Received: 9 November 2021 | Accepted: 29 November 2022

DOI: 10.1111/inr.12826

International Nursing Review WILEY

LITERATURE REVIEW

Effectiveness of intervention programs aimed at improving the nursing work environment: A systematic review

Gutiérrez-Fernández Eva RN[1] | **Francisco Amo-Setién RN, PHD**[2] | **Leal-Costa César RN**[3] | **Salcedo-Sampedro Concepción**[4] | **Martín-Melón Roberto**[5] | **Molina-Mula Jesús RN, PHD**[6] | **Ortego-Maté Carmen RN, PHD**[7]

[1]Álava University Hospital, Osakidetza, Spain

[2]Faculty of Nursing, Nursing Department, IDIVAL Nursing group, University of Cantabria, Cantabria, Spain

[3]Faculty of Nursing, University of Murcia, Murcia, Spain

[4]Marqués de Valdecilla University Hospital, Cantabria Health Service, Santander, Spain

[5]Library assistant, Biosciences Library, University of Cantabria, Cantabria, Spain

[6]Nursing and Physiotherapy Department, University of Illes Balears, Palma, Spain

[7]Nursing Department, IDIVAL Nursing group, University of Cantabria, Cantabria, Spain

Correspondence
Francisco Amo-Setién. RN, PhD. Nursing Department. University of Cantabria (Spain). IDIVAL Nursing group, Faculty of Nursing, Valdecilla Avenue s/n, Postal Code: 39008, Santander, Cantabria, Spain.
Email: amofj@unican.es

Abstract

Background: The nursing work environment can be compromised due to workload, stress and many other issues. A good nursing work environment is needed to for the health and wellbeing of nurses and therefore measures are developed to improve nursing work environment.

Aim: To determine whether measures designed to improve the work environment for nursing professionals are effective.

Methodology: Online research in the Medline, Scopus, Web of Science, ERIC, CINHAL, PsycINFO, and American Doctoral Dissertations databases, along with manual search, was carried out. Primary experimental studies made up of intervention and control groups were included, with pre-/post-measure evaluation in the nursing team, based on the effects of the interventions. Risk of bias was calculated using the Cochrane tool.

Results: A total of 1997 studies were examined; 19 clinical trials met the inclusion criteria. A total of 1427 nurses participated in the selected studies. The fields of application of the interventions were personal and environmental. Out of the fields targeting individuals, three methodologies were identified: cognitive-behavioral techniques, stress management, channeling anxiety and physical well-being; and those aimed at environmental fields: aromatization and organization. The most evaluated characteristic was teamwork, and the most analyzed symptom was stress. Most of the interventions concluded with at least one significant improvement.

Conclusions: Interventions aimed at enhancing the work environment are effective ways of increasing job satisfaction. The heterogeneity of the data did not allow us to determine which intervention is the most effective. The combination, type, and duration are variables that affect efficacy.

Implication for nursing and nursing policy: This systematic review provides resources for improving the work environment that affects nursing staff, other professionals, and patients. Encouraging a healthy atmosphere leads to excellence in care and improved safety.

KEYWORDS
Intervention, job satisfaction, nursing, systematic review, work environment

INTRODUCTION

"Work environment" is understood as the physical, organizational, and psychological conditions that influence the working day of the professional (Koppler et al., 2012), while "work climate" is the interaction of different professionals who constitute a team and pursue the same objective (Mause et al., 2022). Based on the above, it is assumed that "work environment" includes different determinants, while "work climate" focuses on a single aspect of the "work environment." On the other hand, job satisfaction is a set of reactions, sensations, and feelings, that is, affective and cognitive attitudes that arise as a result of the work environment, willingness to work, colleagues, superiors, and the institution as a whole.

Consequently, satisfaction depends on motivating factors (Ayalew et al., 2019).

The hospital nursing environment is a source of exposure to stressors, especially physical and mental workload, individual responsibility as healthcare managers, pressure due to lack of time, and the scarcity of both material and human resources (Labrague et al., 2018). Organizational and individual strategies arise from this that allow harmful factors to be tackled in order to maintain a good working environment (Knupp et al., 2018), as a comfortable environment not only benefits the health of the workers themselves, but also improves the quality of care offered (International Council of Nurses, 2018).

As a result, the term "nursing work environment" (NWE), which defines an effective environment for nursing practice, has emerged (Lake, 2007). The NWE determines a professional practice environment that supports the nursing community in achieving excellence in care through effective work as part of an interdisciplinary team, as well as the adequate mobilization of resources.

Different interventions have been carried out to alleviate tensions or favor the well-being of workers, to achieve the ideal work environment and job satisfaction in the team, aimed at both the group and their environment, such as those focused on nursing leadership or improving working conditions (Barrientos-Trigo et al., 2018; Buruck et al., 2018; Cummings et al., 2018; Labrague et al., 2018). In addition, these interventions are geared toward achieving personal well-being with actions such as stress management, building resilience, or the use of energy and anxiety channeling techniques such as mindfulness (Chesak et al., 2019; Craige et al., 2016; Jacques et al., 2018; Nowrouzi et al., 2015; Ribeiro-Santiago & Colussi, 2018). These demonstrated effectiveness in promoting comfortable work environments, as well as increasing levels of job satisfaction in nursing.

However, in a systematic review (SR), Schalk et al. (2010) analyzed interventions that improve the NWE and found that it is necessary to develop high-quality controlled research, with pre/post measures, and based on the best scientific evidence. This is because studies carried out to date suggest the existence of methodological problems and hamper a thorough evaluation of effects due to study design.

In the Schalk et al. (2010) project, a taxonomy was created in which the characteristics of the NWE are classified. It was developed to facilitate the evaluation of interventions aimed at improving the work environment in nursing. This taxonomy is recorded in Supplementary Table S1. In addition, some of the interventions agree with those indicated in the Code of Ethics of the American Nurse Association (ANA) (2014) to achieve an effective work environment.

The main objective of this SR is to evaluate whether the interventions designed to improve the work environment of specialized care nursing professionals are effective.

METHODOLOGY

This SR on the effectiveness of interventions focused on improving the work environment of specialized care nursing professionals has been carried out in accordance with the guidelines of the Cochrane Handbook (Higgings & Green, 2011). The protocol is registered in PROSPERO (International prospective register of SRs).

Details on the workflow to be followed, the coding manual, eligibility criteria, and data extraction sheets were compiled in a protocol. During the pilot phase, the applicability of the coding table and coding manual was assessed, and these were modified as they were used and as new studies were added. Before a new change was introduced, it was agreed upon by the researchers.

