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# What are the barriers and facilitators to the acceptance of information and communication technology-based interventions for improving resilience and mental health of healthcare workers: a scoping review protocol

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## ABSTRACT

**Introduction** Healthcare workers (HCWs) report overwhelming demands and experience crisis levels of burnout and unique challenges that further impair their mental health. Promotion of mental health among HCWs using information and communication technology (ICT) has received little empirical research attention and interventions for improving mental health resilience in HCWs are not well established.

**Design** Scoping review to map existing evidence and identify gaps for future research regarding the main barriers and facilitators of the acceptance of ICT-based interventions for improving resilience and mental health among HCWs working in all healthcare settings.

**Methods and analysis** This protocol was developed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines. A comprehensive bibliographic search will be conducted between October 2024 and October 2025 in Pubmed, Web of Science, PsycINFO, Scopus, Cochrane Library and CINAHL Ultimate (MedicLatina, Psychology and Behavioural Sciences Collection), with the assistance of a qualified research librarian, to retrieve studies describing data on the main barriers and facilitators to the acceptance of ICT-based interventions for improving resilience and mental health among HCWs working in healthcare settings. There will be no restrictions based on date of publication or language. Inclusion and exclusion criteria will be defined for each element of the PICO(D) framework, and both quantitative and qualitative data will be extracted. Quality will be assessed using the mixed methods assessment tool. Two independent investigators will perform the eligibility assessment and data extraction, and any disagreements will be resolved by a third reviewer. The main results will be narratively synthesised and analysed.

**Ethics and dissemination** Since secondary data will be analysed, no ethical approval is required. The results will be disseminated through publications subject to peer review.

**Registration** https://doi.org/10.17605/OSF.IO/5R36Q.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The scoping review will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews framework to ensure methodological rigour and transparency.

⇒ A comprehensive search strategy across six major databases will be conducted without language or date restrictions.

⇒ Two independent reviewers will perform study selection, data extraction and quality appraisal using the validated tools.

⇒ The inclusion of both qualitative and quantitative studies will provide a broad overview of available evidence.

⇒ The exclusion of grey literature may limit the comprehensiveness of the findings.

## INTRODUCTION

The declining availability of healthcare workers (HCWs) and the increasing workload described in the last decades have profoundly affected societies, placing considerable pressures on healthcare services and their staff.[1 2] The prevalence of mental health disorders such as depression, anxiety and sleeping disorders has been increasing among the general population.[3–5] This increase was particularly notable in at-risk populations facing additional stressors, such as HCWs, exacerbated by the COVID-19 pandemic,[6–8]

posing significant risk factors for patient safety.[9] [10] Currently, HCWs are exposed to heavy workloads under stressful working conditions due to higher patient acuity, frequent changes in work processes, the proliferation of new technology, regulatory requirements, skills shortages, redeployment away from their primary expertise, diminished team support, lack of trust in their hospitals and leaders related to personal protective equipment availability and reliability, and lack of positive expectations about their future.[11–13] In addition, physical and psychological demands such as constant exposure to illness and ethical dilemmas are high,[14] [15] with nurses experiencing the highest prevalence of mental illness (eg, major depression disorder, anxiety disorder and post-traumatic stress disorder) among hospital staff.[16] It is crucial to address mental health problems in HCWs and conduct timely screening to provide appropriate interventions, tailored to health professionals' needs.[6] [10] [17]

The WHO defines resilience as the processes and skills that result in good individual and community health outcomes in the face of negative events, serious threats and hazards.[18] It is influenced by a combination of psychological, biological, genetic and environmental factors resulting in 'resilience factors' (eg, self-efficacy, problem-solving, acceptance) and is mediated by various 'resilience mechanisms' (eg, effective emotion regulation, positive appraisal style, job resources, sleep quality).[19–21] A recent review concluded that 26% of health professionals worldwide have low resilience,[22] making it an important target for prevention. Resilience is important for HCWs for several reasons: first, it is a major resource enabling mental health and a quality of life[23]; second, a good and stable mental health is the basis for formal carers to reliably and safely perform their tasks—to the benefit of patients;[24] [25] and thirdly, HCWs face extraordinarily high stress levels in their daily work, witnessing stress in others during their work, which makes them a particularly vulnerable group to the development of mental illness.[7] [26] [27]

