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Effectiveness of interventions on occupational stress, health and well-being, performance, and job satisfaction for midwives: A systematic mixed methods review

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ABSTRACT

Background: Work-related stress is high in midwifery with negative implications for midwives' health and performance. This systematic review therefore examined which stress management interventions (SMIs) are most effective at reducing occupational stress and improving midwives' health and well-being, performance, and job satisfaction.
Methods: A systematic review included studies if they were: investigating midwives or student midwives; examining an individual- or organisation-level intervention; reporting the intervention effects on at least one outcome (e.g., job performance); peer-reviewed; and published in English. Methodological quality was assessed using the Mixed Methods Appraisal Tool. A narrative synthesis was conducted and data were presented by SMI level (i.e., individual vs. organisation) and modality type (e.g., mindfulness, care model). Sum codes were used to compare the effects of individual- and organisation-level SMIs on outcomes.
Findings: From 2605 studies identified, 30 were eligible (18 individual- and 12 organisation-level SMIs). Eight studies were deemed low quality. While individual- and organisation-level SMIs were equally effective in improving job satisfaction and performance, there was a trend for organisation-level SMIs more effectively reducing work stress and improving health and well-being. Specific individual- (i.e., mindfulness, simulation training) and organisation-level (i.e., reflective groups, midwifery care models) SMIs were most beneficial.
Conclusion: It is recommended that health practitioners and policy makers implement interventions that target both individual- and organisation-levels to optimally support midwives' work stress, health, well-being, and performance. Notwithstanding these findings and implications, some studies had poor methodological quality; thus, future research should better follow intervention reporting guidelines.

Statement of Significance

Problem or Issue

Work-related stress is high in midwifery, with many leaving the profession.

What is Already Known

Individual-level stress management interventions may improve the health and wellbeing of midwives; however, evidence is limited and of low quality.

What this Paper Adds

Stress management interventions for midwives have not been systematically reviewed since 2017 and this is the first review to include organisation-level interventions. As a result, the findings not only provide updated evidence for most beneficial interventions by modality type, but also a useful comparison of individual versus organisation-level interventions on important outcomes.

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Introduction

Self-reported work-related stress in registered nurses and midwives in England is on the rise, growing from 49% in 2020 to 53% in 2021 [1,2]. Focusing on midwives specifically, nearly 40% report burnout and 50% feel unwell because of work-related stress [3]. Furthermore, levels of stress, anxiety, and depression are significantly higher in UK midwives than the general population, and higher than other countries [4,5]. Midwifery stress and compromised well-being has not only led to a chronic shortage of midwives in England, with ~70% considering leaving the profession, but also compromises the quality of care of women and their babies [5,6]. There is, therefore, a clear need to identify stress management interventions (SMIs) for the midwifery profession, particularly as few midwives (38%) believe their organisation takes positive action on health and wellbeing [1].

While some interventions exist for managing stress in the healthcare domain [e.g., in midwifery, 7], there have been calls for better designed interventions that are more strategically planned and can ultimately demonstrate better and more sustained effectiveness [8]. SMIs can be targeted at the individual- or organisation-level, or a combination of these levels. Individual-level interventions focus on helping employees to develop skills to manage, cope with, and/or reduce stress, whereas organisation-level interventions focus more on making systemic changes to workplace practices and tackling sources of stress (or stressors) that either negatively impact all midwives or a specific group [e.g., students; 9,10]. Evidence hints that organisation-level interventions may be more effective in addressing work-related stress than individual-level interventions due to their greater scope and sustainability [11,12]. However, to date, few reviews have compared the effectiveness of these SMI types.

Two systematic reviews have been recently conducted to evaluate the effectiveness of SMIs in combatting occupational stress among intensive and critical care nurses [13] and nurses in general [14]. For intensive and critical care nurses, cognitive behavioural skills training and mindfulness were found to be the most effective at reducing occupational stress [13]. For general nurses, a range of interventions (e.g., cognitive-behavioural therapy, web-based stress management, and massage therapy) showed promise in reducing occupational stress, but the authors concluded that there was a lack of well-designed randomised controlled trials to confirm intervention effectiveness [14]. To date, there has only been one review of interventions designed to help midwives in work-related psychological distress [15]. This review found few eligible studies, with only six studies included of relatively low to medium quality (i.e., small sample sizes, no control group). The authors therefore concluded that there was a lack of evidence-based interventions to support midwives in distress. As this review's inclusion criteria was midwives in work-related distress (rather than work stress as a whole), the findings were restricted to individual-level and tertiary (or reactive) type interventions such as mindfulness, resilience workshops, and clinical supervision. Each intervention type was found to have some positive outcomes for midwives [e.g., clinical supervision reduced stress, burnout, and compassion fatigue; 16]. However, no organisation-level interventions were included in the review, and the emphasis on tertiary style interventions [i.e., those that rehabilitate and maximise functioning for those who are already experiencing or suffering from psychological ill-health, 17] meant that few primary or secondary style interventions [i.e., those that aim to prevent the causal factors of stress or aim to reduce the severity or duration of symptoms, 17] were included. In addition, the review [15] only included studies published until 2016, and so an updated and extended review is required that summarises the effects of individual- and organisation-level SMIs on a range of key outcomes among midwives.

Objectives

This systematic review examined the effects of individual- and organisation-level SMIs on occupational stress, health and well-being, performance, and job satisfaction among midwives and student midwives. This review included studies sampling all midwives and student midwives, and was not restricted to studies sampling midwives experiencing work-related distress [15]. As a result, it is envisaged that the results of this comprehensive review will provide direction when developing new interventions, or improving current interventions, designed to address occupational stress and its deleterious effects in midwifery.

Methods

Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) recommendations were followed in conducting and reporting this review [18, see Supplementary materials], and Population, Intervention, Control, and Outcomes (PICO) criteria were used in defining the research question (i.e., What interventions are effective at reducing stress and improving health and well-being, performance, and/or job satisfaction among midwives and student midwives?). The review protocol was pre-registered on PROSPERO (CRD42021240203).

Eligibility criteria

Studies published between June 2000 and June 2023 were considered, as this time is likely to include more contemporary practice issues in the workplace [15]. All studies met the following inclusion criteria: (a) sampled midwives or student midwives, (b) investigated an individual- or organisation-level SMI, (c) reported the effects of an SMI on at least one outcome (i.e., work stress, health and well-being, performance, or job satisfaction), (d) peer-reviewed, and (e) published in English. Review papers were excluded.

Information sources

Searching was conducted using four electronic databases: PubMed, Web of Science, APA PsychNet, and Embase.

Search strategy

An initial broad scope of the literature was conducted in relation to occupational stress and midwives to help formulate a search strategy. Text words contained in the abstract and key index terms were identified in significant papers (e.g., burnout, well-being). Recurring phrases were recorded and applied to the search. Search terms and the approach used for the database searches were independently checked by one university librarian and two additional reviewers. Search terms fell into three broad categories: (1) midwifery, (2) occupational stress, and (3) interventions (see Fig. 1). The Boolean operators "AND" and "OR" were also used. In addition, the truncation operator "*" was used for extracting relevant research articles.

Study selection

One reviewer undertook the database searches and exported all retrieved articles into Endnote, removing all duplicates. Next, the reviewer screened titles and abstracts to identify eligible studies. Two independent reviewers then assessed the full-text of eligible studies for inclusion. A third reviewer discussed and assessed any studies where there was disagreement or indecision about inclusion until consensus was reached. Finally, backward searching was conducted by reviewing the reference lists of included studies and forward searching, aided by the 'cited by' function in Google Scholar, was conducted by reviewing articles that cited included studies.

