




The effect of mindfulness training on burnout syndrome in nursing: A systematic review and meta-analysis

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Abstract

Aim: To analyse the effect of mindfulness training on levels of burnout among nurses.

Background: Burnout syndrome is a common occupational hazard for nursing staff. Mindfulness training has been proposed as a valid intervention for burnout.

Design: Systematic review and meta-analysis.

Data sources: The CINAHL, LILACS, Medline, ProQuest, PsycINFO, Scielo and Scopus databases were consulted, using the search equation 'Nurs * AND burnout AND mindfulness'. There was no restriction on the year of publication.

Review methods: Papers were selected for analysis in accordance with the PRISMA guidelines. The meta-analysis was carried out using Review Manager 5.3 software.

Results: The sample was of 17 articles including 632 nurses. Mindfulness training reduces levels of burnout, producing lower scores for emotional exhaustion and depersonalization and higher for personal accomplishment. The differences in the means were 1.32 (95% CI: -9.41-6.78), 1.91 (95% CI: -4.50-0.68) and 2.12 (95% CI: -9.91-14.14), respectively, between the intervention and control groups.

Conclusion: Mindfulness training reduces the emotional burden and hence levels of burnout, among nurses. However, further randomized clinical trials are required.

KEYWORDS

burnout, health promotion, intervention, literature review, mindfulness, nursing, systematic review

1 | INTRODUCTION

The healthcare environment can have a negative impact on workers, due to factors such as shift working, stress, the burdens of care, peer relationships and performance targets, together with high levels of emotional demand that may cause anxiety, frustration, stress, depression and burnout (Johnson et al., 2017; Lee, Chiang, & Kuo, 2019; Maslach, Schaufeli, & Leiter, 2001; Salvarani et al., 2019). This situation can provoke major problems for healthcare personnel in general and for nurses in particular (Cañadas-De la Fuente et al.,

2015), who often present high levels of burnout (Akman, Ozturk, Bektas, Ayar, & Armstrong, 2016; Gómez-Urquiza et al., 2017; Molina-Praena et al., 2018; Monsalve-Reyes et al., 2018; Pradas-Hernández et al., 2018).

1.1 | Background

Burnout syndrome arises from chronic exposure to stress-provoking factors and is characterized by three dimensions: emotional exhaustion (EE); depersonalization (D); and low personal accomplishment (PA) (Maslach & Jackson, 1981). This syndrome has a negative

impact on physical and mental health (Bagheri Hosseinabadi et al., 2019; McVicar, 2016; Salvagioni et al., 2017), decreases productivity and quality of care (Cañadas-De la Fuente et al., 2018; Daigle, Talbot, & French, 2018; Dall'Ora, Griffiths, Ball, Simon, & Aiken, 2015; De la Fuente-Solana et al., 2017; Hall, Johnson, Watt, Tsipa, & O'Connor, 2016; Ramirez-Baena et al., 2019) and raises staffing costs due to increased sick time (Letvak, Ruhm, & Lane, 2011; Sarafis et al., 2016).

In response to this severe problem, various strategies have been developed to prevent the onset and/or reduce the consequences of burnout; research shows different cognitive-behavioural skills development, improving physical and mental problems, such as mediation, progressive relaxation techniques, muscle and breathing exercises (Ruotsalainen, Verbeek, Mariné, & Serra, 2015; Smith, 2014; Veiga et al., 2019).

One such intervention is based on mindfulness training (Kabat-Zinn, 2003; Segal, Williams, & Teasdale, 2002). Mindfulness is defined as the human capacity to take full, intentional ownership of an act, by assuming control of our reactions to the immediate environment (Braun, Kinser, Carrico, & Dow, 2019; Zeller & Levin, 2013) and to respond positively when faced by stressful events, through the exercise of individual and interpersonal skills and psychological self-regulation (Burton, Burgess, Dean, Koutsopoulou, & Hugh-Jones, 2017; Garland et al., 2010; Marthiensen, Sedgwick, & Crowder, 2019).

Several types of mindfulness-based intervention have been proposed, based on goals such as stress reduction (MBSR) (Kabat-Zinn, 1990), cognitive therapy (MBCT) (Segal et al., 2002) and, more recently, self-care and resilience (MBSCR) (Flarity, Gentry, & Mesnikoff, 2013). A typical MBSR programme is based on 8 weeks' training, involving eight 2.5-hr face-to-face sessions plus a full-day's 'retreat' (Kabat-Zinn, 1990). Each session presents different forms of meditation, such as yoga, breathing exercises, social support or exposure and resistance to stressors.

The MBCT and MBSCR variants build on the MBSR method, but additionally incorporate cognitive elements. In MBCT, the goal is to determine the association between emotions and negative thoughts and actions, whereas the MBSCR approach seeks to reinforce individual resilience (Flarity et al., 2013; Segal et al., 2002).

Mindfulness programmes have achieved tangible effects in reducing burnout in healthcare personnel (Eby et al., 2019; Eriksson, Germundsjö, Åström, & Rönnlund, 2018; Hamilton-West, Pellatt-Higgins, & Pillai, 2018; Lu et al., 2019) and even in nursing students (Song & Lindquist, 2015). Their positive effect has also been demonstrated in studies with nurses, although the types of intervention vary and different effect sizes have been reported (Dos Santos et al., 2016; Slatyer, Craigie, Heritage, Davis, & Rees, 2018).

For this reason, it is important to perform a systematic review of the studies conducted in this area to characterize the different interventions made, to evaluate the outcomes achieved and, if the necessary data are available, to meta-analyse the effect sizes found. Even though there are other meta-analysis about interventions for occupational stress and well-being in healthcare professionals (Lomas, Medina, Ivtzan, Rupperecht, & Eiroa-Orosa, 2019; Ruotsalainen et al.,

Impact

- Mindfulness intervention reduces the level of burnout among nursing staff.
- Mindfulness, through body-mind training, allows workers to address and overcome situations of severe emotional impact.
- These results may have a positive impact for well-being and quality of life in nurses and also for the quality care.
- Hospitals can provide mindfulness training, which has been proposed as a potential strategy to reduce nurses burnout.