Resilience factors and mechanisms are ideal targets for psychological interventions because they are modifiable through training.[19] However, the design of resilience interventions has been highly heterogeneous[28] and often lacks a foundation of empirical evidence regarding the most critical factors for specific populations and individuals. This may explain why the efficacy of resilience interventions is inconsistent and the benefits measured are modest at best.[21] [29] At the same time, innovative solutions are urgently needed to better support the health professionals' well-being and address work-related mental health concerns,[30] with recent literature supporting the use of digital training in improving resilience.[21] [31] However, the acceptability of information and communication technology (ICT) based interventions for mental health promotion and prevention needs to be further explored.

In this context, a knowledge synthesis that uses a systematic and iterative approach is needed to identify and synthesise the body of literature on ICT-based interventions for improving resilience and mental health among HCWs is needed. Such knowledge will contribute to delineating an effective and robust mental health strategic plan for HCWs.

The objective of this scoping review is to map out key concepts as a basis for a deeper understanding of the evidence available regarding the barriers and facilitators to the acceptance of ICT-based interventions for improving resilience and mental health among HCWs working in all healthcare settings. Also, we intend to identify gaps in our current knowledge to inform the design of future research and the design of more effective ICT interventions.

## METHODS AND ANALYSIS

Scoping reviews are a traceable method of 'mapping' areas of research and highlighting gaps in the literature for future research.[32] They are a useful tool in the ever-increasing arsenal of evidence synthesis approaches and require rigorous and transparent methods to ensure that the results are trustworthy.[33] We used O'Malley's and Arksey framework for undertaking a scoping review.[34] The available evidence on a topic is summarised to convey the breadth and depth of that topic by mapping the existing literature in a field of interest in terms of the volume, nature and characteristics of the primary research and identifying gaps in the existing literature.

The review includes the following five key phases: identifying the research question, identifying relevant studies, study selection, charting the data and collating, summarising and reporting the results. Our PICO search strategy for identifying and selection of studies is outlined below. The studies were divided into categories based on similarities in their main objectives/findings and the themes discussed.

This protocol was developed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines[35] and was registered with the Open Science Framework (OSF; Registration DOI: https://doi.org/10.17605/OSF.IO/5R36Q). Patients or the public were not involved in the design of the current study protocol. This protocol was developed in October 2024, and the respective scoping review will be conducted from November 2024 to October 2025.

### Research question

Our preliminary search of the literature was helpful in determining: (1) The breadth of our question, (2) Whether a scoping review on the topic had already been conducted and (3) If there was sufficient literature to warrant a scoping review. This review was guided by the question: "What are the main barriers and facilitators, described in current literature, on the acceptance of ICT-based interventions for improving resilience and mental health of HCWs?". The research questions were developed

collaboratively by the multidisciplinary research team, which includes experts in nursing, psychology, health economics and digital health. Although HCWs were not directly involved in formulating the questions, the team drew on findings from recent studies and systematic reviews on HCWs' well-being and digital interventions to ensure that the research questions addressed real-world needs.

Our PICO(D) search strategy for identifying and selecting studies is outlined below.

### Search strategy
#### Data sources
A comprehensive bibliographic search will be carried out the following databases will be searched: PubMed, Web of Science, PsycINFO, Scopus, Cochrane Library and CINAHL Ultimate (MedicLatina, Psychology and Behavioural Sciences Collection), with the assistance of a qualified research librarian.

