Interventions to foster mental health, psychosocial support, resilience and/or stress management in healthcare workers in face of the COVID-19 pandemic – protocol for a living systematic review

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BRIEF SUMMARY

This protocol for a living systematic review is elaborated in view of the current SARS-CoV-2 pandemic. The ongoing pandemic is causing a worldwide burden on the community at large through measures such as testing, tracing, self-isolation, and quarantine measures as well as broader population measures ranging from travel bans, school closures, assembly restrictions, curfews, to full lockdowns. Substantial stressors vary from those for individuals (e.g., social distancing) to socio-economic consequences for the affected countries (e.g., global supply chain disruptions) and overtaxed healthcare systems (e.g., disruption of essential health services). Given the work-related stressors in the context of disease outbreaks (e.g., high workload, risk of infection, triage decisions), healthcare workers may suffer from a particularly high burden. The

acute and chronic stress exposure during the pandemic may have a negative short and long-term impact on the individual mental health of healthcare professionals (e.g., general psychological distress, increase in psychological symptoms such as anxiety or depressive symptoms). This, in turn, can negatively affect their individual work performance and work ability (e.g., absence from work, job satisfaction), the performance of the healthcare system and the quality of patient care (e.g., absenteeism and resulting staff shortages, medical mistakes made by stressed healthcare staff in stressful situations). Furthermore, overloading the healthcare system might (especially in the short-term) jeopardize a favorable progress in dealing with the current pandemic, resulting in a poorer management of the number of COVID-19 patients in intensive care units and/or more COVID-19 related deaths.

Therefore, we intend to conduct a regularly updated living synthesis to identify and summarize the available literature on interventions to foster mental health, psychosocial support, resilience and/or stress management in healthcare workers in the face of the current pandemic. The identification and systematic examination of relevant research in the field may inform researchers, policy makers and other deciders in clinical and public settings about available health-promoting approaches and crucial intervention elements. The living systematic review will be updated every two months within the duration of the project **CEOsys** (https://www.covid-evidenz.de; https://www.ceosys.de) until March 31, 2020. CEOsys ("Establishment of a COVID-19 evidence ecosystem to improve knowledge management and knowledge translation") is part of the national network of academic medical research into COVID-19, Germany (Nationales Netzwerk Universitätsmedizin, NUM). Any potential changes concerning the update frequency will be subsequently added to this protocol.

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AIM

To identify and summarize the available literature of interventions that aim to promote mental health, psychosocial support, resilience and/or stress management in healthcare workers in the face of the SARS-CoV-2 pandemic.

METHODS

PARTICIPANTS/POPULATION

- **Inclusion:** healthcare workers, for example:
  - physicians (irrespective of medical specialty);
  - nursing staff;
  - ambulance personnel, paramedics;
  - allied healthcare professionals*, such as:
    - social care professionals or social workers*;
    - psychologists*;

- o any kind of therapists (e.g., physiotherapists, occupational therapists, psychotherapists etc.)*;
- hospital staff* (e.g., medical-technical staff in laboratories, radiology, pharmacy; cleaning staff; service staff; administrative staff, pastoral/spiritual care staff in hospitals* etc.);
- healthcare students (e.g., medical students and other fields)*

with direct patient contact, contact to patient environment or contact to contaminated material

- If any of the above-mentioned groups is investigated, the study will be included irrespective of country, age, sex, working experience, health status, or whether the healthcare workers were directly involved in the care of patients with COVID-19 (i.e., healthcare workers do not necessarily have to be "frontline healthcare workers").

- **Exclusion:**
  - other target groups (e.g., general population, patients);
  - allied healthcare professionals, hospital staff or healthcare students not meeting the criterion of direct patient contact, contact to patient environment or contact to contaminated material

INTERVENTION(S), EXPOSURE(S)

- **Inclusion:**
  - *exposure:*
    - o exposure to SARS-CoV-2 pandemic; intervention conducted in anticipation of, during, or in the aftermath of SARS-CoV-2 pandemic outbreak
    - o irrespective of medical care for COVID-19 patients (i.e., level of contact)
  - *intervention:*
    - o psychological and/or non-psychological interventions that aim to address mental health and/or psychosocial support and/or resilience with related concepts (e.g., hardiness, posttraumatic growth, psychological adjustment, psychological adaptation) and/or stress management (or combinations of any of these or all), for example:
      - ◊ psychological support, psychological and psychosocial interventions (e.g., psychological counselling, peer support, relaxation and mindfulness techniques, interventions focused on the promotion of psychosocial resources, self-care and self-compassion techniques; emotion regulation)
      - ◊ psychotherapy
      - ◊ workplace and organizational interventions (e.g., measures regarding workplace structures and [clinical/patient care] routines, such as adaptation of working shifts, regular breaks; information and training, for example, on dealing with suffering and death; supervision and leadership)
      - ◊ lifestyle interventions (e.g., exercise, sleeping hygiene, nutrition, social support from family and friends, positive activities, regeneration)
      - ◊ pharmacological interventions (e.g., antidepressant therapy)
    - o The interventions should focus on improving the healthcare workers' coping ability with the various pandemic stressors
    - o If the above criteria are fulfilled, studies will be included irrespective of:
      - ◊ intervention setting (i.e., group, individual, or combined setting);
      - ◊ delivery format of the intervention (i.e., face-to-face, online/computer, mobile-based with smartphone app, text, video material, audio, book-based, combination);
      - ◊ place of implementation (e.g., workplace, private setting, combination);