2015; Slemp, Jach, Chia, Loton, & Kern, 2019) none is focused on nurses burnout.

Implementing interventions focused on coping skills are necessary, however, a few interventions among nurses to prevent burnout are developed (Ruotsalainen et al., 2015). Many studies focused their aims to specific disorders such as anxiety or depression, however, few studies show the effects of a mindfulness training in burnout syndrome, as a multidimensional construct includes mental and physical health, cognitive performance and social relationship (Foureur, Besley, Burton, Yu, & Crisp, 2013; Pipe et al., 2009). Accordingly, determining the impact of mindfulness programme remains important.

2 | THE REVIEW

2.1 | Aims

Given the prevalence of burnout among nurses, the aim of this systematic review and meta-analysis was to assess the impact of mindfulness-based interventions on nurses and to determine the relationship between these interventions and subsequent levels of burnout experienced. The different types of intervention are compared, and the impact made on burnout dimensions, in each case, is measured. This review addresses the following research question: (1) What effect does a mindfulness-based intervention programme have on the burnout suffered by nurses?

2.2 | Design

We conducted a systematic review and meta-analysis.

2.3 | Search methods

In this systematic review and meta-analysis, the following databases were consulted: CINAHL, LILACS, Medline, ProQuest

(Health and Medical Complete), PsycINFO, Scielo and Scopus, following the recommendations of the PRISMA statement (Moher, Liberati, Tetzlaff, & Altman, 2009). The search equation used was 'Nurs * AND burnout AND mindfulness', with the Medical Subject Headings (MeSH) descriptors. The search was performed on June 2019.

The following inclusion criteria were applied to the studies found: (a) clinical trial or quasi-experimental study; (b) analysis of the impact of mindfulness-based interventions on burnout; (c) sample of nurses; (d) article published in English, Spanish, French or Portuguese and (e) no restriction on the year of publication. Papers were excluded if the sample was mixed and did not provide independent data for nurses.

2.4 | Search outcomes

After the database search, duplicate studies were identified and discarded. A title and abstract reading was then performed and the papers that did not meet the inclusion criteria were eliminated. For those remaining, the complete text was read. The process was carried out by two investigators working independently and a third was consulted if any disagreement arose.

2.5 | Quality appraisal

The studies were classified by level of evidence in accordance with the recommendations of the Oxford Center for Evidence-based Medicine (OCEBM) (Howick et al., 2011). The risk of bias was analysed by pairs of independent reviewers using the Cochrane Collaboration Risk of Bias tool (Higgins & Green, 2011). No study was excluded, all articles reached a quality level according to quality assessment tools.

2.6 | Data abstraction

The data were recorded using a data coding manual, by two researchers working independently. The degree of their agreement on this coding was tested by Cohen's kappa and the intraclass correlation coefficient.

The following study variables were compiled:

Publication variables: a) First-named author; b) Year of publication; c) Country where the investigation was conducted; d) Language of publication; e) Gender (percentage of women in the sample); and f) Average age of the sample.

Methodological variables: a) Sample size; b) Research design (experimental/quasi-experimental); c) Burnout measurement instrument; and d) Type of mindfulness-based intervention.

The main outcomes of each intervention were determined by reference to the following measures: a) Prevalence of each dimension of burnout (EE, D and PA) before and after the intervention; b)

Mean value and/or standard deviation of EE, D and PA before and after the intervention.

2.7 | Synthesis

For the systematic review, a descriptive analysis and classification of the data was carried out, to obtain the corresponding data table and categorize the results. When sufficient statistical data were available, three meta-analyses were performed of random effects, one for each dimension of burnout syndrome. Heterogeneity of the sample was assessed by the I^2 index. Review Manager 5.3 software for MacOS was used for all statistical analysis.

3 | RESULTS

3.1 | Characteristics of the studies included

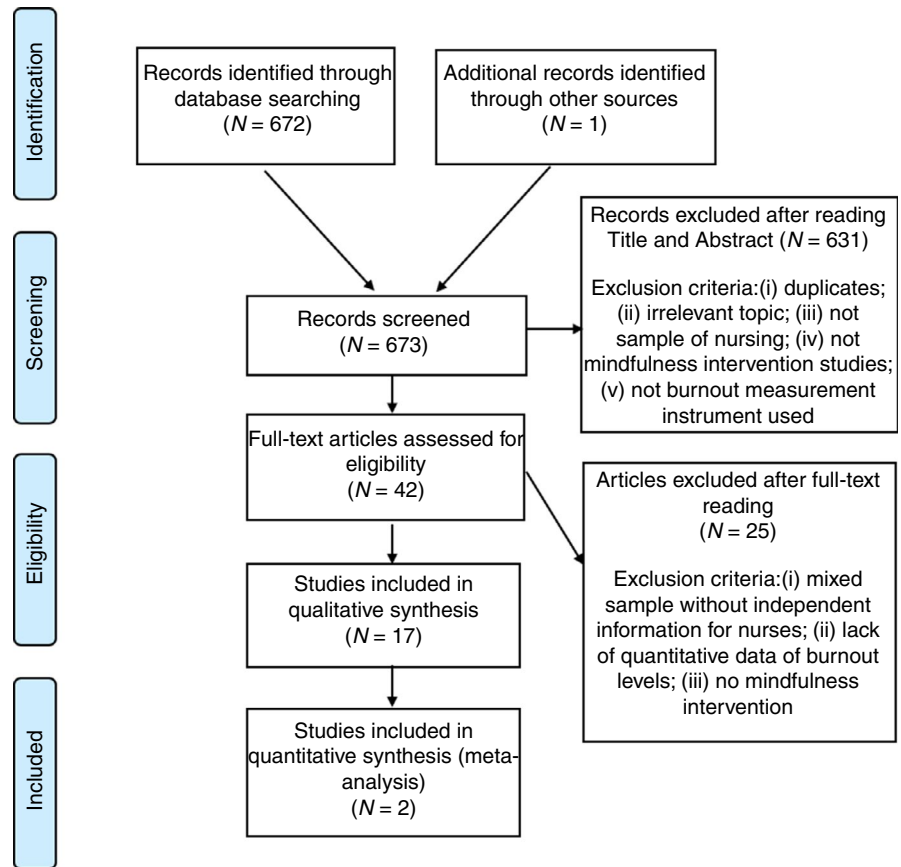
In total, 673 articles were found in the different databases. After reading the title and abstract of each one, 631 were excluded because they did not meet the inclusion criteria or because they were duplicates. After reading the complete text and performing a reverse and forward search, the final sample obtained for analysis was composed of 17 articles (Figure 1).

