infectious diseases outbreaks - an integrative literature review. *Psychiatry Clin Neurosci.* 2020;74(11):617-618.
40. World Health Organization. Mental health and psychosocial considerations during the COVID-19 outbreak. 2020; <https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf>. Accessed 2021 Apr 22.
41. COVID-19 guidelines: version 3. Camberwell (AZ): Australian and New Zealand Intensive Care Society; 2020: https://www.anzics.com.au/wp-content/uploads/2020/10/ANZICS-COVID-19-Guidelines_V3.pdf. Accessed October 20, 2020.
42. Dubey S, Biswas P, Ghosh R, et al. Psychosocial impact of COVID-19. *Diabetes Metab Syndr.* 2020;14(5):779-788.
43. Vizheh M, Qorbani M, Arzaghi SM, Muhidin S, Javanmard Z, Esmaeili M. The mental health of healthcare workers in the COVID-19 pandemic: a systematic review. *J Diabetes Metab Disord.* 2020:1-12.

Appendix 1: Full IMPRESS Search Results

1. Arora T, Grey I, Ostlundh L, Lam KBH, Omar OM, Arnone D. The prevalence of psychological consequences of COVID-19: a systematic review and meta-analysis of observational studies. *J Health Psychol.* 2020;1359105320966639. <https://pubmed.ncbi.nlm.nih.gov/33118376/>
2. Braquehais MD, Vargas-Caceres S, Gomex-Duran E, et al. The impact of the COVID-19 pandemic on the mental health of health care professionals. *QJM.* 2020:hcaa207. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7337807/>
3. Carmassi C, Foghi C, Dell'Oste V, et al. PTSD symptoms in health care workers facing the three coronavirus outbreaks: what can we expect after the COVID-19 pandemic. *Psychiatry Res.* 2020; 292: 113312. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7370915/>
4. da Silva FCT, Rolim Neto ML. Psychiatric symptomatology associated with depression, anxiety, distress, and insomnia in health professionals working in patients affected by COVID-19: a systematic review with meta-analysis. *Prog Neuropsychopharmacol Biol Psychiatry.* 2021;104:110057. <https://pubmed.ncbi.nlm.nih.gov/32777327/>
5. Giorgi G, Lecca LI, Alessio F, et al. COVID-19-related mental health effects in the workplace: a narrative review. *Int J Environ Res Public Health.* 2020;17(21):7857. <https://pubmed.ncbi.nlm.nih.gov/33120930/>
6. Hossain MM, Sultana A, Purohit N. Mental health outcomes of quarantine and isolation for infection prevention: a systematic umbrella review of the global evidence. *Epidemiol Health.* 2020;42:e2020038. <https://www.e-epih.org/journal/view.php?doi=10.4178/epih.e2020038>
7. Institut national d'excellence en santé et en services sociaux. COVID-19 et les effets du contexte de la pandémie sur la santé et mesures à mettre en place pour contrer ces effets. Québec (QC): Gouvernement du Québec; 2020: https://www.inesss.qc.ca/fileadmin/doc/INESSS/COVID-19/COVID-19_Sante_mentale-population.pdf
8. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on health care workers: rapid review and meta-analysis. *BMJ.* 2020;369:m1642. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7199468/>
9. Kontoangelos K, Economou M, Papageorgiou C. Mental health effects of COVID-19 pandemic: a review of clinical and psychological traits. *Psychiatry Investig.* 2020;17(6):491–505. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7324731/>
10. Krishnamoorthy Y, Nagarajan R, Saya GK, Menon V. Prevalence of psychological morbidities among general population, health care workers and COVID-19 patients amidst the COVID-19 pandemic: a systematic review and meta-analysis. *Psychiatry Res.* 2020;293:113382. <https://pubmed.ncbi.nlm.nih.gov/32829073/>
11. Luo M, Guo L, Yu M, Jian W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - a systematic review and meta-analysis. *Psychiatry Res.* 2020;291:113190. <https://pubmed.ncbi.nlm.nih.gov/32563745/>
12. Magill E, Siegel Z, Pike KM. the mental health of frontline health care providers during pandemics: a rapid review of the literature. *Psychiatr Serv.* 2020;71(12):1260-1269. <https://pubmed.ncbi.nlm.nih.gov/33019857/>
13. da Silva Neto RM, Rodrigues Benjamim CJ, Moreira de Medeiros Carvalho P, Neto MLR. Psychological effects caused by the COVID-19 pandemic in health professionals: a systematic review with meta-analysis. *Prog Neuropsychopharmacol Biol Psychiatry.* 2021;104:110062. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7409979/>
14. Paiano M, Jaques AE, Nacamura PAB, Salci MA, Radovanovic CAT, Carreira L. Mental health of health care professionals in China during the new coronavirus pandemic: an integrative review. *Rev. Bras. Enferm.* 2020;73(suppl. 2). https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672020001400304&lng=en
