Supplementary material

Table S1. Data extraction for 136 included studies.

ID	Study Design	Author/ Title	Aim/Objective	Setting/ Context/ Duration	Participants	Interventions I = Intervention group C = control group	Outcomes	Results	Quality/methods (Consort/Trend checklist score)
1	RCT	Yang et al. 2018 Effect of Mindfulness-Based Stress Reduction Therapy in Work Stress and Mental Health of Psychiatric Nurses	To examine the effect of mindfulness-based stress reduction (MBSR) therapy on work stress and mental health of psychiatric nurses.	Three hospitals in Hunan Province of China (The First Xiangya Hospital of Central South University, The Second Xiangya Hospital of Central South University, and The Fourth Xiangya Hospital of Central South University) 8 weeks	N=100 nurses (95 with full data; 48 in I, 47 in C) 68% F Mage=29.5 (7.1)	I = MBSR therapy (The nurses were intervened in the nurse station every Thursday morning or afternoon (once a week) for a total of eight times. It included relaxation, mindful breathing, and meditation). C = routine psychological support and activities	Physical symptoms (The Symptom Checklist-90; SCL-90) Depression (Self-Rating Depression Scale; SDS) Anxiety (Self-Rating Anxiety Scale; SAS) Stress (Nursing Stress Scale; NSS)	All the outcomes showed significant decrease in intervention group, but not in control group. After the intervention, the physical symptoms (p<.001), depression (p<.001), anxiety (p<.001) and stress of the intervention group decreased significantly. No statistically significant differences were found for the control group (ps>.05).	10/23 Very limited discussion, no effect sizes, no blinding info, no power analysis, no randomisation info
2	Pre-post controlled	Yuan et al. 2009 An Intervention to Promote Health-Related Physical Fitness in Nurses	To assess the effects of exercise intervention on nurses' health-related physical fitness.	A medical centre in central Taiwan 3 months	N=90 nurses (86 with full data; 45 in I, 41 in C) Mage=33 No gender info	I = A three-month intervention program consisting of treadmill exercise; given a stair-stepper which was to be used daily after work C = no	Body mass index (BMI) Grip strength Flexibility Abdominal muscle durability Back muscle	Significant differences were found between pre- and post-intervention scores in BMI (p=.002), gripping strength (p=.018), flexibility (p<.001), abdominal muscle durability (p<.001), back muscle durability (p<.001) and cardiopulmonary durability (p<.001) in	16/20 No power analysis, not much detail on assignment, no info on blinding, no flow diagram, no effect sizes, somewhat limited discussion

Supplementary material
Table S1. Data extraction for 136 included studies.

							intervention	durability	the experimental group.	
								Cardio-pulmonary durability	In the control group there was only a significant negative difference in gripping strength and flexibility. The experimental group improved in grip strength, flexibility, abdominal muscle durability, back muscle durability and cardiopulmonary durability compared with the control group adjusted for preintervention baseline. No significant difference was found for the blood pressure (BP) in the postintervention period between the two groups (Diastolic BP p=.059 Systolic BP p=.738).	
3	RCT	Wei et al. 2017 Active Intervention Can Decrease Burnout in ED Nurses	To evaluate whether active intervention can decrease job burnout and improve performance among ED nurses.	The emergency departments of 3 hospitals randomly selected from 8 comprehensive high-level hospitals in Jinan, China 6 months (data	N=102 nurses (102 completed) 86% F Age 20-48	I = treated with ordinary treatment plus comprehensive management (classes pertaining to communication skills, approaches to conflict, efficacy	Burnout (Maslach Burnout Inventory– General Survey [MBI-GS], which includes emotional exhaustion (EE), depersonalizatio	EE decreased in intervention group (I: 9.65 ± 3.27; C: 15.39 ± 4.94, p<.05) DP decreased in intervention group (I: 6.92 ± 1.41; C: 11.49 ± 4.86, p<.05)	9.5/23 No power analysis, no blinding info, no effect sizes, no much info on randomisation, very limited discussion

				at baseline and end of study)		elevation, and emotion control, as well as working skills; 6 months) C = treated with ordinary management (focus group discussions and luncheon parties; 2xweek, 30min)	n (DP), and personal achievement (PAch))	No difference in PAch between groups (I: 25.98 ± 5.21; C: 24.54 ± 4.21, p>.05)	
4	Randomised Crossover Trial	Tucker et al. 2016 Worksite Physical Activity Intervention for Ambulatory Clinic Nursing Staff	Can NEAT intervention positively affect sedentary time, physical activity, and body composition of nursing staff without jeopardizing work productivity.	Two ambulatory clinics in USA 6 months	N=27 (100% F) Early I group N=13 Late I group (100%F) Age 20-65	I = 6-month worksite non-exercise activity thermogenesis (NEAT) intervention, with and without personalized health coaching via text messaging (I1=Early texting group, I2=late texting group) 1h of PA a day 1-2 messages a day The environmental component included a menu of options for each clinic: workstation	Sedentary and PA level (Sensewear monitor) Fat mass (dual energy x-ray absorptiometry) Weight BMI (calibrated scale and stadiometer) Work productivity (25-item Work Limitation Questionnaire WLQ) + record of absences	When the groups were combined, changes from baseline to 6 months were significant for BMI (p = .01), weight (p = .01), total lean mass (p = .01), percentage time in moderate PA (p = .02), percentage time in sedentary PA (p = .01), active energy expenditure (p = .01), and steps (p = .05) in desired direction. The changes in absence days did not differ significantly for groups over time, the same for WLQ.	11.5/23 Not much detail on intervention, little details on randomisation, no blinding, no power analysis, no effect sizes, somewhat limited discussion.

Supplementary material

Table S1. Data extraction for 136 included studies.

						treadmill (a computer desk adapted, so that the user walks on a treadmill while performing desk and computer tasks), Wii™ video game system, WellMe in 3™ video clips (3-minute video clips created by the investigators to allow quick bursts of PA in any setting, wearing any attire), stair climbing and walking meetings.			
5	Pre-post controlled	Tsai & Liu 2015 An eHealth Education Intervention to Promote Healthy Lifestyles among Nurses	To evaluate health-promoting effects of an eHealth intervention among nurses compared with conventional handbook learning.	2 hospitals in China (Hsin-Chu and Chia-Yi) 3 months	N=115 nurses (105 nurses completed (55 in I, 60 in C) Mage=35 No gender info	I = healthy lifestyle website (A physician provided consultation and participated in chat room discussions, set up the website and served as the website maintainer and administrator; includes health info, discussion board) C = received only conventional handbook	Health (Short Form Health Survey; SF-36) Health-Promoting Lifestyle Profile (HPLP; exercise and behaviour) Height, weight (BMI)	Significant difference in MCS (Mental Component Summary) assessing mental health was found only between groups at post-test. Experimental group improved in self-actualisation (59.8-69.5, p=.003), nutrition (53.2-65.0, p < .001), and exercise (43.4-53.3, p < .001). Control group – no improvement. Experimental group also improved in	16/20 Not described method of assignment to conditions, no info on blinding, very limited discussion and limitations.

								learning intervention. The handbook Healthy Life and Exercise was mailed to control subjects who were asked to read the handbook independently.		physical health (288.7-305.4, p = .030), as well as mental health (238.8-250.7, p= .0497), no improvement found for control group. However, when controlling for baseline data, no significant differences found in HPLP or BMI, but sign. difference for post PCS (mean diff of 111.88, p=.003), and total SF-36 (mean diff 31.64, p = .007)	
6	Pre-post not controlled	Szeto et al. 2013 The impact of a multifaceted ergonomic intervention program on promoting occupational health in community nurses	To examine the short- and long-term benefits of a multifaceted intervention program for musculoskeletal symptoms.	Hong Kong, China, 4 hospitals 8 weeks	N=50 nurses (47 with follow up data) Age 20-50 No gender info	I = ergonomic training, daily exercise program, equipment modification, computer workstation assessment and typing training.	Perceived rate of exertion (RPE) Self-reported musculoskeletal symptoms (Standardized Nordic Questionnaire) Perceived physical risk factors Perceived psychosocial risk factors Pain (Northwick Park Neck Pain Questionnaire; NPQ)		After 3 months: 7 out of 11 dependent variables showed significant changes (summed pain score (t = 3.80, p < .001) and the three functional outcomes, NPQ (t=3.82, p=.00), CODI (t=2.57, p=.01) and DASH (t=2.66, p =.01), as well as IKDC (t= 3.01, p < .01). Also, a reduction in physical (t = 2.93, p = .01) and psychosocial risk factors (t =2.70, p = .01) was observed. No sign. changes in physical mobility or	13/18 No power analysis to determine sample, no effect sizes, very limited discussion

#	Design	Reference	Aim	Setting	Sample	Intervention	Outcomes	Results	Quality
							Disability (Chinese Oswestry Disability Score Index; CODI) Knee form (International Knee Documentation Committee Subjective Knee Form; IKDC) Disability (Disability for Arm, Shoulder and Hand Questionnaire' DASH)	perceived exertion. After 1 year: Six (four functional outcomes and two types of risk factors) out of 7 outcomes stayed sign. improved. One additional outcome - bilateral handgrip strength had a statistically significant increase at the 1-year follow-up.	
7	Pre-post controlled	Speroni et al. 2012 Effect of Nurses Living FitTM Exercise and Nutrition Intervention on Body Mass Index in Nurses	To determine effectiveness of NLF intervention on BMI.	7 hospitals in USA 3 months	N=217 (108 in I, 109 in C) (data for 165 (70 in I, 95 in C) Mage=46.4 (22-67) 96% F	I = NLF (Nurses Living Fit) including exercise (12x1h weekly sessions), yoga (4x1h weekly), nutrition (4x1h monthly), diary C = no intervention	BMI (objective measure) Waist circumference	BMI change for I group = -.5, for C group =-.2 (p<.05) Waist change for I group = -.9, for C group = -.1 (p<.001) Neither sustained after the end of intervention (p>.05).	16/20 No matching, no stats software info, no effect sizes, quite limited discussion.
8	Pre-post controlled	Shimizu et al. 2003 Relationship between burnout and communication skill training among	To examine effect of communication skills training on burnout.	Japan, Kyushi area, a hospital 4 days	N=45 nurses (I=19, C=26; only 26 completed) 100% F	I = communication skills training (2x 2 days) C = no	Burnout (Maslach Burnout Inventory; J-MBI)	Only sig. improvement in personal accomplishment subscale of J-MBI (I = +2.6, C= -3.0; p<.05); no difference in	14/20 No info on scales, no power analysis, no effect sizes, some info

Table S1. Data extraction for 136 included studies.