Of the 17 articles included in the final sample, eight referred to randomized controlled trial and nine described quasi-experimental studies. In nine of the papers, a mindfulness-based intervention was compared with the results for a control group and eight studies analysed the effects of a mindfulness programme over time, with follow-up ranging from 1 month (Craigie et al., 2016; Gauthier, Meyer, Greffe, & Gold, 2015) to 13 months (Watanabe et al., 2019). The main characteristics of all the studies included are shown in Table 1.

Most nurses taking part in these studies were women, with gender values ranging from 87% (Duarte & Pinto-Gouveia, 2016) to 100% (Bazarko, Cate, Azocar, & Kreitzer, 2013; Cohen-Katz et al., 2005; Hevezi, 2016; Mackenzie, Poulin, & Seidman-Carlson, 2006; Watanabe et al., 2019). The youngest participants were aged 29 years (Montanari, Bowe, Chesak, & Cutshall, 2018) and the oldest, 52 years (Bazarko et al., 2013). All the nurses described worked in hospitals, in medical or surgical areas ($N = 16$) or performing supervisory functions ($N = 1$). These data are shown in Table 1.

Fifteen of the articles were published after 2012 and eight referred to studies conducted in the USA. The remaining nine studies were conducted in Australia, Brazil, Canada, Iran, Ireland, Japan and Portugal. Nine studies used the Maslach Burnout Inventory questionnaire (MBI) to measure levels of burnout and seven used the Professional Quality of Life Scale questionnaire (ProQOL). One study (Bazarko et al., 2013) used only the Copenhagen Burnout Inventory questionnaire (CBI) and one (Ceravolo & Raines, 2018) used both CBI and ProQOL. Fourteen studies used the MBSR programme and the remaining three used the MBSCR version. The sample population was composed of 632 nurses.

FIGURE 1 Flow diagram [Colour figure can be viewed at wileyonlinelibrary.com]



3.2 | The effectiveness of mindfulness training in reducing burnout

In all cases, decreased levels of EE were reported following the mindfulness intervention. The sample populations initially presented medium-high levels of EE, ranging from 42–69% (Mealer et al., 2014; Montanari et al., 2018). Mackenzie et al. (2006) and Norouzinia, Ramezani, Khalili, Dehghani, and Sharifi (2017) also observed medium-high levels of EE, with mean scores of 26.38 and 29.27 points, respectively, for this dimension of burnout. The intervention achieved reductions in EE of 14.32–31% (to medium-low levels) (Mackenzie et al., 2006; Mealer et al., 2014; Montanari et al., 2018; Norouzinia et al., 2017; Poulin, Mackenzie, Soloway, & Karayolas, 2008).

Several authors observed medium-high initial levels of D, which after the intervention had decreased by 7–17.60% (Gauthier et al., 2015; Mealer et al., 2014; Norouzinia et al., 2017). However, other authors observed medium-low levels for this parameter, with no significant changes following the intervention (Cohen-Katz et al., 2005; Mackenzie et al., 2006; Montanari et al., 2018; Poulin et al., 2008; Watanabe et al., 2019).

Mealer et al. (2014) reported low levels of PA (77%) pre-intervention; however, other authors observed moderate levels for this parameter (Mackenzie et al., 2006; Norouzinia et al., 2017; Poulin et al., 2008). According to Mackenzie et al. (2006), Mealer et al. (2014) and Poulin et al. (2008), the mindfulness intervention produced mean

rises in PA ranging from 4.22% to 8%. In contrast, Montanari et al. (2018) reported that the moderate levels of PA in their sample remained unchanged after mindfulness training, thus corroborating the earlier findings of Norouzinia et al. (2017) and Watanabe et al. (2019). In the studies conducted by Craigie et al. (2016), Delaney (2018) and Dos Santos et al. (2016), the total burnout score decreased by 12–30% after nurses followed mindfulness-based programmes.

Among the studies included in our review, four analysed the influence of MBSR on specific hospital units. Two focused on oncology departments, where high levels of burnout have been reported (Duarte & Pinto-Gouveia, 2016; Hevezi, 2016) and found that the intervention reduced burnout to a moderate level. The same pattern of results was observed for nurses working in intensive care units (Gauthier et al., 2015; Mealer et al., 2014), where the mindfulness training reduced levels of burnout, enhanced satisfaction and fostered positive cognitive retraining (Duarte & Pinto-Gouveia, 2016).