       ◊   intervention providers (e.g., non-guided self-help, guided self-help, therapist-delivered, combination);
       ◊   training duration or intensity;

- ◊ intervention providers (e.g., non-guided self-help, guided self-help, therapist-delivered, combination);
- ◊ training duration or intensity;
- ◊ theoretical approach used in the intervention (e.g., cognitive behavior therapy [CBT], mindfulness, combined approaches);
- ◊ time point of the intervention (i.e., before, during, or after the pandemic);
- ◊ study design;
- ◊ outcome measures assessed

- **Exclusion:**
  - exposure:
    - o exposure to other epidemic or pandemic infectious disease outbreaks (e.g., Severe Acute Respiratory Syndrome Coronavirus-1 [SARS-CoV-1], Middle East respiratory syndrome-related Coronavirus [MERS-CoV], Ebola, Human Immunodeficiency Virus [HIV], influenza);
    - o chronic infectious diseases (e.g., HIV/Acquired Immune Deficiency Syndrome [AIDS], tuberculosis, hepatitis B and C, malaria)
  - intervention:
    - o interventions for infection prevention and/or control;
    - o hygiene education (if no focus on fostering mental health or any of the other constructs);
    - o interventions to increase vaccination rates;
    - o experimental studies to test the effect of health communication manipulation;
    - o changes in curricula/education for healthcare students (if no focus on fostering mental health or any of the other constructs);
    - o practical aspects in patient care such as restructuring in clinics (if no focus on fostering mental health or any of the other constructs)

COMPARATOR(S)/ CONTROL

No eligibility criteria

TYPES OF STUDIES TO BE INCLUDED

- **Inclusion:**
  - Quantitative, qualitative and mixed-methods studies focusing on or measuring the effects of the above-defined interventions:
    - o randomized controlled trials (RCTs; individual and cluster-RCTs);
    - o randomized studies;
    - o cohort studies;
    - o case series;
    - o respective study protocols
- **Exclusion:**
  - editorials, commentaries, letters to the editor, theoretical/discussion papers;
  - reviews (for systematic reviews: although these will be excluded at the title/abstract screening stage, the reference lists of relevant reviews [i.e., reviews potentially including primary studies of interest] will be hand searched for further relevant studies)

PUBLICATION DATE
No restrictions

PUBLICATION LANGUAGE

No restrictions (translation of non-English articles)

PUBLICATION FORMAT

No restrictions (preprints will be included)

CONTEXT

Studies conducted among healthcare workers in the face of current SARS-CoV-2 pandemic, diverse settings

MAIN OUTCOMES

No eligibility criteria

SEARCH STRATEGY

- **Electronic databases:**
    - MEDLINE Ovid
    - Cochrane Covid-19 Register (CC19R)
    - Cochrane Central Register of Controlled Trials (CENTRAL)
    - PsycINFO Ovid
    - Web Of Science (Core Collection)
- **Additional sources:** In addition to the electronic search, we will inspect the reference lists of all included studies and of relevant systematic reviews. If data are missing or unclear, we will contact the respective author.

The search strategy was developed by an experienced information specialist (Maria-Inti Metzendorf) and underwent a quality assessment by a second information specialist (Robin Featherstone). The strategy comprises three blocks of search terms: 1) terms related to the SARS-CoV-2 pandemic (e.g., "COVID-19", "SARS coronavirus 2"), 2) terms associated with healthcare workers as population of interest (e.g., "health personnel", "medical staff"), and 3) terms related to mental health and work ability (e.g., "mental health", "anxiety", "burnout"). As appropriate for each database, different search terms and synonyms (e.g., MeSH terms, text words) are used. The timespan will be restricted from 2020 to current. Updates will be performed monthly or every two months within the duration of the CEOsys project until March 31, 2020. The final search frequency will be determined as soon as the study selection process of the first search (November 8, 2020) has been completed. The search strategy is detailed for each database in Appendices 1-5.