Midwifery:

Midwives OR midwif*

Occupational Stress:

(Stress* OR burnout OR Pressure* OR wellbeing OR "well being" OR well-being OR compassion fatigue OR strain OR resilience OR coping OR emotion*) AND (work OR occupation* OR job OR profession* OR employment)

Interventions:

"Stress management" OR "Anxiety Management" OR "Coping Strateg*" OR "Coping Skill*" OR "Occupational Programme" OR "Occupational Program*" OR Intervention* OR "Behaviour modification" OR "Cognitive technique*" OR "Coping Behaviour*" OR "Employee Assistance Programme*" OR "Employee Assistance Program*" OR "Workplace intervention*" OR "Relaxation techniques" OR "Behaviour therapy" OR "Behavior therapy" OR "mind body techniques" OR "Alternative therapies" OR counselling, OR counseling, OR therapy, OR therapies OR mindfulness OR evaluation OR "Integrative therapies" OR yoga or massage OR meditation or "cognitive behavioural therapy" OR "cognitive behavioral therapy" OR "CBT" OR "psychological intervention"

Fig. 1. : Search strategy.

Study records

Data collection process and data items

One reviewer extracted the data from studies using a Microsoft Excel spreadsheet based on the following items: author, publication year, study population type and size, study design, description of the intervention and its timeframe, data collection instruments, outcome measures and their timeframe, and study findings. A seconder reviewer independently extracted data from a random 10% of the studies. Any discrepancies were resolved by discussion with a third reviewer and a consensus was reached.

Only outcomes that were considered relevant to the review question were extracted and reported (i.e., occupational stress, health and well-being, job performance and satisfaction). Occupational stress included measures related to stress, burnout, coping, and resilience. The outcome category of health and well-being included measures of physical health, mental health, and well-being. The outcome category of job satisfaction and performance included measures of professional and personal satisfaction, attitudes towards work, work engagement, and job performance.

Synthesis of results

A narrative synthesis of included studies was used to enable a textual summary and critique of research that has used qualitative, quantitative, or mixed methods designs [19]. A meta-analysis was not conducted because of the lack of effect size reporting in the studies and because of the wide variety of study designs, methods, interventions, and outcomes used across studies [20]. The summaries of the characteristics and findings of the studies were collated into tables, separated by SMI level (i.e., individual- vs organisation-level) and modality type (e.g., mindfulness, reflective groups). The sum code classification system [21], which focuses on the percentage of studies that demonstrate a positive, negative, or null effect, was used to summarise the effects of SMIs on occupational stress, health and well-being, and job performance and satisfaction. Codes of '0', '?', and '+' indicate that 0–33%, 34–59%, and 60–100% of the studies supported the benefits of an intervention, respectively. Codes are doubled when four or more studies supported an intervention's benefits (i.e., '00', '??' or '++'). These sum codes not only give an indication of whether an intervention benefitted an outcome or not, but also highlighted the number of studies that had been conducted. As such, the codes help elucidate the likely effectiveness of each SMI and gaps for future research.

Quality appraisal

Two reviewers assessed the quality of included studies using the Mixed Methods Appraisal Tool [MMAT; [22]], with a third reviewer assessing any indecision or disagreements. Two screening questions (i.e., whether the article has clear research questions and whether the collected data addresses the research questions) were used to determine the feasibility of using the MMAT. If the answer was "Yes" to both questions, each article was appraised with five criteria according to its study design (see supplementary materials).

Results

Study selection

Fig. 2 displays the screening results. From 2605 studies, 70 were screened at full-text level by two reviewers. A third reviewer discussed and assessed 18 studies where there was disagreement and a consensus was reached. A final total of 30 studies met the inclusion criteria.

Quality appraisal of included studies

Information obtained from the MMAT helped two reviewers rate studies' methodological quality. A third reviewer discussed and assessed four studies where there was disagreement and a consensus was reached. Studies were assigned an overall quality score ranging from zero to five based on methodological quality criteria from the MMAT (see Table 1 and Supplementary material). No studies were excluded due to their quality score because the review aimed to provide a full, comprehensive synthesis of all literature on SMIs among midwives and to offer recommendations to strengthen future research (e.g., better control for confounding variables). MMAT findings identified that five studies scored 5/5, eight studies scored 4/5, nine studies scored 3/5, three studies scored 2/5, three studies scored 1/5, and two studies scored 0/5. All studies that received 5/5 used qualitative methods only [23-27]. Eight studies that scored 2/5 or less were considered low quality [16,26,28-33].

Study design

More than half of the studies used quantitative methods (60%; n = 18). Of these 18 studies, 78% (n = 14) used a pre-post intervention design [7,16,29-31,34,36-38,48,50], with only 29% (n = 4) of these 14 studies including a control or comparison group [16,29,30,38]. Of the remaining four quantitative studies, 50% (n = 2) employed a comparative design [42,43] and 50% (n = 2) used a cohort design [28,33]. Seven (23%) studies used mixed methods, all of which used a pre-post intervention design [27,32,35,39,44,46,48], with only one (14%; n = 1) including a comparison group [36]. The remaining mixed methods study (14%; n = 1) used a cohort design [48]. Finally, 17% (n = 5) of studies used qualitative methods [23-26,47].

Intervention types

Overall, 60% (n = 18) of the 30 studies examined the effects of an individual-level SMI (Table 2), while 40% (n = 12) investigated the impact of an organisation-level SMI (Table 3). No studies contained an SMI targeting both levels. Of the 18 studies examining individual-level SMIs, 33% (n = 6) examined a mindfulness-based intervention [7,23,24,28,34,35]; 22% (n = 4) investigated a stress education or management intervention [29,36-38]; 11% (n = 2) investigated relaxation training [e.g., Qigong; 32, 33]; and 11% (n = 2) explored resilience training [25,39]. The remaining 22% (n = 4) of studies involved a range of 'other' individual-level SMIs including narrative medicine [32], a multimodal intervention directed at trauma [40], simulation training [41], and clinical supervision [16].

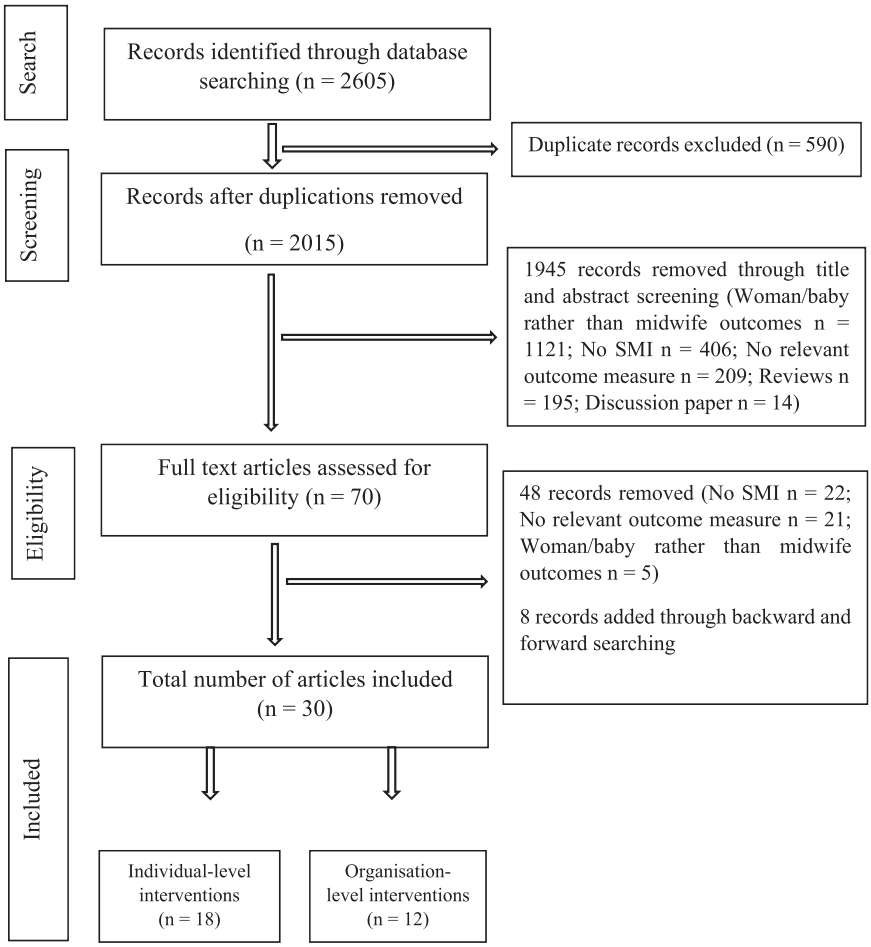

Fig. 2. Flowchart of literature searching and screening process.