To merge the information from primary studies, the protocol contained six large dimensions and a section dedicated to observations: 1. Identification, 2. Design, 3. Intervention, 4. Baseline data, 5. Results, 6. Biases, 7. Observations.

The inclusion criteria for primary studies are as follows:

- The study had to be an intervention aimed at improving the work environment that reported quantitative outcome measures.
- The participating population had to be made up of registered, specialized care nurses (registered, graduate, or with a doctorate in nursing, supervisors, and managers).
- The study design had to be a clinical trial: randomized controlled trials (RCTs), cluster randomized trials (CRCTs), and non-randomized.
- The study had to involve at least two groups, one experimental and one control group.
- The study had to provide pre/post measures in both groups.
- The year of publication had to be after 2008, the final selection date of studies included in the SR by Schalk et al. (2010), up to the date of the search, in December 2020.
- The drafting language had to be English or Spanish.

Seven electronic databases, both specific for health sciences and multidisciplines, were used and these included: Medline, Scopus, Web of Science, ERIC, CINHAL, PsycINFO, and American Doctoral Dissertations.

Before proceeding with the bibliographic search, a preliminary search of articles related to the subject was carried out to identify the terms and descriptors of interest, focusing on the elaboration of the final search phrases. These were developed by an expert in literature search methodology (RM). A snowball search was added to this from the references cited in the selected studies to find unidentified primary studies, SRs, and meta-analyses in the main search.

In the search strategy, free language terms expanded with truncations were used: ((“practice environment*” OR “work* environment*” OR work life* OR workplace* OR “work* condition*” OR “work* climate*”)) AND (innovation OR “intervention* OR (”organizational* improvement)) AND (strateg*) AND (nurs*)); and studies published as of 2008 written in English or Spanish were used as limits. The database search strategy is presented in Supplementary Table S2.

The study selection process was made up of four phases: identification, screening, selection, and inclusion. After finishing the first stage, which included the revision of the bibliography and the removal of duplicate studies, the

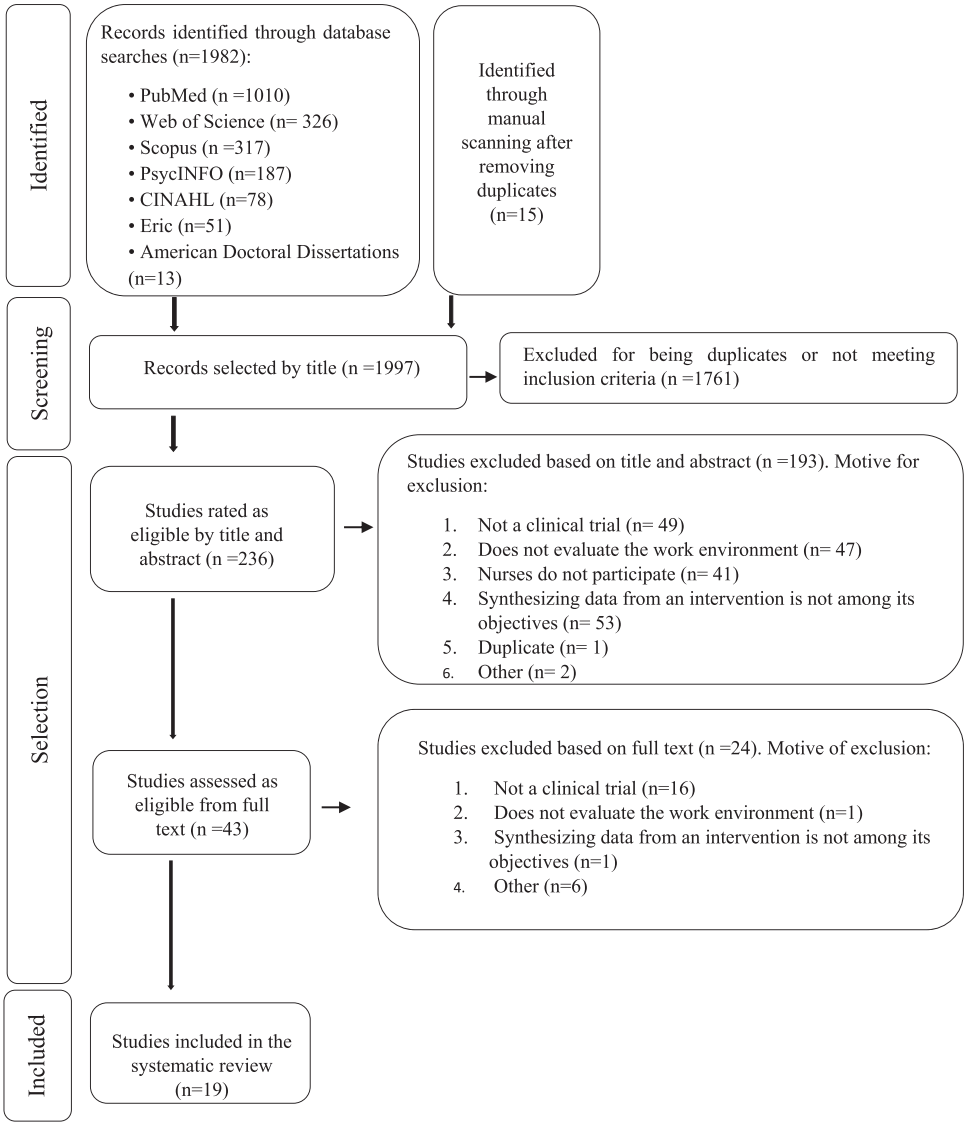

FIGURE 1 Flowchart of the selection process

screening is carried out. The titles of all articles were filtered according to the inclusion criteria. Works with unclear titles were included to be analyzed in depth in the next phase. Afterward, in the selection phase, a peer review of the abstracts was carried out in search of interventions focused on improving the work environment for nursing professionals. Studies in which there was no complete certainty that they included interventions were included. The studies were then rated as eligible from the full text. In this selection, all the inclusion criteria had to be met to be incorporated into the review. Finally, we proceeded with phase four, studies were included in the systematic review (Figure 1).

Using a digital data collection sheet, independent double coding of the studies was carried out (EG-F and CS-S). In the event of discrepancies, data were reanalyzed. If disagreements continued to exist retrospectively, a third expert evaluator in the area resolved the discrepancies (CO-M). The data collection sheet with the information from each primary study is presented in Supplementary Table S3.

