

BMJ Open How can we build and maintain the resilience of our health care professionals during COVID-19? Recommendations based on a scoping review

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ABSTRACT

Objective To explore how to build and maintain the resilience of frontline healthcare professionals exposed to COVID-19 outbreak working conditions.

Design Scoping review supplemented with expert interviews to validate the findings.

Setting Hospitals.

Methods We searched PubMed, Embase, PsycINFO, CINAHL, bioRxiv and medRxiv systematically and grey literature for articles focusing on the impact of COVID-19-like working conditions on the physical and/or mental health of healthcare professionals in a hospital setting. Articles using an empirical design about determinants or causes of physical and/or mental health and about interventions, measures and policies to preserve physical and/or mental health were included. Four experts were interviewed to reflect on the results from the scoping review.

Results In total, 4471 records were screened leading to an inclusion of 73 articles. Recommendations prior to the outbreak fostering resilience included optimal provision of education and training, resilience training and interventions to create a feeling of being prepared. Recommendations during the outbreak consisted of (1) enhancing resilience by proper provision of information, psychosocial support and treatment (eg, create enabling conditions such as forming a psychosocial support team), monitoring the health status of professionals and using various forms and content of psychosocial support (eg, encouraging peer support, sharing and celebrating successes), (2) tasks and responsibilities, in which attention should be paid to kind of tasks, task mix and responsibilities as well as the intensity and weight of these tasks and (3) work patterns and working conditions. Findings of the review were validated by experts.

Conclusions Recommendations were developed on how to build and maintain resilience of frontline healthcare professionals exposed to COVID-19 outbreak working conditions. These practical and easy to implement recommendations can be used by hospitals and other healthcare organisations to foster and preserve short-

Strengths and limitations of this study

- Combination of a scoping review based on a systematic literature search with expert interviews to foster evidence-based recommendations about how to keep healthcare professionals healthy and resilient during COVID-19 working conditions.
- An extensive overview of the current body of knowledge was provided by the extended search strategy, the inclusion of preprints and grey literature.
- The review process followed a universally agreed protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews 2018) to ensure the quality of reporting.
- This study did not critically appraise the included articles and we cannot make conclusions regarding the quality of the evidence.
- Each outbreak has its own dimensions and each culture acts differently, which should be considered when interpreting the results.

term and long-term physical and mental health and employability of their professionals.

INTRODUCTION

Since it was first recognised in China in late 2019, COVID-19 has become a pandemic that continues to spread quickly around the world. By 17 November 2020, it has infected more than 55 million people worldwide and caused more than 11 327 253 deaths.¹

The sudden massive outbreak of COVID-19 overwhelmed healthcare systems. Even the most resilient healthcare systems face insufficient treatment capacities due to the unexpected increase of often very ill patients with COVID-19.^{2 3} Besides insufficient resources,



this pandemic poses extreme pressures on healthcare professionals.³

Experiences from previous similar outbreaks of infectious diseases, such as severe acute respiratory syndrome (SARS) (2003), middle east respiratory syndrome (MERS) (2013–2016) and Ebola (2014–2016) show that healthcare professionals are pushed to their limits in such situations. Each outbreak has its own dynamics, but they are all characterised by exposure to high workload, a shift in tasks and responsibilities, risk of infection, more difficult working conditions due to protective clothing and procedures, in addition to intense exposure to emotional events and trauma.⁴ Studies after the SARS, MERS and Ebola outbreaks show that, in the short term, persistent exposure to stress, anxiety, trauma/emotional events, sleep deprivation and fatigue lead to errors and decreased employability among healthcare professionals. Long-term effects include burn-out, depression and anxiety disorders as well as post-traumatic stress disorder.^{5–9} A variety of social and occupational factors affected the mental well-being, implying that it is important to take measures as early as possible to minimise harm.¹⁰

Early studies of and experiences with COVID-19 from China and Italy^{11–15} indicate that healthcare professionals face similar situations as encountered in previous outbreaks. The demand for care is increasing rapidly and care must be provided in stressful and uncertain circumstances causing emotional and physical exhaustion.¹⁶

A recent meta-analysis found a pooled prevalence of 23.2% for anxiety, 22.8% for depression and 38.9% for insomnia among healthcare professionals during the COVID-19 outbreak.¹⁷ As healthcare professionals are considered to be the ‘most valuable resource’, maintaining mental and physical health for the short and long term, and hence the employability of healthcare professionals, is essential in coping with what is expected to be a long-term COVID-19 outbreak. Several international organisations, such as the WHO, have developed documents providing recommendations to improve mental well-being of healthcare professionals during this COVID-19 outbreak.^{18–20}

Furthermore, two systematic reviews investigated the psychological well-being of healthcare professionals involved in SARS. Brooks *et al*¹⁰ concluded the importance of preparing healthcare professionals for the potential psychological impact, to stimulate a supportive working environment and to ensure provision of support for those who need it. Koh *et al*²¹ advise to empower healthcare professionals through education and training, to provide safe environments and to offer incentives to those who are exposed to extra high risks.