15. Pan R, Zhang L, Pan J. The anxiety status of Chinese medical workers during the epidemic of COVID-19: a meta-analysis. *Psychiatry Investig.* 2020;17(5):475–480. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7265026/>
16. Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on health care workers: rapid review of the evidence. *Curr Psychiatry Rep.* 2020;22(8):43. <https://pubmed.ncbi.nlm.nih.gov/32651717/>
17. Que J, Yuan K, Gong Y, Meng S, Bao Y, Lu L. Raising awareness of suicide prevention during the COVID-19 pandemic. *Neuropsychopharmacol Rep.* 2020. <https://pubmed.ncbi.nlm.nih.gov/33022901/>
18. Rogers JP, Chesney E, Oliver D, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *Lancet Psychiatry.* 2020;7(7):611–627. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7234781/>
19. Sanghera J, Pattani N, Hashmi Y, et al. The impact of SARS-CoV-2 on the mental health of health care workers in a hospital setting—a systematic review. *J Occup Health.* 2020;62(1):e12175. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7603426/>
20. Serrano-Ripoll MJ, Meneses-Echavez JF, Ricci-Cabello I, et al. Impact of viral epidemic outbreaks on mental health of health care workers: a rapid systematic review and meta-analysis. *J Affect Disord.* 2020;277:347–357. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7443314/>
21. Sheraton M, Deo N, Dutt T, et al. Psychological effects of the COVID 19 pandemic on health care workers globally: a systematic review. *Psychiatry Res.* 2020;292:113360. <https://www.sciencedirect.com/science/article/pii/S0165178120324987?via%3Dihub>

22. Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by health care workers due to the COVID-19 pandemic—a review. *Asian J Psychiatr*. 2020;51:102119. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7175897/>
23. Stuifzand S, Deforges C, Sandoz V, et al. Psychological impact of an epidemic/pandemic on the mental health of health care professionals: a rapid review. *BMC Public Health*. 2020;20:1230. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7422454/>
24. Tavares Lima CK, Moreira de Medeiros Carvalho P, de Araujo Araruna Silva Lima I, et al. The emotional impact of Coronavirus 2019-nCoV (new Coronavirus disease). *Psychiatry Res*. 2020;287:112915. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7195292/>
25. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. *Brain Behav Immun*. 2020;89:531–542. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7260522/>
26. Vizheh M, Qorbani M, Arzaghi SM, et al. The mental health of health care workers in the COVID-19 pandemic: a systematic review. *J Diabetes Metab Disord*. 2020:1–12. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7586202/>
27. COVID-19 Scientific Advisory Group. Key Research Questions: 1) Among countries who are past their initial peak of COVID-19 cases, what proportion of total cases were in health care workers (HCW), and what is the estimated proportion of the total number of HCWs who developed COVID-19 from presumed occupational exposure? 2) Is there any evidence that household members of HCWs are at elevated risk of COVID-19 disease, and if so, are there guidelines for mitigating that risk? Edmonton (AB): Alberta Health Services; 2020: <https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-hcw-risk-rapid-review.pdf>
28. Amanullah S, Shankar RR. The impact of COVID-19 on physician burnout globally: a review. *Health care*. 2020,8(4):421. <https://www.mdpi.com/2227-9032/8/4/421/htm>
29. Chou R, Dana T, Buckley DI, et al. Epidemiology of and risk factors for Coronavirus infection in health care workers: a living rapid review. *Ann Intern Med*. 2020:M20-1632. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7240841/>
30. Salazar de Pablo G, Vauquerizo-Serrano J, Catalan A, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. *J Affect Disord*. 2020;275:48–57. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7314697/>
31. Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on health care workers: a scoping review. *Int J Emerg Med*. 2020;13:40. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7370263/>
32. Muhidin S, Vizheh M, Moghadam ZB. Anticipating COVID-19-related stigma in survivors and health-care workers: lessons from previous infectious diseases outbreaks - an integrative literature review. *Psychiatry Clin Neurosci*. 2020;74(11):617-618. <https://pubmed.ncbi.nlm.nih.gov/32889754/>
33. National Collaborating Centre for Methods and Tools. Rapid review: what is known about stigmatization related to COVID-19 in Canada? 2020. <https://www.nccmt.ca/uploads/media/media/0001/02/e8ea5243f373ea981ae35366197fca44e16aa1ef.pdf>