To evaluate the risk of bias, the guidelines in Chapter 8 of the Cochrane Handbook 5.1.0 (Higgins & Green, 2011) were followed, including seven items with three possible response options: "low," "high," and "unclear."

The degree of intercoder agreement was estimated with an average calculation using the Spearman-Brown coefficient for quantitative variables, and Cohen's Kappa coefficient for categorical variables.

The characteristics of the interventions included were:

- Theory: Contextual framework, the pillar of the development of the intervention. It was recorded whether the study was based or not on a theory.
- Scales: Measurement instruments used to evaluate the work environment.

- Length of the intervention: Time, in weeks, devoted to developing the intervention, excluding follow-up.
- Sessions: Number of sessions that made up the intervention.
- Time per meeting: Duration of a session in minutes.
- Additional material: Reinforcement material in written, audiovisual, or any other form, to supplement the sessions.
- Incentive: Compensation, financial or not, given to professionals for their participation in the study.
- Follow-up period: Time, in weeks, assigned to evaluate the effects of the intervention once finished.
- Aspect of the workplace: Characteristics of the work environment evaluated based on the taxonomy created by Schalk et al. (2010).

Statistically significant changes in the work environment after the implementation of improvement interventions were employed to synthesize the data.

RESULTS

From the bibliographic search, 1997 studies were obtained, of which 19 were included in this SR. The review process is broken down in the flow chart.

Of these 19 studies, 21 intervention groups were obtained. Nineteen control groups were produced and 21 interventions because two of the studies had two experimental groups (Günüşen & Ustün, 2010; Kurebayashi et al., 2012). The description of the studies, including sample, interventions, and instruments for measuring the work environment, is presented in Table 1.

All the studies were written in English and only 21.1% (n = 4) were funded. Twelve (63.2%) studies were carried out in Asia. Fourteen (73.7%) studies were RCTs and 7 (36.8%) were multicenter. In 42.1% (n = 8) of the studies, interventions were theory based.

A total of 1427 nursing professionals participated in the selected studies, 733 in the experimental group and 694 in the control group. In the intervention group, 39 were men and 560 women, while in the control group, 51 were men and 510 women. In four of the studies, these sociodemographic data were not provided. The mean age was 38.10 years in both groups (standard deviation [SD] 7.49 in intervention and 7.84 in control; range, 30–50 years). Again, a very high amount of unreported data was detected. All the participants were registered nurses who carried out their work at a healthcare or clinical level and/or in specialized care management positions.

The duration of interventions ranged from 3 (Ghazavi et al., 2010) to 32 weeks (Redhead et al., 2011), the most effective being those carried out in an interval of between 3 and 4 weeks, 78% (n = 4). Variability was observed in the number of sessions given, with a follow-up of 42.1% (n = 8).

Two general fields of action were distinguished: individual and environmental. In turn, five types of actions were focused on cognitive-behavioral reinforcement, stress and anxiety management, physical well-being, environmental well-being, and work organization, through activities such as coping strategies, motivation, yoga, tai chi, acupuncture, aromatherapy, or leadership. Psychoeducation was the most frequently used technique, 36.8% (n = 7) with significant improvements in 57.1% (n = 4) of the programs, to which can be added the significant effects obtained in all results through the combination of psychoeducation with counseling, mindfulness, physical exercise, and relaxation.

The most evaluated characteristic of the work environment was teamwork in 78.9% (n = 15) of the studies. In 36.8% (n = 7) of them, incidents that arose throughout the implementation of the intervention were reported, adverse secondary effects due to the handling of materials that were necessary for the development of the intervention, limited physical space, changes in the duration of interventions, intergroup contamination, or exhausting work shifts.

In the evaluation of the actions aimed at improving the work environment, scales related to stress, burnout, levels of anxiety and depression, empowerment, and job satisfaction were used, and the Maslach Burnout Inventory, 31.6% (n = 6), was the most used, adapted to each country and language, respectively.

The most evaluated symptom in the assessment of the work environment was stress 52.6% (n = 10). Scores in this area underwent a statistically significant decrease after the interventions in 70% (n = 7) of the cases. The scores that evaluate exhaustion and depersonalization, parameters associated with burnout, were significantly reduced by 75% (n = 3) and 66.7% (n = 2), respectively. Job satisfaction improved significantly in a single study (Motamed-Jahromi et al., 2017), workplace bullying, evaluated in a single case (Kang & Jeong, 2019), decreased significantly and work effort increased significantly in both arms of the study (Uchiyama et al., 2013).

The risk of bias was assessed based on the guidelines contained in the Cochrane Handbook 5.1.0 (Higgings & Green, 2011). Information on the bias assessment can be found in Figure 2.

DISCUSSION

This SR includes 19 clinical trials that evaluated strategies directed at improving the work environment in nursing teams in a hospital setting. Most of the studies reported improvements related to work anxiety, burnout, stress, and depression, as well as an increase in job satisfaction, motivation, and empowerment. Similar results were found in the study carried out by Bluth et al. (2021) in which symptoms of stress and depression were reduced in nursing assistants who had participated in self-compassion training. Despite satisfactory results, the available literature on interventions that improve the work environment is limited, not only in the nursing team but in health professionals (Elder et al., 2020). This scarce knowledge may be due to the need to invest financial, material, and personnel resources beyond the budgets of organizations (Jayawardhana et al., 2014), in addition to requiring changes in the habits and routines of professionals.

TABLE 1 Summary of the data

Author, year, country	Study type	Interventions	Variables	T	Intervention			Control			Results
					M	W	A	M	W	A	
Calisi (2017), USA	RCT	Relaxation response (RR)	Anxiety Depression Work-related stress Well-being Confidence	8	0	24		0	22		Nonsignificant reduction in levels of anxiety, depression, well-being, and work-related stress.
Chang et al. (2008), Taiwan	Non-R	Psychological empowerment	Effectiveness at work/organizational empowerment Psychological empowerment Job satisfaction Work productivity Innovative behavior	4	0	29		0	32		Significant differences in empowerment (skills and impact), work productivity, and innovative behaviors. It does not improve organizational empowerment or job satisfaction.
Chen et al. (2015), Taiwan	RCT	Lavender aromatherapy	Stress		0	53		0	57		Significant reduction in stress-related symptoms in the experimental group on the third and fourth days. Pain from work-related stress decreased in the experimental group and increased in the control group.
Ghazavi et al. (2010), Iran	RCT	Group psychoeducation	Work-related stress	3							Significant reduction in stress levels immediately and one month after the intervention.
Günüşen et al. (2010), Turkey	RCT	Coping strategies and support techniques	Burnout	7	0	72		0	36		Significant reduction in emotional exhaustion after the intervention with an increase at 6 months. No significant differences in depersonalization and personal fulfillment after the intervention.
Kang et al. (2019), South Korea	CRCT	Nonviolent conversation by telematic channels	Occupational bullying	8	0	36	31	1	35	30	Significant decrease in the occurrence of personal and work harassment and in turnover. No statistical significance in bullying. No significant differences between ICU and other hospitalization units.
Kurebayashi et al. (2012), Brazil	RCT	Auriculotherapy	Stress	8	2	51	43	2	20	39	Significant reduction in stress with better results in acupuncture than in seeds with effects lasting for 15 days after the study.