DATA EXTRACTION (SELECTION AND CODING)

Two reviewers will independently screen the titles and abstracts of identified records to assess eligibility. Irrelevant papers will be excluded immediately. At full text level, the eligibility of relevant papers will also be checked in duplicate. Any disagreement will be resolved by discussion or by consulting a third reviewer. We will use EndNote to collect and de-duplicate studies. The screening will be performed using Covidence online software[1]. Inter-rater reliability for both title/abstract and full text screening will be calculated, and the screening process will be reported in a preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow diagram[2].

We will develop a customized data extraction sheet including the following information:

- full citation
- country
- participant characteristics (e.g., sociodemographic data, sample size)
- studied subpopulation (e.g., nurses, physicians)
- time point of intervention (i.e., before, during or after SARS-CoV-2 pandemic outbreak)
- study design (e.g., RCT or non-randomized study; quantitative or qualitative study)
- intervention name, intervention setting (e.g., group setting), delivery (e.g., face-to-face), theoretical approach (e.g., CBT), intervention providers, intervention content
- control group (if available)
- outcomes and time points assessed, with outcome measures used
- results (i.e., reported quantitative [e.g., means and standard deviations, SDs] and/or qualitative effects of the intervention, for example, on mental health outcomes, resilience etc.)
- miscellaneous aspects (e.g., cut-off values of the outcome measures used).

The data will be extracted by two reviewers, working independently. Any disagreements will be resolved by discussion or by consulting a third reviewer.
The process will adhere to the PRISMA standards[2].

DATA ANALYSIS

Risk of bias (quality) assessment for randomized controlled trials (RCTs)

The risk of bias of RCTs will be assessed independently and in duplicate using the following five domains of the revised Cochrane risk-of-bias tool for randomized trials (RoB 2)[3]:
1. Risk of bias arising from the randomization process
2. Risk of bias due to deviations from the intended interventions
3. Missing outcome data
4. Risk of bias in measurement of the outcome
5. Risk of bias in selection of the reported result

In addition to the risk of bias in each domain, the overall risk of bias at the study and outcome level will be assessed. Judgements can be "low" or "high" risk of bias or can express "some concerns".

Risk of bias (quality) assessment for non-randomized trials (NRTs)

The risk of bias of NRTs will be assessed independently and in duplicate using the following seven domains of the "Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I)" tool for non-randomized trials[4]:

1. confounding (pre-intervention)
2. selection bias (pre-intervention)
3. information bias (at-intervention)
4. confounding (post-intervention)
5. selection bias (post-intervention)
6. information bias (post-intervention)
7. reporting bias (post-intervention)

In addition to the risk of bias in each domain, the overall risk of bias at the study and outcome level will be assessed. Judgements can be "low risk of bias", "moderate risk of bias", "serious risk of bias", "critical risk of bias" and "no information". Adapted versions of the tool will be used as

intended for follow-up studies, (uncontrolled) before-after studies and controlled before-after studies.

Any disagreements arising from the quality assessment for RCTs and NRTs will be resolved by discussion or by consulting a third reviewer.

Assessment of the certainty of evidence

The certainty of evidence will be assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE)[5] by one reviewer; the results will be discussed in the review team.

Data synthesis

Based on the extracted data, we will carry out a narrative synthesis of the included studies describing the study characteristics, interventions and measured outcomes in text and tabular form.

If the included studies are sufficiently homogeneous (e.g., intervention design, time point of the intervention, study design and outcome measures assessed) and in case of available data, we will perform pairwise meta-analyses (e.g., RCTs, controlled before-after studies: intervention group vs. control group; controlled/uncontrolled before-after studies: pre-intervention vs post-intervention) for different mental health outcomes (e.g., resilience, anxiety, depression, stress), in order to determine pooled intervention effects of interventions to foster mental health, psychosocial support, resilience and/or stress management in healthcare professionals. NRTs considered to be at critical risk of bias will be excluded from these analyses. In addition, NRTs with different study designs (e.g., follow-up studies, uncontrolled before-after studies, controlled before-after studies) will only be combined in a meta-analysis if they address the same research question[6].

Meta-analyses both for RCTs and NRTs will be conducted if the same outcome is assessed in at least two studies, if the studies do not differ excessively in their content and, in case of RCTs, if studies at high risk of bias do not prevail. RCTs and NRTs will *not* be combined in a meta-analysis.

For continuous outcomes, we will calculate standardized mean differences (SMDs, Hedge's g) and their respective 95% confidence intervals (CIs) as pooled effect estimates based on means, standard deviations (SDs) and sample sizes (e.g., between-group comparison of intervention and control group at post-test and, if possible, at different follow-up periods). If means and SDs are not available, we will contact the study authors to ask for the respective values or use alternative statistical information (e.g., t test, change score).