However, to our knowledge, there has been no attempt to systematically summarise the evidence on improving and maintaining healthcare professionals’ resilience generated from several similar outbreaks. As COVID-19 is a new disease, we decided to have a broad scope and also explored what we can learn from previous similar virus outbreaks in the 21st century such as SARS, MERS and

Ebola. These viruses have in common that they all are fast-spreading viruses impacting entire communities.²² Given the urgency of the COVID-19 outbreak, we felt the need to rapidly synthesise the evidence and to produce practical recommendations, which can be implemented in a quick and easy way.

METHODS

In this study, a scoping review was conducted and filled with information provided by expert interviews. Given the broad scope of the research aim, expected heterogeneity of the body of evidence and urgency to get results,^{23–27} a scoping review was conducted without the use of a formal protocol. The scoping review is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).²⁸

Identification of articles

The databases PubMed, Embase, PsycINFO, CINAHL, bioRxiv and medRxiv were systematically searched for (prepublished) literature on interventions and measures for the preservation of short-term and long-term physical and/or mental health and employability of healthcare professionals exposed to epidemic/pandemic outbreak working conditions, published between January 2003 and March 2020. Epidemic/pandemic outbreaks of interest include SARS (2003), MERS (2013–2016), Ebola (2014–2016) and COVID-19. Because the SARS outbreak took place in 2003, we used this year as a starting point for our search. The full search strategies were developed in collaboration with a medical librarian from Utrecht University and further refined through team discussion (see online supplemental appendix 1). Additionally, the grey literature was searched with a focus on leading organisations with expertise in outbreak situations, including the WHO, Médecins Sans Frontières, The International Committee of the Red Cross, United Nations, International Council of Nurses and the Dutch Ministry of Defense. Healthcare professionals were defined as ‘a person associated with either a specialty or a discipline and who is qualified and allowed by regulatory bodies to provide a healthcare service to a patient’.²⁹ Resilience is typically defined as the ‘successful adaptation to adversity’, entailing the concept of recovery, that is, ‘how well do people bounce back and recover fully from challenge’ and sustainability, that is, ‘the capacity to continue forward in the face of adversity’.³⁰ We chose a multifaceted approach to resilience,³¹ not only recognising the role of the individual but also personal, social and workplace features.^{32 33}

Selection of articles and data extraction

Peer-reviewed and preprint articles were included when they concerned empirical research (both original articles and reviews) and focused on COVID-19 and other outbreak-related working conditions on the short-term and long-term physical and/or mental health and

employability of healthcare professionals. Research on predictors or causes of physical and/or mental health as well as research into interventions, measures and policies to preserve physical and/or mental health were included. Articles written in a language other than English or Dutch were excluded. Articles were screened on title and abstract by pairs of independent reviewers (AR, DS, DtC, EM, ES, JCAT, JDV, LCS, NB, WdL). Discrepancies were resolved by a third reviewer (LCS, WdL).

The full-text assessment and data extraction were performed by one reviewer per article (AR, DS, DtC, EM, JMdm-vG, JDV, LCS, NB, JCAT, WdL) and subsequently checked for accuracy by a second reviewer (AR, DtC, EM, JMdm-vG, JDV, LCS). Data extraction was performed using a standardised form with which data were extracted regarding the first author, year of publication, location, target population, type of disease outbreak, type of study, method(s) of data collection, interventions/measures, recommendations regarding the use of the intervention/measure, timing of the intervention/measure (before or during the outbreak) and purpose of the intervention/measure. The process of data extraction with the standardised form was piloted on four studies, by two reviewers (DtC and LCS).

Data extraction and development of recommendations

A matrix was drawn up for data extraction that would allow for summarising recommendations based on the timing of the interventions/measures (before or during the outbreak) and the specific topics: resilience, tasks and responsibilities and working conditions.

The matrix was constructed based on a rough exploration of the literature and was further refined through team discussion, interviewing experts (see below) and was adapted iteratively based on the findings of the included studies. Per article, one reviewer (ES, EM, DS, DtC, JMdm-vG, JDV, LCS, NB) narratively synthesised data regarding interventions/measures for each topic. This synthesis was then checked by a second reviewer. The findings of the scoping review were triangulated with the findings of the expert interviews (see next paragraph) and subsequently practical recommendations regarding the preservation of short-term and long-term physical and/or mental health and employability of healthcare professionals exposed to COVID-19 and other outbreak-related working conditions were formulated. The quality of evidence was not considered when formulating recommendations. Two reviewers (JCAT, LS) checked the recommendations for accuracy. The recommendations turned out to be on environmental, individual and organisational levels. Thus, when presenting the results, we indicate the level.