3.3 | Duration and monitoring of mindfulness interventions

Six papers (Bazarko et al., 2013; Ceravolo & Raines, 2018; Cohen-Katz et al., 2005; Delaney, 2018; Norouzinia et al., 2017; Poulin et al., 2008) analysed outcomes achieved under the traditional MBSR approach, with a total duration of 8 weeks. The other studies of MBSR used shorter versions, lasting 6 weeks (Dos Santos et al.,

TABLE 1 Characteristics of the included studies

Authors, (year), Country	Participants (n, gender, mean age)	Design	Programme/Measures	Intervention Mean (SD)		Main outcomes	OCEBM
				Before	After		
Bazarko et al. (2013) USA	n = 36 nurses, 100% female, 52.2 years	Quasi-experimental	MBSR/CBI	CBI-P: 44.56 (19.74) CBI-W: 49.50 (19.43) CBI-C: 19.49 (18.05)	CBI-P: 2-month follow-up: 26.27 (17.48) 4-month follow-up: 24.88 (17.66) CBI-W: 2-month follow-up: 37.55 (15.83) 4-month follow-up: 32.24 (14.45) CBI-C: 2-month follow-up: 14.22 (16.12) 4-month follow-up: 13.48 (15.56)	Significant reduction in burnout levels maintained over time in nurses who followed the daily training routine MBSR intervention decreased perceived stress and burnout Improved physical, mental and social well-being and overall effectiveness with patient care	LE: 2c GR: B
Ceravolo & Raines (2018) USA	n = 13 nurse manager	Quasi-experimental	MBSR/ProQOLCBI	Risk for burnout: 3.4 (0.61) CBI-P: 4.2 (0.36) CBI-W: 4.0 (0.51) CBI-C: 2.1 (0.40)	Risk for burnout: 2.8 (0.51) Postintervention: CBI-P: 3.8 (0.44) CBI-W: 3.5 (0.54) CBI-C: 2.0 (0.48) 3-month follow-up: CBI-P: 4.0 (0.34) CBI-W: 3.6 (0.34) CBI-C: 2.2 (0.16)	MBSR decreased burnout risk CBI for personal burnout and work-related burnout: decreased mean score, thus, decreased potential for burnout At the 3-month follow-up, the score had returned to pre-intervention level	LE: 2c GR: B
Cohen-Katz et al. (2005) USA	n = 25 nurses, IG n = 12 CG n = 13, 100% female, 46 years	Randomized controlled trial	MBSR/MBI	-	EE: 8 weeks postintervention (p = .001); 3-month postintervention (p = .01) D: 8 weeks postintervention (p = .08), 3-month postintervention (p = .09) PA: 8 weeks postintervention (p = .076); 3-month postintervention (p = .31). p-values for this study obtained from independent Student's t test.	Major reduction in EE after intervention and at 3 months No significant changes in D pre-intervention to postintervention and follow-up PA levels increased after intervention but in posttreatment (3 months) the score was not maintained	LE: 1b GR: B
Craigie et al. (2016) Australia	n = 20 nurses, 95.2% female, 48.6 years	Quasi-experimental	MBSR/ProQOL	Burnout: 23.8 (4.81) ProQoL risk categories (variable burnout %) Low: 20 Average: 35 High: 45	Burnout: 20.0 (4.06) 1-month follow-up: 20.5 (4.12) ProQOL risk categories (variable burnout %) Low: 45 Average: 40 High: 15 1-month follow-up: Low: 35 Average: 50 High: 15	High levels of burnout before intervention The burnout score was 30% lower postintervention and the effect sizes for these changes were maintained at 1-month follow-up MBSR correlated negatively with burnout and negative emotions	LE: 2c GR: B

(Continues)

TABLE 1 (Continued)

Authors, (year), Country	Design	Participants (n, gender, mean age)	Programme/Measures	Intervention Mean (SD)		Main outcomes	OCEBM
				Before	After		
Delaney et al. (2018) Ireland	Quasi-experimental	n = 13 nurses, 100% female, 44 years	MBSR/ProQOL	Burnout: 29.07 (4.34)	Burnout: 23.07 (3.35)	Mindfulness correlated negatively with burnout Positive correlation between mindfulness and resilience The level of burnout was 21% lower after the intervention	LE: 3b GR: B
Dos Santos et al. (2016) Brazil	Quasi-experimental	n = 13 nurses, 92.3% female, 47.38 years	MBSR/MBI	MBI: 50.23 (5.59)	MBI: 38.23 (5.25) After 6 weeks; 37.85 (5.20)	Mindfulness training improved physical and psychological parameters and had a positive effect on burnout prevention MBSR is a positive coping style, protective against burnout and decreasing levels of burnout, stress and depression Changes were maintained at 6 weeks postintervention	LE: 2c GR: B
Duarte and Pinto-Gouveia (2016) Portugal	Randomized controlled trial	n = 48 oncology nurses, IG n = 29 CG n = 19, 87.15% female, 40.50 years	MBSR/ProQOL	Burnout IG: 26.57 (6.09) CG: 24.74 (4.64)	Burnout CG: 23.89 (4.82) IG: 24.29 (5.09)	MBSR is related to the decrease in stress levels and burnout The life satisfaction score was higher postmindfulness intervention Following the intervention, 75% of nurses reported a changed lifestyle, and that the effects persisted in the medium-long term	LE: 1b GR: A
Gauthier et al. (2015) USA	Quasi-experimental	n = 38 paediatric ICU nurses, 93.3% female, 40 years	MBSR/MBI	EE: 31.49 (9.85) D: 13.33 (5.84) PA: 42.29 (7.43)	-	Positive correlations between mindfulness and self-compassion EE correlated negatively with mindfulness programme after intervention and during follow-up D was also negatively correlated with MBSR, but without significant correlation in the follow-up PA correlated positively with mindfulness after intervention, but decreased in the follow-up (p = .03) p-value obtained from Wilcoxon signed rank test. Negative correlation between job satisfaction and mindfulness	LE: 2c GR: B

(Continues)

TABLE 1 (Continued)