For studies reporting dichotomous outcomes (e.g., prevalence with number of participants below and above cut-off score for mental health outcome in intervention and control group), we will contact the study authors to ask for the respective means, SDs and sample sizes in order to eventually calculate SMDs as well. If these values cannot be obtained by the authors, we plan to calculate the prevalence risk ratio (RR) as pooled effect estimate, with uncertainty being expressed using 95% CIs.

Since we anticipate a considerable between-study heterogeneity in the reported assessment tools[7-9], pairwise meta-analyses will be performed based on random-effect models. In addition to the inspection of the clinical and methodological between-study heterogeneity, we will investigate the statistical heterogeneity using different statistical indicators (e.g., I^2, Tau^2, Chi^2 test, prediction intervals).

A sensitivity analysis will be performed based on the quality assessment, by excluding studies judged to be of high risk of bias. Depending on the evidence found, further sensitivity analyses will be added during the review development process.

The statistical analyses will be performed using Review Manager 5.4 (RevMan 5.4)[10] or R 4.0.3 (e.g., libraries meta, metafor, metasens)[11-14], if appropriate.

ANALYSIS OF SUBGROUPS OR SUBSETS

The publications will be clustered by the following characteristics:
- *population characteristics*
  - age;
  - geographical location (e.g., country or region);
  - subpopulation (e.g., type of staff);
  - level of contact with COVID-19 patients (i.e., ≥50% of the sample is reported to have had direct contact with COVID-19 patients)
- *intervention characteristics*
  - setting (e.g., group, individual, combined);
  - delivery format (e.g., face-to-face, online, mobile-based, video, book-based);
  - training duration/intensity;
  - theoretical approach (e.g., CBT, mindfulness, combined approaches)

Quantitative subgroup analyses will be conducted if data are available. Further potentially relevant subgroups will be added during the review development process.

TYPE AND METHOD OF REVIEW

Living systematic review; living synthesis; narrative and quantitative synthesis; meta-analysis

KEYWORDS

Mental health, psychosocial support, resilience, stress management, intervention; pandemic, SARS-CoV-2, COVID-19, healthcare workers

GENERAL INFORMATION

START DATE: November 2020

(ANTICIPATED) COMPLETION DATE: April 2021

LANGUAGE: English

COUNTRY: Germany

FUNDING SOURCES: The CEOsys project is funded by the German Federal Ministry for Education and Research (BMBF) as part of the Network for University Medicine *(Grant number* 01KX2021).

CONFLICT OF INTEREST: The authors report grants from the German Federal Ministry of Education and Research (BMBF) during the conduct of the study.

CURRENT REVIEW STATUS

Preliminary searches: completed

Piloting of the study selection process: completed
Screening of search results against eligibility criteria: started
Data extraction: not started
Risk of bias assessment: not started
Data analysis: not started

ACKNOWLEDGEMENTS

REFERENCES

1   Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia. Available at www.covidence.org

2   Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Med 6: e1000097

3   Sterne JAC, Savović J, Page MJ, Elbers RG, Blencowe NS, Boutron I, Cates CJ, Cheng H-Y, Corbett MS, Eldridge SM, Hernán MA, Hopewell S, Hróbjartsson A, Junqueira DR, Jüni P, Kirkham JJ, Lasserson T, Li T, McAleenan A, Reeves BC, Shepperd S, Shrier I, Stewart LA, Tilling K, White IR, Whiting PF, Higgins JPT. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ 2019; 366: l4898.

4   Sterne JAC, Hernán MA, McAleenan A, Reeves BC, Higgins JPT. Chapter 25: Assessing risk of bias in a non-randomized study. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (editors). Cochrane Handbook for Systematic Reviews of Interventions version 6.1 (updated September 2020). Cochrane, 2020. Available from www.training.cochrane.org/handbook

5   Schünemann H, Brozek J, Guyatt G, Oxman A (editors). GRADE Handbook for Grading the Quality of Evidence and the Strength of Recommendations. The GRADE Working Group, 2013.

6   Reeves BC, Deeks JJ, Higgins JPT, Shea B, Tugwell P, Wells GA. Chapter 24: Including non-randomized studies on intervention effects. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (editors). Cochrane Handbook for Systematic Reviews of Interventions version 6.1 (updated September 2020). Cochrane, 2020. Available from www.training.cochrane.org/handbook

7   Kunzler AM, Helmreich I, Chmitorz A, König J, Binder H, Wessa M, Lieb K. Psychological interventions to foster resilience in healthcare professionals. Cochrane Database of Systematic Reviews 2020, Issue 7. Art. No.: CD012527.