#### Search terms
The search expression will include the combination of five key concepts, according to Medical Subject Headings terms: psychological resilience, mental health, HCWs, ICT and acceptability. The following search expression will probably be used: (("resilience, psychological" OR "resilienc*" OR "resilient response" OR "resilient" OR "coping") AND ("mental health" OR "mental disorder*" OR "mental illness*") AND ("personnel, health" OR "healthcare worker*" OR "healthcare worker*" OR "healthcare provider*" OR "healthcare provider*" OR "healthcare professional*" OR "healthcare professional*" OR "nurse*" OR "nursing personnel" OR "physician*" OR "medical doctor*" OR "healthcare workforce" OR "healthcare workforce") AND ("information and communication technology*" OR "ICT" OR "information technology" OR "device*" OR "digital" OR "tablet*" OR "computer*" OR "PC" OR "virtual reality" OR "VR" OR "phone*" OR "smartphone*" OR "mobile app*" OR "videogame*") AND ("perspective*" OR "experience*" OR "evaluation" OR "barrier*" OR "facilitator*")). The search will cover the full range of publication dates from inception until 2024, with no language restrictions. The full search strategies for all databases are displayed in online supplemental file 1.

### Eligibility criteria
Inclusion and exclusion criteria were defined for each element of the PICO(D) framework[36] and only those

**Table 1** Eligibility criteria according to the PICO(D) strategy[36]

| PICO(D) | | Inclusion criteria | Exclusion criteria |
|---|---|---|---|
| P | Population | 1. Healthcare workers (physicians, nurses, paramedics, pharmacists, physiotherapists, dieticians, nutritionists, optometrists, occupational therapists, dentists, psychologists, audiologists and others)<br>2. Healthcare setting (acute care hospitals, urgent care centres, primary healthcare centres, rehabilitation centres, nursing homes and other long-term care facilities and outpatient services and centres, both public or private) | 1. Providers without formal training and experience<br>2. Informal caregivers<br>3. No healthcare setting |
| I | Intervention | 1. ICT-based interventions for improving resilience and mental health | 1. No ICT-based interventions<br>2. ICT-based interventions not designed for improving resilience and mental health |
| C | Comparison | 1. Intervention with a control group receiving no intervention or placebo<br>2. Intervention without a control group | – |
| O | Outcome | 1. Barriers and facilitators on the acceptance of ICT-based interventions | 1. Studies that did not report data on barriers and facilitators on the acceptance of ICT-based interventions |
| D | Study design | 1. Experimental (randomised controlled trials) or quasi-experimental studies<br>2. Observational studies (quantitative, qualitative or mixed-methods studies)<br>3. Reviews or meta-analysis | 1. Study protocols<br>2. Commentary<br>3. Editorials<br>4. Conference proceedings and abstracts<br>5. Reports<br>6. Guidelines<br>7. Grey literature<br>8. Scale validations |

ICT, information and communication technology.

meeting the eligibility criteria will be included (table 1). Grey literature, such as reports, conference proceedings and theses, will be excluded.

## Population

Studies conducted with HCWs in healthcare settings will be included. HCWs, as defined by the WHO,[37] are individuals who provide healthcare treatment and advice based on formal training and experience. This includes physicians, nurses, paramedics, pharmacists, physiotherapists, dietitians, nutritionists, optometrists, occupational therapists, dentists, psychologists, audiologists, among others. The term healthcare setting represents a broad array of services and places where healthcare occurs, including acute care hospitals, urgent care centres, primary healthcare centres, rehabilitation centres, nursing homes and other long-term care facilities, and outpatient services and centres, both public or private.[38]

## Intervention

The current scoping review will include all studies about:
1. The acceptance of ICT-based interventions for improving resilience and mental health among HCWs, whether through assessment instruments or other types of evaluations;
2. The experiences and perspectives of HCWs after engaging in ICT-based interventions to improve their resilience and mental health, focusing on the main barriers and facilitators perceived.

## Comparison

Studies with comparative groups (receiving no intervention or placebo) and without comparative groups will be included in this review.

## Outcome

The main outcome considered in this review will be the barriers and facilitators to the acceptance of ICT-based interventions. The data retrieved can be of a quantitative or qualitative nature.