Expert interviews

Parallel to the scoping review, four experts were recruited for a semistructured interview based on a purposive sampling method. Two experts were selected based on their expertise (psychological trauma and prevention and treatment of psychological disorders following trauma).

One of the experts recommended another expert based on her expertise with supporting healthcare professionals after traumatic events or difficult work situations. The fourth expert was recommended by one of the researchers (JCAT) based on her expertise (integrity and resilience in law enforcement training and practice). The experts were asked to evaluate the data synthesis matrix (completeness and importance of the topics, additions based on their expertise). The interviews were conducted by telephone, audio-recorded and subsequently summarised. In addition to the interviews, the experts received a draft of the recommendations once the data synthesis was completed. Some content-related additions were made accordingly.

Patient and public involvement

This study was planned in collaboration with the University Medical Hospital Utrecht. This study was conducted for and by healthcare professionals (mostly nurses). Some of them worked in a COVID-19 ward or intensive care unit during the COVID-19 outbreak. Additionally, various experts were involved in the validation of the findings. Two frontline nurses, working at the COVID-19 unit or the intensive care unit, were asked to review our recommendations and comment on the fit of the recommendations with their daily work circumstances.

RESULTS

Scoping review

Study selection

The literature search identified 6054 articles. After removing duplicates, 4471 articles remained. Based on the screening of title and abstract, 4318 articles were excluded. The full texts of the remaining 158 articles were assessed for eligibility, which resulted in the inclusion of 73 articles reporting on 71 unique studies (see [figure 1](#) for the selection process). Two studies were both reported in two articles.^{5 34-36} In addition, we considered five articles from the grey literature as relevant. These articles were reports by international organisations rather than empirical studies.

Study characteristics

Studies were conducted in a variety of countries between 2003 and 2020 (see [table 1](#)). They referred to an outbreak of MERS (n=11), SARS (n=36), Ebola (n=13) or COVID-19 (n=9). Two studies did not refer to a specific disease outbreak or referred to various disease outbreaks. Studies used qualitative methods (n=21), quantitative methods (n=43) or mixed-methods (n=4). Two were systematic reviews and one a focused review. See [table 2](#) for detailed study characteristics.

Expert interviews

Interviews were conducted in March 2020 with four experts: a professor and chair of psychological trauma, a senior researcher in the field of prevention and treatment of psychological disorders following trauma, a

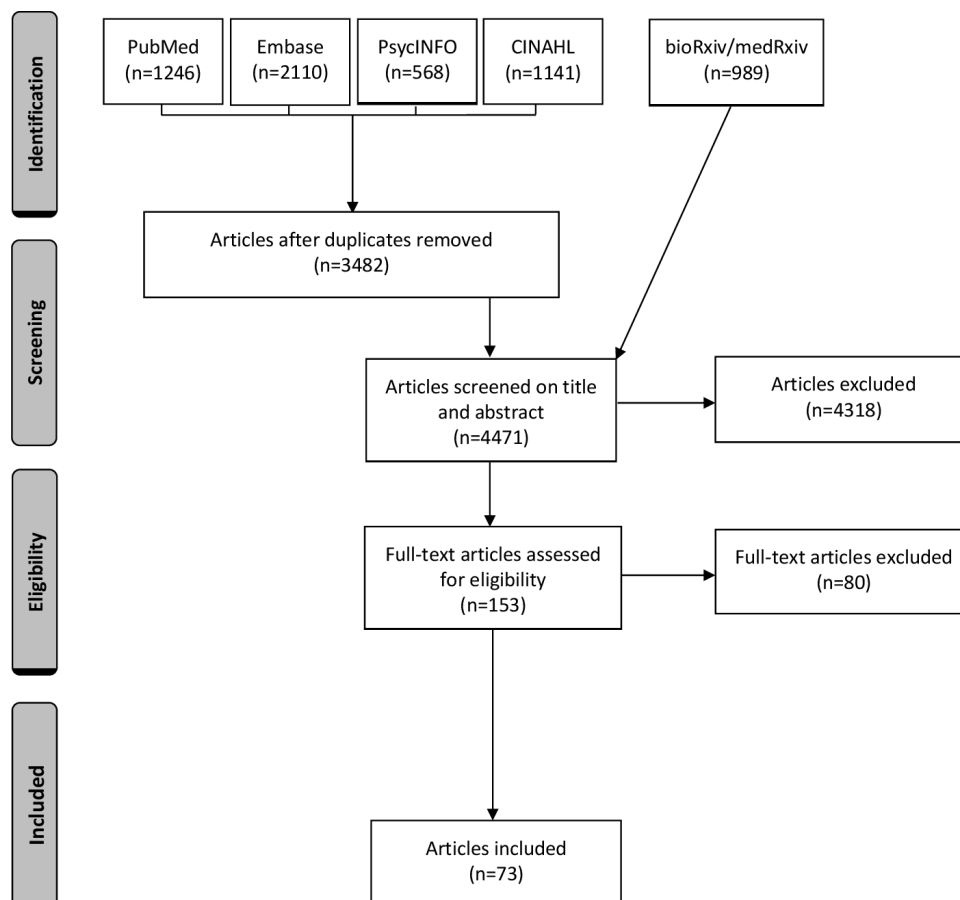


Figure 1 Flow diagram of the selection process.

senior researcher in the field of integrity and resilience in law enforcement training and practice and a trauma coordinator at a general hospital. Interviews lasted between half an hour and 45 min.