		Japanese hospital nurses: a pilot study			Mage=39.3 (5.65)	intervention	Communication skills checklist	emotional exhaustion, or depersonalisation. 2 communication skills improved (accepting valid criticisms, and negotiation; p<.05)	missing in discussion
9	RCT	Sharif et al. 2013 Teaching Emotional Intelligence to Intensive Care Unit Nurses and Their General Health: A Randomized Clinical Trial	To examine effect of emotional intelligence course on health.	Iran, an intensive care unit 2 days	N=56 (52 nurses completed; 25 in I, 27 in C) Mage=35(6.5) No gender info	I = training in emotional intelligence (2 days) C = no training	Health (GHQ-20; general health questionnaire) Emotional intelligence (EI)	Health: Intervention group improved significantly (p=.03). I (25.4 -> 18.1 -> 14.6) C (22 -> 24.2 -> 26.5) EI: Intervention group improved significantly (p=.005). I (319 -> 337 -> 361) C (325 -> 320 -> 316)	16.5/23 Mostly lacking in discussion and blinding, and description of randomisation
10	Pre-post not controlled	Sarabia-Cobo et al. 2017 Emotional Intelligence and Coping Styles: An Intervention in Geriatric Nurses	To examine effectiveness of theory-based intervention on coping and emotional intelligence (EI).	Spain, nursing homes 1 month	N=92 nurses and CNAs (87 with full data) 85% F Mage=34.7 (9.7)	I = 4x4h weekly sessions on EI	EI (Trait Meta-Mood Scale) Coping (Coping with stress questionnaire)	Significant increase after the workshop and 1-year follow-up for EI (p=.02 post, p=.01 follow-up), and most coping scales (apart from positive reappraisal; focused on solving problems) (ps between .001 and .045)	14/18 No power analysis, limited discussion.
11	Pre-post controlled	Sallon et al. 2017 Caring for the Caregivers: Results of an Extended, Five-Component Stress-Reduction Intervention for Hospital Staff	To examine the effectiveness of stress-reducing intervention on health and wellbeing.	Israel, a tertiary care centre 8 months	N=164 (149 with full data) Mage=43.5 No gender info	I = 5 elements (meditation, relaxation, music, art, acupressure); 2.25h/week of instructions (75h) C = no intervention	Burnout (MBI) Job-related tension index (JRTI) Stress (Perceived Stress Scale; PSS)	Drop of 32% in the number of reports of upper respiratory infections; drop of 25% in number of family doctor visits in the intervention group Significant between groups changes in	16/20 No power analysis, no blinding, no effect sizes, limited discussion.

Table S1. Data extraction for 136 included studies.

							Productivity Scale (PS) Health (GHQ) Emotions (Positive and Negative Affect Schedule; PANAS) Visual Analogue Scale (VAS) for stress symptoms	emotional exhaustion, general health, tension, productivity and affect (ps between .001 and .01) Trend for change in depersonalisation (p=.06) and personal achievement (p=.07) No difference in perceived stress (p=.86) VAS - all stress symptoms decreased (p <.001, and up to .03)	
12	Pre-post controlled	Orly et al. 2012 Are cognitive-behavioural interventions effective in reducing occupational stress among nurses?	To investigate the impact of a cognitive–behavioural (CB) course on the nurses' well-being.	A hospital in Israel 4 months	N=36 (16 in C, 20 in I) Mage=50.6 (10.7) No gender info	I = CB course (16 meetings and 5 seminars, in total 64h; 4 months,), demonstrating varied coping strategies (relaxation, biased thinking) C = participation in 5 seminars only	Sense of coherence (SOC) Perceived stress (PSS) Profile of Mood States (POMS)	A significant increase in SOC (change M=4.22; p<.05) and the mood state of vigour (M=2.1; p<.05). A significant decrease in PSS (M=-3.45; p<.05) and fatigue (M=-4.69; p<.05) only among participants on the CB course. No significant changes in POMS tension, depression, anger and confusion.	14.5/20
13	RCT	Oman et al. 2006 Passage meditation reduces perceived stress in health professionals: A randomized, controlled	To examine effect of spiritual intervention on wellbeing.	A hospital in USA 8 weeks	N=61 health professionals (58 completed; 27 in I, 31 in C) 86% F	I = 8-week of spiritual skills training (2h/week) in passage meditation	Perceived stress (Cohen & Wiliamson, 1988) Burnout (MBI)	Beneficial treatment effects were observed for stress (Mchange=-5.23, p =.0013) and mental health (Mchange=4.82, p =	18.5/23 Blinding not commented on, non-structured abstract, no info on funding and

		trial			Age 26-70	C = no intervention	Mental health (Psychological Wellbeing Scale; PWB) Life satisfaction (5-items) Job satisfaction (1-item)	.03). No significant impact on life satisfaction, vitality, emotional exhaustion, depersonalisation, personal achievement or job satisfaction.	registration
14	Pre-post controlled	Oldervoll et al. 2001 Comparison of two physical exercise programs for the early intervention of pain in the neck, shoulders and lower back in female hospital staff	To compare the effect of increased aerobic capacity versus muscle strength rehabilitation of female hospital staff with long-lasting musculoskeletal back pain.	A university hospital in Norway 15 weeks	N=65 (endurance training n=22, strength promotion exercise n=24, control n=19) Complete data for 51, analysis for 49 Mage=42.9 No gender info	I = exercise 1h 2x a week for 15 weeks; 2 types (endurance training ET n=22, or strength promotion exercise ST n=24) C = no intervention	Aerobic capacity (VO$_{2max}$) Musculoskeletal pain (Nordic Questionnaire) BMI	Aerobic capacity significantly increased in the ET group (M=3.2, p=.005), whereas no change was observed in the SP group (M=.2, p>.05), and a significant reduction was found in the C group (M=-1.8, p=.009) from T1 to T2. Musculoskeletal pain was significantly reduced in both intervention groups (ET: M=-9.4, p=.0001; SP: M=-7, p=.005), whereas minor changes were observed in the control group (M=-1.9, p>.05). The beneficial effect was still present 7 months after intervention (but smaller). No change in BMI	14.5/20 No psychometric details for measures, no power analysis, no effect sizes, very limited discussion

Supplementary material

Table S1. Data extraction for 136 included studies.

| 15 | Cluster RCT | Noben et al. 2014

Comparative cost-effectiveness of two interventions to promote work functioning by targeting mental health complaints among nurses: Pragmatic cluster randomised trial | To evaluate the comparative cost-effectiveness of two strategies to promote work functioning among nurses by reducing symptoms of mental health complaints. | An academic hospital in Netherlands

Duration not reported | N=633 (538 completed; 206 controls, 207 physician intervention, 204 in e-health condition)

Mage=40.63 (11.61)

81% F | I1 = the occupational physician condition consisted of screening, feedback and referral to the occupational physician for screen-positive nurses.

I2 = The third condition included screening, feedback, and referral to e-mental health (e.g., PsyFit, drinking less)

C = online screening for mental health problems without feedback about the screening results. | Work functioning (Nurses Work Functioning Questionnaire)

Intervention costs | At 6 months follow-up, significant improvement in work functioning occurred in 20%, 24% and 16% of the participating nurses in the control condition, the occupational physician condition and the e-mental health condition, respectively. The difference between physician and control condition was not significant.

The average per-responder costs in the three conditions were 1266 euro in the occupational physician condition, 1375 in the e-mental health condition and 1752 in the control condition. | 20.5/24

Lacking in blinding description, and some details on sample drop out |
| 16 | Pre-post not controlled | Nahm et al. 2014

Implementation of a Participant-Centered Weight Management Program for Older | To examine the feasibility of a novel participant-centered weight management program | A hospital in USA

8 weeks | N=25 (18 at follow-up)

100% F

Mage=54.8 (6.1) | I = face-to-face sessions (2x), Wii exercise programs at work + dance DVDs, eHealth portal | Stress (PSS)

Weight (objective)

Dietary | A significant decrease in body weight (Mchange=-.44 BMI, p<.001), increased fruit and vegetable consumption | 13/18

No power analysis, no software info, limited flow info, |

		Nurses: A Feasibility Study	(PCWM) among nurses.				behaviour (Rapid Block Food Screener) Activity behaviours (Yale Physical Activity Survey + pedometer) Job satisfaction (Job Enjoyment Scale)	(Mchange=1.65, p=.025), and increased exercise (Mchange=15m min, p<.001, and Kcal/week, p<.05) at eight weeks was found. The effects were not sustained at 3 moths. No significant change in stress (p=.63), job enjoyment (p=.25), or fat level (p=.13) was found. Neither in steps per day.	no effect sizes, limited discussion.
17	RCT	Müller et al. 2016 Improving well-being at work- A randomized controlled intervention based on selection optimization and compensation	To develop, implement, and evaluate an occupational health intervention based on SOC model.	A community hospital in Germany 6 weeks	N=70 nurses (I=36, C=34; 46 with complete data) 94% F Mage=43.7	I = 6 sessions (16.5h), introduction to SOC (selection, optimization, compensation) model, implementation in one's life C = wait-list	Mental wellbeing (WHO-5) Work ability index (WAI) Job control (Work analysis instrument for hospitals-Self report version)	A trend suggesting that the proposed SOC training enhanced mental well-being (p=.09) and job control (p=.09), particularly in employees with a strong commitment to the intervention. Perceived work ability (p=.73) was not improved by the training.	16.5/23 Lacking in blinding and randomising description
18	Pre-post controlled	Morrison Wylde et al. 2017	To compare the effects of a	USA, a Children's	N=95 nurses (TDM=49,	I1 = mindfulness via smartphone	Mindfulness skills (Five	Nurses in the SDM group reported	14.5/18

		Mindfulness for Novice Pediatric Nurses: Smartphone Application Versus Traditional Intervention	traditionally delivered mindfulness (TDM) intervention to a smartphone delivered mindfulness (SDM) intervention.	hospital\n\n4 weeks	SDM=46)\n\n92% F\n\nMajority (85%) < 30 years	(SDM), asked to use 4 times (1x week), plus 3-month subscription to Headspace app\n\nI2 = traditional mindfulness (TDM), 4 sessions (1x week) in person	Facet Mindfulness Questionnaire)\n\nBurnout (The compassion fatigue self-test)\n\nThe life events checklist\n\nPosttraumatic stress disorder checklist	significantly more "acting with awareness" (p=.01) and marginally more "non-reactivity to inner experience" skills (p=.06) compared to the TDM group.\n\nThe smartphone intervention group also showed marginally more compassion satisfaction (p<.08) and marginally less burnout (p<.10).\n\nAdditionally, nurses in the SDM group had lower risk for compassion fatigue compared to the TDM group, but only when the nurses had sub-clinical posttraumatic symptoms at the start of the residency training program (p=.053).	No power analysis, no software info, no effect sizes, no all info on flow, no psychometrics
19	Quasi RCT	Moazzami et al. 2015\n\nEffect of an Ergonomics-Based Educational Intervention Based on Transtheoretical Model in Adopting Correct Body Posture Among Operating Room Nurses	To examine effectiveness of an intervention for back pain in operating room nurses.	4 hospitals of Hamadan (Iran)\n\n4 weeks	N=82 (I=42, C=40)\n\n66% F\n\nMage=31.5 (6.25)	I = 4x1h per week ergonomics educational intervention, based on Transtheoretical Model (TTM)\n\nC = no intervention	Body posture (observational checklist)\n\nTTM variables (Decisional Balance Scale, self-efficacy scale, Process of change, Staging algorithm for adopting appropriate	A higher proportion of nurses (62% vs 0%) in the intervention group moved into the action stage of behaviour change (p < .05).\n\nMean scores of self-efficacy, pros, experimental processes and correct body posture were also significantly higher in	10/23\n\nNo power analysis, not much info on randomisation, no demographic table, no effect sizes, no limitations addressed, no registration/funding details

							body posture)	the intervention group (p < .05).	
								No significant differences were found in the cons and behavioural processes, except for self-liberation, between the two groups (p > .05) after the intervention.	
20	RCT	Menzel & Robinson 2006 Back pain in direct patient care providers: Early intervention with cognitive behavioral therapy	To assess the feasibility and effect size of a cognitive behavioural therapy (CBT) intervention to reduce the measures of back pain, stress, and disability in direct care providers working with back pain.	An academic medical centre in USA 6 weeks	N=32 (20 with full data) 84% F Mage=40.3	I = CBT intervention (weekly stress and pain management session over 6 weeks led by a clinical psychologist) C = waiting list	Pain (eg. VAS) Stress (PSS) Disability (eg. Pain Disability Index) Depression and anxiety (STAI, BDI) Work-family conflict Scale Burnout (MBI)	Pain intensity decreased in the I group, but increased in C group (p=.06, but large effect size). Stress increased for I group, and decreased for C group (p<.05) – an unexpected result. No significant differences between groups on any other measures found.	12/24 Lacking in blinding and randomising description; not much on generalisation or discussion, some results missing
21	RCT	Mealer et al. 2014 Feasibility and acceptability of a resilience training program for intensive care unit nurses	To determine if a multimodal resilience training program for ICU nurses was feasible to perform and acceptable to the study participants.	USA, an academic institution (ICU) 3 months	N=27 (I=13, C=14) 89% F No age info	I = 2-day educational workshop, written exposure sessions, counselling, stress reduction, aerobics (12 weeks in total) C = no intervention	Resilience (Connor-Davidson Resilience Scale) Anxiety and depression (HADS) PTSD (Posttraumatic	The multimodal resilience training was feasible to conduct and acceptable to ICU nurses. Both nurses in the treatment and control groups showed a significant decrease in PTSD symptoms (p<.02) after the	20.5/23 No info on trial reg., sample size calculation

Supplementary material
Table S1. Data extraction for 136 included studies.

