



## Short Communication

## Interventions on Well-being, Occupational Health, and Aging of Healthcare Workers: A Scoping Review of Systematic Reviews

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## ABSTRACT

**Introduction:** With recent higher awareness of the necessity of improving healthcare workers' well-being, we aimed to overview systematic reviews dealing with interventions on well-being, occupational health, and aging of healthcare workers.

**Methods:** From three databases (PubMed, Embase, and Web of Science), a scoping review of systematic reviews was carried out to determine current knowledge on interventions focused on the well-being or aging of healthcare workers. Only systematic reviews were considered, with appropriate extraction and quality evaluation.

**Results:** Of the total of 445 references identified, 10 systematic reviews were included, mostly published since 2019. Nurses were the most frequent targets of interventions, and mental health was the main outcome described. The overall level of quality was also heterogeneous, with high to low-quality reviews. **Conclusions:** Workers' mental health well-being was the major outcome targeted by intervention, with varying level of evidence. Further studies are needed with integrative approaches on global health and life course perspectives, with a focus on the plurality of settings, worker types, and women.

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## 1. Introduction

Healthcare workers are exposed to many occupational risks that might affect their health and well-being, as well as the cause of premature aging [1]. The COVID-19 pandemic has highlighted the strengths of this workforce but also its weaknesses [2]. Thus, preserving healthcare workers' health has become a major challenge for many countries. Though there are studies on interventions that might affect such outcomes, there are no synthesis or practical recommendations to help occupational health and public health makers in improving healthcare workers' health. Moreover, interventions are scarcely the focus of one specific disorder or exposure [3]. The notion of well or healthy aging is often defined by the development and maintenance of optimal physical, mental, spiritual, and social well-being and function with advancing age. It is related to occupational health defined as the area of work in public health promoting and maintaining the highest degree of physical, mental, and social well-being of workers in all

occupations. Thus, we aimed to carry out a scoping review of systematic reviews that deals with interventions on well-being, occupational health, and aging of healthcare workers.

## 2. Methods

A systematized design was used to make an overview of the knowledge on interventions focused on the health, well-being, or aging of healthcare workers. The three following electronic academic databases were searched to identify relevant articles.

1. PubMed (from 1 January 1946 to April 2022).
2. Embase (from 1 January 1947 to April 2022).
3. Web of Science (from 1 January 1945 to April 2022).

The string-based search was elaborated with a librarian and is available in [Appendix 1](#). The strategy used to optimize the string-based search focused on the following axis.

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**Table 1**  
Extraction of the 10 systematic reviews

Name	Title	Countries covered	Years (min-max)	Number of studies (intervention only)	Numbers of workers	Population nurse/aid, physician, ...)	Location (hospital, retirement home ...)	Time of follow-up (min-max)	Outcomes	Type of intervention
Acquadro 2022	Animal-Assisted Intervention and Health Care Workers' Psychological Health: A Systematic Review of the Literature	USA, Europe	2005–2020	10	20 to 236	Medical staff/nurses	Hospital	1 hour/1 years	Work stress/satisfaction questionnaire, validated scales, and cortisol (serum/salivary)	Animal program
Berardo 2021	Assessment of burnout prevention and wellness programs for US-based neurosurgical faculty and residents: a systematic review of the literature	USA	2019	2	8 to 25	Residents and faculty of neurosurgery	Hospital	Not reported	Well-being and self-care/stress scale	Wellness initiative
Buselli 2021	Mental health of Health Care Workers (HCWs): a review of organizational interventions put in place by local institutions to cope with new psychosocial challenges resulting from COVID-19	Not applicable	2019–2021	0	0	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Cheetham 2021	Education and training for preventing sharps injuries and splash exposures in healthcare workers	Europe, Asia	2002–2018	7	Not quantifiable (ITS)	Nurses mostly	Hospital	10 hours to 12 months	Sharp and splash injuries, questionnaires, and hospital data	Education
Cocchiara 2020	Tai Chi and Workplace Wellness for Health Care Workers: A Systematic Review	USA, Ireland	2012–2018	3	12 to 41	Nurses (mostly)	Hospital	8 to 15 weeks	Scores of stress/sleep/well-being	Tai Shi program once a week
Gray 2019	Workplace-Based Organizational Interventions Promoting Mental Health and Happiness among Healthcare Workers: A Realist Review	All (mainly North America, Europe)	1993–2018	33	Not available	Hospital mostly, residential care, and home		20 days to 48 months	Burnout, stress, job satisfaction, support	Organizational intervention: skill and knowledge development, stress management team building, communication, workload time, and mixed
LaMontagne 2006	Primary prevention of latex related sensitisation and occupational asthma: a systematic review	North America, Europe, Australia	1996–2002	7	Not available	Dental and other healthcare workers	Hospital or dental school	6 weeks to 5 years	Clinical allergies or prick-tests	Substitution and education