Country	Number of studies
Canada	13
China	16
Congo-Kinshasa, Congo-Brazzaville and Uganda	1
Germany	1
Japan	1
Liberia	2
Saudi Arabia	5
Sierra Leone	3
Singapore	4
South Korea	6
Spain	1
Taiwan	10
The Netherlands	1
USA	4
Various	3

Practical recommendations

Results of the data extraction are presented in online supplemental appendix 1. Below a range of the developed practical recommendations are depicted.

Before the outbreak

Resilience

Three intervention components prior to or in the run-up to the outbreak were found regarding the concept of resilience: (1) education and training, (2) resilience training and (3) perception of preparedness.

Education and training—organisational level

Several studies recommended to provide information and education to healthcare professionals about the virus, method of transmission, symptoms and protective measures. This information should be up to date and be clearly communicated.^{34 35 37 38} Furthermore, many studies found it essential to train professionals in recognising symptoms, in preventing transmission and in using protective measures and associated procedures.^{10 10 34 35 39–43}

Resilience training—organisational level

Resilience training, moral and psychological support to healthcare professionals from outside and within the healthcare teams that provide direct (daily) patient care should be provided.^{44–47} Professionals should be

Table 2 Study characteristics

First author (publication year)	Year	Study location(s)	Population	Disease outbreak	Study type	Method(s) of data collection	Centre(s) (number)
Abolfotouh <i>et al</i> ⁴⁴	2015	Saudi Arabia	Various	MERS	Quantitative	Survey	Multicentre (3)
Al-Dorzi <i>et al</i> ⁵⁵	2015	Saudi Arabia	Various	MERS	Mixed-methods	Registry data, individual interview(s), open discussions	Monocentre
Al Ghobain <i>et al</i> ⁵¹	2015	Saudi Arabia	Physicians	MERS	Quantitative	Survey	Multicentre (4)
Andertun <i>et al</i> ⁴⁸	2014–2015	Sierra Leone	Various	Ebola	Qualitative	Individual interview(s), focus group(s)	Unknown
Bai <i>et al</i> ⁶¹	2003	Taiwan	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Belfroid <i>et al</i> ³⁹	2016	The Netherlands	Various	Ebola	Qualitative	Individual interview(s)	Unknown
Bell <i>et al</i> ⁴⁰	2016	Liberia	Various	Ebola	Qualitative	Individual interview(s)	Multicentre (unknown)
¹¹³	2020	Various	Various	COVID-19	Quantitative	Survey	Worldwide
Bournes <i>et al</i> ⁷⁸	2003	Canada	Various	SARS (non-COVID-19)	Qualitative	Individual interview(s)	Monocentre
Brooks <i>et al</i> ¹⁰	Various	Various	Various	Various	Systematic review	NA	NA
¹¹⁴	2014	Saudi Arabia	Nurses	MERS	Quantitative	Survey	Monocentre
Carvalho <i>et al</i> ⁴¹	2014–2015	Spain	Various	Ebola	Quantitative	Survey	Monocentre
Chan <i>et al</i> ⁶²	2003	Singapore	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Chan <i>et al</i> ⁵⁶	2003	China	Nurses	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (8)
Chen <i>et al</i> ⁴²	2003	Taiwan	Nurses	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Chen <i>et al</i> ⁷⁷	2003	Taiwan	Various	SARS (non-COVID-19)	Quantitative	Survey, antibody test	Monocentre
Chen <i>et al</i> ⁷⁵	2003	Taiwan	Nurses	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Chua <i>et al</i> ⁶²	2003	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (2)
Dai <i>et al</i> ⁷⁴	2020	China	Various	COVID-19	Quantitative	Survey	Nationwide
¹¹³	2004	Canada	Nurses	SARS (non-COVID-19)	Quantitative	Survey	Unknown
Gearing <i>et al</i> ⁸³	2003	Canada	Various	SARS (non-COVID-19)	Qualitative	Focus group(s)	Monocentre
¹¹⁵	1995, 2000–2001, 2002–2003	Congo-Kinshasa, Congo-Brazzaville, Uganda	Nurses	Ebola	Qualitative	Individual interview(s), focus group(s)	Unknown
Huang <i>et al</i> ⁸⁶	2020	China	Nurses	COVID-19	Quantitative	Survey	Nationwide
Grace <i>et al</i> ⁸²	2003	Canada	Physicians	SARS (non-COVID-19)	Mixed-methods	Survey, open-ended survey questions	Multicentre (3)
¹¹⁶	2003	Japan	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (7)
Jeong-Sil <i>et al</i> ⁸⁷	2015	South Korea	Nurses	MERS	Quantitative	Survey	Multicentre (6)