							Diagnostic Scale) Burnout (MBI) Client Satisfaction	intervention. No change in anxiety, but a significant change in depression (p=.03) in I group was observed, and a trend for resilience (p=.05). But similar results for the control group.	
22	Pre-post controlled	McElligott et al. 2010 The effect of a holistic program on health-promoting behaviours in hospital registered nurses	To examine the effect of a holistic program on health-promoting behaviours.	An academic medical centre in USA 8h	N=408 to start with, but 103 with full data 95% F Mage=39	I = Collaborative Care Model program, development of a self-care plan (8h) C = no intervention	Health Promoting Lifestyle Profile II survey	A significant increase ($p = .02$) in the overall HPLP II mean, spirituality ($p = .04$), interpersonal relations ($p = .04$), and nutrition scores ($p = .04$) for the experimental group. No difference in health responsibility, PA, or stress management (ps>.05)	17/20 Not much detail on intervention itself, some aspects overlooked in the discussion, only few effect sizes reported
23	RCT	McElligott et al. 2003 A pilot feasibility study of the effects of touch therapy on nurses	To examine effectiveness of AMMA therapy for nurses' wellbeing.	USA, a tertiary care centre 4 weeks	N=30 (20 with full data) 87.5% F Mage=36	I = AMMA therapy (touch therapy) C = mock treatment (4 weekly mock treatments)	Anxiety (VAS) Blood pressure Heart rate Pulse-oximetry Stress dot	Both groups reported decrease in anxiety, blood pressure, and heart rate. Experimental group showed increased relaxation and blood oxygenation. No significant differences between groups (no p values provided).	10.5/23 No info on trial reg., sample size calculation, little info on randomisation, no effect size, no generalizability explored.
24	RCT	Matsugaki et al. 2017	To evaluate the	Japan,	N=30 nurses (29	I = exercise with	Aerobic fitness	Aerobic fitness	17/23

Supplementary material

Table S1. Data extraction for 136 included studies.

		Effectiveness of workplace exercise supervised by a physical therapist among nurses conducting shift work: A randomized controlled trial	effectiveness of supervised exercise among nurses conducting shift work for health promotion.	University of Occupational and Environmental Health 3 months	completed) 100% F Age 20-40	supervision (2x week for 12 weeks; aerobics and resistance) (SG) C = exercise without supervision (VG)	(maximum oxygen uptake) Muscle strength (objective, dynamometer) Anthropometric data (BMI, body fat, body composition analyser) Biochemical parameters (cholesterol; blood tests) Depressive symptoms (BDI, POMS)	increased in the SG whereas it decreased in the VG, but these changes were not statistically significant (p=.053 and .073, respectively). However, the between-group difference was significant for the intervention effect (p =.010). Muscle strength p=.001), high-density lipoprotein cholesterol (p=.03) and metabolic profile (high-molecular weight adiponectin p=.007), and depressive symptoms (p=.01) significantly improved in the SG over time. For VG, body fat (p=.04), cholesterol (p=.03), Low Density Lipoprotein-Cholesterol (p=.03), insulin (p=.04), and reactive oxygen metabolites (p=.002) significantly increased, whereas muscle mass (p=.017) and basal metabolic rate (p=.014) significantly decreased. The SG group scored significantly better on muscle strength (p=.045), low-density lipoprotein cholesterol	No info on trial funding and reg., no power calculation, some info missing on randomisation

								(p=.034) and reactive oxygen metabolite levels (p=.045).	
25	Pre-post not controlled	Martin-Asuero & Garcia-Banda 2010

The Mindfulness-based Stress Reduction program (MBSR) reduces stress-related psychological distress in healthcare professionals | To examine how Mindfulness facilitates a distress reduction in a group of health professionals. | Various hospitals in Palma de Mallorca (Spain)

2 months | N=29 (27 with follow-up)

Mage=41.10 (9.54)

83% F | I = 8 weeks of psychoeducation on mindfulness (28h)

Two separate Is, collapsed for data analysis. | Distress (SCL-90-R)

Daily stress (Survey of Recent Life Experiences, PSS)

Affect (Positive And Negative Affect Schedule)

Rumination (Emotional Control Questionnaire) | No differences in perceived stress (p=.07) or positive affect found.

18% decrease in daily stress

35% decrease in distress (p=.016)

30% decrease in rumination (p=.01), 20% decrease in negative affect (p=.002) | 13.5/18

No power analysis, no software info, not much baseline info, some info missing in the discussion |
| 26 | Pre-post not controlled | MacKenzie et al. 2006

A brief mindfulness-based stress reduction intervention for nurses and nurse aides | To evaluate a brief 4-week mindfulness intervention for nurses and nurse aides. | A large urban geriatric teaching hospital

Canada

4 weeks | N=30 (14 in C, 16 in I)

97% F

Mage=46.7 (7.34) | I = 4x30min mindfulness sessions, plus CD with mindfulness exercises (over 4 weeks) | Burnout (MBI)

Relaxation (the Smith Relaxation Dispositions Inventory)

Job satisfaction Scale

Satisfaction with Life Scale (SWLS)

Orientation to Life Questionnaire | Some significant improvements were observed in burnout symptoms (emotional exhaustion and depersonalisation, p<.05), relaxation (p<.05), and life satisfaction (p<.01), of the intervention group.

No significant change in job satisfaction, sense of coherence, and personal accomplishment. | 15/20

No psychometrics, some info missing on the intervention, no power analysis, no software info, no much info on flow, some info missing in the discussion. |

Supplementary material

Table S1. Data extraction for 136 included studies.

27	RCT	Maatouk et al. 2018 Healthy ageing at work - Efficacy of group interventions on the mental health of nurses aged 45 and older: Results of a randomised, controlled trial	To examine efficacy of small-group intervention promoting successful aging at work.	4 hospitals in Germany 14 weeks	N=115 (I=54, C=61) With complete data n=107 Age >=45 Mage=52 87% F	I = 7 weekly sessions (2h each) + booster session after 6 weeks (16h), SOC model, mindfulness, role C = waiting list	Wellbeing (WHO-5) Quality of life (WHOQOL-BREF) Irritation (8-items) Depressive symptoms (PHQ-9) Anxiety (GAD-7) Work ability (WAI) Job control (Work analysis instrument for hospitals-Self report version)	ITT analysis showed a significant increase in I group, in quality of life (d=.3, p=.045), and irritation (two forms d=.24, d=.31, p=.004) No differences were found between wellbeing (p=.85), depressive symptoms (p=.33), anxiety (p=.68), and work-related outcomes (p=.21, p=.13) However, in the sensitivity analysis, there was a significant change in WAI.	22/22 Everything reported (Gold standard)
28	Pre-post not controlled	Leppämäki et al. 2003 Time bright-light exposure and complaints related to shift work among women	To examine whether brief exposure to light increases wellbeing.	4 hospitals in Finland 2 weeks	N=104 nurses (86 with complete data) Mage=39.2 (7.8) No gender info	I = 4 x 20min of bright light therapy during night shifts (2 weeks)	Scale for shift-work complaints (SSC) Seasonal pattern assessment (SPAQ) Health (SF-36) Morningness-eveningness questionnaire (MEQ)	Significant decrease in distress, in both seasons, independently of age (p=.02)	17/19 Not all info on the intervention, no psychometrics, no power analysis, some info missing in discussion

Supplementary material

Table S1. Data extraction for 136 included studies.

29	Randomised Crossover Trial	Lai & Li 2011 The effect of music on biochemical markers and self-perceived stress among first-line nurses: a randomized controlled crossover trial	To examine effects of music on stress.	Taiwan, various medical units 30min	N=54 nurses 100% F Mage=23.4 (2.46)	I1 = music + chair rest sequence (sitting quietly) (30 min) I2 = chair rest + music sequence Self-selected soothing music used	Heart rate Arterial pressure Finger temperature Cortisol	After music lowered stress, cortisol (p<.05) Post-intervention results showed a difference in heart rate, cortisol, finger temperature, and blood pressure (p<.05)	17.5/23 No info on randomisation, blinding, no registration
30	RCT	Kurebayashi & da Silva 2014 Efficacy of Chinese auriculotherapy for stress in nursing staff	To examine efficacy of auriculotherapy for improving QoL and reducing stress.	Brazil, a private hospital 1.5 month	N=175 Mage=33.98 (7.85) 92% F	Three groups C = no intervention I2 = protocol group (12 sessions, 5-10min, bi-weekly, of Chinese auriculotherapy, always on the same points on the ear) I3 = without protocol group (as above, but choice of points on the ear in response to treatment)	Stress symptoms (Stress Symptoms List; SSL) Physical symptoms (SF36v2)	Both intervention groups showed decrease in stress (p≤.004), with greater effect for I3 (36% decrease, d=1.15) than I2 (27% decrease, d=.79) Group I3 also showed higher QoL (p=.05), and lower physical symptoms when compared to control (6% increase, d=.37) Both I2 (17%) and I3 (15%) showed improvement in mental health domain (p=.033)	12.5/23 Very limited info about randomisation, no demographics for each group, practically no limitations, no registration info
31	RCT	Kurebayashi et al. 2012 Applicability of auriculotherapy in reducing stress and as a coping strategy in nursing professionals	To examine efficacy of auriculotherapy in reducing stress.	Brazil, a teaching hospital in Sao Paulo 2 months	N=109 (75 completed) 95% F Age 39-45	I1 = auriculotherapy with needles (8 sessions; 1x/week, 5-10 min)	Stress (SSL) Coping (Ways of Coping Scale)	Difference in stress for I1/C, and in spacing domain I1/C Within group: decreased stress in I1 and I2 (p<.05), but not	12.5/23 No blinding info, no power calculation, no demographic table, no effect