8   Kunzler AM, Stoffers-Winterling J, Stoll M, Mancini, AL, Walter S, Blessin M, Gilan D, Helmreich I, Hufert F, Lieb K. Mental health and psychosocial support strategies in highly contagious emerging disease outbreaks of substantial public concern: a systematic scoping review. PLOS ONE (under review)

9   Pollock A, Campbell P, Cheyne J, Cowie J, Davis B, McCallum J, McGill K, Elders A, Hagen S, McClurg D, Torrens C, Maxwell M. 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 of Systematic Reviews 2020, Issue 11. Art. No.: CD013779.

10   Review Manager (RevMan) [Computer program]. Version 5.4, The Cochrane Collaboration, 2020.

11   R 2019 [Computer program]. R Foundation for Statistical Computing R: A language and environment for statistical computing. Version 3.5.3. Vienna, Austria: R Foundation for Statistical Computing, 2019. Availableat www.r-project.org.

12   Balduzzi S, Rücker G, Schwarzer G. How to perform a metaanalysis with R: a practical tutorial. Evidence-Based Mental Health 2019;22(4):153-60.

13   Viechtbauer W. Conducting meta-analyses in R with the metaphor package. Journal of Statistical So;ware 2010;36(3):1-48.

14   metasens: Advanced Statistical Methods to Model and Adjust for Bias in Meta-Analysis. Schwarzer G, Carpenter JR, Rücker G, Version 0.4-0. Freiburg: Guido Schwarzer, 2019.Available at CRAN.R-project.org/package=metasens.

APPENDIX

Appendix 1: MEDLINE Search strategy
MEDLINE Ovid - *Ovid MEDLINE(R) ALL 1946 to November 06, 2020*

1. covid.mp.
2. COVID-19.rs.
3. COVID19.tw,kf.
4. ("SARS-CoV-2" or "SARS-CoV2" or SARSCoV2 or "SARSCoV-2" or "SARS coronavirus 2").mp.
5. (2019 nCoV or 2019nCoV or 2019-novel CoV or nCov 2019 or nCov 19).tw,kf.
6. ("severe acute respiratory syndrome coronavirus 2" or "novel coronavirus disease" or "novel corona virus disease" or "corona virus disease 2019" or "coronavirus disease 2019" or "novel coronavirus pneumonia" or "novel corona virus pneumonia").tw.
7. (severe acute respiratory syndrome coronavirus 2).os,mp.
8. or/1-7
9. exp "Health Personnel"/
10. (health adj (practitioner* or worker* or provider* or staff or profession* or personnel)).tw.
11. (care adj (practitioner* or worker* or provider* or staff or profession* or personnel)).tw.
12. (healthcare adj (practitioner* or worker* or provider* or staff or profession* or personnel)).tw.
13. (hospital adj (worker* or staff or personnel or administrator*)).tw.
14. (medical adj (worker* or staff or profession* or personnel or administrator*)).tw.
15. (care unit? adj (worker* or staff or profession* or personnel)).tw.
16. (icu adj (worker* or staff or profession* or personnel)).tw.
17. (nurs* or physician? or doctor? or paramedic? or emergency medical technician? or emergency medical assistant? or medical student? or resident?).tw.
18. (anesthesist? or anaesthesist? or anesthesiologist? or anaesthesiologist? or cardiologist? or dentist? or dental practitioner? or dental staff or dental assistant? or general practitioner? or geriatrician? or internist? or neurosurgeon? or nephrologist? or neurologist? or ophthalmologist? or neurologist? or pediatrician? or paediatrician? or palliative care specialist? or palliative care staff or pharmacist? or psychiatrist? or pulmologist? or radiologist? or rheumatologist? or surgeon? or surgical staff or urologist?).tw.
19. or/9-18
20. exp "Stress, Psychological"/
21. Resilience, Psychological/
22. Anxiety/
23. Mental Health/
24. Social Support/
25. Depression/
26. Suicide/
27. (mental adj (health or fatigue or illness or disorder?)).tw.
28. (psychological adj (assistance or care or crisis or distress or effect? or factor? or impact? or intervention? or need? or outcomes or pressure or reaction? or status or support)).tw.
29. (stress or stressed).tw.
30. (burnout or burned out or burnt out or burn out).tw.
31. (resilien* or coping).tw.
32. (anxiety or fear).tw.
33. (psychosocial or psycho-social).tw.
34. (depress* or suicid*).tw.
35. (insomnia or sleep).tw.