Continued

Table 2 Continued							
First author (publication year)	Year	Study location(s)	Population	Disease outbreak	Study type	Method(s) of data collection	Centre(s) (number)
Kang <i>et al</i> ⁵⁷	2015	South Korea	Nurses	MERS	Qualitative	Individual interview(s), focus group(s)	Multicentre (9)
Khalid <i>et al</i> ⁶⁹	2014	Saudi Arabia	Various	MERS	Quantitative	Survey	Monocentre
Khee <i>et al</i> ⁹⁰	2003	Singapore	Various	SARS (non-COVID-19)	Qualitative	Observations	Monocentre
Kim <i>et al</i> ⁶³	2015	South Korea	Nurses	MERS	Quantitative	Survey	Multicentre (15)
Kim <i>et al</i> ⁸⁴	2016–2017	South Korea	Nurses	MERS	Qualitative	Individual interview(s)	Multicentre (4)
Koh <i>et al</i> ⁶	2003	Singapore	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (9)
¹¹⁷	Various	Various	Various	SARS (non-COVID-19)	Systematic review	NA	NA
Lai <i>et al</i> ¹⁴	2019	China	Various	COVID-19	Quantitative	Survey	Multicentre (34)
Lee <i>et al</i> ⁶⁴	2003	Taiwan	Nurses	SARS (non-COVID-19)	Qualitative	Individual interview(s)	Monocentre
Lehmann <i>et al</i> ⁶⁴	Unknown	Germany	Various	Ebola	Quantitative	Survey	Multicentre(2)
Li <i>et al</i> ⁴⁵	2015–2016	Liberia	Various	Ebola	Qualitative	Individual interview(s)	Monocentre
Li <i>et al</i> ¹²	2020	China	Nurses	COVID-19	Quantitative	Survey	Nationwide
Lin <i>et al</i> ⁷⁰	2003	Taiwan	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Liu <i>et al</i> ⁷¹	Unknown	China	Nurses	Ebola	Qualitative	Individual interview(s)	Monocentre
¹¹⁸	2006	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Liu <i>et al</i> ¹²	2020	China	Various	COVID-19	Quantitative	Survey	Nationwide
Lu <i>et al</i> ⁶⁵	2003–2004	Taiwan	Various	SARS (non-COVID-19)	Mixed-methods	Survey, open-ended survey questions	Monocentre
Marjanovic <i>et al</i> ⁶⁶	2004	Canada	Nurses	SARS (non-COVID-19)	Quantitative	Survey	Nationwide
Marrs <i>et al</i> ⁴⁹	Unknown	USA	Various	Ebola	Quantitative	Survey	Monocentre
Mauder <i>et al</i> ⁷⁹	Unknown	Canada	Various	SARS (non-COVID-19)	Focused Review	NA	NA
Mauder <i>et al</i> ⁷⁹	2003	Canada	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (3)
Mauder <i>et al</i> ⁴⁶	2004–2005	Canada	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (13)
Mauder <i>et al</i> ⁷	2003	Canada	Various	SARS (non-COVID-19)	Qualitative	Individual interview(s), observations	Monocentre
O'Boyle <i>et al</i> ⁸⁰	2003	USA	Nurses	Public health emergencies	Qualitative	Focus group(s)	Multicentre (3)
O'Sullivan <i>et al</i> ⁵²	Unknown	Canada	Nurses	SARS (non-COVID-19)	Qualitative	Focus group(s)	Nationwide
Poon <i>et al</i> ⁶⁷	2003	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Qi <i>et al</i> ⁷⁶	2020	China	Various	COVID-19	Quantitative	Survey	Nationwide
¹¹⁹	2003	Canada	Physicians	SARS (non-COVID-19)	Qualitative	Individual interview(s)	Multicentre (4)