(Continues)

TABLE 1 (Continued)

Author, year, country	Study type	Interventions	Variables	T	Intervention			Control			Results
					M	W	A	M	W	A	
Lin et al. (2015), China	RCT	Yoga	Stress	12	4	26	32	8	22	30	Significant reduction in work-related stress in the experimental group. Nonsignificant improvement in adaptation to stress in the experimental group. Control group unchanged.
Mealer et al. (2014), USA	RCT	Psychoeducation, mindfulness, and expressive writing	Resilience Posttraumatic stress syndrome Anxiety and depression Burnout	12	1	12		2	12		Significant decrease in depression-related symptoms in the intervention group and in post-traumatic stress symptoms in both groups.
Motamed- Jahromi et al. (2017), Iran	RCT	Positive thinking by Telegram	Quality of work life	12	8	42	30	10	40	30	Significant increase in work life quality, with an increase in satisfaction in the working world and work setting as well as a feeling of belonging to the group formed for that intervention arm.
Nazari et al. (2015), Iran	RCT	Swiss massage	Work-related stress	4	16	17	34	12	21	35	Significant decrease in work stress in the experimental group and with respect to the control group immediately and 2 weeks after the intervention.
Özbaş and Tel (2016), Turkey	RCT	Psychological empowerment	Psychological empowerment Occupational empowerment in nursing Burnout	10							Significant increase in psychological empowerment at 1 and 3 months, post-intervention, and occupational at 3 months.
Palumbo et al. (2012), USA	RCT	Tai chi Yang	Occupational limitations Stress in nursing Stress	15	0	7		0	7		Nonsignificant reduction in work-related stress and in stress related to lack of support from the intervention group.
Pipe et al. (2009), USA	RCT	Mindfulness	Distress	4	0	15	50	1	16	49	Significantly greater improvement in stress-related symptoms in the intervention group. Significantly greater improvement in positive symptoms and global severity. Almost significantly greater improvement in total positive symptoms of those in the intervention group as opposed to those in the control group.

(Continues)

TABLE 1 (Continued)

Author, year, country	Study type	Interventions	Variables	T	Intervention			Control			Results
					M	W	A	M	W	A	
Redhead et al. (2011), England	RCT	Psychosocial intervention. (PSI)	Burnout	32	8	14	39	9	11	43	Nonsignificant reduction in emotional exhaustion. Significant reduction in depersonalization in the experimental group.
Sarid et al. (2012), Israel	Non-R	Cognitive-behavioral interventions (CBI)	Stress Mood				50			50	Significant reduction in stress and fatigue in the study group.
Uchiyama et al. (2013), Japan	CRCT	Participatory intervention in the work environment	Depression Work environment	24	0	149	33	4	166	32	Significant improvement in participatory management, work control, and colleague support in the intervention group. Significant decrease in the objectives in the control group. Significant increase in effort in both groups.
Veiga et al. (2019), Portugal	Non-R	Relaxation	Burnout Mood	8	2	13	39	2	13	43	Significant improvement in emotional exhaustion and depression in the experimental group.
Wei et al. (2017), China	RCT	Active intervention	Burnout	24							Significant reduction in work-related exhaustion after the intervention in casualty nursing staff. Significant decrease in emotional exhaustion and depersonalization after the intervention in casualty nursing staff compared with the control group.

RCT: randomized control trial; CRCT: cluster randomized control trial; Non-R: Nonrandom; T: time, duration of the intervention (weeks); M: man; W: woman; A: mean age.

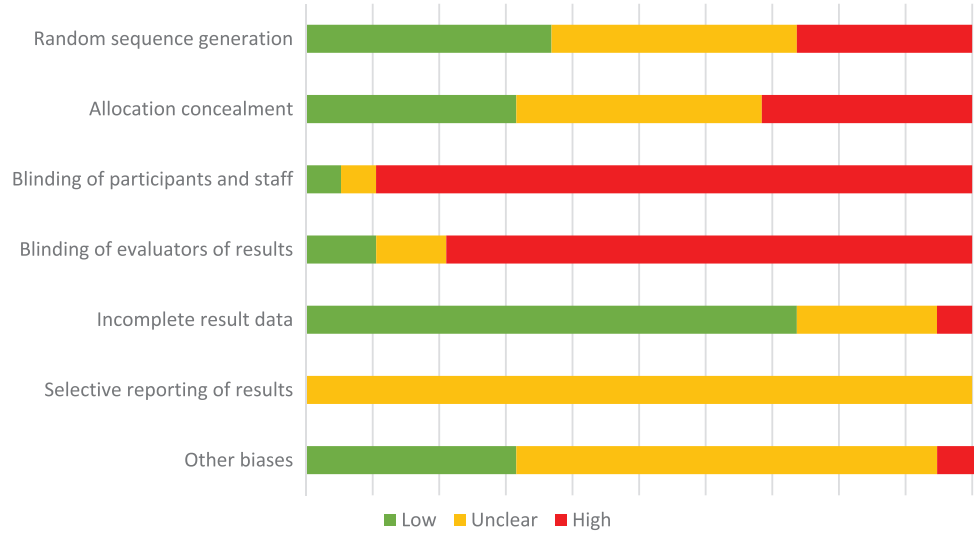

FIGURE 2 Risk of bias assessment

Overall, the quality of the studies could be considered poor, as the classification of "high risk" of bias related to blinding of participants and evaluators is very common. Blinding of behavioral and counseling interventions is difficult since participants realize that they are receiving such training. Friedberg et al. (2010) recommend the use of a sham or placebo intervention in the control group to minimize the risk of participant blinding bias. Furthermore, due to the subjectivity of the self-report questionnaires, participants in the intervention group have higher chances to notify improvements in symptoms, while those in the control group are more likely to report no improvement in symptoms (Chang et al., 2008; Chen et al., 2015; Günüşen & Ustün, 2010; Kang & Jeong,, 2019; Kurebayashi et al., 2012). Concerning outcome assessors or evaluators, Friedberg et al. (2010) argue that they should be blinded to treatment or intervention assignment. On the other hand, in this SR, all studies are determined as "unclear" risk in selective reporting results. This is a result of a shortage of information about the research protocols used to conduct it.