36. social support.tw.
37. (well being or wellness).tw.
38. or/20-37
39. exp Health Personnel/px [psychology]
40. 8 and 19 and 38
41. 8 and 39
42. 40 or 41
43. "2020*".dt.
44. 42 and 43

Appendix 2: Cochrane Covid-19 Register Search strategy
Cochrane Covid-19 Register (CC19R)

"health personnel" or "health practitioner" or "health practitioners" or "health worker" or "health workers" or "health provider" or "health providers" or "health staff" or "health professional" or "health professionals" or "healthcare personnel" or "healthcare practitioner" or "healthcare practitioners" or "healthcare worker" or "healthcare workers" or "healthcare provider" or "healthcare providers" or "healthcare staff" or "healthcare professional" or "healthcare professionals" or "care personnel" or "care practitioner" or "care practitioners" or "care worker" or "care workers" or "care provider" or "care providers" or "care staff" or "care professional" or "care professionals" or "hospital worker" or "hospital workers" or "hospital staff" or "hospital personnel" or "hospital administrator" or "hospital administrators" or "medical worker" or "medical workers" or "medical staff" or "medical professional" or "medical professionals" or "medical personnel" or "medical administrator" or "medical administrators" or "care unit worker" or "care unit workers" or "care unit staff" or "care unit professional" or "care unit professionals" or "care unit personnel" or "icu worker" or "icu workers" or "icu staff" or "icu professional" or "icu professionals" or "icu personnel" or nurs* or physician* or doctor* or paramedic* or "emergency medical technician" or "emergency medical technicians" or "emergency medical assistant" or "emergency medical assistants" or "medical student" or "medical students" or resident* or anesthesist* or anaesthesist* or anesthesiologist* or anaesthesiologist* or cardiologist* or dentist* or "dental practitioner" or "dental practitioners" or "dental staff" or "dental assistant" or "dental assistants" or "general practitioner" or "general practitioners" or geriatrician* or internist* or neurosurgeon* or nephrologist* or neurologist* or ophthalmologist* or neurologist* or pediatrician* or paediatrician* or "palliative care specialist" or "palliative care specialists" or "palliative care staff" or pharmacist* or psychiatrist* or pulmologist* or radiologist* or rheumatologist* or surgeon* or "surgical staff" or urologist*

AND

"mental health" or "mental fatigue" or "mental illness" or "mental disorders" or "psychological assistance" or "psychological care" or "psychological crisis" or "psychological distress" or "psychological effect" or "psychological effects" or "psychological factor" or "psychological factors" or "psychological impact" or "psychological impacts" or "psychological intervention" or "psychological interventions" or "psychological need" or "psychological needs" or "psychological outcomes" or "psychological pressure" or "psychological reaction" or "psychological reactions" or "psychological status" or "psychological support" or stress or stressed or burnout or "burned out" or "burnt out" or "burn out" or resilien* or coping or anxiety or fear or psychosocial or "psycho social" or depress* or suicid* or insomnia or sleep or "social support" or "well being" or wellness

Appendix 3: CENTRAL Search strategy
Cochrane Central Register of Controlled Trials [CENTRAL] (Cochrane Register of Studies Online)

1. (COVID OR COVID-19 OR COVID19):TI,AB,KY
2. ("SARS-CoV-2" OR "SARS-CoV2" OR SARSCoV2 OR "SARSCoV-2" OR "SARS coronavirus 2"):TI,AB,KY
3. (2019 nCoV OR 2019nCoV OR 2019-novel CoV OR nCov 2019 OR nCov 19):TI,AB,KY ("severe acute respiratory syndrome coronavirus 2" OR "novel coronavirus disease" OR "novel corona virus disease" OR "corona virus disease 2019" OR "coronavirus disease 2019" OR "novel coronavirus pneumonia" OR "novel corona virus pneumonia"):TI,AB,KY
4. (severe acute respiratory syndrome coronavirus 2):TI,AB,KY
5. #1 OR #2 OR #3 OR #4 OR #5
6. (health ADJ (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)):TI,AB,KY
7. (care ADJ (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)):TI,AB,KY
8. (healthcare ADJ (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)):TI,AB,KY
9. (hospital ADJ (worker* OR staff OR personnel OR administrator*)):TI,AB,KY
10. (medical ADJ (worker* OR staff OR profession* OR personnel OR administrator*)):TI,AB,KY
11. (care unit? ADJ (worker* OR staff OR profession* OR personnel)):TI,AB,KY
12. (icu ADJ (worker* OR staff OR profession* OR personnel)):TI,AB,KY
13. (nurs* OR physician* OR doctor* OR paramedic* OR "emergency medical technician*" OR "emergency medical assistant*" OR medical student* OR resident?):TI,AB,KY
14. (an?esthesist? OR an?esthesiologist? OR cardiologist? OR dentist? OR dental practitioner? OR dental staff OR dental assistant? OR general practitioner? OR geriatrician? OR internist? OR neurosurgeon? OR nephrologist? OR neurologist? OR ophthalmologist? OR neurologist? OR p?ediatrician? OR palliative care specialist? OR palliative care staff OR pharmacist? OR psychiatrist? OR pulmologist? OR radiologist? OR rheumatologist? OR surgeon? OR surgical staff OR urologist?):TI,AB,KY
15. #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15
16. (mental ADJ (health OR fatigue OR illness OR disorder?)):TI,AB,KY
17. (psychological ADJ (assistance OR care OR crisis OR distress OR effect? OR factor? OR impact? OR intervention? OR need? OR outcomes OR pressure OR reaction? OR status OR support)):TI,AB,KY
18. (stress OR stressed):TI,AB,KY
19. (burnout OR burned out OR burnt out OR burn out):TI,AB,KY
20. (resilien* OR coping):TI,AB,KY
21. (anxiety OR fear):TI,AB,KY
22. (psychosocial OR psycho-social):TI,AB,KY
23. (depress* OR suicid*):TI,AB,KY
24. (insomnia OR sleep):TI,AB,KY
25. social support:TI,AB,KY
26. (well being OR wellness):TI,AB,KY
27. #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27
28. #6 AND #16 AND #28
29. 2020 TO 2020:YR
30. #29 AND #30