Of the 12 studies examining organisation-level SMIs, 50% (n = 6) focused on the care models provided by midwives, either continuity of care for the woman and baby [26,42,43,45,46] or woman-centred care (also termed person-centred care) [44]. Of the remaining six organisation-level SMIs, 17% (n = 2) focused on organisation structure (e.g., ranging from reviewing workloads to graduate recruitment) [47] or rostering [48], 17% (n = 2) utilised reflective practice groups [27,49], and 17% (n = 2) were considered 'other' interventions, including patient education kits [33] and self-care and resilience awareness [50].

Data collection techniques

Most of the 30 studies (77%; n = 23) collected quantitative data related to the outcomes via validated questionnaires [7,16,27,29–45,48,49,50]. However, 10% (n = 3) collected quantitative data related to outcomes through non-validated questionnaires [28,40,43]. Qualitative data collection techniques were used to assess outcomes in 33% (n = 10) of the studies. Specifically, of these 10 studies, 60% (n = 6) used interviews [25,26,35,44,46,47], 60% (n = 6) used focus groups [24,27,35,44,47,49], 20% (n = 2) used field notes [25,46], and 10% (n =1) used logbooks [35].

Outcome measures across all studies

Outcomes were grouped into three categories: occupational stress, health and well-being, and job satisfaction and performance. These outcome measures will first be described overall (i.e., which studies include them, and which measures were used). Second, the findings across all the three outcome categories will be detailed. Third, the findings will be compared between individual- and organisation-level SMIs. Finally, the findings from specific SMIs within our individual- and organisation-level categories will be described. Full details of each study, the SMI, outcome measures, and findings can be found in Tables 2 and 3.

Occupational stress was measured by 80% (n = 24) of the 30 studies [7,16,27–29,31,32–46,48,49,50]. Specifically, of these 24 studies, 58% (n = 14) measured stress [7,16,29,31,33-36,38,41,44,48-50], 46% (n = 11) assessed burnout [16,27,32,40,42–46,48,50], 13% (n = 3) measured coping [7,37,39], and 8% (n = 2) assessed resilience [28,39]. The mostly commonly used questionnaires included the Copenhagen Burnout Inventory [41,43–45,51], Perceived Stress Scale [7,34,44,50,52], and Nursing Stress Scale [29,36,48,53].

Health and well-being were measured in 43% (n = 13) of the 30 studies [16,23-25,28,30,34,35,40,41,43,47,49]. Of these 13 studies, 62% (n = 8) measured mental health [16,24,28,30,35,40,43,47], 47% (n = 7) assessed well-being [23-25,28,34,35,41,49], and 8% (n = 1) measured physical health [30]. The most used questionnaire was the Depression Anxiety and Stress Scale (DASS-21; [54]) [30,35,43].

Job satisfaction and performance was measured by 37% (n = 11) of the 30 studies [23,26,29,40–45,48,49]. Of these 11 studies, 91% (n = 10) assessed job satisfaction [26,29,40–45,48] and 9% (n = 1) measured job performance [28]. The most used questionnaire was the Midwifery Process Questionnaire [42,45,55].

Findings Across All Outcome Measures

Of the 24 studies that measured occupational stress, 92% (n = 22) [7,16,27,28,31,33–35,38,39–43,45,46,48–50] reported positive findings,

Table 1
Quality appraisal results from the Mixed Methods Appraisal Tool.

Ref	Author	Criteria from the Mixed Methods Appraisal Tool																									Quality*
		Qualitative					Quantitative RCTs					Quantitative nonrandomized					Quantitative descriptive					Mixed methods					
		1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.2	3.4	3.5	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5	
Individual-level SMI studies																											
[34]	Aghamohammadi et al. (2022)	1	1	1	1	1	1	1	0	0	1	1	1	0	0	1											***
[35]	Foureur et al. (2013)	1	1	1	1	1						1	1	0	0	1						1	1	1	1	1	***
[23]	Hunter et al. (2018)	1	1	1	1	1																					******
[24]	van der Riet et al. (2015)	1	1	1	1	1																					******
[28]	Warriner et al. (2016)											1	0	0	0	1											**
[7]	Wright (2018)											1	1	1	0	1											****
[36]	Didehvar et al. (2016)											1	1	0	0	1											***
[29]	Jahromi et al. (2016)						0	0	0	0	0																0
[37]	McCarthy et al. (2018)											1	1	0	0	1											***
[38]	Navidian et al. (2019)						1	1	1	0	1																****
[30]	Chan et al. (2013)						0	1	0	0	1																**
[31]	Jourabchi et al. (2020)											0	1	0	0	0											*
[39]	Johnson et al.(2020)	1	1	1	1	1						1	1	0	0	1						1	1	1	1	1	***
[25]	McDonald et al. (2013)	1	1	1	1	1																					******
[32]	Dobrina et al. (2023)	0	0	1	1	0						0	1	1	0	1						1	0	0	0	1	**
[40]	Slade et al. (2018)											1	1	0	0	1											***
[41]	Sørensen et al. (2009)											1	1	0	0	1											***
[16]	Wallbank (2010)						0	0	0	0	1																*
Organisation-level SMI Studies																											
[42]	Dawson et al. (2018)											1	1	1	0	1											****
[26]	Dharni et al. (2021)	1	1	1	1	1																					******
[43]	Fenwick et al. (2018)											1	1	1	0	1											****
[44]	Hansson et al. (2020)	1	1	1	1	1						1	1	1	0	1						1	1	1	1	1	****
[45]	Newton et al. (2014)											1	1	1	0	1											****
[46]	Newton et al. (2016)	1	1	1	1	1						1	1	1	0	1						1	1	1	1	1	****
[47]	Brook & Kemp (2021)	1	1	1	1	1																					******
[48]	Rickard et al. (2012)											1	1	0	0	1											***
[49]	Dawber (2013)	1	1	1	1	1											1	0	1	1	1	1	1	1	0	1	****
[27]	Hata et al. (2022)						1	0	0	0	1																**
[33]	Howarth et al. (2017)						0	0	0	0	0																0
[50]	O'Riordan et al. (2020)											1	1	0	0	1											***

0 = Criteria not met; 1 = Criteria met. RCTs: Randomized Controlled Trial. A full description of MMAT criteria 1.1–5.5 is provided in the Supplementary Materials.
* 5***** or 100% quality criteria met; 4 **** or 80% quality criteria met; 3 *** or 60% quality criteria met; 2 ** or 40% quality criteria met; 1 * or 20% quality criteria met

Table 2
An overview of the studies (n = 18) that evaluated an individual-level SMI.