Continued

Table 2 Continued

First author (publication year)	Year	Study location(s)	Population	Disease outbreak	Study type	Method(s) of data collection	Centre(s) (number)
Raven <i>et al</i> ⁶⁸	2015	Sierra Leone	Various	Ebola	Qualitative	Individual interview(s)	Nationwide
¹²⁰	2003	Taiwan	Nurses	SARS (non-COVID-19)	Qualitative	Focus groups, open-ended survey questions	Multicentre (unknown)
Shih <i>et al</i> ⁶¹	2003	Taiwan	Nurses	SARS (non-COVID-19)	Qualitative	Individual interview(s)	Multicentre (4)
Sin <i>et al</i> ⁸¹	2003	Singapore	Paramedics	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Smith <i>et al</i> ⁶⁵	2016	USA	Various	Ebola	Qualitative	Individual interview(s)	Monocentre
Son <i>et al</i> ⁹	2015	South Korea	Various	MERS	Qualitative	Written notes	Monocentre
Son <i>et al</i> ⁶⁸	2015	South Korea	Various	MERS	Quantitative	Survey	Monocentre
Speroni <i>et al</i> ^{34*}	2014	USA	Nurses	Ebola	Quantitative	Survey	Nationwide
Speroni <i>et al</i> ^{35*}	2014	USA	Nurses	Ebola	Qualitative	Open-ended survey questions	Nationwide
Styra <i>et al</i> ⁶⁹	2003	Canada	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Su <i>et al</i> ⁷³	2003	Taiwan	Nurses	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Tam <i>et al</i> ⁷²	2003	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (3)
Tolomiczenko <i>et al</i> ⁶⁰	2003	Canada	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
von Strauss <i>et al</i> ⁴³	2014–2015	Sierra Leone	Nurses	Ebola	Quantitative	Survey, open-ended survey questions	Monocentre
Wong <i>et al</i> ⁴⁷	2003	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Multicentre (14)
Wu <i>et al</i> ^{36†}	2006	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Wu <i>et al</i> ^{5†}	2006	China	Various	SARS (non-COVID-19)	Quantitative	Survey	Monocentre
Xiao <i>et al</i> ¹¹	2020	China	Various	COVID-19	Quantitative	Survey	Multicentre (unknown)
Zhu <i>et al</i> ¹³	2020	China	Various	COVID-19	Quantitative	Survey	Monocentre

*Articles reporting the same study.

†Articles reporting the same study.

MERS, middle east respiratory syndrome; NA, not applicable.

informed about the psychosocial risks of working in outbreak situations and be trained on how to deal with isolation, stigmatisation, fatigue, stress and feelings of depression.^{10 37 48 49} The expert interviews added that this training should also be targeted at managers. Besides, Marrs *et al*⁴⁹ recommended training on inter-professional teamwork.

Perception of preparedness—organisational level

To maximise perception of preparedness, protocols should be up to date, a clear action plan should be made and effective communication strategies be implemented. The hospital or organisation must ensure that sufficient staff and materials are available to handle the outbreak. A safe work environment should be promoted, for example, minimal movements of heavy materials, enough space to work and keep distance and locks between high-risk and low-risk patients.⁵⁰ Besides, involving the staff in the preparations for the planning of the upcoming demand of care is recommended.^{40 46 51} Attention should be paid to potential ethical dilemmas in healthcare and the intensity of care. These dilemmas can for instance include not being able to provide good care or feeling obliged to do the job even if it is not possible.^{5 36 43 46 52}

During the outbreak

Resilience

During the outbreak, some interventions were also related to the concept of resilience: (1) communication, (2) psychosocial support and treatment, (3) monitoring health status.

Communication—organisational, individual and environmental level

One person within each healthcare team should be responsible for grouping information.^{38 50 53 54} Realistic scenarios or actual scenarios should be discussed within a healthcare team that provides direct (daily) patient care.^{50 53 54} It is recommended to create a blame-free environment in which frontline professionals are provided the ability to report incidents, ethical or emergency issues, challenges and advice for management.^{37 50 55} A platform on which healthcare professionals can share information, experiences and good practices for communication among peers and with collaborating parties should be offered.^{56–59} Furthermore, involving nursing staff in the decision-making processes (also at management level) has been recommended as this group is often neglected. Having short communication lines between professionals is important.^{9 60}

Psychosocial support and treatment: create enabling conditions—organisational level

It is important to create enabling conditions early on in the outbreak for optimal professional psychosocial support for healthcare professionals both within regular care and in acute situations.^{11 12 14 53} These facilities should be accessible for all healthcare professionals and this should be clearly communicated. Furthermore,

there should be sufficient resources/capacity for a multi-disciplinary psychosocial support team consisting of peer support, psychologists, spiritual counsellors, social professionals, occupational health and safety physicians.⁵³ It is recommended to create a simple and agile organisational structure for the psychosocial support team. There should be a clear functional and hierarchical management of and communication towards as well as within the operational core. For example, making a 24/7 telephone number by members of the psychosocial support team available to professionals who are in need to talk to someone.⁷ Furthermore, it is recommended to create an efficient referral system for professionals with physical or psychological problems so that they can obtain a diagnosis quickly and professional treatment if indicated.⁴² Sufficient professional psychosocial capacity during the peak of the outbreak is needed and financial compensation for the treatment needs to be ensured.^{9 46 61–68} It is beneficial to identify professionals who are at high risk of psychosocial problems early. Special attention should be paid to front-line professionals, professionals in quarantine, women, young/inexperienced and conversely older professionals.^{5 46 47}