Appendix 4. PsycINFO Search strategy
PsycINFO Ovid *APA PsycINFO 1806 to October Week 4 2020*

1. covid.mp.
2. COVID-19.mp.
3. COVID19.mp.
4. ("SARS-CoV-2" or "SARS-CoV2" or SARSCoV2 or "SARSCoV-2" or "SARS coronavirus 2").mp.
5. (2019 nCoV or 2019nCoV or 2019-novel CoV or nCov 2019 or nCov 19).mp.
6. ("severe acute respiratory syndrome coronavirus 2" or "novel coronavirus disease" or "novel corona virus disease" or "corona virus disease 2019" or "coronavirus disease 2019" or "novel coronavirus pneumonia" or "novel corona virus pneumonia").mp.
7. (severe acute respiratory syndrome coronavirus 2).mp.
8. or/1-7
9. exp "Health Personnel"/
10. (health adj (practitioner* or worker* or provider* or staff or profession* or personnel)).tw.
11. (care adj (practitioner* or worker* or provider* or staff or profession* or personnel)).tw.
12. (healthcare adj (practitioner* or worker* or provider* or staff or profession* or personnel)).tw.
13. (hospital adj (worker* or staff or personnel or administrator*)).tw.
14. (medical adj (worker* or staff or profession* or personnel or administrator*)).tw.
15. (care unit? adj (worker* or staff or profession* or personnel)).tw.
16. (icu adj (worker* or staff or profession* or personnel)).tw.
17. (nurs* or physician* or doctor* or paramedic* or "emergency medical technician*" or "emergency medical assistant*" or medical student* or resident?).tw.
18. (an?esthesist? or an?esthesiologist? or cardiologist? or dentist? or dental practitioner? or dental staff or dental assistant? or general practitioner? or geriatrician? or internist? or neurosurgeon? or nephrologist? or neurologist? or ophthalmologist? or neurologist? or p?ediatrician? or palliative care specialist? or palliative care staff or pharmacist? or psychiatrist? or pulmologist? or radiologist? or rheumatologist? or surgeon? or surgical staff or urologist?).tw.
19. or/9-18
20. exp Stress/
21. Resilience, Psychological/
22. Anxiety/
23. Mental Health/
24. Social Support/
25. Depression/
26. Suicide/
27. (mental adj (health or fatigue or illness or disorder?)).tw.
28. (psychological adj (assistance or care or crisis or distress or effect? or factor? or impact? or intervention? or need? or outcomes or pressure or reaction? or status or support)).tw.
29. (stress or stressed).tw.
30. (burnout or burned out or burnt out or burn out).tw.
31. (resilien* or coping).tw.
32. (anxiety or fear).tw.
33. (psychosocial or psycho-social).tw.
34. (depress* or suicid*).tw.
35. (insomnia or sleep).tw.
36. social support.tw.
37. (well being or wellness).tw.
38. or/20-37

39. 8 and 19 and 38
40. (2020*).up.
41. 39 and 40

Appendix 5. Web of Science Search strategy
Web of Science (WOS) *Web of Science Core Collection (1945-present)*