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
MINDFULNESS BASED											
[34]	Aghamohammadi et al. (2022)	Iran	Midwives	42	Parallel randomized clinical trial	Adapted group mindfulness-based stress management program • Adapted version of Mindfulness-based stress reduction	8-week carried out in 8 sessions of 90–120 min once a week	• PSS • DERS	• Stress • Difficulties in Emotion Regulation	• Pre-intervention • In the last session • 3 months after the last session	• Stress improved immediately post and 3 months post intervention • Emotional regulation improved only immediately post intervention
[35]	Foureur et al. (2013)	Australia	Nurses and Midwives	40 Total Participants • 20 Nurses • 20 Midwives	• Mixed methods pilot study with a pre- and post-intervention design (no control) • Subgroup with qualitative interviews or focus group.	Adapted Mindfulness-based stress reduction intervention (MBSR) • Psychologist provided information and introductory practice in MBSR and supported participants with practical strategies to embrace mindfulness practice on a daily basis	• 1-day workshop • 8 weeks meditation	• Log books • GHQ-12 • DASS • Qualitative interviews or focus group	• Orientation to life • Comprehensibility • Manageability • Meaning • Depression • Anxiety • Stress • General health	• Pre-intervention • 4–8 weeks post-intervention	• Quantitative measures found improved general health, a more positive sense of orientation and reduced stress • Quantitative measures did not reveal any differences for Depression, Anxiety, Manageability and Meaning • Qualitative measures found intervention was positively received and that it reduced stress and increased relaxation
[23]	Hunter et al. (2018)	UK	Midwives	9	Qualitative study	Mindfulness course • Adapted from mindfulness-based cognitive therapy • Introduced different formal and informal mindfulness practices to people who are not familiar with mindfulness	Eight 60–90 min group sessions	Semi-structured interviews	Impact on professional practice, particularly work stress	Post-intervention (no detail provided)	• Increased awareness of self • Increased sense of control • Greater connections with themselves, colleagues and women • More confident and positive about the future
[24]	van der Riet et al. (2015)	Australia	First year nursing and midwifery students	10 (no detail provided on split of nursing and midwifery students)	Qualitative cohort study	Stress management and mindfulness program • Designed (by the 2 researchers) to provide beginning students with skills that would build resilience, reduce stress levels and improve concentration • Educate on the	Seven 1-hour sessions - each held once a week over 7 weeks	Semi-structured focus groups	Experience of the programme	2 weeks post-intervention	• Three main themes capture the participants' experience: attending to self, attending to others and attending to program related challenges. • Positive impact on sleep, concentration, clarity of thought and a reduction in negative cognitions.

(*continued on next page*)

Table 2 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
						impact of stress and an in-session experience of a range of mindfulness exercises					
[28]	Warriner et al. (2016)	UK	Midwives, maternity support workers, student midwives and doctors	43 (69% midwives)	Cohort study	Mindfulness meditation course • Adapted from mindfulness-based cognitive therapy • Introduced different formal and informal mindfulness practices to people who are not familiar with mindfulness	• Runs over 8 weeks, typically 60–90 minutes a week • Participants encouraged to practice at home for 30 minutes daily for 6 days a week	• Quantitative questionnaire measuring satisfaction with course and sustained impact of intervention with (non-validated measures)	• Opinions of the intervention • Stress • Anxiety • Resilience • Self compassion • Mindfulness	• Immediate post-intervention • 4–6 months post-intervention	• Intervention was found to be helpful and useful, benefited home/work lives and workplace culture • Intervention had a sustained impact on stress, anxiety, resilience, self-compassion and mindfulness
[7]	Wright (2018)	US	Midwives	10	Pre- and post-intervention design (no control)	Web-based holistic stress reduction intervention • Modalities of yoga, meditation, and mindfulness-based stress reduction techniques were used on an alternating basis	Four days per week for 4 weeks	• PSS • CSES	• Stress • Coping	Pre- and post-intervention (no detail provided)	Reduced stress and improved coping self-efficacy
STRESS EDUCATION/MANAGEMENT											
[36]	Didehvar et al. (2016)	Iran	Nurses and Midwives	62 Total Participants • 40 Nurses • 22 Midwives	Pre- and post-intervention design (no control)	PRECEDE-PROCEED-based stress management training course • The PRECEDE-PROCEED model (Green & Kreuter, 2005) provides a framework that helps health planners and policy-makers effectively design health programs based on the assessment and analysis of situations with the active participation of the audience.	Two 4-hour sessions	• NSS • PRECEDE-PROCEED Model Questionnaire (items on stress and coping strategies)	• Stress • PRECEDE Scores (Measuring constructs of the PRECEDE-PROCEED Model)	• Pre-intervention • 1-month post-intervention • 3 months post-intervention	• Stress decreased in both groups of nurses and midwives • PRECEDE scores increased in both groups of nurses and midwives
[29]	Jahromi et al. (2016)	Iran	Midwives	70	Pre- and post-intervention	Stress management workshop • First session:	Two-day workshop	• NSS • JDI checklist	• Occupational stress • Job satisfaction	• Immediate post-intervention	• Occupational stress reduced immediately post intervention but

(*continued on next page*)

Table 2 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
					randomised controlled trial	education and training in relaxation, mental visualization, nutrition, and deep breathing • Second session: anger management, determination, time management, recording daily events, discussion on saying "no", delegation, and Q&A				• Second day post-intervention • 1-month post-intervention	after one month it returned to its initial state. • No significant difference for satisfactions across the two groups
[37]	McCarthy et al. (2018)	Ireland	First year undergraduate nursing and midwifery students.	138 Total Participants • 127 Nursing students • 9 Midwife students	Pre- and post-intervention design (no control)	Psycho-educational intervention "Coping with Stressful Events" • Required module designed by the researcher that provided students with knowledge and understanding of stress and associated coping mechanisms	Delivered over a 4-month period and involved 14 contact hours with students	COPE Inventory	Coping skills	• Pre-intervention • 1-month post-intervention	Coping skills improved (as show by some of the subscales of the coping measurement)
[38]	Navidian et al. (2019)	Iran	Midwives	80	Pre- and post-intervention randomised controlled trial	Stress immunization program • First session explained stress, its consequences and its causes, identified coping skills and negative thoughts and discussed relaxation training • Second session included cognitive reconstruction and time management techniques.	Two four-hour workshops in two consecutive weeks	HSE Management SIT	Occupational Stress	• Pre-intervention • Immediate post-intervention • 1-month post-intervention	Reduced occupational stress immediately after the programme and 1 month after
RELAXATION TRAINING											
[30]	Chan et al. (2013)	Brunei	1st year nursing and midwifery students	34 (no detail on split of students)	Pre- and post-intervention randomised controlled trial	Self-Healing Qigong • Each session had 3 stages: warm-up, Qigong exercise and cooling-down stage. • The exercise stage had 4 parts: (1) tensing and relaxing hands; (2) standing	One-hour session twice per week for 10 weeks	• Cough and Cold Questionnaire • DASS-21 • PHQ • Salivary samples	• Depression • Anxiety and somatic symptoms • Levels of salivary cortisol and secretory immunoglobulin (IgA)	• Before starting the study • at week 6 • at week 10	• At week 10, only Qigong group showed an improvement in depression, anxiety and stress • Increases in secretion rates of salivary immunoglobulin A, and decreases in salivary