Form and content of psychosocial support—organisational and environmental level

Many of the included studies encouraged communication between professionals in the workplace, even during busy periods and create time for non-binding discussion of positive and negative aspects of the situation.^{38 47 50 62 67 69–71} Communication should make use of natural coping strategies (acceptance, active coping, positive framing) rather than the broad use of psychological interventions such as therapy.^{5 7 36 38 46 47 52 64} When professionals suffer from complaints in acute situations, it is recommended to offer evidence-based interventions following a formal diagnosis and treatment process by professionals who are not involved in the workplace.^{9 46 61–68} Furthermore, hospitals should offer professionals the opportunity to quickly withdraw from an emotionally stressful situation³⁷ by creating a safe area where professionals can catch their breath or blow off steam and get peer support. Opportunities to stay in direct or indirect contact with family and friends should be created.^{52 63 71 72}

Monitoring health status of professionals—organisational level

It is important to constantly be aware of the mental or physical health of professionals and to scale up monitoring when problems increase and/or the outbreak persists.¹³ Besides, frequent but casual monitoring of the physical and mental health status aiming at early identification of the problems is needed. A daily check-in/check-out is an excellent low-threshold method to gauge how someone is doing, whether there are concerns, and if something is bothering someone.^{13 73}

Tasks and responsibilities

Intensity of tasks and responsibilities—organisational level

A good care provider–patient ratio is crucial meaning that the care-related workload is in proportion to the care providers' capacity since it safeguards safety and quality of care.⁵⁵

Work pattern and working conditions

Work pattern—organisational level

Limiting shifts to a maximum of 12 hours shifts with light tasks⁵⁰ or 8–10 hours for shifts within intense tasks⁴² are recommended. For evening and night shifts 8 hours are indicated.⁵⁰ A series of shifts should be followed by days off,^{37 50 54} which should be scheduled often enough (which also applies for breaks).^{50 74 75} More specifically, after a series of 8–10-hour shifts, at least 1 or 2 days off should be scheduled.⁵⁰ Days off and vacation should also be planned during an outbreak^{38 56 75} and healthcare professionals should not be approached with work-related information and/or questions when not at work.

Working on the frontline should be limited to 6–8 weeks. These frontline shifts should be alternated with non-frontline shifts.³⁸ To ensure healthy work patterns, it is recommended to deploy managers as role models⁷ and review and evaluate the division of labour and planning and the strict adherence to the working hours.^{56 57 71 76 77}

Team composition—organisational and individual level

Deploying full-time professionals wherever possible enhances the continuity of care.⁷⁸ Shifting professionals who held non-essential positions before the outbreak to essential positions should be done only after adequate training.⁵⁰ Several studies highlighted the benefits of setting up a buddy system in which two professionals are linked together during a shift.^{37–39 46 50 53 59 64 79 80} Furthermore, it is recommended that there is always someone with whom professionals can talk before, during and after their shift and with whom they can unload.^{11 57 62 81 82}

Team building—organisational and individual level

Many of the included studies recommended to improve the atmosphere in the department by creating a sense of togetherness and positivity. Everyone should feel that their voice is heard.^{7 9 10 43 57 68 74 78 82–86}

Respect the autonomy—organisational level

It is widely agreed that the autonomy of healthcare professionals should be respected. They should have a choice of whether or not to work with patients with COVID-19 and should not be judged on their choice.^{34 35 52 54 64 72 87} If healthcare professionals develop complaints while working, they should be given the choice to perform other activities elsewhere (expert interview).

Rooms and facilities—environmental level

Ideally, each department should have a separate room available for professionals to retreat, rest or sleep.^{7 38 50 53 70 71 76 80 88 89} Time, space and opportunities should be offered to let professionals exercise individually

or jointly and/or perform (relaxing) activities. Exercise can serve as an outlet to reduce stress.^{38 50 89}

Availability of materials—organisational level

It is essential to provide healthcare professionals, especially those on the frontline, with adequate materials.^{7 9 34 35 52 64 68 74 79 80} Besides, training in and supervision of correct use of personal protective equipment are needed.^{9 37 67 68 73 80 86 87 90} It is recommended not to share concerns about lack of materials with all professionals in the department.^{72 80} The expert interviews added that one person should be assigned the responsibility to further inventor the availability and to take any action to resolve shortages.

Compensation—organisational level

It is recommended to offer (frontline) professionals' compensation for practical support, in relation to extraordinary tasks, responsibilities and risks.^{42 58 64 72 80 84 91} Additionally, social services such as child or animal care or care for the elderly should be provided to the next of kin/family of the (frontline) professionals.⁷⁹ It should be ensured that staff have a good living environment at home, so that sufficient relaxation and sleep can be achieved.^{38 50 61}

Possibility to eat and drink—organisational level

It is recommended to offer professionals, especially those in the frontline, sufficient and easy accessible high nutritional food and drinks during every shift.^{38 42 50 64 80} Working in protective clothing considerably reduces the possibility of eating. As frontline professionals should take as much rest as possible during their time off, they should not be worried about preparing a balanced diet at home and to work.^{7 42 71}