					Only stressed nurses included	I2 = with seeds C = no intervention		between groups In I1 – difference in confrontation coping (p=.029) In I2 – difference in social support seeking (p=.022)	sizes, no limitations, no registration
32	Pre-post not controlled	Kravits et al. 2010 Self-care strategies for nurses- A psycho-educational intervention for stress reduction and the prevention of burnout	To develop and evaluate psycho-educational program for stress management.	USA, a comprehensive cancer centre in Southern California 6h	N=248 76% F Age 20-60 42% above 40 years	I = discussion of nursing-specific risk factors, practice with relaxation, exploration via art, positive self-care behaviours (6h)	Burnout (MBI) Draw a person in the rain	10% decrease in emotional exhaustion (p<.0005) 3% decrease in depersonalisation (p<.0005) Surprisingly, low personal achievement increased by 10% (no statistical data) The number of people experiencing all criteria of burnout dropped from 4% to 0%	13/18 No power analysis, not much info on flow, no effect sizes, very limited discussion
33	Pre-post not controlled	Koehne 2015 A New Threat to the Nursing Workforce	To examine the effect of workstation wellness intervention.	4 clinics in USA 4 weeks	N=31 No gender info No age info	I = workstation wellness intervention ("Sip, stand, stretch") + 1 introductory session on risks associated with prolonged sitting + water bottle + weekly logs to record activity (incl. weekly check-ins, prizes and stretch	Knowledge, awareness, physical activity (self-report)	Increase in knowledge about workplace ergonomics (p=.0034) Increase in activity importance awareness (standing up, walking, p=.0078) Increase in number of people reporting awareness of amount of stretching they do (p<.001)	8.5/18 Written in non-academic format, no measures explained, no power analysis, no statistics mentioned, no baseline characteristics, no effect sizes or basic results (only p), almost no discussion

						reminders) 4 weeks of stretching, drinking water, standing and walking			
34	Cluster RCT	Jakobsen et al. 2015 Effect of workplace-versus home-based physical exercise on musculoskeletal pain among healthcare workers: a cluster randomized controlled trial	To examine the effect of workplace versus home-based physical exercise on musculoskeletal pain.	3 hospitals in Denmark 10 weeks	N=200 (184 completed both surveys) 100% F Mage=42	I1 = ten weeks of workplace physical exercise (WORK) performed during working hours for 5×10 minutes per week (elastic bands and kettlebells) and up to 5 group-based coaching sessions on motivation for regular physical exercise I2 = home-based physical exercise (HOME) performed during leisure time for 5×10 minutes per week (posters with instructions provided) Both groups received ergonomic counselling on patient handling and use of lifting	Pain intensity in the low back Back muscle strength Use of analgesics	Pain intensity, back muscle strength and use of analgesics improved more following WORK than HOME (p<0.05).	23/23 All aspects described (Gold standard)

						aides			
35	Pre-post controlled	Horner et al. 2014

A pilot study to evaluate mindfulness as a strategy to improve inpatient nurse and patient experiences | To explore the impact of mindfulness training for nursing staff on levels of mindfulness, compassion satisfaction, burnout, and stress. | 1 nursing unit in a hospital in USA

10 weeks | N=74 (post-intervention data for 43)

No gender info
No age info | I = 10-week mindfulness training (10 x 30min)

C = no intervention | Mindfulness (MAAS)

Burnout (ProQoL)

Stress (2 items) | The intervention group showed non-significant improvement in levels of mindfulness (p=.37), burnout (p=.55), and stress (p=.10) as well as patient satisfaction while the control group remained largely the same. | 15/20

No power analysis, no matching, limited info on flow of participants, no baseline characteristics per condition, no effect sizes. |
| 36 | Pre-post controlled | Hartvigsen et al. 2005

Intensive education combined with low tech ergonomic intervention does not prevent low back pain in nurses | To evaluate the effectiveness of an intensive educational and low-tech ergonomic intervention programme aimed at reducing low back pain. | Home care nurses in 4 cities in Denmark

2 years | N=309 (255 with follow up data)

Mage=44.5

100% F | I = participants were divided into small groups, each of which was assigned one specially trained instructor. During weekly meetings participants were educated in body mechanics, patient transfer, and lifting techniques, and use of low-tech ergonomic aids (min 1h/week for 2 years + meetings with psychologist)

C = participants attended one three-hour instructional | Low back pain (LBP; Standardised Nordic Questionnaire)

Episodes of LBP

Care seeking for LBP | No significant differences were found between the two groups for any of the LBP variables (days with pain p<.88, episodes p <.84, seeking treatment p=.76)

Both groups thought that education was helpful. | 17.5/20

No theories behind interventions, no psychometric info, no effect sizes, some omissions in discussion |

							meeting		
37	Pre-post not controlled	Foureur et al. 2013 Enhancing the resilience of nurses and midwives: Pilot of a mindfulness-based program for increased health, sense of coherence and decreased depression, anxiety and stress	To pilot the effectiveness of an adapted mindfulness-based stress reduction intervention on the psychological wellbeing of nurses and midwives.	2 teaching hospitals in NSW (Australia) 2 months	N=40 (28 with follow-up) No gender info No age info	I = one day workshop of mindfulness (MBSR), plus meditation for 8 weeks (20min a day, with CD)	Health (GHQ-12) Sense of coherence (SOC) Depression, stress, anxiety (DASS-14)	There were significant improvements on the GHQ-12 (p=.01), SOC (p=.009) and the stress (p=.004) subscale of the DASS. Depression (p=.80) and anxiety (p=.08) decreased non-significantly.	13.5/18 No power analysis, no baseline demographics, no effect sizes, limited discussion
38	Wait-list RCT	Ewers et al. 2002 Does training in psychosocial interventions reduce burnout rates in forensic nurses	To evaluate the effect of Psychosocial Intervention Training (PSI) on the knowledge, attitudes and levels of clinical burnout in a group of forensic mental health nurses.	UK, forensic mental health nurses in regional secure unit 6 months	N=33 (20 with follow-up measures; 10 in I, 10 in C) 30% F Mage=42.5 (6.67)	I = Psychosocial Intervention (PSI) training (6 months; 20 days in total; practical skills for reducing distress; change in attitudes to mental health) C = waiting list	Knowledge about schizophrenia Attitude towards mental health and patients care Burnout (MBI)	Staff in the experimental group showed significant improvements in their knowledge (p<.001; difference in increase between groups 23.42) and attitudes (p<.001; difference in increase between groups 24.71) about serious mental illness and a significant decrease in burnout rates (EE: p=.04, DP: p=.01, PA: p=.01), whilst staff in the control group showed a small but nonsignificant improvement in knowledge and attitudes, and increase in burnout.	11.5/23 No psychometrics, no power analysis, not all info on participant flow, no effect sizes, no details on randomisation, rather limited discussion

Supplementary material
Table S1. Data extraction for 136 included studies.

| 39 | Pre-post not controlled | Craigie et al. 2016 A pilot evaluation of a mindful self-care and resiliency (MSCR) intervention for nurses | To evaluate the feasibility of a mindfulness-based intervention aimed at reducing compassion fatigue and improving emotional well-being in nurses. | A teaching hospital in Western Australia 4 weeks | N=21 (20 with complete data) Mage=48.6 (9.94) 95% F | I = Mindful Self-Care and Resiliency (MSCR) intervention, 1-day compassion fatigue prevention educational workshop, followed by a series of weekly mindfulness training seminars conducted over 4 weeks (12 h total) | Burnout (ProQoL5) PTSD (SSSP) Drug and alcohol misuse (CAGE-AID; only for exclusion) Depression, anxiety, stress (DASS, STAI-Y2) Resilience (CD-RISC) Passion for work (PWS) | Significant improvements were observed following the intervention for compassion satisfaction (p<.05), burnout (p<.001), trait-negative affect (p<.001), obsessive passion (p<.05), and stress scores (p<.05) (at least at one of the measurement points). At pre-intervention, 45 % of the sample had high burnout scores, but this reduced to just 15 % at post-intervention. No significant changes were observed for general resilience, anxiety, or secondary traumatic stress at post-intervention or at follow-up. | 15.5/18 No power analysis, no structured abstract |
| 40 | Pre-post controlled | Karpaviciute & Macijauskiene 2016 The Impact of Arts Activity on Nursing Staff Well-Being: An Intervention in the Workplace | To investigate the impact of arts activity on the well-being of nursing staff. | A hospital in Lithuania 10 weeks | N=115 (111 with full data) 100% F Majority aged 40+ | I = 10 weeks (1/week x 2h) of silk painting C = no intervention | Wellbeing (WEMWBS) Stress (Reeder stress scale) Fatigue (MFI-20) | In the intervention group, there was a tendency (non-significant) for participation in arts activity having a positive impact on general health and mental well-being, reducing stress and fatigue, awaking creativity and | 14/20 No power analysis, not much info on condition assignment, no theory behind intervention, no effect sizes, very limited discussion |

							Health (SF-36)	increasing a sense of community at work. The control group did not show any improvements. Between group comparisons showed a significant difference in the intervention group for emotional wellbeing only (p<.001), and a trend for vitality, anxiety and fatigue (p=.07).	
41	Pre-post not controlled	Karahan & Bayraktar 2013 Effectiveness of an education program to prevent nurses' low back pain: an interventional study in Turkey	To evaluate an education program to prevent low back pain among nurses.	4 hospitals in Turkey 2 days	N=60 Majority < 36 No gender info	I = training booklet on back pain + 4h workshop (2 days)	Knowledge on back pain Observation of handling procedures	The mean knowledge (p<.05) and procedure (p<.05) scores of the nurses were higher just after and 3 months after the training compared to before training.	12.5/18 No power analysis, no effect sizes, no psychometrics, very limited discussion
42	Pre-post not controlled	Isaksson et al. 2010 A self-referral preventive intervention for burnout among Norwegian nurses: one-year follow-up study	To investigate levels and predictors of change in burnout dimensions after an intervention for help-seeking nurses.	Norway, hospital and municipality employees 5 days	N=172 (160 completed) 97% F Mage=47.0 (9.3)	I = self-referral, 1 counselling session and a 5-day course to enhance health and life quality, and prevent burnout (PA, relaxation, mindfulness, cognitive theory) 1-year follow-up	Burnout (MBI) Seeking therapy	Mean level of emotional exhaustion (one dimension of burnout, scale) was significantly reduced from 2.87 (SD 0.79) to 2.52 (SD 0.8), t = 5.3, p < .001, to the level found in a representative sample of Norwegian nurses. The same for depersonalisation (t=3.48, p=.001), but not for personal	15/18 No power analysis, no effect sizes, some aspects omitted in the discussion

Table S1. Data extraction for 136 included studies.

								achievement (t=1.69, p=.09). The proportion of nurses seeking psychotherapy increased after the intervention, from 17.0% (25/147) to 34% (50/147), p < 0.001.	
43	Pre-post not controlled	Hevezi 2016 Evaluation of a Meditation Intervention to Reduce the Effects of Stressors Associated with Compassion Fatigue Among Nurses	To evaluate whether short (less than 10 minutes) structured meditations decrease compassion fatigue and improve compassion satisfaction in oncology nurses.	USA, an academic medical centre 4 weeks	N=15 100% F No age info	I = meditation and breathing exercise 5 days a week for 4 weeks (via audio CD) after a 1-to-1 initial information session	Professional Quality of Life Survey (ProQoL)	Results showed a statistically significant increase in Compassion Satisfaction scores (mean difference = −2.66, 95% confidence interval [CI] = [−4.98, −0.36], $t[14] = −2.48$, $p = .027$, $d = 0.63$) and decreases in Burnout (mean difference = 4.13, 95% CI = [1.66, 6.60], $t[14] = 3.581$, $p = .003$, $d = 0.92$) and Secondary Trauma (mean difference = 3.00, 95% CI = [0.40, 5.96], $t[14] = 2.174$, $p = .047$, $d = 0.56$) scores. All participants reported increased feelings of relaxation and well-being on supplemental questions.	11.5/18 Not much detail on intervention, no psychometrics, no power analysis, no software info, no baseline demographics, very limited discussion
44	Wait-list RCT	Hersch et al. 2016 Reducing nurses' stress: A randomized controlled trial of a web-based stress	To evaluate the effectiveness of the web-based BREATHE: Stress Management for	6 hospitals (Virginia and New York) in USA 3 months	N=104 (90 with full data) Mage=41 88% F	I = access to BREATHE web-based program, 3 months, to be used as often as needed (based on	Perceived nursing-related stress (NSS) Distress (Orioli et al., 1991)	Intervention group participants experienced significantly greater reductions than the control group on the full Nursing Stress Scale (t	16/23 No power analysis, no blinding, no effect sizes, trial

Supplementary material

Table S1. Data extraction for 136 included studies.