Only a few studies based their interventions on a theory (Calisi., 2017; Chang et al., 2008; Günüşen & Ustün, 2010; Kurebayashi et al., 2012; Özbaş & Tel, 2016; Palumbo et al., 2012; Pipe et al., 2009; Redhead et al., 2011). According to Moore and Evans (2017), interventions need to be based on a theoretical foundation in order to understand the assumptions of causality between intervention and outcome. Grounding interventions in a theoretical framework could facilitate understanding and extrapolation of data.

Best results were obtained using comprehensive or multicomponent programs (Mealer et al., 2014), which consist of interventions focused on different areas of the individual or their environment (Joyce et al., 2016). This can be understood by the fact that the person is a bio-psycho-social being who needs well-being in all spheres. These results are in agreement with those obtained by Taylor et al. (2018), an SR that defended the implementation of concurrent activities that addressed various approaches based on the benefits they produced in occupational well-being. Also, Niskala et al. (2020) emphasized the need to work on personal identity together with spiritual intelligence through educational and organizational programs in their SR with a meta-analysis about job satisfaction.

Interventions with a shorter duration yielded better results, as did those that were followed up. The same results were found in the SR with a meta-analysis by Amo et al. (2019), which shows that short interventions with follow-up periods lead to better effects. These have the advantage of not being perceived by participants as a "burden" or sacrifice, that is, a factor on top of the usual stressors in their lives, such as shift work or family reconciliation. Therefore, it seems more feasible to incorporate changes that do not involve modifications of personal extra-work habits and routines. However, similar to the SR conducted by Hesketh et al. (2020), which assessed mental health in the workplace, the data obtained were limited, and these factors deserve more attention by researchers.

The literature currently available focuses mainly on interventions at the individual level, which obtain good results (de Diego-Cordero, et al., 2021; Elder et al., 2020). At the same time, studies carried out at the organizational level also show an important positive influence on the work environment (Bloemhof, et al., 2021; Rodríguez-García et al., 2021). The intervention based on organizational planning (Uchiyama et al., 2013; Wei et al., 2017) was one of the least studied. Both achieved a significantly more suitable work context, and improvements in participatory management, work control, and support among colleagues from two different prisms, reflecting an increase in job satisfaction with regard to the organization. As in the previous studies,

Viselita et al. (2019), in their SR on the level of quality of work life and improvement interventions, expressed the need to develop nurse participation within organizational planning. In this way, the incorporation of organizational support measures by the management, increase in the active participation of nurses, and increase in decision-making power could improve the work environment since the resolutions would be consensual.

Cummings et al. (2018), Häggman-Laitila and Romppanen (2018), and Goodhue and Harris (2019) affirmed the importance of leadership styles in strengthening the NWE, concluding that an appropriate leadership method could be an optimal intervention for strengthening organizational support, and therefore, reduce work stress and burnout as well as fostering a good work environment.

Despite the benefits of organizational interventions, there may be barriers to their implementation, such as limited financial resources or lack of sufficient legal support for their development. In addition, planning, implementation, and evaluation are more difficult. Therefore, there is a need for further research on interventions in this area, as the results are very promising in terms of improving the work environment (Uchiyama et al., 2013; Wei et al., 2017).

One relevant study by Uchiyama et al. (2013) observed a significant increase in effort and involvement in the planning and implementation of improvements in the work environment of components of both arms of the clinical trial. The SR conducted by Romppanen and Häggman-Laitila (2017) revealed a similar result: the active participation of employees could affect the implications of interventions. This could suggest that the intention to change, desire for renovation and achieving a healthier and more comfortable work atmosphere for professionals were not limited to the experimental group. That is, despite a complete lack of support in promoting a more appropriate work environment in this group, the nursing team joined forces and pulled together, their ultimate goal being to achieve the maximum level of harmony in relationships and the working environment. Thus, this result could be biased by participants' intentionality to change.

Recently, Paguio et al. (2020) in an SR evaluates interventions aimed at improving the work environment through their implementation in the nursing team, in the patient, and in the medical environment, concluding that the use of a participatory approach provided the basis for improving the working atmosphere. These results are in accordance with the findings by Uchiyama et al. (2013), reported in this SR. In this, it was argued that the use of participatory approaches fosters job satisfaction, autonomy, and leadership. In addition, the results by Paguio et al. (2020) were similar to ours, in the sense that they were not determinant, making it difficult to formulate recommendations to guide future strategies because of their heterogeneity. However, one positive aspect of the current SR is that it is more thorough in the selection of primary studies since they had to meet the requirement of being clinical trials with at least two study arms in order to meet the inclusion criteria, which reduced the risk of methodological bias.

The most outstanding strengths of this studyinclude the exhaustiveness in both the selection and quality evaluation of studies, as well as that they are up to date. Specific focus of the nursing team's work environment, avoiding jobs analyzed globally, should be added to this. That is, they studied multidisciplinary teams in which other health categories such as medicine, technical health assistants, or physical therapists could be included, avoiding possible biases arising from the inherent characteristics and responsibilities of each stratum.

The limitations were related to the number of studies available since, despite being a growing issue, there is a limited amount of literature that includes clinical trials that analyze interventions aimed at improving the work environment in nursing professionals. The availability of cross-sectional, case, or control studies was higher. Likewise, another limitation was the origin of the studies chosen, largely Asian, with a limited number from European nationalities. On the other hand, the possible language bias must be considered since the search was restricted to studies published in English and Spanish.

As a future line of research, a multicenter intervention aimed at improving the work environment of units strongly affected by SARS CoV-2 should be conducted, such as intensive care, in which various methods and techniques reviewed in this SR are combined in short periods of time with follow-up. Special emphasis should be placed on organizational interventions using mixed-methods approaches, in which the information would be collected and analyzed from a quantitative and qualitative prism. Likewise, our results should be expanded by carrying out a meta-analysis that would allow a quantitative synthesis.