34. World Health Organization. Attacks on health care in the context of COVID-19; 2020. <https://www.who.int/news-room/feature-stories/detail/attacks-on-health-care-in-the-context-of-covid-19>
35. Salari N, Khazaie H, Hosseini-Far A, et al. The prevalence of sleep disturbances among physicians and nurses facing the COVID-19 patients: a systematic review and meta-analysis. *Global Health*. 2020;16: 92. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7522913/>
36. COVID-19 guidelines: version 3. Camberwell (AZ): Australian and New Zealand Intensive Care Society; 2020: https://www.anzics.com.au/wp-content/uploads/2020/10/ANZICS-COVID-19-Guidelines_V3.pdf
Note: Staff Well-Being (p. 28)
37. Fight COVID-19 with better sleep health: a guide for hospital workers. Bethesda (MD): Center for the Study of Traumatic Stress; https://www.cstsonline.org/assets/media/documents/CSTS_FS_Fight_COVID19_w_Better_Sleep_Health.pdf
38. Mental health and behavioral guidelines for preparedness and response to Coronavirus and other emerging infectious outbreaks. Bethesda (MD): Center for the Study of Traumatic Stress; https://www.cstsonline.org/assets/media/documents/CSTS_FS_Mental_Health_Behavioral_Guidelines_Response_to_Coronavirus_Outbreak.pdf
39. Sustaining the well-being of health care personnel during Coronavirus and other infectious disease outbreaks. Bethesda (MD): Center for the Study of Traumatic Stress; https://www.cstsonline.org/assets/media/documents/CSTS_FS_Sustaining_WellBeing_Health_care_Personnel_during_Infectious_Disease_Outbreaks.pdf
40. Newfoundland & Labrador Centre for Applied Health Research. Best practices for personal care workers providing home care in the context of COVID-19. St. John's (NL): Memorial University; 2020: <https://www.nlcahr.mun.ca/CHRSP/COVID19QRRRPersonalCareJune302020.pdf>
41. Barello S, Falco-Pegueroles A, Rosa D, et al. The psychosocial impact of flu influenza pandemics on health care workers and lessons learnt for the COVID-19 emergency: a rapid review. *Int J Public Health*. 2020;65(7):1205–1216. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7472941/>
42. Cabarkapa S, Nadjidai SE, Murgier J, Ng CH. The psychological impact of COVID-19 and other viral epidemics on frontline health care workers and ways to address it: a rapid systematic review. *Brain Behav Immun Health*. 2020;8:100144. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7494453/>
43. Dubey S, Biswas P, Ghosh R, et al. Psychosocial impact of COVID-19. *Diabetes Metab Syndr*. 2020;14(5):779–788. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7255207/>
44. Muller AE, Hafstad EV, Himmels JPW, et al. The mental health impact of the covid-19 pandemic on health care workers, and interventions to help them: a rapid systematic review. *Psychiatry Res*. 2020;293:113441. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7462563/>

45. Salazar de Pablo G, Vauquerizo-Serrano J, Catalan A, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. *J Affect Disord.* 2020;275:48–57. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7314697/>
46. Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on health care workers: a scoping review. *Int J Emerg Med.* 2020;13:40. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7370263/>
47. Lizarondo L. Moral distress (nurses): strategies in emergency department settings. Joanna Briggs Institute; 2020: <https://joannabriggs.org/sites/default/files/2020-05/23873%20Moral%20Distress%20Emergency%20Dept.pdf>
48. World Health Organization. Mental health and psychosocial considerations during the COVID-19 outbreak; 2020: <https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf>
49. Pollock A, Campbell P, Cheyne J, et al. Interventions to support the resilience and mental health of frontline health and social care professionals during and after a disease outbreak, epidemic or pandemic: a mixed methods systematic review. *Cochrane Database Syst Rev.* 2020;11:CD013779. <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013779/full>
50. Pappa S, Ntella V, Giannakas T, et al. Prevalence of depression, anxiety, and insomnia among health care workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun.* 2020; 88: 901–907. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7206431/>
51. Chew QH, Wei KC, Vasoo S, Sim K. Psychological and coping responses of health care workers toward emerging infectious disease outbreaks: a rapid review and practical implications for the COVID-19 pandemic. *J Clin Psychiatry.* 2020;81(6):20r13450. <https://pubmed.ncbi.nlm.nih.gov/33084255/>