Authors, (year), Country	Design	Participants (n, gender, mean age)	Programme/Measures	Intervention Mean (SD)		Main outcomes	OCEBM
				Before	After		
Hevezi (2016) USA	Quasi-experimental	n = 15 oncology nurses, 100% female	MBSR/ProQOL	Burnout: 26.4	Burnout: 22.2 mean difference = 4.13, (95%IC: 1.66–6.60)	Decrease in burnout levels after 4 weeks of intervention Patient safety correlated positively with MBSR MBSR also correlated negatively with sick leave	LE: 3b GR: B
Horner et al. (2014) USA	Quasi-experimental	n = 43 nurses	MBSR/ProQOL	Burnout: IG: 46.20 CG: 46.05	Burnout: IG: 45.71 CG: 45.00	No significant improvement in burnout levels after MBSR More effective communication with the patient after mindfulness training	LE: 3b GR: B
Mackenzie et al. (2006) Canada	Randomized controlled trial	n = 30 geriatric nurses, IG n = 16, 94% female, 48.62 years; CG n = 14, 100% female, 44.78 years	MBSR/MBI	EE: CG: 16.15 (8.76) IG: 26.38 (10.42) D: CG: 3.42 (5.12) IG: 4.75 (4.49) PA: CG: 33.42 (7.74) IG: 37.38 (5.86)	EE: CG: 17.23 (10.62) IG: 20.67 (10.39) D: CG: 5.00 (5.89) IG: 4.80 (4.43) PA: CG: 33.33 (6.77) IG: 41.60 (3.25)	Intervention group presented reduced EE, but no significant improvements in D Mindfulness was positively associated with PA Significant findings in MBSR, with increased life satisfaction and well-being and reduced stress and burnout	LE: 1b GR: A
Mealer et al. (2014) USA	Randomized controlled trial	n = 27 ICU nurses, IG n = 13, IC n = 14, 89% female	MBSR/MBI	M (25th–75th quartiles) EE: CG: 10.0 (7–15) IG: 9 (5–16) D: CG: 12 (7–13) IG: 12 (7–13) PA: CG: 12 (11–13) IG: 11 (10–13)	M (25th–75th quartiles) EE: CG: 25.0 (13–28) IG: 13.0 (8–28) D: CG: 10 (7–15) IG: 9 (5–16) PA: CG: 32 (28–40) IG: 37 (30–42)	Intervention group presented a significant reduction in D and increased PA MBSR was positively related to cognitive reappraisal, incorporating emotional mechanisms against negative events	LE: 1b GR: A

(Continues)

TABLE 1 (Continued)

Authors, (year), Country	Design	Participants (n, gender, mean age)	Programme/ Measures	Intervention Mean (SD)		Main outcomes	OCEBM
				Before	After		
Montanari et al. (2018) USA	Quasi-experimental	n = 50 nurses, 92.31% female 29.9 years	MBSR/ MBI	EE: 0-16:26% 17-26:42% >26:32% Total: 23.38 (8.71) D: 0-6:48% 7-12:28% >13:24% Total: 8.02 (6.36) PA: 0-31:14% 32-38:38% >39:48% Total: 37.10(5.67)	EE: 0-16:40.63% 17-26:34.38% >26:25% Total: 20.03 (9.10) D: 0-6:46.88% 7-12:43.75% >13:9.38% Total: 7.28 (5.24) PA: 0-31:15.63% 32-38:40.63% >39:43.75% Total: 37.19 (6.11)	MBSR reduced EE and slightly reduced D PA scores remained unchanged 75% of nurses reported benefits from participation in the mindfulness programme, with a positive appraisal after MBSR Loss of sample due to lack of follow-up	LE: 3b GR: B
Norouzinia et al. (2017) Iran	Randomized controlled trial	n = 60 nurses, IG n = 30 CG n = 30, <30 years: 26.65% 31-40 years: 56.65% 41-50 years: 16.65%	MBSR/MBI	EE: IG: 29.27 (9.5) CG: 29.77 (7.6) D: IG: 11.53 (5.9) CG: 11.67 (4.7) PA: IG: 36.47 (8.40) CG: 37.90 (5.50)	EE: IG: 25.47 (9.40) CG: 30.37 (7.90) D: IG: 9.50 (5.60) CG: 12.43 (4.80) PA: IG: 34.33 (8.30) CG: 38.33 (6.0)	EE and D decreased PA remained stable	LE: 1b GR: A
Poulin et al. (2008) Canada	Randomized controlled trial	n = 30 geriatric nurses, IG n = 16, 93.8% female, 48.6 years; CG n = 14, 100% female, 44.8 years	MBSR/MBI	EE: IG: 26.4 (10.4) CG: 16.8 (8.7) D: IG: 4.8 (4.5) CG: 3.3 (4.9) PA: IG: 38.2 (5.9) CG: 34.3 (8.1)	EE: IG: 20.70 (10.4) CG: 18.3 (10.9) D: IG: 4.8 (4.3) CG: 4.8 (5.7) PA: IG: 41.6 (3.2) CG: 34.2 (7.2)	Significant reduction in EE and slight increase in PA after intervention The differences in burnout levels between IG-CG were not significant, except for a reduction in EE	LE: 1b GR: A

(Continues)

TABLE 1 (Continued)

Authors, (year), Country	Design	Participants (n, gender, mean age)	Programme/Measures	Intervention Mean (SD)		Main outcomes	OCEBM
				Before	After		
Slatyer et al. (2018) Australia	Randomized controlled trial	n = 91 nurses, IG n = 65 CG n = 26, 45.71 years	MBSR/ ProQOL	Burnout: CG: 23.35 (5.97) IG: 23.75 (5.84)	Burnout: CG: 23.38 (5.57) IG: 21.65 (5.12) IG 6-month follow-up: 21.49 (5.89)	MBSR intervention significantly reduced burnout and the changes persisted at the 6-month follow-up A brief intervention of 11.5 hr duration maintained the gains over time with significantly lower scores for burnout There is a positive association between mindfulness and job satisfaction	LE: 1b GR: A
Watanabe et al. (2019) Japan	Randomized controlled trial	n = 80 nurses IG n = 40 CG n = 40 100% female	MBSR/MBI	EE: IG: 22.6 (10.9) CG: 20.5 (11.4) D: IG: 7.3 (4.6) CG: 6.8 (5.2) PA: IG: 23.7 (8) CG: 19.8 (8.3)	13-weeks /26-weeks/ 52-weeks follow-up: EE IG versus CG: 1.60 (95% IC: -2.56-5.76) p = .45/ -2.02 (95% IC: -6.2-2.15) p = .34/ -0.32 (95%IC: -4.88-4.51) p = .88 D IG versus CG: 2.36 (95%IC: -0.08-4.78) p = .05/ 1.38 (95%IC: -1.06-3.82) p = .27/ 1.23 (95%IC: -1.22-3.67) p=.32 PA IG versus CG: 2.16 (95%IC: -1.02-5.34) p = .18/ 0.71 (95%IC: -2.49-3.90) p = .66/ 2.45 (95%IC: -1.76-5.65) p = .13 p-values for this study obtained from independent Student's t test.	No significant differences between groups	LE: 1b GR: A