		management program for nurses	Nurses program.			stress and coping; M time using 43 min) C = wait list	Coping (Orioli et al., 1991) Job satisfaction (Nurse satisfaction scale), Work limitations (work limitations questionnaire), Substance use, understanding of depression and anxiety (self-report, own measure)	= -2.95; p<.001), and six (.001<ps<.05) of the seven subscales (the only non-significant difference in stress due to lack of support t=-1.49). No other significant results were found (symptoms of distress, coping, work limitations, job satisfaction, substance use, understanding depression and anxiety). Moderator analysis found that nurses with greater experience benefitted more.	limitations not considered, no registration
45	RCT	Glavas et al. 2003 Smoking cessation with nicotine replacement therapy among health care workers: randomized double-blind study	To assess the smoking prevalence and efficacy of nicotine replacement therapy on the quitting rate after 3 weeks of therapy and after 1- and 5-year follow-up among health care workers with a smoking habit in Split, Croatia.	A University Hospital in Croatia 3 weeks	N=311 (112 smokers; 107 with full data) nurses and medics 64% F Mage=34(4.5)	I = applying daily a transdermal nicotine system (TNS) for 3 weeks C = placebo patch	Abstinence	The abstinence rates after the 3-week intervention period were 39% in the TNS group and almost 20% in the control group (chi-square test, p=0.038). After one year, these rates declined to 23% and 16%, respectively (p=0.476), and converged to 18% and 14% (p=0.797), respectively, at 5-year follow-up.	14.5/23 No power calculation, no limitations, registration info
46	Pre-post controlled	Geary & Rosenthal 2011	To evaluate self-reported stress	University of Texas Medical	N=153 (108 took part in the follow	I = MBSR (8 weeks)	Cohen's Perceived Stress	MBSR participants improved on all	14/20

		Sustained impact of MBSR on stress, well-being, and daily spiritual experiences for 1 year in academic health care employees	levels and daily spiritual experiences in academic health care employees before, immediately after, and 1 year after enrolling in a mindfulness-based stress reduction (MBSR) course.	Branch in Galveston, USA

2 months | up)

Mage=45(9.1)

91% F | C = no intervention | Scale (PSS)

the SCL-90, the SF-36 Measure of Health and Well-Being

the Daily Spiritual Experiences Scale | measures except the physical component score of the SF-36 upon completion of the MBSR course, and these results were maintained at the 1-year follow-up.

The control group did not significantly change on any of the measures.

No p values provided. | No eligibility criteria, limited description of intervention, no psychometrics, no power analysis, no effect sizes, very limited discussion/limitations |
| 47 | Pre-post not controlled | Gauthier et al. 2015

An on-the-job mindfulness-based intervention for paediatric ICU nurses: A pilot | To examine the feasibility of a 5-minute mindfulness meditation for PICU nurses before each work-shift for change in nursing stress, burnout, self-compassion, mindfulness, and job satisfaction. | An academic hospital in USA

4 weeks | N=45 (38 with full data)

93% F

75.5% under the age of 39 | I = 5 min mindfulness before work (MBSR) plus weekly 30-min group sessions, 10-min at home with CD; for 1 month | Nursing Stress Scale

Maslach Burnout Inventory

Mindfulness Attention Awareness Scale

Self-Compassion Scale | The intervention was found to be feasible for nurses on the PICU.

A repeated measures ANOVA revealed significant decreases in stress (p=.006) from baseline to post intervention and maintained 1 month following the intervention.

No significant changes in burnout (potential trend for personal accomplishment), self-compassion (p=.26), job satisfaction (p=.15) or mindfulness (p=.37) noted.

No moderating effect of state and trait | 13/18

No power analysis, no software info, not all info on flow, no effect sizes, some things lacking in the discussion |

Supplementary material
Table S1. Data extraction for 136 included studies.

									mindfulness found.	
48	Pre-post not controlled	Freitas et al. 2014 Impact of a physical activity program on the anxiety, depression, occupational stress and burnout syndrome of nursing professionals	To assess the effects of a workplace physical activity (WPA) program on levels of anxiety, depression, burnout, occupational stress and self-perception of health and work-related quality of life of a nursing team in a palliative care unit.	A hospital in Brazil 3 months	N=54 (21 with full data) Mage=37.4(9.1) 95% F	I = 10-min WPA 5 times per week, for 3 months	the Hospital Anxiety and Depression Scale the Maslach Burnout Inventory the Job Stress Scale Interview (perceptions of changes in health and QoL)	The WPA did not yield significant results for the levels of anxiety (difference of 3 people over cut-off, p=.18), depression (4 people difference, p=.10), burnout (.54<ps<.88) or occupational stress (.18<ps<.65). But participants reported improved perceptions of bodily pain (95% of respondents) and feeling of fatigue (63%) at work. 86% reported improved overall QoL.	11/18 Almost no info on the intervention, no power analysis, no effect sizes, very limited discussion
49	Pre-post not controlled	Flarity et al. 2016 Intervening to Improve Compassion Fatigue Resiliency in Forensic Nurses	To examine the treatment effectiveness of a multifaceted education program on compassion fatigue (CF).	USA, 2 hospitals within a university health system 4h	N=9 (for intervention part; 7 with full data) 100% F All 30+	I = multifaceted CF resiliency intervention program (4h seminar on compassion fatigue; relaxation skills, guided imaging; also provided with DVD and CD with music)	Professional Quality of Life tool (ProQOL)	In the intervention group, the education program resulted in a statistically significant increase in CF resiliency (M=7.1 score difference, p<.001) and decreases in burnout symptoms (5.1 score difference, p=.04) and secondary traumatic stress symptoms (6.8 score difference, p=.003).	13/18 No eligibility criteria explained, no power analysis, no software info, no effect sizes, limited discussion.

| 50 | Pre-post not controlled | Flarity et al. 2013

The effectiveness of an educational program on preventing and treating compassion fatigue in emergency nurses | To examine the treatment effectiveness of a multifaceted education program to decrease compassion fatigue (CF) and burnout (BO) symptoms and increase compassion satisfaction of emergency nurses. | 2 emergency departments in Colorado Springs, USA

4h | N=73 (59 with full data)

Majority 30+

89% F | I = 4h seminar about compassion fatigue, suggestions for prevention and treatment, imagery exercise; participants given leaflet, CD and access to educational website | ProQOL (compassion satisfaction, burnout, secondary traumatic stress symptoms) | The intervention resulted in a statistically significant decrease in CF (change of 1.9 point, p = .004) and a decrease in BO (change -3.9 points, p < .001) and STS (change -2.1 point, p = .001) symptoms | 13/18

No eligibility criteria, no power analysis, no effect sizes, very limited discussion |
|---|---|---|---|---|---|---|---|---|---|
| 51 | RCT | Fang & Li 2015

A regular yoga intervention for staff nurse sleep quality and work stress: A randomised controlled trial | To determine the impact of yoga on the quality of sleep and work stress of staff nurses. | China, a general hospital

6 months | N=120 (105 with full data)

Age 25-51

Mage=35.5 (10.5)

No gender info | I = yoga more than two times every week for 50–60 minutes each time after work (6months)

C = no intervention | Pittsburgh Sleep Quality Index

Questionnaire on Medical Worker's Stress (QMWS) | Nurses in the yoga group had better overall sleep quality (p=.048) (including significant improvement in sleep duration, efficiency, disturbances, medications use, and daytime dysfunction ps<.002) and lower work stress (p <.001) compared with nurses in the non-yoga group. | 14/23

Power calculations, randomisation details, blinding, confidence intervals, trial limitations, registration missing |
| 52 | Pre-post not controlled | Edmonds et al. 2012

Alleviating emotional exhaustion in oncology nurses: An evaluation of Wellspring's "Care for the Professional Caregiver Program" | To assess changes in the effects of the intervention on burnout, as well as psychological morbidity. | 4 major hospitals in Canada

1 day | N=182 (150 with full data after 1 month, and 79 after 7 months)

98% F

No age info | I = 1-day workshop (Care for the Professional Caregiver) + booster session (adaptive coping with grief, | Maslach burnout inventory (MBI)

General health questionnaire | The nurses demonstrated a significant decrease in emotional exhaustion (1.7 point at 1 month, 2.4 at 7 months) and an improvement on the GHQ (2 points at 1 | 14.5/18

No eligibility criteria, no psychometrics, not much info on flow, no effect sizes, no |

						burnout prevention, relaxation techniques)	(GHQ) Short form of the Marlowe–Crowne social desirability scale (M–C)	month, 1.5 at 7 month), at the 1-month follow-up testing (p=0.003 and 0.001, respectively) and 7-month follow-up testing (p = 0.002 and 0.001). No significant change in depersonalisation or personal achievement subscales.	discussion of generalizability
53	Pre-post not controlled	Dyess et al. 2018 Self-Care for Nurse Leaders in Acute Care Environment Reduces Perceived Stress: A Mixed-Methods Pilot Study Merits Further Investigation	To investigate a self-care simple meditation practice for nurse leaders.	2 acute practice sites in USA 3 months	N=24 nurse leaders (22 with data) Mage=47.82 (9.20) 86% F	I = meditation practice taught within 2h session, with intention to practice daily (weekly reminders sent), plus printed guide (12 weeks)	Stress (PSS) Locus of control Mindfulness (MAAS) Self-esteem (Rosenberg) Focus groups	The results showed a statistically significant drop (-4.59 points) in perceived stress at 6 weeks and kept the same at 12 weeks (p=.009). Locus of control (p=.16), and mindfulness (p=.16) did not show significant differences, but there was a trend for self-esteem (p=.052). Few themes identified: Acknowledging stress; Identifying self-care outcomes, Appreciating Stress Management Support, Thriving on challenges; Incorporating self-care into professional routine, Noncommitting to use self-care as a	14/18 No power analysis, no participant numbers for each analysis, very limited discussion

									vital tool	
54	Pre-post Wait-List controlled	Duarte & Pinto-Gouveia 2016 Effectiveness of a mindfulness-based intervention on oncology nurses' burnout and compassion fatigue symptoms: A non-randomized study	To explore the effectiveness of an on-site, abbreviated mindfulness-based intervention for nurses.	2 oncology hospitals in Portugal 6 weeks	N=94 nurses (48 with full data) 90% F Mage=41 (8.43)	I = 6-week mindfulness-based group intervention, plus CD with guidance to practice at home 15min a day C = wait list	Burnout, compassion fatigue (ProQOL) Mindfulness (FFMQ) Self-compassion scale Experiential avoidance (acceptance and action questionnaire) Rumination (Ruminative Responses Scale) Satisfaction with life (SWLS) Depression and anxiety (DASS-21)	Nurses in the intervention reported significant decreases in compassion fatigue (p<.001), burnout (p=.002), stress (p=.008), experiential avoidance (p=.001), and increases in satisfaction with life (p=.026), mindfulness (p=.026) and self-compassion (p=.02), with medium to large effect sizes. Some of these (compassion fatigue, experiential avoidance, observing, self-compassion) hold when controlling for pre-test scores. No effect for depression and anxiety. Nurses in the comparison group didn't present significant changes on these variables.	17.5/20 No matching, no baseline comparison.
55	Pre-post not controlled	Croteau 2016 Using Pedometers to Increase the Non-Workday Steps of Hospital Nursing and	To examine the effects of a 12-week pedometer-based PA intervention on daily steps of	A Portland area hospital, USA 3 months	N=20 nurses Mage=47.6 (7.1) 95% F	I = 12-week minimal-contact, self-managed PA intervention with pedometer (based on Maine in	Physical activity (steps, pedometer) BMI (objective)	Significant differences were found between total daily steps at baseline (8,446) and at 12 weeks (10,655; p = .014), and between	14/18 No eligibility info, no power analysis, no effect sizes, limited

Table S1. Data extraction for 136 included studies.