DISCUSSION

This study presents practical recommendations on how to build and maintain the resilience among frontline healthcare professionals exposed to COVID-19 and other outbreak-related working conditions based on a scoping review and expert interviews. These recommendations encompass a variety of small and large interventions prior to the outbreak as well as during the outbreak. Recommendations prior to the outbreak fostering resilience included optimal provision of education and training, resilience training and interventions to create a feeling of being prepared. Recommendations during the outbreak consisted of (1) enhancing resilience by proper provision of information, psychosocial support and treatment, monitoring the health status of professionals and using various forms and contents of psychosocial support, (2) tasks and responsibilities, in which attention should be paid to kind of tasks, task mix and responsibilities as well as the intensity and weight of these tasks and (3) work patterns and working conditions.



Strengths and limitations

To our knowledge, this is the first study that combined a scoping review based on a systematic literature search with expert interviews to foster evidence-based recommendations about how to keep healthcare professionals healthy and resilient during COVID-19 working conditions. Due to the COVID-19 outbreak and the urgent need for scientific research, no study protocol was published in advance. However, the unpublished protocol is available from the corresponding author on request. Yet, an extensive overview of the current body of knowledge was provided by the extended search strategy, the consideration of preprints and grey literature.

The review process followed a universally agreed protocol (PRISMA Extension for Scoping Reviews 2018) to ensure the quality of reporting.²⁸ However, this study did not critically appraise the included articles and we cannot make conclusions regarding the quality of the evidence.⁹²⁻⁹³ The data collection and data management processes were thorough as all phases of the scoping review were checked by a second reviewer and when necessary a third reviewer. The synthesis of the results was approved by all 12 authors to ensure the validity of the findings. Additionally, the expert interviews increased the trustworthiness of the data.

Most studies included in this review were conducted during or after previous outbreaks that were similar to COVID-19. However, each outbreak has its own dimensions and each culture acts differently. This holds especially true for the Ebola outbreak in Africa, which was included in this review. Hence, care might have been carried out in other ways, due to differences in disease transmission, culture and the healthcare system. Though we consider this literature to be relevant, this should be considered when interpreting the results.

Comparison with other studies

The literature of the impact of the COVID-19 outbreak on healthcare professionals is currently expanding rapidly especially on the impact of changed patient care on the involved healthcare professionals.⁹⁴⁻⁹⁶ Furthermore, predictors for mental health problems of healthcare professionals during the COVID-19 outbreak accompanied by suggestions of global and small interventions to implement rapidly.⁹⁷⁻¹⁰⁰ In most studies, only a particular aspect of mental health problems was explored such as anxiety, burnout and fatigue or psychological (dis) stress.¹⁰¹⁻¹⁰³

Enhancement of resilience by proper provision and receiving of information and by providing psychosocial support and treatment embedded in a safe and blame-free (working) environment is also emphasised by De Brier *et al's*⁹⁹ rapid systematic review on mental health support during outbreaks. Reducing other tasks to allow healthcare professionals to focus on the immediate needs³ is in line with our findings. Research prior to the COVID-19 outbreak showed that occupational factors such as shift work, hours worked and job strain led to depression

and burnout.¹⁰⁴⁻¹⁰⁶ Work conditions as a lack of breaks during shifts have been associated with nurses' fatigue. Fatigue can directly affect the physical health of professionals by increasing risk of injuries.¹⁰⁷⁻¹⁰⁸ Breaks to rest are important for managing fatigue and improving short-term performance.¹⁰⁹⁻¹¹² The sudden massive outbreak of COVID-19 that overwhelmed healthcare systems will further magnify these occupational factors if no attention is paid to healthcare professionals.³

COVID-19 is a new disease outbreak, we so far have only limited knowledge about. Some of our recommendations as providing good information and clarity were at the begin of the outbreak rather difficult to put into practice. Especially the shortage of protective material in many countries caused great unrest. In a second wave, it should be ensured that this will be better regulated.

Implications

These practical recommendations provide an overview of possible interventions that can be implemented in clinical practice to reduce the burden of healthcare professionals exposed to COVID-19 working conditions and may prevent and reduce possible negative consequences. Government should provide healthcare organisations with sufficient resources to implement these recommendations that fit their needs and adapt them to their context. Recommendations were targeted at various levels: from senior management to healthcare professionals. Even though the recommendations were primarily developed for hospitals, many are transferable to other settings as well. To enhance the evidence base of the recommendations, evaluating the effectiveness of the above-mentioned recommendations during COVID-19 working conditions should be stimulated.

CONCLUSION

Healthcare professionals should be supported in various ways during the extreme COVID-19 working conditions to prevent and reduce possible negative consequences. Many practical and easy to implement recommendations were created to foster physical and mental health of healthcare professionals. Hospitals (and other healthcare organisations) should stimulate the implementation of interventions mentioned in these recommendations at various levels in their organisations.

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