Abbreviations: CBI, Copenhagen Burnout Inventory; CBI-C, Copenhagen Burnout Inventory Client Subscale; CBI-P, Copenhagen Burnout Inventory Personal-Related Subscale; CBI-W, Copenhagen Burnout Inventory Work-Related Subscale; CG, Control group; D, Depersonalization; EE, Emotional exhaustion; GR, Grade of recommendation; ICU, Intensive Care Unit; IG, Intervention group; LE, Level of evidence; MBI, Maslach Burnout Inventory; MBSR, Mindful self-care and resiliency; MBSR, Mindfulness-based stress reduction; OCEBM, Levels of evidence of the Oxford Centre for Evidence-Based Medicine; PA, Personal accomplishment; ProQOL, Professional Quality of Life Scale.

2016; Duarte & Pinto-Gouveia, 2016; Montanari et al., 2018) or 4 weeks (Craigie et al., 2016; Gauthier et al., 2015; Hevezi, 2016; Mackenzie et al., 2006). Several authors (Horner, Piercy, Eure, & Woodard, 2014; Mealer et al., 2014) used training programmes of 12 and 10 weeks, respectively, whereas Slatyer et al. (2018) used one lasting only 3 weeks. Brief interventions (with a duration of less than 8 weeks) were shown to be equally effective in reducing burnout scores. The characteristics of each mindfulness intervention are detailed in Tables 2 and 3.

Several authors (Craigie et al., 2016; Dos Santos et al., 2016; Slatyer et al., 2018) showed that a brief intervention can be effective, reducing burnout and maintaining the positive outcome for 6 months. However, Cohen-Katz et al. (2005) found that 3 months after an MBSR programme, the changes obtained only persisted in one of the burnout dimensions (EE), whereas Ceravolo and Raines (2018) recorded an increase in the burnout score during the three subsequent months. Gauthier et al. (2015) observed a negative relationship between the EE dimension of burnout and MBSR, immediately following the intervention and at the 1-month follow-up, a similarly negative relationship for D immediately after the

intervention and a positive one for PA. On the other hand, Bazarko et al. (2013) measured a stable average score, for all dimensions of burnout, after 2 and 4 months. Follow-up studies of nurses' adherence to the programme recorded rates of 60–100% in the short term (Craigie et al., 2016; Horner et al., 2014), but in a study that followed up outcomes over a longer period over time, the adherence fell to 12.8% (Duarte & Pinto-Gouveia, 2016).

3.4 | Meta-analysis of the effect size of the mindfulness intervention in reducing the impact of burnout

Two of the studies of mindfulness-based interventions (Mackenzie et al., 2006; Norouzinia et al., 2017) provided the data necessary to perform a statistical analysis of possible bias (see Figure 2). The total sample of nurses was $N = 46$ for the intervention group and $N = 44$ for the control group.

Regarding heterogeneity, the I^2 results were 71% for EE, 26% for D and 95% for PA.

TABLE 2 Overview of mindfulness-based intervention

Authors (year)	Length	Duration of intervention	Attrition rates	Follow-up
Bazarko et al. (2013)	8 weeks	Full-day retreat + 9 hr with instructor + 25–30 min (home practice)	12.2%	2–4 months
Ceravolo and Raines (2018)	8 weeks	60-min weekly (group)	7.69%	3 months
Cohen-Katz et al. (2005)	8 weeks	2.5 hr/week + 6-hr daylong retreat + 6 days/week (home practice)	8%	3 months
Craigie et al. (2016)	4 weeks	1 educational workshop day + 12 hr (home practice)	0%	1 month
Delaney (2018)	8 weeks	2.5 hr/week + daylong retreat + 1 meditation session/week	27.7%	–
Dos Santos et al. (2016)	6 weeks	24 sessions, 60 min/session	0%	6 weeks
Duarte and Pinto-Gouveia (2016)	6 weeks	2 hr/week (group) + 15 min/day (home practice)	Baseline: 4.16% 3-month follow-up: 87.5%	–
Gauthier et al. (2015)	4 weeks	30 min/day (group) + 10 min/day (home practice)	16%	1 month
Hevezi (2016)	4 weeks	1 educational workshop instruction + 5 sessions/week (home practice)	6.6%	–
Horner et al. (2014)	10 weeks	30 min/day	40%	–
Mackenzie et al. (2006)	4 weeks	30 min/day (group) + 10 min/day, 5 days/week (home practice)	–	–
Mealer et al. (2014)	12 weeks	2 educational workshop day + 15 min/day, 3 days/week (home practice) + aerobic exercise 30–45 min/day, 3 days/week + 1 therapy session in ICU ward	34%	–
Montanari et al. (2018)	6 weeks	9–20 min/day	36%	–
Norouzinia et al. (2017)	8 weeks	–	–	–
Poulin et al. (2008)	8 weeks	30 min/day + 15–20 min/day (home practice)	–	–
Slatyer et al. (2018)	3 weeks	11.50 hr + 1 educational workshop	35.38%	6 months
Watanabe et al. (2019)	3 weeks	7 workshop hours + 4 sessions/week with instructor (30 min/session)	0%	52 weeks

TABLE 3 Coping strategies in MSBR programmes

Authors (year)	Cognitive training therapy	Meditation/Mindfulness instruction	Body scan	Stretching/Exercise/Yoga	Breathing exercises	Communication skills (oral or written)	Aromatherapy/music
Bazarko et al. (2013)		x		x	x	x	
Ceravolo and Raines (2018)		x	x		x	x	x
Cohen-Katz et al. (2005)	x	x	x				
Dos Santos et al. (2016)		x	x		x		x
Duarte and Pinto-Gouveia (2016)		x		x	x		
Gauthier et al. (2015)	x	x	x		x		
Hevezi (2016)		x			x		
Horner et al. (2014)		x			x		
Mackenzie et al. (2006)	x	x	x	x	x		
Mealer et al. (2014)	x	x	x	x		x	
Montanari et al. (2018)		x			x	x	x
Norouzinia et al. (2017)		x	x	x	x		
Poulin et al. (2008)		x	x	x	x		
Watanabe et al. (2019)	x	x	x		x		

For EE, the difference in the means was 1.32 (95% CI: -9.41-6.78), with lower mean values in the intervention group. For D, the difference in the means was 1.91 (95% CI: -4.50-0.68) in favour of the intervention group. Finally, for PA the difference in the means was 2.12 (95% CI: -9.91-14.14), in favour of the intervention group. Figure 3 shows the forest plot for each dimension.