CONCLUSION

This SR has been successful in gathering and summarizing all the available and current evidence on the subject and also determining that the interventions aimed at improving the work environment of specialized care nurses are effective. However, no conclusive data allow us to state which type of intervention is the most appropriate, due to either their heterogeneity, the lack of use of a unified measurement instrument, or deficiencies in the detailed description of data and analysis.

More short-term randomized clinical trials with pre/post measures, a follow-up, and a larger sample size are necessary to consolidate the results. It would also be advisable to include a combination of interventions, with special emphasis on a structural or organizational level, based on a theoretical model and with blinding of participants through simulated interventions, blinding of staff through evaluation of results by a team external to the delivery of the intervention and access to the study protocol. The implementation of such interventions, together with the involvement of workers in the fight for change, innovation, and the search for a comfortable working environment, could multiply the positive results.

IMPLICATION FOR NURSING PRACTICE AND POLICY

The results provide valuable information for the health systems, governments, and nurse managers worldwide in the field of management as they confirm the relationship between the benefit of developing integrative interventions and improvements in the work environment. This is because the interventions reduce levels of stress, burnout, depersonalization, and bullying and increase job satisfaction and work effort. In other words, investment in an intervention program would have good cost-effective results in terms of decreasing absenteeism and turnover intention. Therefore, they must be especially considered in the current pandemic situation, in which stress and exhaustion are markedly affecting the nursing force.

In the same way as there are policies focused on improving the quality of life of citizens, it would be appropriate to develop strategic plans that contribute to enhancing the well-being at work of the nursing team. These could incorporate the interventions identified in the current SR, especially those focused on the organizational level.

Furthermore, these policies would not be limited to the nursing team. Increasing knowledge with the established guidelines can provide the basis for future research in other professionals. In this way, the benefits could be exponentially amplified as they would contribute to the improvement of the well-being of these professionals but, indirectly, to improving the work atmosphere of the multidisciplinary team and to providing excellent quality care.

AUTHOR CONTRIBUTIONS

Study design: EG, FA, CO; data collection: EG, CS, RM, CO; data analysis: EG, CO; study supervision: FA, CO; manuscript writing: EG, FA, CL, CS, RM, JM, CO; critical revisions for important intellectual content: EG, FA, CL, JM, CO.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

FUNDING

This research did not receive specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ETHICAL CONSIDERATIONS

As SRs are secondary research, they do not obtain personal or confidential information from participants, but publicly available documents, and it is not necessary to request institutional ethical approval.

ORCID

Gutiérrez-Fernández Eva RN https://orcid.org/0000-0002-3583-027X

Francisco Amo-Setién RN, PHD https://orcid.org/0000-0002-0797-0953

Salcedo-Sampedro Concepción https://orcid.org/0000-0002-2541-4774

Martín-Melón Roberto https://orcid.org/0000-0001-9079-1261

Molina-Mula Jesús RN, PHD https://orcid.org/0000-0002-5789-1313

REFERENCES

American Nurses Association. (2014) *The code of ethics for nurses with interpretative statements*. Available at: https://homecaremissouri.org/mahc/documents/CodeofEthicswInterpretiveStatements20141.pdf [Accessed 8th July 2021].

Amo, F. J., Abajas-Bustillo, R., Torres-Manrique, B., Martín-Melón, R., Sarabia-Cobo, C., Molina-Mula, J. et al. (2019) Characteristics of nursing interventions that improve the quality of life of people with chronic diseases: a systematic review with meta-analysis. *Plos One*, 14(6), e0218903. https://doi.org/10.1371/journal.pone.0218903

Ayalew, F., Kibwana, S., Shawula, S., Misganaw, E., Abosse, Z., Van Roosmalen, J. et al. (2019) Understanding job satisfaction and motivation among nurses in public health facilities of Ethiopia: a cross-sectional study. *BMC Nursing*, 18(46). https://doi.org/10.1186/s12912-019-0373-8

Barrientos-Trigo, S., Vega-Vázquez, L., De Diego-Cordero, R., Badanta-Romero, B. & Porcel-Gálvez, A. M (2018) Interventions to improve working conditions of nursing staff in acute care hospitals: scoping review. *Journal of Nursing Management*, 26(2), 94–107. https://doi.org/10.1111/jonm.12538

Bloemhof, J., Knol, J., Van Rijn, M. & Burman, B. M. (2021) The implementation of a professional practice model to improve the nurse work environment in a Dutch hospital: a quasi-experimental study. *Journal of Advanced Nursing*, 77(12), 4919–4934. https://doi.org/10.1111/jan.15052

Bluth, K., Lathren, C., Silbersack Hickey, J. V. T., Zimmerman, S., Wretman, C. J. & Sloane, P. D. (2021) Self-compassion training for certified nurse assistants in nursing homes. *Journal of the American Geriatrics Society*, 69(7), 1896–1905. https://doi.org/10.1111/jgs.17155

Buruck, G., Tomaschek, A. & Lütke-Lanfer, S. S. (2018) Burnout prevention team-process evaluation of an organizational health intervention. *Journal of Public Health*, 1–12. https://doi.org/10.1007/s10389-018-0999-0

Calisi, C. C. (2017) The effects of the relaxation response on nurses' level of anxiety, depression, well-being, work-related stress, and confidence to teach patients. *Journal of Holistic Nursing*, 35(4), 318–327. https://doi.org/10.1177/0898010117719207

Chang, L. C., Liu, C. H. & Yen, E. H. (2008) Effects of an empowerment-based education program for public health nurses in Taiwan. *Journal of Clinical Nursing*, 17(20), 2782–2790. https://doi.org/10.1111/j.1365-2702.2008.02387.x

Chen, M. C., Fang, S. H. & Fang, L. (2015) The effects of aromatherapy in relieving symptoms related to job stress among nurses. *International Journal of Nursing Practice*, 21(1), 87–93. https://doi.org/10.1111/ijn.12229

Chesak, S. S., Cutshall, S. M., Bowe, C. L., Montanari, K. M. & Bhagra, A. (2019) Stress management interventions for nurses: critical literature review. *Journal of Holistic Nursing*, 37(3), 288–295. https://doi.org/10.1177/0898010119842693

Craige, M., Slatyer, S., Hegney, D., Osseiran-Moisson, R., Gentry, E., Davis, S. et al. (2016) A pilot evaluation of a mindful self-care and resiliency (MSCR) intervention for nurses. *Mindfulness*, 7(3), 764–774. https://doi.org/10.1007/s12671-016-x

Cummings, G. G., MacGregor, T., Davey, M., Lee, H., Wong, C. A., Lo, E. et al. (2018) Leadership styles and outcome patterns for the nursing workforce and work environment: a systematic review. *International Journal of Nursing Studies*, 85, 19–60. https://doi.org/10.1016/j.ijnurstu.2018.04.016

de Diego-Cordero, R., Zurrón Pérez, M. P., Vargas-Martínez, A. M., Lucchetti, G. & Vega-Escaño, J. (2021) The effectiveness of spiritual interventions in the workplace for work-related health outcomes: a systematic review and meta-analysis. *Journal of Nursing Management*, 29(6), 1703–1712. https://doi.org/10.1111/jonm.13315

Elder, E. G., Johnston, A., Wallis, M. & Crilly, J. (2020) Work-based strategies/interventions to ameliorate stressors and foster coping for clinical staff working in emergency departments: a scoping review of the literature. *Australasian Emergency Care*, 23(3), 181–192. https://doi.org/10.1016/j.auec.2020.02.002.