Park 2022	The effectiveness of e-healthcare interventions for mental health of nurses	All	2008–2020	7	25 to 617	Nurses	Hospital	3 weeks to 6 months	Work functioning, job stress, mental health	Web-based program, e-mental health condition, positive thinking on application.
Pollock 2020	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	Sierra Leone /Liberia	2019	1	408	Nurse and maternal health assistant	Community services	6 months	Self-report questionnaire of burnout, mixed form Burnout scale/ProQoL-5/compassion fatigue scale	Training in the delivery of psychological first aid
Ruotsalainen 2015	Preventing occupational stress in healthcare workers	All (mainly North America, Europe)	12 before 2000, 22 between 2000 and 2010, 24 after 2010	58	7188 (including 6 over 300 workers)	35 among nurses, 15 healthcare workers (mostly nurses), 6 among physicians	Hospital for 39, 8 residential care/home, and 7 mixed	24 less than 1 month, 22 between 1 to 6 months, 12 more than 6 months	21 MBI, 6 PSS, 2 NSS	22 relaxation interventions, 21 organizational interventions, 13 cognitive-behavioral intervention
Scheepers 2020	The impact of mindfulness-based interventions on doctors' well-being and performance: A systematic review	USA, Europe, Australia	2011–2018	22	26 to 148	Doctors, residents, and radiologist	Hospital	8 weeks to 12 months	Physical/psychological well-being	Group-based MBI
Serrano-Ripoll 2020	Impact of viral epidemic outbreaks on mental health of healthcare workers: a rapid systematic review and meta-analysis	Canada, Taiwan	2006–2010	2	274	Nurses and healthcare workers	Hospital	0 to 2 weeks	Unstandardized questionnaire	Education
van Wyk 2010	Preventive staff-support interventions for health workers	North America, Europe, Asia	1983–2008	10	716	Nurses and healthcare workers	Hospital	6 days to 24 months	Scales: MBI, STAI, other stress scales	Stress management training, management interventions

**Table 2**  
Risk of bias

	1. Are the study groups at risk of not representing their source populations in a manner that might introduce selection bias?	2. Was knowledge of the group assignments inadequately prevented (i.e. blinded or masked) during the study, potentially leading to subjective measurement of either exposure or outcome?	3. Were exposure assessment methods lacking accuracy?	4. Were outcome assessment methods lacking accuracy?	5. Was potential confounding inadequately incorporated?	6. Were incomplete outcome data inadequately addressed?	7. Does the study report appear to have selective outcome reporting?	8. Did the study receive any support from a company, study author, or other entity having a financial interest in any of the exposures studied?	9. Did the study appear to have other problems that could put it at a risk of bias? Very specific intervention and generalizability
Name									
Acquadro 2022	High	Probably low	Probably low	Probably low	Probably high	Probably low	Probably low	Low	Probably high
Berardo 2021	Probably high	Probably low	Probably low	Probably low	Probably high	Probably low	Probably low	Low	High
Buselli 2021	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Cheetham 2021	Low	Low	Low	Probably low	Probably low	Low	Probably low	Low	Probably high
Cocckhiara 2020	High	Probably high	Probably high	Probably high	High	Probably low	Probably low	Low	High
Gray 2019	Probably high	Probably high	Probably low	Probably high	Probably high	Probably low	Probably low	Low	High
LaMontagne 2006	Probably high	Probably high	Probably low	Probably low	Probably low	Probably low	Probably low	Low	Probably high
Park 2021	Probably high	Probably high	Probably low	Probably low	Probably low	Probably low	Probably low	Low	Probably high
Pollock 2020	Low	Low	High	High	High	Probably low	Probably high	Low	High
Ruotsalainen 2015	Low	Low	Low	Low	Probably low	Low	Low	Low	Low
Scheepers 2020	High	Low	Low	Low	Probably low	Low	Low	Low	High
Serrhano-Ripoll 2020	Probably high	Probably low	Probably high	Probably high	Probably high	Probably low	Probably high	Low	High
van Wyk 2010	Probably low	Probably high	Low	Low	Probably low	Low	Low	Low	Low

- Occupational health field
- Population of Healthcare workers
- Intervention study types
- Outcome with aging and well-being.

We performed searches in electronic databases operated in the English language using a search strategy in April 2022 and update in October 2022. Records published in any year and any language were included. Since the aim was on overview of the knowledge on the subject and given the sufficient number of papers, only systematic reviews were included. However, the plurality of field explored and the heterogeneity of study types did not allow an umbrella review with details of extraction neither a meta-analysis [4]. When summarizing the results, studies contained in the systematic review selected that did not meet selection criteria were excluded. Two different authors selected studies at each stage of the selection process, and a consensus was obtained in case of disagreement. The following variables were extracted from selected systematic reviews: first author, year of publication, country, Population, Intervention, Comparator, and Outcome (PICO) criteria, including the type of workers/facilities involved in the intervention, intervention type with the characteristics of the procedure, and the type of outcomes (type of health issue, well-being, or aging).

The Navigation Guide for systematic reviews in environmental and occupational health was used as a guiding methodological framework, particularly for the evaluation of risk bias, and applied wherever feasible [5]. We registered the protocol in PROSPERO under CRD42022311436. The review has been carried out in concordance with the Preferred Reporting Items for Systematic Review and Meta-analysis statement (PRISMA) [6].