#	Type	Author/Title	Aim	Setting/Duration	Sample	Intervention	Outcomes	Results	Quality/Critique
		Support Staff: A Pilot Study	hospital nursing and support staff.			Motion); includes guide, counselling, and self-monitoring, with self-goal of increasing daily steps	Waist circumference (objective)	workday steps at baseline (10,398) and at 12 weeks (13,056; $p = 0.005$).\n\nThe increase in the non-workday steps from baseline (5,850) to 12 weeks was non-significant ($p = .087$; but for one of the groups there was a significant increase p=.003; 3979 steps).\n\nThe BMI (p=.17) and waist (p=.97) also did not show change.	discussion
56	Pre-post not controlled	Codier et al. 2011\n\nThe impact of emotional intelligence development on nurse managers	To explore the impact of a peer coaching intervention on emotional intelligence abilities of nurse managers.	A medical centre in Hawaii, USA\n\n6 months	N=24 (15 with full data)\n\nMage=49.2\n\nBoth genders, no more info	I = initial training sessions on EI, plus weekly one-to-one peer coaching; and monthly group meetings (6 months)	Emotional intelligence (MSCEIT)\n\nManagement skills\n\nBurnout (MBI)	Participants perceived that the intervention improved their management skills and EI, even though the scores suggested a significant decrease in EI (p<.05)\n\nNo other results reported.	12/18\n\nNo eligibility info, not all of intervention info provided, no power analysis, no statistics info or software, no effect sizes, limited discussion
57	RCT	Chen et al. 2014\n\nEffectiveness of a stretching exercise program on low back pain and exercise self-efficacy among nurses in Taiwan: A randomized clinical trial	To examine the effectiveness of a stretching exercise program (SEP) on low back pain (LBP) and exercise self-efficacy among	2 hospitals in Taiwan\n\n6 months	N=127 nurses (64 in I, 63 in C; some drop-out with time, 127 at 2-months, 81% at 6-months)\n\nWith LBP\n\nMage=34 (6.7)	I = SEP (warm-up, back-pain exercise, core muscle training and relaxation exercise) for 50 min per time, 3x a week (available during lunch and evening in a	Pain (VASP)\n\nSelf-efficacy (Exercise Self-Efficacy Scale)	During the 6-month follow-up, the experimental group had significantly lower pain scores than did the control group at the second (p=.04), fourth (p=.01), and sixth	14/24\n\nInfo on randomisation, and blinding, effect sizes, trial limitations, registration

			nurses in Taiwan. No gender info		C = performing usual activities for 50 minutes per time, three times a week (6 months).			month (p=.002). In addition, the experimental group showed significantly higher exercise self-efficacy than did the control group at the fourth (p=.02) and sixth (p=.003) months. A total of 81% of the participants in the experimental group reported a moderate to high level of LBP relief. 78% were satisfied with SEP.	
58	Pre-post controlled	Chalmers et al. 2001 A smoking reduction and cessation program with registered nurses: Findings and implications for community health nursing	To examine the effect of 8-week intervention on smoking cessation among nurses.	Canada, nurses from 3 provinces (the type of work context not specified) 2 months	N=119 nurses (90 with post data) (44 in C, 75 in I) Age 22-60 Mage=40.6 97% F	I = 8-week group smoking intervention delivered with facilitator support, 1x per week, (CloseUp resource manual) C = self-directed program, with nurse-specific resources, same resources but researched independently	Number of cigarettes smoked Number of nurses smoking Nicotine dependence Stage of behavioural change model (Attitudes to change) Perceived gains and losses (Decisional Balance Scale) Confidence to resist smoking	No significant difference between groups in the amount of cigarettes smoked (p=.30). Analysis changed to one group collapsed – pre-post due to missing data. Statistically significant changes at 8 weeks in nurses' smoking practices were found on the number of nurses continuing to smoke, mean number of cigarettes smoked (p=.0001), nicotine dependence (p=.0001) and movement in the stage of behavioural change (p=.0001).	16/21 No psychometrics, no power analysis, no blinding info, no effect sizes, no comments on generalizability.

									Many changes not sustained during the long follow-up.	
59	Pre-post controlled	Buruck et al. 2016

Enhancing well-being at work: The role of emotion regulation skills as personal resources | To evaluate the impact of a standardized emotion regulation training (Affect Regulation Training [ART]; Berking, 2010) to improve emotion regulation skills and well-being of employees in elderly health care. | 14 nursing homes in Germany

10 weeks | N=96 care workers (60 with post data, 28 with follow up)

93% F

Mage=41.5 (11.0) | I = ART training (group intervention, based on CBT), 8-9 sessions 1.5h each, aimed at improving emotion regulation abilities (plus audio material to practice skills; 8-12 weeks)

C = no intervention | Emotion regulation skills (ERSQ)

Wellbeing (WHO-Five)

Satisfaction with training | The findings show that the ART fosters emotion regulation skills. In particularly, acceptance (p=.039, eta square =.07), tolerance (p=.006, eta square = .11), and modification of negative emotions (p=.018, eta square = .09) was higher in the intervention than control group at post-test.

Well-being (p<.001, eta square = .21 at post, p = .02 at follow-up, eta square = .17) of participants also increased for all measurement time points in the ART-group compared with the control-group.

Positive assessment of the training. | 16/20

Some missing info in abstract, no power analysis. |
| 60 | RCT | Brox & Froystein 2005

Health-related quality of life and sickness absence in community nursing home employees: Randomized controlled trial of physical exercise | To evaluate the effectiveness of physical exercise at the workplace. | A nursing home in Norway

6 months | N=129 (97 followed at post-test, 81 with most data)

96.5% F

Mage=42.5 | I = physical exercise (weekly 1h light aerobic exercise for 6 months) plus chance to take part in classes on nutrition, stress management, and PA | Aerobic fitness (UKK walking test, objective)

Health-related quality of life (COOP/WONCA)

Sickness | Self-reported physical activity increased in the intervention group compared with the control group (p < 0.01). Aerobic fitness improved in both groups (p < 0.01).

Mean sickness absence | 17.5/23

No eligibility criteria, no method of random number generation, no generalisability, or registration details |

Table S1. Data extraction for 136 included studies.

							C = no intervention	absence (days) Leisure time PA (self-report) Health complaints (no details) Job satisfaction (no details)	increased from 6.8 to 15.6 days in the exercise group and from 10.4 to 14.5 in the control group. No differences between groups were found for aerobic fitness, health-related quality of life (.06<ps<.92), sickness absence (p=.64), or health complaints. Self-reported PA was higher in the intervention group (48%) compared with controls (14%, p<.01).	
61	Pre-post not controlled	Bormann et al. 2006 Relationship of frequent mantram repetition to emotional and spiritual well-being in healthcare workers	To examine the effectiveness of frequently repeating a mantram (a word with spiritual meaning) on emotional and spiritual well-being.	The Veterans Affairs San Diego Healthcare System, USA 5 weeks	N=62 (42 with full data for some measures) Mage=47.8 (8.33) 87.5% F	I = 5-week mantram programme (group meetings, 90min per week; based on The Mantram Handbook by Easwaran, 1998; 2001)	Stress (PSS) State/trait anxiety and anger (Spielberg) Quality of life (Endicott's Quality of Life Enjoyment and Satisfaction Short Form) Spiritual well-being (Ellison & Jonker-Bakker, 1983)	Significant improvements were found in stress (p < .001), trait-anxiety (p = .002), trait-anger (p = .02), quality of life (p = .001), existential wellbeing (p=.001) and spiritual well-being (p = .003). There was no significant change in state anxiety (p=.14) or anger (p=.08), or religious wellbeing (p=.22). High mantram users had significant reductions in trait-anxiety and increases in both religious and total	13/18 No eligibility info, no power analysis, no effect sizes, limited discussion	

Supplementary material

Table S1. Data extraction for 136 included studies.

									spiritual wellbeing compared to low mantram users (ps <.05).	
62	RCT	Becker et al. 2017 The prevention of musculoskeletal complaints: A randomized controlled trial on additional effects of a work-related psychosocial coaching intervention compared to physiotherapy alone	To determine whether a coaching intervention which was focussed on enabling better strategies for coping with work stressors is superior to physiotherapy alone in the reduction of musculoskeletal complaints (MSC).	Five hospitals in the Paderborn region (Germany) 10 weeks	N=68 nurses (34 in I, 34 in C), 65 with full data 87% F Mage=44 (10.27)	I = a weekly individual physiotherapy exercises (10 weeks, 45 min each), plus 5 coaching sessions (90min each), and one opening and one closing session (90min each) C = a weekly individual physiotherapy exercises (10 weeks).	MSC (Functional status of the locomotor system) Work ability (WAI) Irritations scale Burnout (MBI)	In respect of MSC, the IG compared to the CG showed a significant improvement in the pain severity of everyday movements (p=.037), and trends (p=.07) towards an improvement of movement in the vertebral column as well as a reduction of the pain severity due to maximum degree movements. No effects were observed in respect to muscle strengths, and restrictions of everyday activities. The IG exhibited a significant improvement of work ability (p<.035) in reference to the physical working demands, and work-related wellbeing (p<.05). Analysis indicates that improvements in the IG increased further in the 12 weeks after the intervention.	18.5/23 Random number generator details, blinding, protocol

Supplementary material

Table S1. Data extraction for 136 included studies.

| 63 | RCT | Bay et al. 2010

The effect of spiritual retreat on nurses' spirituality: A randomized controlled study | To test whether two 1-day retreats focused on spiritual self-care would positively change nurse participants' spirituality. | 2 hospitals in USA

2 days | N=231 (197 nurses completed data)

96% F

Mage=35 (10.3) | I = two 1-day spiritual retreats (self-awareness, self-care, healthy boundaries)

C = no intervention | Spirituality (SWBS, DSES) | Retreat participants demonstrated increased spirituality (SWBS p =.04, DSES p=.05) | 15/23

Eligibility criteria, randomisation and blinding details, reasons for exclusions, registration |
|---|---|---|---|---|---|---|---|---|---|
| 64 | RCT | Appel et al. 2013

A comparative study of a happiness intervention in medical-surgical nurses | To evaluate impact of journaling on nurse happiness and gratitude. | A midwestern hospital in USA

4 weeks | N=91 nurses

Mage=37 (12)

No gender info | I = provided a journal and the book Three Good Things: Happiness Every Day, No Matter What! (Oliver, 2007), asked to write daily for 4 weeks (also to record three good things about each day, and share the list with one or more co-workers or family members)

C = received a book of similar value to read at their leisure. | Happiness (2 items)

Gratitude (6 items)

Quality of care provided | No differences in general happiness (p=.23), and percentage of time being happy (p=.96) were detected among groups although journaling was qualitatively described as meaningful.

There was a significant difference in gratitude (p=.045).

Gratitude was correlated with quality of care provided (p<.05). | 8/23

Info missing in abstract, not much detail on the intervention, no psychometrics, no info on flow of participants, no effect sizes, not much info on randomisation, almost no discussion |
| 65 | Cluster RCT | Andersen et al. 2015

Effect of physical exercise on workplace social capital: Cluster | To investigate the effect of physical exercise on social capital at work. | 3 hospitals in Denmark

10 weeks | N=200 nurses and nurse aids (184 with full data) | I = 10 weeks (5 x 10min a week) of group-based physical exercise (strength training | Workplace social capital (Bonding, bridging, linking) | A group by time interaction was found for bonding social capital (p=0.02), where physical exercise at | 21/23

Some randomisation and blinding |

| | | | | | 100% F

Mage=42 (11) | with kettlebells, Swiss balls, and elastic bands) at work during working hours; plus 5 coaching sessions (30-45 min)

C = 10 weeks (5 x 10min) of physical exercise (strength training) at home during leisure time (participants given elastic bands and exercise instructions) | | work compared with physical exercise during leisure time increased by 5.3 (95% confidence interval 2.3–8.2) (effect size, Cohen's d = 0.31) from baseline to follow-up.