Friedberg, J. P., Lipsitz, S. R. & Natarajan, S. (2010) Challenges and recommendations for blinding in behavioral interventions illustrated using a case study of a behavioral intervention to lower blood pressure. *Patient Education and Counseling*, 78(1), 5–11. https://doi.org/10.1016/j.pec.2009.04.009

Ghazavi, Z., Lohrasbi, F. & Mehrabi, T. (2010) Effect of communication skill training using group psychoeducation method on the stress level of psychiatry ward nurses. *Iranian Journal of Nursing and Midwifery Research*, 15(1), 395–400.

Goodhue, C. J. & Harris, D. G. (2019) Nurse practitioner job satisfaction and the healthy work environment. *AACN Advanced Critical Care*, 30(3), 274–277. https://doi.org/10.4037/aacnacc2019451

Günüşen, N. P. & Ustün, B. (2010) An RCT of coping and support groups to reduce burnout among nurses. *International Nursing Review*, 57(4), 485–492. https://doi.org/10.1111/j.1466-7657.2010.00808.x

Häggman-Laitila, A. & Romppanen, J. (2018) Outcomes of interventions for nurse leaders' well-being at work: a quantitative systematic review. *Journal of Advanced Nursing*, 74(1), 34–44. https://doi.org/10.1111/jan.13406

Hesketh, R., Strang, L., Pollitt, A. & Wilkinson, B. (2020) What do we know about the effectiveness of workplace mental health interventions? Literature review. *The Policy at Institute King's College London*.

Higgins, J. P. T. & Green, S. (2011) Cochrane handbook for systematic reviews of interventions version 5.1.0. The Cochrane Collaboration. Available at: https://handbook.cochrane.org [Accessed 19th September 2021].

International Council of Nurses. (2018) *Evidence-based safe nurse staffing*. Available at: https://www.icn.ch/sites/default/files/inline-files/ICN%20PS%20Evidence%20based%20safe%20nurse%20staffing_0.pdf [Accessed 3rd June 2021].

Jacques, J., Ribeiro, R. P., Scholze, A. R., Galdino, M. J. Q., Martins, J. T. & Ribeiro, B. G. D. A. (2018) Wellness room as a strategy to reduce occupational stress: quasi-experimental study. *Revista brasileira de enfermagem*, 71(Suppl 1), 483–489. https://doi.org/10.1590/0034-7167-2017-0572

Jayawardhana, J., Welton, J. M. & Lindrooth, R. C. (2014) Is there a business case for magnet hospitals? Estimates of the cost and revenue implications of becoming a magnet. *Medical Care*, 52(5), 400–406. https://doi.org/10.1097/MLR.0000000000000092

Joyce, S., Modini, M., Christensen, H., Mykletun, A., Bryant, R., Mitchell, P. B. et al. (2016) Workplace interventions for common mental disorders: a systematic meta-review. *Psychological Medicine*, 46(4), 683–697.https://doi.org/10.1017/S0033291715002408

Kang, J. & Jeong, Y. J. (2019) Effects of a smartphone application for cognitive rehearsal intervention on workplace bullying and turnover intention among nurses. *International Journal of Nursing Practice*, 25(6), e12786. https://doi.org/10.1111/ijn.12786

Knupp, A. M., Patterson, E. S., Ford, J. L., Zurmehly, J. & Patrick, T. (2018) Associations among nurse fatigue, individual nurse factors, and aspects of the nursing practice environment. *The Journal of Nursing Administration*, 48(12), 642–648. https://doi.org/10.1097/NNA.0000000000000693

Klopper, H. C., Coetzee, S. K., Pretorius, R. & Bester, P. (2012) Practice environment, job satisfaction and burnout of critical care nurses in South Africa. *Journal of Nursing Management*, 20(5), 685–695. https://doi.org/10.1111/j.1365-2834.2011.01350.x

Kurebayashi, L. F., Gnatta, J. R., Borges, T. P., Belisse, G., Coca, S., Minami, A. et al. (2012) Aplicabilidade da auriculoterapia com agulhas ou sementes para diminuição de estresse em profissionais de enfermagem [The applicability of auriculotherapy with needles or seeds to reduce stress in nursing professionals.]. *Revista da Escola de Enfermagem da U S P*, 46(1), 89–95. https://doi.org/10.1590/s0080-62342012000100012

Labrague, L. J., McEnroe-Petitte, D. M., Leocadio, M. C., Van Bogaert, P. & Cummings, G. G. et al. (2018) Stress and ways of coping among nurse managers: an integrative review. *Journal of Clinical Nursing*, 27(7–8), 1346–1359. https://doi.org/10.1111/jocn.14165

Lake, E. T. (2007) The nursing practice environment: measurement and evidence. *Medical Care Research and Review*, 64(2), 104S–22S. https://doi.org/10.1177/1077558707299253

Lin, S. L., Huang, C. Y., Shiu, S. P. & Yeh, S. H. (2015) Effects of yoga on stress, stress adaption, and heart rate variability among mental health professionals–a randomized controlled trial. *Worldviews on Evidence-Based Nursing*, 12(4), 236–245. https://doi.org/10.1111/wvn.12097

Mause, L., Hoffmann, J., Ohnhäuser, T., Gunkel, S., Stöcker, A. & Scholten, N. (2022) Work climate in pandemic times: which burdens do German physicians in primary care report? *Family Practice*, 39(1), 46–51. https://doi.org/10.1093/fampra/cmab085

Mealer, M., Conrad, D., Evans, J., Jooste, K., Solyntjes, J., Rothbaum, B. et al. (2014) Feasibility and acceptability of a resilience training program for intensive care unit nurses. *American Journal of Critical Care*, 23(6), e97–105. https://doi.org/10.4037/ajcc2014747