1. AB=((COVID OR "COVID-19" OR COVID19) OR ("SARS-CoV-2" OR "SARS-CoV2" OR SARSCoV2 OR "SARSCoV-2" OR "SARS coronavirus 2") OR ("2019 nCoV" OR "2019nCoV" OR "2019-novel CoV" OR "nCov 2019" OR "nCov 19") OR ("severe acute respiratory syndrome coronavirus 2" OR "novel coronavirus disease" OR "novel corona virus disease" OR "corona virus disease 2019" OR "coronavirus disease 2019" OR "novel coronavirus pneumonia" OR "novel corona virus pneumonia") OR ("severe acute respiratory syndrome coronavirus 2")) OR TI=((COVID OR "COVID-19" OR COVID19) OR ("SARS-CoV-2" OR "SARS-CoV2" OR SARSCoV2 OR "SARSCoV-2" OR "SARS coronavirus 2") OR ("2019 nCoV" OR 2019nCoV OR "2019-novel CoV" OR "nCov 2019" OR "nCov 19") OR ("severe acute respiratory syndrome coronavirus 2" OR "novel coronavirus disease" OR "novel corona virus disease" OR "corona virus disease 2019" OR "coronavirus disease 2019" OR "novel coronavirus pneumonia" OR "novel corona virus pneumonia") OR ("severe acute respiratory syndrome coronavirus 2"))

2. AB=((health NEAR/1 (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)) OR (care NEAR/1 (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)) OR (healthcare NEAR/1 (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)) OR (hospital NEAR/1 (worker* OR staff OR personnel OR administrator*)) OR (medical NEAR/1 (worker* OR staff OR profession* OR personnel OR administrator*)) OR ("care unit*" NEAR/1 (worker* OR staff OR profession* OR personnel)) OR (icu NEAR/1 (worker* OR staff OR profession* OR personnel)) OR (nurs* OR physician* OR doctor* OR paramedic* OR "emergency medical technician*" OR "emergency medical assistant*" OR "medical student*" OR resident*) OR (anesthesist* OR anaesthesist* OR anesthesiologist* OR anaesthesiologist* OR cardiologist* OR dentist* OR "dental practitioner*" OR "dental staff" OR "dental assistant*" OR "general practitioner*" OR geriatrician* OR internist* OR neurosurgeon* OR nephrologist* OR neurologist* OR ophthalmologist* OR neurologist* OR pediatrician* OR paediatrician* OR "palliative care specialist*" OR "palliative care staff" OR pharmacist* OR psychiatrist* OR pulmologist* OR radiologist* OR rheumatologist* OR surgeon* OR "surgical staff" OR urologist*)) OR TI=((health NEAR/1 (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)) OR (care NEAR/1 (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)) OR (healthcare NEAR/1 (practitioner* OR worker* OR provider* OR staff OR profession* OR personnel)) OR (hospital NEAR/1 (worker* OR staff OR personnel OR administrator*)) OR (medical NEAR/1 (worker* OR staff OR profession* OR personnel OR administrator*)) OR ("care unit*" NEAR/1 (worker* OR staff OR profession* OR personnel)) OR (icu NEAR/1 (worker* OR staff OR profession* OR personnel)) OR (nurs* OR physician* OR doctor* OR paramedic* OR "emergency medical technician*" OR "emergency medical assistant*" OR "medical student*" OR resident*) OR (anesthesist* OR anaesthesist* OR anesthesiologist* OR anaesthesiologist* OR cardiologist* OR dentist* OR "dental practitioner*" OR "dental staff" OR "dental assistant*" OR "general practitioner*" OR geriatrician* OR internist* OR neurosurgeon* OR nephrologist* OR neurologist* OR ophthalmologist* OR neurologist* OR pediatrician* OR paediatrician* OR "palliative care specialist*" OR "palliative care staff" OR pharmacist* OR psychiatrist* OR pulmologist* OR radiologist* OR rheumatologist* OR surgeon* OR "surgical staff" OR urologist*))

3. AB=((mental NEAR/1 (health OR fatigue OR illness OR disorder*)) OR (psychological NEAR/1 (assistance OR care OR crisis OR distress OR effect* OR factor* OR impact* OR intervention* OR need* OR outcomes OR pressure OR reaction* OR status OR support)) OR (stress OR stressed) OR (burnout OR "burned out" OR "burnt out" OR "burn out") OR (resilien* OR

coping) OR (anxiety OR fear) OR (psychosocial OR "psycho-social") OR (depress* OR suicid*) OR (insomnia OR sleep) OR "social support" OR ("well being" OR wellness)) OR TI=((mental NEAR/1 (health OR fatigue OR illness OR disorder*)) OR (psychological NEAR/1 (assistance OR care OR crisis OR distress OR effect* OR factor* OR impact* OR intervention* OR need* OR outcomes OR pressure OR reaction* OR status OR support)) OR (stress OR stressed) OR (burnout OR "burned out" OR "burnt out" OR "burn out") OR (resilien* OR coping) OR (anxiety OR fear) OR (psychosocial OR "psycho-social") OR (depress* OR suicid*) OR (insomnia OR sleep) OR "social support" OR ("well being" OR wellness))

4. #1 AND #2 AND #3
   Indexes=SCI-EXPANDED, SSCI, A&HCI, ESCI Timespan=2020