4 | DISCUSSION

The aim of the systematic review and meta-analysis presented in this paper was to determine the effectiveness of mindfulness interventions in reducing levels of burnout among nurses. Before the intervention, the nurses in each of the study populations considered showed high levels of burnout. In every case, the mindfulness programme produced a reduction in burnout among these nurses, to a degree comparable with that reported in similar studies focused on physicians and other healthcare personnel (Braun et al., 2019;

Fortney, Luchterband, Zakletskaia, Zgierska, & Rakel, 2013). It has been suggested that this type of guided intervention may enhance self-awareness and promote motivation towards and acceptance of behavioural change (Reddy & Roy, 2019; Westphal et al., 2015).

Regarding the individual dimensions of burnout, EE scores were reduced by the intervention (Duchemin, Steinberg, Marks, Vanover, & Klatt, 2015; Steinberg, Klatt, & Duchemin, 2017) and those for PA increased. However, no significant changes were observed in D (Sallon, Katz-Eisner, Yaffe, & Bdoah-Abram, 2017; Verweij, van Ravesteijn, van Hooff, Lagro-Janssen, & Speckens, 2018).

Regarding the duration of the benefits obtained, some authors observed no significant changes or even reported an increase in

the postintervention burnout score. This outcome may be due to low adherence by the nurses taking part in the studies, since regular training is known to maintain low levels of burnout. However, the studies in question (Duarte & Pinto-Gouveia, 2016; Wong, Teng, Chee, Doshi, & Lim, 2018) reported high dropout rates, a pattern that has been repeated in other studies of healthcare workers (De Vibe et al., 2018; Shapiro, Astin, Bishop, & Cordova, 2005). Nevertheless, in line with some of our review findings, other authors have observed persistent improvements, lasting up to 12 months postintervention, with a reduction of 8.2% in burnout scores (Askey-Jones, 2018; Fortney et al., 2013; Lebares et al., 2018; Martín-Asuero & García-Banda, 2010; Steinberg et al., 2017). In this respect, it should be taken into account that in providing a mindfulness-based intervention for nursing staff, with a commitment of exclusive dedication, an extended duration of 8 weeks may give rise to serious practical difficulties and therefore some studies have used shorter versions of the programme, finding them to be equally effective (Brady, O'Connor, Burgermeister, & Hanson, 2012; Lebares et al., 2018).

In hospital services where nurses may be especially vulnerable to burnout, such as intensive care units and oncology, mindfulness intervention is considered an effective instrument (Duarte & Pinto-Gouveia, 2016; Podgurski, Greco, Croom, Arnold, & Claxton, 2019). However, some studies of workers in these departments have observed no changes in burnout levels, or improvements only in EE but not in D or PA, possibly due to the high initial levels of burnout experienced (Moody et al., 2013). In this respect, too, a negative correlation has been reported between work satisfaction and mindfulness training in paediatric intensive care units. This may be due to conflicts between the nurse's role in the organization and his/her personal goal of providing fully care-focused attention (Gauthier et al., 2015).

The regulation of burnout levels has been associated with adherence to mindfulness training and with perseverance, which are considered to be complementary forces (Sallon et al., 2017). Thus, studies have highlighted the long-term beneficial effects that these resources have produced in individuals suffering from pathologies such as fibromyalgia (Andrés-Rodríguez et al., 2019), cancer (Zhang, Zhao, & Zheng, 2019), mental disorders (Hedman-Lagerlöf,

Hedman-Lagerlöf, & Öst, 2018; Rupp, Jürgens, Doebler andor, & Buhlmann, 2019), stress (Gawrysiak et al., 2018) and insomnia (Wang et al., 2018).

Mindfulness training for nurses also enhances positive cognitive retraining (Luberto et al., 2017), an outcome that has been corroborated by studies of brain images, which have shown that mindfulness training produces increases in brain activity, associated with positive moods and the regulation of emotions (Guillaumie, Boiral, & Champagne, 2017; Huang et al., 2019; Young et al., 2018). Some researchers have even observed improvements in reactions to posttraumatic situations (Meyer et al., 2018; O'Mahony, Gerhart, Grosse, Abrams, & Levy, 2016) and even positive effects on stress biomarkers such as reduction in cortisol salivary cortisol levels (Veiga et al., 2019).

Although mindfulness interventions have shown effectiveness in reducing burnout syndrome among nurses, there is still a limitation in knowing for which aspect is more effective like, for example, improving patient care, develop of enhanced awareness, sense of pleasure of the moment, changes in the personality of the conductor or increased curiosity and hope for the new (Hemanth & Fisher, 2015; Hunter, 2019; Irving et al., 2014). In addition, it would be advisable to take into account other external variables related to the work environment, such as lack of organization, resources and staff, heavy workloads or work shift, that may harm nurses' physical and mental well-being and that are related directly to the organization's management policy (Basar & Basim, 2016; Weigl et al., 2016). Thus, it would be important to implement mindfulness training in each work area, taking into account these factors to evaluate the effectiveness of this training under the same conditions to explain these limitations.