Moore, G. F. & Evans, R. E. (2017) What theory, for whom and in which context? Reflections on the application of theory in the development and evaluation of complex population health interventions. *SSM: Population Health*, 3, 132–135. https://doi.org/10.1016/j.ssmph.2016.12.005

Motamed-Jahromi, M., Fereidouni, Z. & Dehghan, A. (2017) Effectiveness of positive thinking training program on nurses' quality of work life through smartphone applications. *International Scholarly Research Notices*, 4965816. https://doi.org/10.1155/2017/4965816

Nazari, F., Mirzamohamadi, M. & Yousefi, H. (2015) The effect of massage therapy on occupational stress of intensive care unit nurses. *Iranian Journal of Nursing and Midwifery Research*, 20(4), 508–515. https://doi.org/10.4103/1735-9066.161001

Niskala, J., Kanste, O., Tomietto, M., Miettunen, J., Tuomikoski, A. M., Kyngäs, H. et al. (2020) Interventions to improve nurses' job satisfaction: a systematic review and meta-analysis. *Journal of Advanced Nursing*, 76(7), 1498–1508. https://doi.org/10.1111/jan.14342

Nowrouzi, B., Lightfoot, N., Larivière, M., Carter, L., Rukholm, E., Schinke, R. et al. (2015) Occupational stress management and burnout interventions in nursing and their implications for healthy work environments: a literature review. *Workplace Health & Safety*, 63(7), 308–315. https://doi.org/10.1177/2165079915576931

Özbaş, A. A. & Tel, H. (2016) The effect of a psychological empowerment program based on psychodrama on empowerment perception and burnout levels in oncology nurses: psychological empowerment in oncology nurses. *Palliative & Supportive Care*, 14(4), 393–401. https://doi.org/10.1017/S1478951515001121

Paguio, J. T., Yu, D. & Su, J. J. (2020) Systematic review of interventions to improve nurses' work environments. *Journal of Advanced Nursing*, 76(10), 2471–2493. https://doi.org/10.1111/jan.14462

Palumbo, M. V., Wu, G., Shaner-McRae, H., Rambur, B. & McIntosh, B. (2012) Tai Chi for older nurses: a workplace wellness pilot study. *Applied Nursing Research*, 25(1), 54–59. https://doi.org/10.1016/j.apnr.2010.01.002

Pipe, T. B., Bortz, J. J., Dueck, A., Pendergast, D., Buchda, V. & Summers, J. (2009) Nurse leader mindfulness meditation program for stress management: a randomized controlled trial. *The Journal of Nursing Administration*, 39(3), 130–137. https://doi.org/10.1097/NNA.0b013e31819894a0

Redhead, K., Bradshaw, T., Braynion, P. & Doyle, M. (2011) An evaluation of the outcomes of psychosocial intervention training for qualified and unqualified nursing staff working in a low-secure mental health unit. *Journal of Psychiatric and Mental Health Nursing*, 18(1), 59–66. https://doi.org/10.1111/j.1365-2850.2010.01629.x

Ribeiro-Santiago, P. H. & Colussi, C. F. (2018) Feasibility evaluation of a mindfulness-based intervention for primary care professionals: proposal of an evaluative model. *Complementary Therapies in Clinical Practice*, 31, 57–63. https://doi.org/10.1016/j.ctcp.2018.01.013

Rodríguez-García, M. C., Márquez-Hernández, V. V., Granados-Gámez, G., Aguilera-Manrique, G. & Gutiérrez-Puertas, L. (2021) Magnet hospital attributes in nursing work environment and its relationship to nursing students' clinical learning environment and satisfaction. *Journal of Advanced Nursing*, 77(2), 787–794. https://doi.org/10.1111/jan.14629

Romppanen, J. & Häggman-Laitila, A. (2017) Interventions for nurses' well-being at work: a quantitative systematic review. *Journal of Advanced Nursing*, 73(7), 1555–1569. https://doi.org/10.1111/jan.13210

Sarid, O., Rivka, B., Rivka, E. & Dorit, S. E. (2012) Are cognitive-behavioral interventions effective in reducing occupational stress among nurses? *Applied Nursing Research*, 25(3), 152–157. https://doi.org/10.1016/j.apnr.2011.01.004

Schalk, D. M., Bijl, M. L., Halfens, R. J., Hollands, L. & Cummings, G. G. (2010) Interventions aimed at improving the nursing work environment: a systematic review. *Implementation Science*, 5(34). https://doi.org/10.1186/1748-5908-5-34

Taylor, C., Yrichis, A., Leamy, M. C., Reynolds, E. & Maben, J. (2018) Can Schwartz center rounds support healthcare staff with emotional challenges at work, and how do they compare with other interventions aimed at providing similar support? A systematic review and scoping reviews. *BMJ Open*, 8(10), e024254. https://doi.org/10.1136/bmjopen-2018-024254

Uchiyama, A., Odagiri, Y., Ohya, Y., Takamiya, T., Inoue, S. & Shimomitsu, T. (2013) Effect on mental health of a participatory intervention to improve psychosocial work environment: a cluster randomized controlled trial among nurses. *Journal of Occupational Health*, 55(3), 173–183. https://doi.org/10.1539/joh.12-0228-oa

Veiga, G., Rodrigues, A. D., Lamy, E., Guiose, M., Pereira, C. & Marmeleira, J. (2019) The effects of a relaxation intervention on nurses' psychological and physiological stress indicators: a pilot study. *Complementary Therapies in Clinical Practise*, 35, 265–271. https://doi.org/10.1016/j.ctcp.2019.03.008.

Viselita, F., Handiyani, H. & Pujasari, H. (2019). Quality level of nursing work life and improvement interventions: systematic review. *Enfermeria Clinica*, 29(2), 223–228. https://doi.org/10.1016/j.enfcli.2019.06.001

Wei, R., Ji, H., Li, J. & Zhang, L. (2017) Active intervention can decrease burnout in ed nurses. *Journal of Emergency Nursing*, 43(2), 145–149. https://doi.org/10.1016/j.jen.2016.07

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Eva, G.-F., Francisco, A.-S., César, L.-C., Concepción, S.-S., Roberto, M.-M., Jesús, M.-M. et al. (2023) Effectiveness of intervention programs aimed at improving the nursing work environment: A systematic review. *International Nursing Review*, 1-12. https://doi.org/10.1111/inr.12826