### 3. Results

Of the total of 542 references identified for screening, 13 systematic reviews were included (including an update, Appendix 1) [7–19].

Interestingly, most of the systematic reviews were very recent as six out of the ten were published in the last three years. The number of studies included in the systematic reviews ranged from none to 55, with an important variation in the number of workers included and an intervention that was mostly carried out in hospital settings (Table 1). Nurses were the most frequent healthcare workers targeted by the interventions. As expected, different aspects of health outcomes were investigated: from training for preventing sharps injuries and splash exposures to allergies, yet most dealt with mental health (Table 1). The intervention carried out was very different and included education [10,13,18], relaxation [9,11,17], cognitive-behavioral interventions [12,15,16], substitution [13], e-program [14], and animal program intervention [7]. The overall level of quality was also heterogeneous, with high to low-quality reviews. One systematic review was included since it fulfilled the inclusion criteria though no complete intervention studies were described in this review [8]. The overall level of evidence is low/very low for mental health and, at opposite, adequate for the substitution of latex (Table 2).

### 4. Discussion

The systematically scoping review of systematic reviews dealing with interventions on well-being, occupational health, and aging of healthcare workers showed that there is more and more publication and research, with a significative increase in the last two years, most probably accelerated by the COVID-19 pandemic. Mental health outcomes in nurses working in a hospital setting were the most frequent subject of intervention reviews, with an overall low level of evidence.

Before stressing the application of the overview and its perspectives, limitations should be discussed. First, we have changed the initial protocol to focus on a scoping review of systematic reviews more than a systematic review and an umbrella review. Indeed, systematic reviews, which are studies with a higher level of evidence, could be targeted since there were a high number of

them identified in the selection process, though the heterogeneity of outcomes and interventions made an umbrella review inadequate [4]. What was performed is a broad critical review with a comprehensive search process without grading the level of evidence for each intervention [20]. Second, the concept in the health of premature aging and well-being applied to interventions is very large, and we did not include all studies that focused on one aspect of health. Then, even though we found studies on very different risks, such as biological or psychosocial risks, we could not find studies focusing on other aspects of occupational hazard, such as biomechanical hazard [21]. Moreover, reviews that did not solely focus on healthcare workers were not included even though healthcare could represent an important sector in the reviews [22]. Third, a scoping of the published review is limited to what has been published. In occupational health, what is published is only the tip of the iceberg, as there are many worthwhile interesting field interventions that are not published [23].

Nevertheless, our overview of the existing reviews highlights different aspects of intervention in occupational health in the healthcare sector. First, there was a reasonable level of evidence and focus on mental health outcomes for nurses in hospital settings in many different countries, which shows the importance of such interventions for researchers and public health agencies. Interestingly, four systematic reviews were performed by a Cochrane initiative: two different, one update, and one review that was retracted as it was too similar to the update [16,19,24]. The reviews included highlighting the multiple aspects of health and well-being with global and mixed approaches. Mixed approaches with both personal and organizational interventions, including skill and knowledge development, stress management, team building, communication, workload, and time management, are important since long work hours are the first occupational risk [22], especially in a pandemic context with high pressure on healthcare workers. Education is complex and should be integrated into a global health strategy, even for fundamental training, like the prevention of sharp injuries. Additional well-being forms of help, such as meditation, Tai Chi, and animal-assisted interventions, might be interesting toward a global improvement of healthcare workers' well-being, though they can only be seen as addition and not a replacement for an exhaustive assessment and prevention of occupational risk factors.

Second, this review also brings information on missing work that needs to be developed in this field. Locations other than hospital settings are important to consider for intervention as they could miss non-hospital workers. Some of the studies included physicians, residents, dentists, maternal health assistants, and settings, such as community services or residential/care home, were included, but specific studies are still needed focus on these singular workers [25]. Likely, the specificity of exposures with singular biological risks, as well as work tasks, are very different between healthcare workers and should be studied in more details. Studies focusing on women's health are also important in all countries, especially since the gender ratio can be significantly different between healthcare professions. A global health approach is needed in order to link together occupational risks (psychosocial, physical, biological, and chemical risk) with other determinants of health (quality of sleep, addiction, and nutrition) and thus better understand how they impact healthcare workers. Life course studies were also missing in the literature, even though they are crucial to apprehend aging by integrating risk factors (e.g., biomechanical) and protective factors (e.g., nutrition and physical activities). Though not covered specifically by our scoping review, the question of cost-effectiveness on well-being programs is relevant [26] and should be developed in future research, as there is a significant need of more high-quality research in cost-effectiveness [27].

In conclusion, this overview highlighted that there are pre-occupations for healthcare workers' mental health well-being as well as the importance of mixed approaches at different levels. However, further studies and systematic reviews are needed with integrative approaches on global health and the concept of singular exposome, as well as life course perspectives, with focus on some areas of interest, such as residential care, women workers, and physicians, including the important question of cost-effectiveness on well-being programs.

## Conflicts of interest

Authors are paid by their institutions. AD is editor in chief of Archives des maladies professionnelles et de l'environnement (Elsevier).

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.shaw.2022.12.003>.

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