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Table 2 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
						still; (3) scanning front part of the body with palms; and (4) gentle bending and stretching of the spine					cortisol concentrations, were seen only in the Qigong group at week 10 • No statistical differences in the frequency of upper respiratory infections
[31]	Jourabchi et al. (2020)	Iran	Midwives	65	Pre- and post-quasi-experimental study	Benson's relaxation technique • Relaxation techniques that control muscle tension and reduce negative emotions	Twice a day for 4 weeks	HSE Management SIT	Occupational stress	Pre and post intervention	Intervention reduced occupational stress (overall SIT score) among midwives.
RESILIENCE TRAINING											
[39]	Johnson et al. (2020)	UK	Midwives, doctors, paramedics, physician medical students	Quantitative: n=66 (29% midwives) Qualitative: n=23 (17% midwives)	Mixed methods pre and post intervention design (no control)	Resilience training intervention • Involved a group workshop and a one to one coaching phone call • Tailored and ran by 2 of the authors who have a background in CBT interventions • Focus was on preparing healthcare professionals for the occurrence of stressful healthcare events, particularly adverse events	• 3.5 hour group workshop • 1 hour one-to-one coaching phone call	• The Confidence in Coping with Adverse Events Questionnaire (non-validated measure) • Knowledge assessment (non-validated measure) • Brief Resilience Scale • Qualitative interviews	Confidence in coping with adverse events • Knowledge about resilience and coping strategies • Self-perceived resilience • Perception of the intervention	• Pre-intervention • Immediate post-workshop • 10–20 days post-workshop • 4–6 weeks post-workshop	• Quantitative measures found increased confidence in coping with adverse events, improved knowledge about resilience and coping strategies and higher resilience post-intervention • Qualitative measures found:(1) Resilience is a mandatory skillset but it may not be effective to make the training a mandatory requirement; (2) Intervention was more appropriate for qualified staff than students; (3) Participants valued the 'peer learning and engagement' they gained in the workshop; (4) The coaching session was an opportunity to personalise the workshop material
[25]	McDonald et al. (2013)	Australia	Nurses and Midwives	14 (no detail on split of nurses and midwives)	Qualitative case study	Resilience workshops • Focused on characteristics associated with resilience using both didactic teaching and innovative methods	Six one-day resilience workshops conducted over a 6-month period .	• Qualitative interviews • Participant evaluations (at the end of each workshop) • Field notes	• Workplace adversities currently faced • Effectiveness of the workshops in relation to their health, well-being	• Pre-intervention • Immediate post-intervention • 6 months	• Increased confidence and assertiveness • Improved self-awareness and self-care • Improved health and well-being by adopting strategies of conserving

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Table 2 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
						such as drawing and painting			and personal resilience • Individual benefits and challenges they experienced	post-intervention	energy, instituting better sleep and work regimes and seeking additional medical help for untreated chronic health issues
OTHER											
[32]	Dobrina et al. (2023)	Italy	Nurses, midwives and allied health professionals	48 Split not provided	Multi-methods, quasi-experimental pre-post intervention design	Narrative medicine training (clinical assistance method to promote compassion and the ability of healthcare providers • Phases of narration followed were: (a) the narration of experiences; (b) reflections; (c) the interpretation of experiences	Once a week 5 three-hour sessions	• ProQOL questionnaire • Free text responses	• Pre-intervention • 8 weeks post last narrative medicine session	• Compassion fatigue • Compassion satisfaction	• No differences pre-post intervention in compassion satisfaction or fatigue scores. • Three themes emerged from participants' touching experiences: "Witnessing death and sufferance"; "Witnessing violence" and "Organizational stressors during COVID-19". • Higher median score for post-intervention compassion satisfaction found among participants who reported at least one touching experience compared to those who had no touching experience.
[40]	Slade et al. (2018)	UK	Midwives	153	Pre- and post-intervention design (no control)	POPPY (Programme for the prevention of PTSD in midwifery) • Package of educational and supportive resources comprising an educational workshop, information leaflet, peer support, and access to trauma-focused clinical psychology intervention	1 year	• Work-related perinatal trauma • Confidence in knowledge of trauma and trauma responses • IES-R • MBI • Attitudes to Professional Role scale	• Exposure to work-related trauma • Knowledge and confidence of managing trauma responses • Professional impacts • Symptoms of PTSD • Burnout • Job satisfaction	• Pre-intervention • 6 months later	• Confidence in recognizing and managing early trauma responses improved • Increased levels of job satisfaction • Reduction in stress-related professional impacts • A trend towards reduced levels of PTSD symptomatology but this was not significant • Burnout - no reduction found for emotional exhaustion but the proportion of midwives reporting high and moderate levels of depersonalization towards care was reduced

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Table 2 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
[41]	Sørensen et al. (2009)	Denmark	Midwives, doctors and auxiliary nurses	147 in Workshop 1 192 in Workshop 2 (No detail on split of health professionals provided)	Pre- and post-intervention design (no control)	A simulation-based training program • Workshop 1 = Simulation-based training in management of postpartum bleeding and shoulder dystocia • Workshop 2 = basic neonatal resuscitation and severe preeclampsia	2 consecutive workshops (2.5 hours) - each included a lecture and a workshop	• Opinion of training program • Self-assessed confidence in performing specified procedures • Statements on whether clinical events were considered stressful • Written objective test • Data on any changes in work-routines from open-ended questions	Confidence and stress levels relating to the carrying out of certain procedures.	• Pre-intervention • Immediate post-intervention (for confidence measures only) • 9–15 months post-intervention	• 92% had a positive attitude toward the training program • Management of shoulder dystocia, preeclampsia, and neonatal resuscitation was considered less stressful and less unpleasant to perform after training (no change found for management of postpartum bleeding) • Confidence scores for all the trained skills improved significantly • More than 90% found the training to have had a positive influence on their work • Sick leave amongst midwives diminished significantly during the study period
[16]	Wallbank (2010)	UK	Midwives and doctors in obstetrics and gynaecology	30 (no detail on split of midwives and doctors)	Pre- and post-intervention randomised controlled trial	Individual clinical supervision with a clinical psychologist • Based on a 'restorative' model that used 'containment' as a method to process anxiety and emotions so the ability of thinking is restored	Six one-hour sessions	• IES • ProQol • PANAS	• Stress • Burnout • Compassion fatigue • Compassion satisfaction	Pre and post intervention	• Stress, Burnout and Compassion fatigue reduced for the intervention group • Compassion satisfaction increased for the intervention group • No differences found on any measures for the control group

COPE: Coping Orientation to Problems Experienced; DASS-21: Depression, Anxiety and Stress Scale-21; DERS: The Difficulties in Emotion Regulation Scale; GHQ-12: General Health Questionnaire-12; HSE Management SIT: Health and Safety Executive Management Stress Indicator Tool; IES: Impact of Event Scale; IES-R: The Impact of Event Scale – Revised (IES-R); JDI: Job Descriptive Index; MBI: Maslach Burnout Inventory; NSS: Nursing Stress Scale; PANAS: Positive and Negative Affect Scale; PHQ: Patient Health Questionnaire; ProQoL: Professional Quality of Life Scale; PSS Perceived Stress Scale; PTSD: Post Traumatic Stress Disorder; SIT: Stress Indicator Tool.

Table 3
An overview of the studies (n = 12) that evaluated an organisation-level SMI.

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
CARE MODEL											
[42]	Dawson et al. (2018)	Australia	Midwives	542 • 107 in caseload model, • 212 in a hospital with a caseload model but did not work in caseload • 220 midwives in a hospital without a caseload model	Comparative study design	Caseload/ continuity midwifery	No details provided	• CBI • MPQ	• Burnout • Midwives' attitudes to their professional role	One timepoint (data were taken from a cross sectional survey)	Midwives working within caseload had a more positive attitude to their work and lower burnout scores than those not working in the model, compared with both midwives working in a hospital with a caseload model and midwives working in a hospital without caseload
[26]	Dharni et al. (2021)	UK	Midwives	14 • 6 CoC midwives • 5 standard midwives • 3 team leaders across both models of care	Qualitative study design	Caseload/ continuity midwifery	CoC model required continuity of carer for the antenatal and postnatal periods but did not require midwives to be present at birth.	Interviews	How satisfied midwives were with the CoC model (and how this compared with the satisfaction of midwives and women from the standard approach)	One timepoint	Despite exclusion of the birth element in the model, CoC midwives expressed high levels of job satisfaction in comparison to women and midwives within the standard approach
[43]	Fenwick et al. (2018)	Australia	Midwives	862 • 214 in continuity care • 648 in standard care	Comparative study design	Caseload /continuity midwifery	No details provided	• CBI • DASS-21 • Satisfaction with time off and work-life balance (non-validated measures)	• Emotional and professional well-being • Burnout • Satisfaction with time off • Work life balance	One timepoint (data were taken from a cross sectional survey)	• Midwives providing continuity of midwifery care reported lower levels of burnout, depression and anxiety compared to those working in non-continuity models • No difference between the groups for satisfaction with time off and work-life balance
[44]	Hansson et al. (2020)	Sweden	Midwives	16 for focus groups 58 for survey	Mixed methods study with a pre- and post-intervention design (no control)	Midwifery Model of Woman-Centred Care (MiMo) • woman centred care model around partnership, holism, respect, and safety • 1 day of education and reflection groups to develop knowledge about MiMo	1 year	• Qualitative secondary analysis from focus group interviews • CBI • PSS • Job Demand-Scale • 7 items from the WSQ	• Impact on work experience and profession • Burnout • Stress • Job Demands • Sense of Coherence	Pre and post intervention (no detail provided)	• Reported strained work situation was evident both pre- and post-intervention. • No significant differences between pre and post measurements for Burnout, Stress, Demand and Control, Organization Climate, and Sense of Coherence, indicating that the MiMo intervention did not affect the measured factors.