Surprisingly, for physical exercise during leisure time and exercise at work combined, a time effect (p=0.001) was found for linking social capital, with a decrease of 4.8 (95% confidence interval 1.9–7.6). | details. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | randomized controlled trial | | | | | | | | |
| 66 | RCT | Alexander et al. 2015

Yoga for Self-Care and Burnout Prevention Among Nurses | To examine the efficacy of yoga to improve self-care and reduce burnout among nurses. | An urban hospital in USA

2 months | N=40 nurses (20 in C, 20 in I)

97.5% F

Mage=46.38 (10.23) | I = 8 weeks of supervised yoga instruction (postural alignment, deep breathing, simple meditations, relaxation)

C = usual care | Health Promoting Lifestyle Profile (HPLP II)

Mindfulness (FMI, Freiburg Mindfulness Inventory)

Burnout (MBI) | Compared with controls yoga participants reported significantly higher self-care as well as less emotional exhaustion and depersonalization after the intervention.

Although the control group demonstrated no change throughout the course of the study, the yoga group showed a significant improvement in scores from pre- to post-intervention for self-care ($p < .001$), | 13/23

No RCT in title, no structured abstract, no info on randomisation, no flow diagram of participants, no registration, limited limitations |

								mindfulness (p = .028), emotional exhaustion (p = .008), and depersonalization (p = .007). No significant improvement from pre- to post- intervention on any outcomes was found for the control group.	
67	Pre-post not controlled	Flarity et al. 2016 Intervening to improve compassion fatigue resiliency in nurse residents	To examine the impact of a compassion fatigue resiliency intervention in new graduate nurse residents.	Two hospitals in USA 4h	N=176 (94 with full data) 82% F 84% < 30years	I = 4h CF Resiliency intervention (seminar on origins of CF, symptoms; exercises on self-regulation, plus CD)	Compassion satisfaction Compassion fatigue (CF) Secondary traumatic stress (STS) Burnout (BO) All measured with ProQOL	A statistically significant decrease in mean STS from baseline to follow-up was found (-2.2 points change, p < .001). A mean increase in CS and decrease in BO were trending in the desired direction but were not statistically significant (mean CS increased from 38.4 to 39.0, p = .27 and mean BO decreased from 22.2 to 21.6, p = .14). The prevalence of CS increased (4%) and STS (14%) and BO (8%) decreased from baseline to 2-months post intervention.	11.5/18 No eligibility criteria, no power analysis, no info on flow, no effect sizes, limited discussion
68	Pre-post not controlled	Flarity et al. 2018 Longitudinal study of a compassion fatigue resiliency intervention in nurse residents	To evaluate the influence of a four-hour resiliency intervention for compassion	2 hospitals in USA 4h	N=37 (34 with full data) 85% F 85% < 30years	I = 4h CF Resiliency intervention (seminar on origins of CF, symptoms;	Compassion satisfaction Compassion	The mean STS showed a statistically significant decrease from 2-months and 6-months (+7% above 2-month data, p <	12.5/18 No eligibility criteria, no power analysis, no software info, no

			fatigue (6month follow-up for the study above).			exercises on self-regulation, plus CD)	fatigue (CF) Secondary traumatic stress (STS) Burnout (BO) All measured with ProQOL	.001). A decrease in BO and mean increase in CS were not statistically significant, but were trending in positive direction.		effect sizes, limited discussion
69	Pre-post controlled	Ando et al. 2011 Efficacy of mindfulness-based meditation therapy on the sense of coherence and mental health of nurses	To assess the efficacy of mindfulness-based meditation therapy on the psychological well-being and sense of coherence of nurses with respect to coping with stress.	Japan, elderly wards 2 weeks	N=28 nurses No age info No gender info	I = 2 sessions (30-60min) of mindfulness-based meditation therapy (breathing, yoga, meditation); plus CD for exercising at home (for 2 weeks) C = no intervention	General health (GHQ) Sense of coherence Spiritual well-being (Functional Assessment of Chronic Illness Therapy; FACIT-SP)	The GHQ scores of the intervention group showed a trend for greater decrease than those of the control group (p=.059). The SOC scores of the intervention group showed a significantly greater increase after the intervention compared to those in the control group (p<.04), with the highest score for the meaningfulness subdomain. There was no significant effect on spiritual wellbeing.		10.5/20 No psychometrics, no power analysis, limited info on assignment, no info on flow of participants, no baseline characteristics, no effect sizes, very limited discussion
70	RCT	Pipe et al. 2009	To rigorously evaluate a brief	USA, a healthcare	N=33 nurse leaders (32 with	I = brief (4 weeks; 5 x 2h	Psychological symptoms	Among MMC participants, change		19/23

					full data)	sessions)	(Symptom	scores on several sub-	Some info
		Nurse leader mindfulness meditation program for stress management: A randomized controlled trial	stress management intervention for nurse leaders.	system in the southwest of USA 4 weeks	Mage=49.8 (6.84) 97% F	mindfulness meditation course (MMC; core MSBR principles; plus 30min daily practice) C = leadership course (containing advanced principles of stress and leadership strategies)	Checklist; SCL-90) Caring efficacy Scale	scales of the Symptom Checklist 90-Revised showed significantly more improvement in self-reported stress symptoms relative to controls (obsessive-compulsive symptoms, anxiety, phobic anxiety, psychoticism, ps<.041). Mindfulness meditation course participants had significantly more improvement in Positive Symptom Distress Index (p = 0.010; confidence interval [CI] =-0.483 to -0.073) and Global Severity Index (p = 0.019; CI = -0.475 to -0.046) and nearly significantly more improvement in Positive Symptom Total (p = 0.066; CI = -16.66 to 0.581) compared with controls. No significant change observed in caring efficacy (p=.99).	missing on randomisation, no details on protocol or registration
71	Pre-post not controlled	Potter et al. 2013 Evaluation of a compassion fatigue resiliency program for oncology nurses	To evaluate a resiliency program de-signed to educate oncology nurses about compassion	A National Cancer Institute–designated comprehensive cancer centre	N=14 oncology nurses (13 with full data) Mage=43.9	I = 5-week group program (5 x 90min sessions) on compassion fatigue resiliency (self-care, self-	Professional Quality of Life (ProQOL)	Secondary traumatization scores on the ProQOL IV declined immediately after the program, remained down at three	11/18 Not all info on intervention, no power analysis, no effect sizes,

			fatigue.	in the midwestern United States 6 weeks	86% F	regulation, knowledge on compassion fatigue)	Burnout (MBI) Subjective distress caused by traumatic events (IES-R) Nursing Job Satisfaction Scale	months, and then dropped again at six months, with a statistically significant mean difference at 6 months when compared with baseline (p<.05). The average IES-R total scores improved significantly overall and for each of the three postintervention time points (.0009<ps<.05). No significant changes in burnout or job satisfaction.	very limited discussion.
72	Pre-post not controlled	Lavoie-Tremblay et al. 2014 Impact of a pedometer program on nurses working in a health-promoting hospital	To describe the impact of a pedometer-based activity program.	A health centre in Canada 2 months	N=60 nurses (51 with post data, 33 with follow-up data) 92% F Mage=47.86 (8.91)	I = the Wellness Challenge (1h lecture, 30min 1-to-1 evaluation, educational modules on health, 8 week pedometer challenge – tracking activity on a website, and fruit/veg intake; goal of 10k steps day; could compare individually and by teams)	Weight, height, Fatigue (4-items), Insomnia (Insomnia Severity Index) Stress (PSS), Step data (self-report, International PA Questionnaire) Blood tests (total cholesterol and low-density	A significant decrease in insomnia was evident in post scores (-3.58, p=.001) compared with baseline scores, and this decrease was maintained at follow-up (-2.6, p=.018). A significant decrease in minutes spent sitting per week was also observed from baseline to post (-70.08min, p=.02) and also maintained at follow-up (-109min, p=.008). Participants' stress (-1.2, p=.051) and low-density lipoprotein	12.5/18 No power analysis, limited discussion, no participant numbers over tables.

							lipoprotein and high-density lipoprotein cholesterol)	cholesterol levels (-0.14, p=.059) decreased non-significantly from baseline to post. Finally, their weight decreased from baseline to follow-up (-0.62kg, p=.077). There were no other significant changes.	
73	Pre-post not controlled	Hess et al. 2011 Workplace nutrition and physical activity promotion at Liverpool Hospital	To evaluate the effectiveness of a workplace intervention to increase PA and healthy eating.	A hospital in Australia 3 months	N=399 (264 with post data) 93% F Mage=39.1 (10.9)	I = 12-week program (participants received a pedometer, healthy cookbook, water bottle, sandwich container and Measure Up campaign resources; they were required to record their steps and eating habits). Also includes email reminders, posters, walks at work.	Physical activity (self-report, Active Australia Questionnaire) Healthy eating (self-report, NSW Health Survey) Stress (1-item), depression (1-item)	Respondents reported a significant increase in median minutes walked (p<.001) and in vigorous physical activity over the previous week (p<.001). Participants consuming adequate fruit and vegetable per day increased by 24.7% and 22.7%, respectively (p<.001). More participants also consumed breakfast on seven days of the week (+16.6%, p<.001) and consumed one or more litres of water per day (+19.2%, p<.001). Also, the number of those who were stressed (-9.8, p=.003) or depressed (-3.4%,	14/18 No power analysis, no comments on generalizability.

								p=.08) decreased, but there was no change in cigarette consumption (p=.73).	
74	Pre-post controlled	Le Blanc et al. 2007 Take Care! The evaluation of a team-based burnout intervention program for oncology care providers	To evaluate the effects of a team-based burnout intervention program combining a staff support group with a participatory action research approach.	29 oncology wards in Netherlands 6 months	N=664 care providers (260 in I, 404 in control) 376 with post-data, 304 with follow-up At baseline Mage=36.2 (8.4) No gender info	I = Take Care! Program (6 monthly sessions of 3h, creating plans to reduce stress on team level; educational sessions, building support; creating plans of action) C = no intervention	Work situation (job control, job demands, participation in decision-making; various scales) Burnout (MBI) Social support	The results showed that staff in the experimental wards experienced significantly less emotional exhaustion at the end of the program (p<.05) and 6 months after (p<.05) and less depersonalization at the end of the program (p<.05), compared with the control wards. However, these increased when compared with baseline (but much smaller increase than in controls). There were no significant changes in work situation variables.	11.5/20 No power analysis, no info on flow of participants, no baseline characteristics, participant numbers for analyses not included, no software info.
75	RCT	Bost & Wallis 2006 The effectiveness of a 15-minute weekly massage in reducing physical and psychological stress in nurses	To investigate the effectiveness of massage therapy in reducing physiological and psychological indicators of stress in nurses.	An acute care hospital in Queensland, Australia 6 weeks	N=60 nurses (48 with full data) Median age=42 No gender info	I = 15-min weekly full back massage (with grape seed oil; Swedish technique) once a week for 5 weeks	Physiological stress (cortisol and blood pressure) Anxiety (STAI)	Differences in the change in urinary cortisol (p=.50) and blood pressure (p=.73) between the two groups did not reach statistical significance.	14/23 No RCT in the title, no power analysis, some info missing on randomisation, no reasons for drop

Table S1. Data extraction for 136 included studies.