## Study design

This scoping review will include empiric experimental or quasi-experimental studies (such as randomised controlled trials), observational studies (quantitative, qualitative or mixed-methods), and reviews or meta-analyses.

## Data collection and analysis
### Selection of studies

All records identified in each database will be exported into the Rayyan Intelligent Systematic Review tool (Qatar Computing Research Institute, Doha, Qatar) and duplicates will be removed. In addition, we will use Active Learning for Systematic Reviews (ASReview), which is an open-source machine learning-aided pipeline applying active learning, for assessing whether the papers meet the inclusion criteria. The advantage of the ASReview method is that it enables us to review a far higher number of articles of relevant quality compared with the traditional literature review approach, with smaller probability to make 'human' mistakes.

Two reviewers will independently analyse all articles, examining the title, keywords and abstract to determine if they meet the inclusion criteria for this scoping review. Studies that do not meet the inclusion criteria will be excluded, and the remaining studies will undergo a full-text review. Publications with titles and abstracts that do not provide enough information to determine inclusion or exclusion will also undergo a full-text review. The full texts will then be assessed based on the same inclusion criteria. Any discrepancies will be discussed between the two reviewers until a consensus is reached. If a consensus cannot be reached, a third reviewer will resolve the conflict. The PRISMA flowchart will be used to present the selection process and the triage results at different stages.

## Data extraction

The extraction of data from the articles will provide a logical and descriptive summary of the results that answer the main objective of this scoping review. Descriptive data will be collected to characterise the studies, including information on the authors and year of publication; country where the study was conducted; period of data collection; setting; participants and sample; study design and data collection methods. Specifically regarding the interventions implemented, data on the content, format, delivery mode and frequency, the instruments used to evaluate the acceptability of the interventions, as well as the main barriers and facilitators reported, will also be withdrawn. The extraction will be performed by two extractors working in parallel. Agreement will be assessed using the total percentage of agreement and the kappa statistics, with the respective 95% CI. Any disagreements that arise between the reviewers will be resolved through discussion or by a third reviewer. Authors of papers will be contacted (eg, email) to request missing or additional data, wherever required.

## Quality appraisal

Since this is a review that intends to integrate quantitative, qualitative and mixed methods studies, the 'Mixed Methods Assessment Tool' will be used to assess the quality of the selected studies.[39] Once again, this step will be carried out by the same two reviewers independently and any disagreement with the evaluation of the quality of the studies must be resolved once again using the third reviewer. The result of the evaluation of the quality of each study will be presented and discussed. In this way, it will be possible to perceive the quality of the evidence produced within the scope of this review and studies of low quality will contribute less to the analytic process.

## Strategy for data synthesis

As a scoping review that will include studies with several methodologies, the synthesis and analysis of the results

will be narrative, structured to answer the main objective described. The main qualitative findings regarding the main facilitators and barriers to acceptance of ICT-based interventions for improving resilience and mental health among HCWs will be retrieved and inductively synthesised into themes and categories, according to Stemler' protocol for content analysis.[40] The quantitative results will be synthesised and deductively included in the taxonomy of categories and themes previously defined. A triangulation strategy will be used to guarantee the rigour and quality of research, with all authors collaborating in the development and validation of the coding framework.

## Ethics and dissemination
There is no need for an ethical approval of the study. This scientific paper is a scoping review protocol, in which the data has not yet been extracted or analysed. The results will be disseminated through publications subject to peer review.

## CONCLUSION
This scoping review protocol outlines a rigorous and transparent approach to identifying and synthesising the current evidence on the barriers and facilitators influencing the acceptance of ICT-based interventions for improving resilience and mental health among HCWs. By mapping the breadth and depth of available studies, the review will contribute to a clearer understanding of existing research gaps and guide future investigations in this emerging field.

The next steps of this protocol will involve conducting a comprehensive search, data extraction and synthesis of findings to determine the range and nature of ICT-based interventions used to support HCWs' mental health and resilience. Through this process, the study is expected to identify common barriers—such as usability issues, limited organisational support and confidentiality concerns—and key facilitators, including user-centred design, leadership endorsement and perceived effectiveness of digital tools.