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Table 3 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
[45]	Newton et al. (2014)	Australia	Midwives	•148 at Baseline •151 at Follow up	Pre and post for two cross sectional surveys	Caseload/ Continuity midwifery	Care model over 2 years	• MPQ • CBI	• Attitudes to their professional role • Burnout	• Pre-intervention • 2 years post-intervention	Caseload midwifery was associated with lower burnout scores and higher professional satisfaction
[46]	Newton et al. (2016)	Australia	Midwives	Survey: • 148 at Baseline • 151 at Follow up Qualitative interviews: • 28 caseload midwives	• Mixed methods pre and post for two cross sectional surveys • Qualitative interviews with caseload midwives only	Caseload/ continuity midwifery	Care model over 2 years	• Open ended responses from quantitative survey • Qualitative interviews • Field notes	• Caseload and standard care midwives' views • Experiences of midwifery work	• Quantitative measures pre and 2 years later • Qualitative 6 months and 2 years after start of caseload care model	Caseload midwifery was a 'different' way of working, involving activity-based work, working on-call, fluid navigation between work and personal time and avoiding burnout.
ORGANISATION STRUCTURE/ROSTERING											
[47]	Brook & Kemp (2021)	UK	Nursing and midwifery students and clinical staff	Pre intervention (n=3 focus groups and n=1 interview): 7 nursing and 6 midwifery students Post intervention (n = 1 focus group and n= 11 interviews): 7 nursing students and 7 staff	Qualitative pre and post study design	Flexible rostering system for students during their clinical placements	4 months	Focus groups and interviews	Participant views (no detail provided)	• Pre intervention • 3–4 month post intervention	The flexible rostering system gave students control over their work-life balance and enabled them to feel empowered in their clinical areas, less anxious, and more focused on their development.
[48]	Rickard et al. (2012)	Australia	Nurse and Midwives	484 (no detail on split of nurses and midwives)	Pre- and post-intervention design (no control)	Organisation intervention: • workload tool to assess workloads and roster • increased personnel to address shortfall • increased graduate access to clinical supervision and support • increased access to professional development • recruitment campaign for new graduates and continuing employees	5 years	• GHQ-12 • UWES-9 • JCQ • COPSOQ • NSS • Additional evidence was gathered from archival data	• Psychological distress • Emotional exhaustion • Work engagement • Job satisfaction • Job demands • Job resources • System capacity • Turnover rates	• Pre-intervention • 2 years later	• Reduction in psychological distress and emotional exhaustion • Increase in job satisfaction • Reduction in job demands • Increase in job resources • Improvements in system capacity (adaptability, communication) • Reduction in turnover
REFLECTIVE GROUPS											

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Table 3 (*continued*)

Ref	Author (Year)	Country	Sample	Sample Size	Study Design	Intervention	Intervention Duration	Data Collection Instruments	Outcome Measures	Outcome Measures Timing	Study Findings
[49]	Dawber (2013)	Australia	Nurses and Midwives	18 for questionnaire 12 for focus groups	Mixed methods cohort pilot study (no control)	Reflective practice groups (RPG) • Groups, facilitated by a consultation liaison psychiatry nurse and author, that organize clinical supervision activities into a model of reflective practice	Respondents had participated in RPG for between 8 months and 3 years	• CSEQ • Qualitative focus groups	• Impact on clinical practice • Self-awareness • Resilience • Work stress	Immediately post-intervention	• Improved quality of care • Developed self-awareness • Increased confidence dealing with the job • Improved ability to cope with work stressors
[27]	Hata et al. (2022)	USA	Clinical physicians, nurse practitioners, and certified nurse midwives.	25 •19 physicians • 6 certified nurse midwives or nurse practitioners	Randomized controlled trial	Self-facilitated, inter-professional groups. Intervention group was given a one-page discussion guide and self-facilitated their discussion over dinner.	3 monthly	• PRU • Single item measures of emotional exhaustion and depersonalization Inventory from MBI • UWES-9 • Empowerment at Work Scale • Focus group	• Burnout • Engagement • Empowerment in work • Stress from uncertainty	• Pre-intervention • 3-month after study post-intervention	• Intervention decreased burnout and improved engagement, sense of connection to colleagues, and sense of departmental commitment to well-being. • Structured discussion guides were not necessary to achieve benefit.
OTHER											
[33]	Howarth et al. (2017)	New Zealand	Midwives	104	Observational study of midwives whose clients participated in a trial to improve childbirth self-efficacy	An education package for childbirth preparation (The Pink Kit (PK) Method for Birthing Better®) delivered to clients of midwives	No detail provided	• Visual analogue scale measuring comparative work stress • Physical complications	• Work-related stress • Physical complications of clients	Post-intervention (no detail provided)	Intervention group experienced less work-related stress after correction for medical complications compared to other groups
[50]	O'Riordan et al. (2020)	Ireland	Doctors in training and Midwives	23 Total Participants • 18 Doctors in training • 5 midwives	Pilot study with pre- and post-intervention design (no control)	• A pocket card and posters promoting self-care and resilience • Recognise and Reflect - end of shift staff meetings for midwives	6 months	• MBI • ProQoL • PSS	• Quality of Life • Burnout • Compassion fatigue • Perceived stress	• Pre-intervention • 6 months post-intervention	• Decrease in Professional Quality of Life and burnout from pre- to post-intervention • Recognise and reflect intervention discontinued after 5 weeks due to low attendance

Caseload/Continuity midwifery: A model of care which aims to provide women with continuity of care from a known midwife throughout the maternity care continuum.
CBI: Copenhagen Burnout Inventory; CSEQ: The Clinical Supervision Evaluation Questionnaire; COPSOQ: Copenhagen Psychosocial Questionnaire; DASS-21: Depression, Anxiety and Stress Scale-21; GHQ-12: General Health Questionnaire-12; JCQ: Job Content Questionnaire; MBI: Maslach Burnout Inventory; MPQ: Midwifery Process Questionnaire; NSS: Nursing Stress Scale; ProQoL: Professional Quality of Life Scale; PRU: Physicians' Reaction to Uncertainty Scale; PSS Perceived Stress Scale; UWES-9: Utrecht Work Engagement Scale-9; WSQ: Work Stress Questionnaire

including reduced work stress [7,16,29,31,33-36,38,41,48,49] and burnout [16,27,40,42,43,45,46,48,50], improved coping [7,37,39], and greater resilience [28,39]. Approximately one quarter (29%, n = 7) of the 24 studies found no changes in occupational stress [16,41,44,50] or burnout [32,40,44,50]. No studies reported negative outcomes (e.g., greater work stress) following an SMI.

Of the 13 studies that measured health and well-being, 92% (n = 12) reported positive outcomes including improvements in mental health such as lower depression and anxiety symptomology [16,24,28,30,35,43,47], greater well-being [23,25,28,34,35,41,49], and improved physical health [30]. Just under a third (31%; n = 4) of the 13 studies found no changes in mental [35,38,43] or physical health [30]. No studies reported negative outcomes (e.g., poorer health) following an SMI.