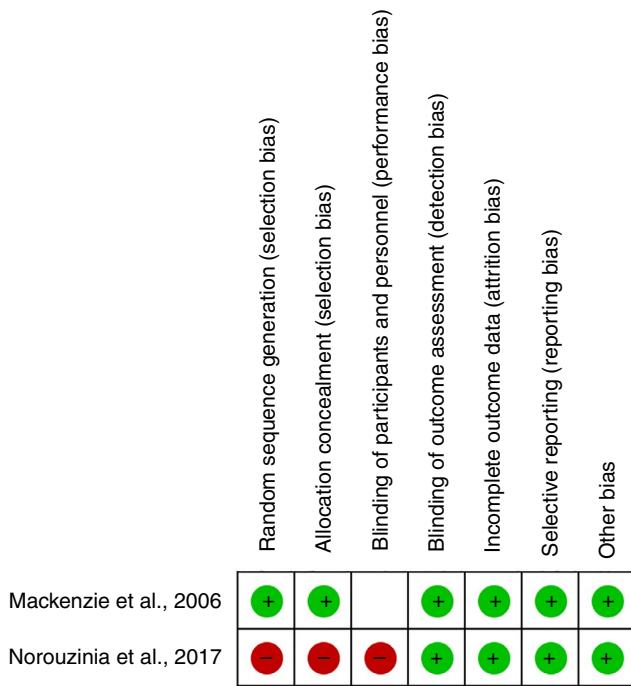


FIGURE 2 Risk of bias summary [Colour figure can be viewed at wileyonlinelibrary.com]

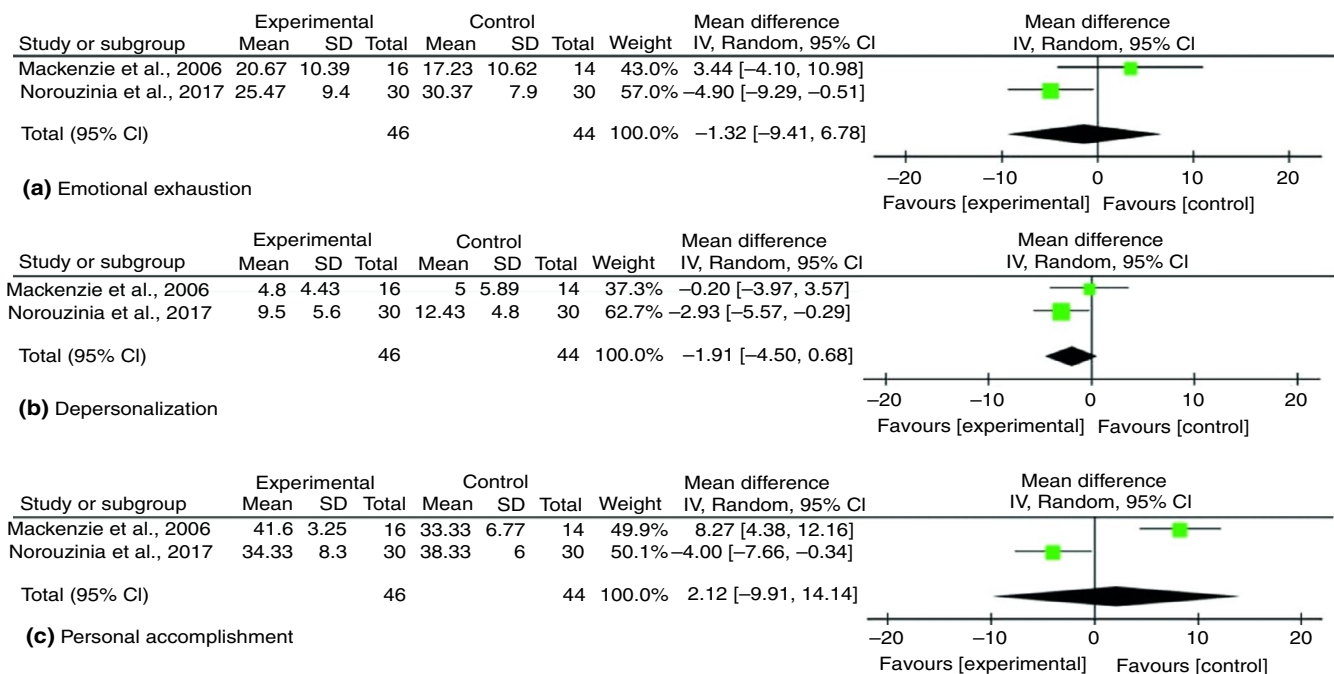


FIGURE 3 Forest plot for each dimension [Colour figure can be viewed at wileyonlinelibrary.com]

4.1 | Limitations

The present review is subjected to various limitations. In the first place, very few controlled randomized clinical trials have been conducted to compare the effectiveness of different mindfulness interventions and so only limited data are available for this meta-analysis. Therefore, the results obtained should be interpreted with caution. Future research is needed with a larger body of randomized clinical trials, to obtain reliable pre- and postintervention scores for the control and intervention groups.

Furthermore, many studies, despite using the mindfulness description, have implemented variations such as reduced session times or the combination of several treatment approaches. Hence, although their stated research aim was to analyse the influence of mindfulness training on burnout syndrome, the heterogeneity of approaches adopted may have affected our inter-study findings.

Another question is that of the limited duration of the intervention and of the time allowed for follow-up. Finally, the fact that the sample population was mainly constituted of female nurses may have biased the results obtained. In consequence, long-term studies should be conducted, with a control group and larger samples, to better understand the effects of mindfulness training on nurses, both male and female.

5 | CONCLUSION

Most studies of mindfulness intervention programmes have highlighted their effectiveness in reducing burnout among nurses. The two meta-analyses considered corroborate these positive results. The remaining studies addressed in our review are quasi-experimental in nature, lacking randomization and higher quality evidence should be obtained and analysed in future research.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (<http://www.icmje.org/recommendations/>): Substantial contributions to conception and design, acquisition of data, analysis and interpretation of data. Drafting the manuscript and revising it critically for important intellectual content.

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