The anticipated findings will inform a more nuanced understanding of HCWs' needs and preferences regarding the adoption of ICT solutions for mental health support. Ultimately, this work will provide a valuable foundation for the development of evidence-based, acceptable and sustainable digital resilience interventions that promote well-being and strengthen the capacity of healthcare systems to support their workforce.

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## REFERENCES
1  Saragih ID, Tonapa SI, Saragih IS, et al. Global prevalence of mental health problems among healthcare workers during the Covid-19 pandemic: A systematic review and meta-analysis. *Int J Nurs Stud* 2021;121:104002.
2  Kabunga A, Kigongo E, Okalo P, et al. Burnout and quality of life among healthcare workers in central Uganda. *PLoS One* 2024;19:e0305713.
3  Nochaiwong S, Ruengorn C, Thavorn K, et al. Global prevalence of mental health issues among the general population during the coronavirus disease-2019 pandemic: a systematic review and meta-analysis. *Sci Rep* 2021;11:10173.
4  Javaid SF, Hashim IJ, Hashim MJ, et al. Epidemiology of anxiety disorders: global burden and sociodemographic associations. *Middle East Curr Psychiatry* 2023;30:44.

5 Collaborators GBDMD. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Psychiatry* 2022;9:137–50.

6 Hao Q, Wang D, Xie M, *et al*. Prevalence and Risk Factors of Mental Health Problems Among Healthcare Workers During the COVID-19 Pandemic: A Systematic Review and Meta-Analysis. *Front Psychiatry* 2021;12:567381.

7 Chutiyami M, Cheong AMY, Salihu D, *et al*. COVID-19 Pandemic and Overall Mental Health of Healthcare Professionals Globally: A Meta-Review of Systematic Reviews. *Front Psychiatry* 2021;12:804525.

8 Blasco-Belled A, Tejada-Gallardo C, Fatsini-Prats M, *et al*. Mental health among the general population and healthcare workers during the COVID-19 pandemic: A meta-analysis of well-being and psychological distress prevalence. *Curr Psychol* 2022;1–12.

9 Hall LH, Johnson J, Watt I, *et al*. Healthcare Staff Wellbeing, Burnout, and Patient Safety: A Systematic Review. *PLoS ONE* 2016;11:e0159015.

10 Nishimura Y. Primary Care, Burnout, and Patient Safety: Way to Eliminate Avoidable Harm. *Int J Environ Res Public Health* 2022;19:10112.

11 Khajuria A, Tomaszewski W, Liu Z, *et al*. Workplace factors associated with mental health of healthcare workers during the COVID-19 pandemic: an international cross-sectional study. *BMC Health Serv Res* 2021;21:262.

12 Ma H-Y, Chiang N-T, Kao R-H, *et al*. Health Workers' Mindfulness-Based Stress Reduction and Resilience During COVID-19 Pandemic. *J Multidiscip Healthc* 2024;17:3691–713.

13 Candido G, Tortù C, Seghieri C, *et al*. Physical and stressful psychological impacts of prolonged personal protective equipment use during the COVID-19 pandemic: A cross-sectional survey study. *J Infect Public Health* 2023;16:1281–9.

14 Busch IM, Moretti F, Mazzi M, *et al*. What We Have Learned from Two Decades of Epidemics and Pandemics: A Systematic Review and Meta-Analysis of the Psychological Burden of Frontline Healthcare Workers. *Psychother Psychosom* 2021;90:178–90.

15 Clark P, Hulse B, Polivka BJ. Resilience, Moral Distress, and Job Satisfaction Driving Engagement in Emergency Department Nurses: A Qualitative Analysis. *J Nurs Adm* 2022;52:112–7.

16 Hill JE, Harris C, Danielle L C, *et al*. The prevalence of mental health conditions in healthcare workers during and after a pandemic: Systematic review and meta-analysis. *J Adv Nurs* 2022;78:1551–73.