Of the 11 studies that measured job satisfaction and performance, 73% (n = 8) reported positive outcomes, including increased job satisfaction and better attitudes towards work [23,26,40–42,45,48] and improved performance in the form of better women's care [49]. Almost half (46%; n = 4) of the 11 studies found no changes in job satisfaction [29,43,44,48]. No studies reported negative outcomes (e.g., poorer job satisfaction) following an SMI.

Findings of individual- vs. organisation-level SMIs

Table 4 displays to the description and results of the sum code classification system [21] used to compare the effects of individual- and organisation-level SMIs on occupational stress, health and well-being, and job satisfaction and performance. For occupational stress, 93% (n = 13) of the 14 studies that evaluated an individual-level SMI reported beneficial effects [7,16,28,29,31,34–41], including reduced work stress [7,16,29,31,34-36,38,41], burnout [16,40], improved coping [7,37,39], and greater resilience [28,39]. All studies (n = 10) that tested an organisation-level SMI reported benefits [27,33,41,43,45,46,48,49,50], including reduced work stress [33,48,49] and burnout [27,43,46,48,50].

In terms of health and well-being, 90% (n = 9) of the 10 studies that evaluated an individual-level SMI reported beneficial effects [16,23,24,28,30,34,40,41], including improved mental health [26, 27, 32, 37, enhanced well-being [23-25,28,34,41,42], and better physical health [30]. In contrast, 100% (n = 3) of the studies that evaluated an organisation-level SMI reported benefits [43,47,49], including improved mental health [43,47] and well-being [49].

For job satisfaction and performance, 75% (n = 3) of the four studies that evaluated an individual-level SMI reported beneficial effects, including improved job satisfaction [23,28,41]. In contrast, 71% (n = 5) of the seven studies that evaluated an organisation-level SMI reported benefits, including greater job satisfaction [26,42,45,48] and performance [49].

Findings from different individual-level SMIs

Nearly all studies (93%; n =13) that evaluated individual-level SMIs and measured occupational stress found a significant reduction. Of the studies that measured this outcome, all reported reduced work stress. These studies included mindfulness [n = 4; 7,28,34,35], stress education/management [n = 4; 29,36-38], relaxation [n = 1; 33], and resilience training [n = 1;16]. 'Other' intervention types that had a positive effect on work stress included simulation training for traumatic

Table 4
A summary of the effects of individual- and organisation-level SMIs on occupational stress, health and well-being, and job satisfaction and performance.

Outcome measure	Reference	Number of studies measuring outcome	Percentage of studies supporting an association			Sum Code
			Positive	Negative	None	
Individual-level SMI studies (n = 18)						
Occupational Stress	[7,16,28,29,31,32,34-41]	14	93	0	21	++
Stress	[7,16,29,31,34-36,38,41]	9	100	0	11	++
Burnout	[16,32,40]	3	67	0	67	+
Coping	[7,37,39]	3	100	0	0	+
Resilience	[28,39]	2	100	0	0	+
Health and well-being	[16,23-25,28,30,34,35,40,41]	10	90	0	20	++
Mental health	[16,24,28,30,35,40]	6	83	0	17	++
Well-being	[23,25,28,34,35,41]	6	100	0	0	++
Physical health	[30]	1	100	0	100	+
Job satisfaction and performance	[23,29,40,41]	4	75	0	25	+
Job Satisfaction	[23,29,40,41]	4	75	0	25	+
Performance	N/A	0	N/A	N/A	N/A	N/A
Organisation-level SMI studies (n = 12)						
Occupational Stress	[27,33,42–46,48,49,50]	10	100	0	20	++
Stress	[33,46,48-50]	5	60	0	40	++
Burnout	[27,42-44,46,48,50]	7	71	0	29	++
Coping	N/A	0	N/A	N/A	N/A	N/A
Resilience	N/A	0	N/A	N/A	N/A	N/A
Health and well-being	[43,47,49]	3	100	0	66	+
Mental health	[43,47]	2	100	0	50	+
Well-being		1	100	0	50	+
Physical health	N/A	0	N/A	N/A	N/A	N/A
Job satisfaction and performance	[26,42–45,48,49]	7	71	0	29	++
Job Satisfaction	[26,42–45,48]	6	67	0	33	++
Performance	[49]	1	100	0	0	+

The sum code system determines the percentage of studies that report an effect. Codes of '0', '?', and '+' indicate that 0–33%, 34–59%, and 60–100% of the studies supported the benefits of an intervention, respectively. Codes were doubled when four or more studies supported an intervention's benefits (i.e., '00', '??' or '++'). The percentages of studies supporting a positive, negative, or no effect do not add up to 100% as there were instances where individual studies reported both positive and no effects

procedures (e.g., neonatal resuscitation [41]) and an educational/supportive package for Post Traumatic Stress Disorder (PTSD) [40]. This latter study [40] also reported no changes in burnout because of the educational/supportive package. Similarly, one of the studies exploring a stress education/management intervention [29] reported mixed results, with a reduction in work stress only being revealed immediately post-intervention and not one month later. Also, no change in work stress was reported by one study [32] examining narrative medicine training.

Most studies (90%; n = 9) that evaluated an individual-level SMI and measured health and well-being found significant improvements. All (n = 5) of the studies involving mindfulness [23,24,28,34,35] reported some improvement in health and wellbeing, with only one of those studies [35] reporting no benefits for mental health (i.e., depression). Studies examining simulation training [40], resilience training [25], and relaxation interventions [30] also found improvements in health and wellbeing. However, the latter study examining relaxation training [30] found mixed findings, with decreases in cortisol but no differences in upper respiratory infections after twice weekly self-healing Qigong. Interestingly, none of studies evaluating stress education/management measured health or well-being.

Three-quarters (75%; n = 3) of studies that evaluated individual-level SMIs and measured job satisfaction reported significant improvements. One study evaluating mindfulness [23], another study investigating an educational package to prevent PTSD [40], and one study examining simulation training [41], all found improvements in job satisfaction. One study did not find any differences in job satisfaction following a two-day stress management workshop [29]. Most studies evaluating individual-level SMIs did not include a measure of job satisfaction (78%; n = 14) or performance (100%; n = 18).

Findings from different organisation-level SMIs

In terms of organisation-level SMI studies that measured occupational stress, 90% (n = 9) reported positive outcomes. Two studies involving reflective practice groups found they improved ability to cope with stressors [49] and decreased burnout [27]. One study investigating an organisation-level intervention with multiple components (i.e., addressing workloads/rostering and increasing personnel and their support) reported reduced job stressors [48]. Most studies (80%, n = 4) evaluating the effects of care model interventions found reduced (or helpful in avoiding) burnout [42,43,45,46]. Only one study evaluated a woman-centred model of care and found that it did not reduce work strain or burnout [44].

All studies (100%; n = 4) that evaluated organisation-level SMIs and measured health and wellbeing found significant improvements. Benefits were reported for a flexible rostering system that reduced anxiety [47] and reflective practice groups that improved self-awareness [49]. Health and well-being were only measured following one continuity of care model SMI [43], with this study showing an improvement in some measures (e.g., depression and anxiety symptomology), but no change in other measures (e.g., distress).

In terms of job satisfaction and performance, 71% (n = 5) of organisation-level SMIs studies that measured these outcomes reported improvements. For care model (continuity of care or women-centred care) interventions, 60% (n = 3) of studies found increases in job satisfaction [26,42,45], whereas 40% (n = 2) found no effect [43,44]. Moreover, one study that investigated a tool to address workloads and rostering found a significant increase in job satisfaction [48], and a study evaluating reflective practice groups reported improvements in job performance [49].

Discussion

This systematic review synthesised the findings of studies that have examined the effects of different SMIs on midwives' occupational stress, health and well-being, and job satisfaction and performance [22,54,56,57]. The review identified 30 eligible studies, with 18 evaluating the effects of individual-level SMIs and 12 evaluating the effects of organisation-level SMIs. Overall, the SMIs seemed to have beneficial effects on occupational stress, health, well-being, and job satisfaction and performance; thus, highlighting and reinforcing the value of investment in SMIs. Interestingly, while individual- and organisation-level SMIs were equally effective in improving job satisfaction and performance, there was a trend for organisation-level SMIs being more beneficial than individual-level SMIs in reducing work stress and improving health and well-being. While this latter finding is in contrast to a meta-analysis of occupational stress management interventions across various work domains, which found that individual-level interventions (e.g., cognitive-behavioural approaches) have larger effects than organisation-level interventions [58], it is in accordance with the broadly shared vision that organisational, primary prevention, interventions should prevail over individual-level interventions to reduce work-related stress [59]. This discrepancy could be explained by the degree of 'decision latitude' (i.e., degree of control over work tasks) an individual has in their job, since it has been suggested that individual interventions are more effective for those roles with high decision latitude (or control), whereas organisational interventions are more appropriate for those with low decision latitude (e.g., midwives have little control of the quantity of workload; [56]).

This review found that the different types of individual-level SMIs were equally effective (e.g., mindfulness, stress education) in benefitting work stress, health and well-being, and job satisfaction and performance. Comparable findings have been reported [15] that noted that individual-level SMIs aided outcomes related to occupational stress, mental health, and well-being. Thus, our review extends these findings and shows, for the first time, that individual-level SMIs can also benefit job satisfaction and performance among midwives, with the latter having important ramifications for the care and safety of women and babies [5]. With regards to specific individual-level SMIs, mindfulness and simulation training were found to be particularly beneficial, as they were the only interventions associated with positive effects across all outcomes (i.e., work stress, health and well-being, and job satisfaction and performance). This finding mirrors the literature on SMIs both within [15] and outside [13,14] midwifery. However, it should be noted that the greater number of studies on these interventions, as well as publication bias (which could not be ascertained in this narrative synthesis), might have driven this, creating an overly glossy picture. Regardless, despite some recent criticisms of promoting individual-level only interventions (e.g., training to make midwives more resilient; [57]), the findings of this review suggest there is some value to these SMIs, potentially when combined with specific organisation-level SMIs (e.g., care models).

The two types of organisation-level SMIs that showed the most benefit across all outcomes were the continuity of care model and reflective practice groups. Providing continuity of midwifery care has, in the past, been proposed to have a negative impact on midwives' emotional wellbeing [45] and work-life-balance [60]. However, there appears to be more evidence that this model of care (vs. more standard shift-based care) can reduce burnout [61] anxiety and depression [44,62] among midwives. This way of working is thought to develop more meaningful relationships with women and improve occupational autonomy and flexibility, all of which contribute to greater job satisfaction for midwives [46,63]. Reflective practice groups are also becoming increasingly important for healthcare professionals, and the use of "reflective rounds" (e.g., Balint, Schwartz) have a growing evidence base in helping clinicians manage stressful encounters and in reducing burnout [64,65].

The assessment of eight studies scored as low quality by the MMAT checklist and included in this review is cause for concern. Of these low-quality studies, several of the non-randomised studies did not account for confounding factors in their design and analysis (e.g., no control or

regression analysis to address potential confounding factors [35], and many of the randomised controlled trials either did not appropriately perform randomisation, failed to achieve sufficient outcome data, or did not blind the assessors or participants to the intervention [29]. It should be noted that blinding of participants or researchers to the intervention is difficult, if not impossible, due to the nature of the interventions. It would be advisable for future intervention research to follow established guidelines such as the American Psychological Association journal article reporting standards [66] or the CONSORT statement [67]. Many of the studies included SMIs in an organisation (e.g., hospital) and therefore considerable difficulties may arise that limit the evidence (e.g., restricted access to midwives leading to small sample sizes, an inability to collect data at appropriate time periods, etc.). Future research should better follow key principles (e.g., use of experimental designs, including more than one measure of stress) for carrying out research in organisations [68]. Finally, it is noted that seven studies [16,24,25,30,32,41,48] did not detail the proportion of midwives or midwifery students within their mixed samples. However, the majority were combined with nurses or nursing students and therefore, while we might expect similar workforce demands, findings from these studies cannot be directly linked to midwifery.

This systematic review is the first since 2017 to systematically review SMIs for midwives and to our knowledge, the first to include organisation-level interventions. However, this review has some limitations. First, since there is substantial heterogeneity in the measurement of outcomes, targeted populations, and methodologies between studies, a meta-analysis combining the data from the reviewed studies was not appropriate [20]. Thus, a narrative approach was used in this review which could provide more comprehensive coverage than the narrow focus of the research question and prescribed methods required in a systematic review but could not quantitatively synthesise the data from the studies to make evidence-based inferences [69]. Second, this review utilised four databases for searching for articles, without searching for other sources such as grey or unpublished literature. While grey literature was excluded in the present review given its typical lack of rigorous peer review and accessibility issues, excluding unpublished work may have biased the findings since studies with significant results are more likely to get published [70]. Furthermore, while not the purpose of this review, future research should consider disentangling the effects of interventions for different midwife groups (e.g., newly qualified vs. more experienced) and across different countries (e.g., UK vs. Australasia).

Turning to the implications for practice, the findings of this review suggest that health practitioners and policy makers should consider designing, implementing, and rigorously evaluating multi-level SMIs that target both the individual- and organisation-level to reap stress, health, well-being, and performance benefits. Indeed, whilst organisation-level SMIs were generally associated with greater benefits in this review, individual-level SMIs were still found to be highly beneficial and may overcome some of the financial and political barriers that can accompany the implementation of organisation-level change [71]. While no multi-level SMIs were identified in this review, multi-level interventions have been successfully employed for health promotion benefits [72–74], and have been found to be more effective for reducing target outcomes than either organisation- or individual-level interventions alone [75]. To optimally inform the design and maximise the effectiveness of such multi-level SMIs, and ensure that a “one size fits all” approach is avoided, practitioners should consider utilising a stress audit to identify within a particular context (e.g., hospital trust) which stressors are having most impact on midwives, why this impact is occurring, which groups are most “at risk”, and what stress management preferences and barriers exist [76,77]. The results of a stress audit, combined with the findings of this review, could then be used in combination to inform decision-making around which interventions are likely to be most effective.

Conclusion

This systematic review investigated which individual- and organisation-level SMIs are the most effective at reducing occupational stress and improving midwives’ health and well-being, performance, and job satisfaction. While individual- and organisation-level SMIs were equally effective in improving job satisfaction and performance, there was a trend for organisation-level SMIs more effectively reducing work stress and improving health and well-being. Specific individual- (i.e., mindfulness, simulation training) and organisation-level (i.e., reflective groups, midwifery care models) SMIs were most beneficial. Informed by a ‘stress audit’, health practitioners and policy makers should design and implement multi-level SMIs that target both the individual- and organisation-level to reap benefits for midwives. Future evaluation of these SMIs should follow intervention reporting guidelines to ensure high quality research outputs.

Author contributions

Zoe Anchors: Conceptualization, Formal Analysis, Investigation, Writing Original Draft and Reviewing and Editing. **Rachel Arnold & Lee Moore:** Conceptualization, Formal Analysis, Investigation, Writing - Reviewing and Editing, Supervision, Funding Acquisition. **Sara Burnard, Catherine Bressington & Annette Moore:** Conceptualization, Project Administration and Writing - Reviewing and Editing.

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Ethical statement

Ethical approval to proceed with the study was given by the Research Ethics Approval Committee for Health at the University of Bath [reference: 19/20 042] and the Health Research Authority (HRA) [15/07/2020, IRAS ID: 283752].

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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