17 Looi JC, Allison S, Bastiampillai T, *et al*. Healthcare provider data breaches – framework for crisis communication and support of patients and healthcare workers in mental healthcare. *Australas Psychiatry* 2024;32:319–22.

18 World Health Organization. Health Promotion Glossary of Terms 2021. Geneva: World Health Organization, 2021.

19 Barasa E, Mbau R, Gilson L. What Is Resilience and How Can It Be Nurtured? A Systematic Review of Empirical Literature on Organizational Resilience. *Int J Health Policy Manag* 2018;7:491–503.

20 Kalisch R, Müller MB, Tüscher O. A conceptual framework for the neurobiological study of resilience. *Behav Brain Sci* 2015;38:e92.

21 Ang WHD, Chew HSJ, Dong J, *et al*. Digital training for building resilience: Systematic review, meta-analysis, and meta-regression. *Stress Health* 2022;38:848–69.

22 Cheng CKT, Chua JH, Cheng LJ, *et al*. Global prevalence of resilience in health care professionals: A systematic review, meta-analysis and meta-regression. *J Nurs Manag* 2022;30:795–816.

23 Choi H-J, Yang C-M, Lee S-Y, *et al*. Mental Health and Quality of Life for Healthcare Workers in a University Hospital Under COVID-19. *Psychiatry Investig* 2022;19:85–91.

24 Lin YP, Tang CJ, Tamin VA, *et al*. The hand-brain-heart connection: ICU nurses' experience of managing patient safety during COVID-19. *Nurs Crit Care* 2022;27:689–97.

25 Pacutova V, Geckova AM, de Winter AF, *et al*. Opportunities to strengthen resilience of health care workers regarding patient safety. *BMC Health Serv Res* 2023;23:1127.

26 Schmuck J, Hiebel N, Kriegsmann-Rabe M, *et al*. Individual Stress Burden and Mental Health in Health Care Workers during the COVID-19 Pandemic: Moderating and Mediating Effects of Resilience. *Int J Environ Res Public Health* 2022;19:6545.

27 Yang S, Tan GKJ, Sim K, *et al*. Stress and burnout amongst mental health professionals in Singapore during Covid-19 endemicity. *PLoS ONE* 2024;19:e0296798.

28 Kunzler AM, Chmitorz A, Röthke N, *et al*. Interventions to foster resilience in nursing staff: A systematic review and meta-analyses of pre-pandemic evidence. *Int J Nurs Stud* 2022;134:104312.

29 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.

30 Levin C, Naimi E, Saban M. Evaluating GenAI systems to combat mental health issues in healthcare workers: An integrative literature review. *Int J Med Inform* 2024;191:105566.

31 Henshall C, Ostinelli E, Harvey J, *et al*. Examining the Effectiveness of Web-Based Interventions to Enhance Resilience in Health Care Professionals: Systematic Review. *JMIR Med Educ* 2022;8:e34230.

32 Colquhoun HL, Levac D, O'Brien KK, *et al*. Scoping reviews: time for clarity in definition, methods, and reporting. *J Clin Epidemiol* 2014;67:1291–4.

33 Munn Z, Peters MDJ, Stern C, *et al*. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol* 2018;18:143.

34 Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.

35 Tricco AC, Lillie E, Zarin W, *et al*. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169:467–73.

36 Melnyk BM, Fineout-Overholt E. *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice*. 4th edn. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins, 2019.

37 World Health Organization. Classifying Health Workers: Mapping Occupations to the International Standard Classification. Geneva: World Health Organization, 2019.

38 Rasmussen SA, Goodman RA. The CDC Field Epidemiology Manual. New York: Oxford University Press, 2019.

39 Hong QN, Fàbregues S, Bartlett G, *et al*. The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *EFI* 2018;34:285–91.

40 Stemler S. An overview of content analysis in practical assessment. *Res Eval* 2001;7:2e34.