#	Design	Study	Aim	Setting	Participants	Intervention	Outcome	Results	Notes
						C = no intervention		However, STAI scores decreased over the five weeks for those participants who received a weekly massage. The STAI scores of the control group increased over the five-week period. This was statistically significant (p=.006 for state anxiety; p=.008 for trait anxiety).	outs, effect sizes missing, no trial registry
76	RCT	Brennan & DeBate 2006 The effect of chair massage on stress perception of hospital bedside nurses	To evaluate the effectiveness of a 10min chair massage on the stress perception of hospital nurses in comparison to a routine ''coffee break'' during a working shift.	A small, suburban hospital in USA 10 min	N=82 nurses 95% female Mage=34.77 (9.32)	I = a 10-min on-site chair massage (massage applications to the back, neck, shoulders, arms, and hands) C = a 10-min ''coffee break''	Perceived stress (PSS)	Stress perception was significantly lower in the massage group (p=.005) and was not significantly changed in the control group (p=.64).	11.5/23 No power analysis, no info on flow of participants, no effect sizes, very limited discussion
77	Pre-post not controlled	Brunero et al. 2008 Reducing emotional distress in nurses using cognitive behavioural therapy: A preliminary program evaluation	To evaluate the effectiveness of a 1 day stress management program on nurses' stress levels.	Australia, new graduate nurses 1 day	N=18 nurses Mage=27.0 (4.0) 83% female	I = an 8 h face-to-face interactive workshop based on cognitive behavioural therapy, plus a self-directed manual with reading and exercises to use after the	Stress (NSS)	The NSS subscales "nurse–doctor conflict" (p=.03), "death and dying" (p=.01), and "nurse–nurse conflict" (p=.02) showed statistically significant improvement at follow-up. The ratings of stress at	12.5/18 No eligibility criteria, no psychometrics, no power analysis, not much info on flow, no effect sizes.

						workshop.		work (p=.02), outside of work (p=.01), and the overall stress (p=.003) also showed statistically significant improvement.	
78	Pre-post not controlled	Cooke et al. 2007

The effect of aromatherapy massage with music on the stress and anxiety levels of emergency nurses: Comparison between summer and winter | To evaluate the use of aromatherapy massage and music as an intervention to cope with the occupational stress and anxiety that emergency department staff experience. | An emergency department in Australia

3 months | N=142 nurses (68 with post data, 33 summer, 35 winter)

Summer period Mage=38.8 83% female

Winter period Mage=35.9 76% female | I = 12 weeks of on-site aromatherapy massage with music (15-min seated chair massage of shoulders, mid back, neck, scalp, forehead, temples; new age music through earphones; aromatherapy spray was sprayed above the participant's head prior to the massage) | Anxiety (Faces anxiety scale)

Sick leave

Occupational stress (Perceived Occupational Stress Scale) | The aromatherapy massage with music significantly reduced anxiety for both seasonal periods (summer and winter); 92% of participants reported no or little anxiety after massage.

No differences in sick leave (p=.20) and workload were found between summer and winter. There was no difference in the occupational stress levels of nurses following the two 12-week periods of massage.

But no data reported on pre-post of POSS. | 12.5/18

No power analysis, no info on participant flow, no effect sizes, limited discussion. |
| 79 | Pre-post not controlled | Cuneo et al. 2011

The Effect of Reiki on Work-Related Stress of the Registered Nurse | To evaluate the effects of Reiki on work-related stress in Registered Nurse | A large academic, urban medical centre in USA | N=26 nurses (17 with full data)

92% female | I = instructions provided for practice of self-Reiki (3-week period; 10-15min | Stress (PSS) | Practicing Reiki resulted in reduced perceived stress levels (-5.9 change, p=.006). The reduction was true | 15.5/19

No psychometric data, no power analysis, no effect |

			Reiki I class participants.	3 weeks	Mage=44.6 (12.2)	per day) plus 8-h informational session; and practice in the class.		for 82% of the nurses. The nurses who were highly compliant (performed at least 15 out of 21 sessions) with self-Reiki had a larger mean decrease in PSS of 8.8 points (median of 12 points, $p = .0469$), whereas those who had low compliance had a smaller, nonsignificant decrease (mean of 3.8 points, median of 6.5 points, p >.05).	sizes.
80	Pre-post not controlled	Cutshall et al. 2011 Evaluation of a biofeedback-assisted meditation program as a stress management tool for hospital nurses: A pilot study	To assess whether a self-directed, computer-guided meditation training program is useful for stress reduction in hospital nurses.	A hospital in USA 4 weeks	N=11 nurses (8 with full data) Median age=44 No gender info	I = 1 month of a meditation program (Healing Rhythms, 15 computer sessions that used biofeedback to reinforce training, 30min per session; 4x per week)	Stress and anxiety (VAS) Anxiety (STAI) Vitality (SF-36)	Intent-to-treat analysis showed significant improvement in stress management, as measured by SF-36 vitality subscale (+0.65 change, p= .04), STAI (-0.41 change, p=.03), VAS stress (-2.09 change, p=.01), and VAS anxiety (-2.27 change, p=.01).	11/18 Not much background, not much detail on questionnaires, no power analysis, no software info, no effect sizes, very limited discussion.
81	Pre-post controlled	Moeini et al. 2011 The Impact of Cognitive-Behavioural Stress Management Training Program on Job Stress in Hospital Nurses: Applying PRECEDE Model	To determine the effect of a cognitive-behavioural stress management training program based on PRECEDE model on stress reduction among	2 hospitals in Iran 3 weeks	N=64 nurses (58 with full data) 100% F Mage=31.25	I = 5 sessions (3 weeks, 60-90min sessions) relaxation and problem-solving, informational booklet, CD for relaxation C = no	Stress (NSS) Stress management behaviours Predisposing, reinforcing and enabling factors (PRECEDE	The intervention group showed a significant change in stress (-19 points, p<.001), whereas it did not change in control group. A significant difference was found in PRECEDE model	13.5/20 Not all info on intervention provided, no baseline characteristics, no numbers for analyses, no effect sizes, very

Table S1. Data extraction for 136 included studies.

					intervention	model)	constructs and stress management behaviours in intervention group compared to control group after training interventions (p<0.001). The same was true for knowledge, attitude, behaviour and job stress (ps<.04).	limited discussion
82	Pre-post not controlled	Wasner et al. 2005 Effects of spiritual care training for palliative care professionals	To investigate prospectively the effects of spiritual care training over a six-month period.	A palliative centre in Germany 3.5 days	N=63 nurses, hospice volunteers and physicians (48 with full data) 91% F Median age=49	I = 3.5-day training "Wisdom and compassion in care for the dying" (the aim is to enable the participants to recognize the different facets of suffering of the dying persons and their relatives and to respond effectively, plus contemplation and meditation)	Attitude toward work Self-transcendence (STS) Spiritual subscale (FACIT-Sp) Religiosity (IIR)	Significant and sustained improvements were found in self-perceived compassion for the dying (after the training: p =0.002; 6 months later: p =0.025), compassion for oneself (p <0.001; p =0.013), attitude towards one's family (p =0.001; p =0.031), satisfaction with work (p<0.001; p=0.039), reduction in work-related stress (p<0.001; p=0.033), and attitude towards colleagues (p=0.039;p=0.040), as well as in spirituality (+2points, p<0.001; p= 0.040). The changes in self-transcendence (p<.01 after the training, but ns 6 months after) and religiosity were non-significant (p>.05 at 6 months).	11.5/18 No eligibility criteria, not much intervention details, no power analysis, no effect sizes, rather limited discussion.

Supplementary material

Table S1. Data extraction for 136 included studies.

								Quality of life increased after the training (p<.05) but not at 6 months (p>.05).	
83	RCT	Nunes da Silva Filho et al. 2017 Acute and chronic effect of stretching exercise on posture and flexibility of nurses and licensed practical nurses	To examine effect of stretching exercise on posture flexibility.	Brazil, a polyclinic in the Niterói city-RJ 2 months	N=28 (15 in I, 13 in C) Age 18-60 No gender info	I = 8 weeks of muscle stretching exercise (static and active), each 40min long, at least 2x a week, relaxation songs in the background C = no intervention	Anthropometric measures (BMI + abdominal perimetry) Flexibility (Fleximeter) Body posture of the trunk (Moire topography)	MSE promoted positive and chronic positive changes in the Experimental Group with attenuation of the concavities of the vertebral column in the cervical and thoracic regions. In the alignment of the cervical region and the curvature of the lumbar region, the effects were observed after the eight weeks of training, including sharp reduction of gibbosity in the scapula region after the exercise session.	11.5/23 No power analysis, no info on blinding, no flow diagram, limited discussion
84	Pre-post not-controlled	Hasson et al. 2018 "Practice what you teach" Public health nurses promoting healthy lifestyles (PHeeL-PHiNe): Program Evaluation	To evaluate the impact of the PHeeL-PHiNe program on attitudes and personal lifestyle behaviours of nurses.	Family health clinics in Jerusalem, Israel 3 months	N=117 nurses (114 with full data) Mage=47 (10.7) 100% F	I = PHeel-PHiNe program (advanced professional training course, 35h, 5 days, 3-month period, includes interactive lectures and workshops on motivating behavioural change, balanced nutrition, and PA (walking,	Healthy lifestyle knowledge, attitude and behaviours (self-report)	At post-intervention, participants knowledge remained stable, but there was a significant improvement in terms of attitudes toward healthy lifestyle (.21 mean change, p<.001), physical activity level (increase of 12% of people who walked at least once a week, p=.027; increase of weekly workout sessions: mean change of .66, p<.001), and	12.5/18 No eligibility criteria, no psychometric info, no power analysis, limited flow info, effect sizes missing for some analyses, no discussion of generalizability

						pedometer); exercise and cooking sessions included), plus a receipt of a pedometer and course materials (e.g., healthy recipes)		consumption of healthy diet (mean change of .32, p<.001). At 18-month follow-up, long-term improvement of dietary habits was reported by 75% of the participants, the improvement of healthy diet consumption was sustained. However, the level of PA returned to baseline. Nurses who practiced healthy lifestyle were over 3x more likely to counsel others on healthy cooking, and 2x as likely to counsel on PA, than those with unbalanced diet.	
85	Pre-post not controlled	Sands et al. 2008 Pediatric Narrative Oncology: Interprofessional Training to Promote Empathy, Build Teams, and Prevent Burnout	To examine the feasibility and effectiveness of narrative training for promoting empathy, building teams, and preventing burnout.	An Inpatient unit of New York Hospital, USA 6 weeks	N=19 health-care staff (12 nurses) Mage=41.1 No gender info	I = weekly narrative training for 6 weeks, 1h per week, participants wrote, listened to and discussed their attachment to patients, their emotional reactions, the perspective of patients, etc. Plus feedback on writing from a coach.	Empathic concern, perspective taking, fantasy, personal distress (Interpersonal Reactivity Index) Stress (Stressor Scale for Paediatric Oncology Nurses, SSPON)	The perspective taking (p=.029), and empathic concern (p=.056) had improved for the whole sample. Stress levels also increased, specifically stress due to death without grace (p=.008), and co-worker incompetence (p=.022). Among nurses only, when compared with physicians, they had a higher stress due to system demands post-intervention (p=.018).	9.5/18 No theories behind intervention, no power analysis, limited flow info, no effect sizes, limited discussion
86	RCT	Oka et al. 2018	To examine the	Japan, 3	N=3381 nurses	I1 = 30-min	Low back pain	A similar trend among	21/23

Table S1. Data extraction for 136 included studies.

		The effect of the 'One Stretch' exercise on the improvement of low back pain in Japanese nurses: A large-scale, randomised, controlled trial	effect of 'One Stretch' exercise on improvement in low back pain, and psychological factors.	hospitals 6 months	with baseline data (2406 with follow-up data, in 3 groups) Mage=35.4 (0.6) 95% F	seminar on manual, plus exercise manual on back extending exercise I2 = 30-min seminar on manual, plus exercise manual on back extending exercise, additionally care of physiotherapist C = no intervention	improvement (LBP) Beliefs and fears about physical activity for LBP (FABQ) Quality of life (EuroQoL) Chronicity of back pain (SBST)	all groups regarding chronicity of pain, QoL, and beliefs about physiotherapy. The percentage of individuals whose LBP improved was 13.3% (control), 23.5% (I1), and 22.6% (I2). The rates of worsened pain were 13% (control), 9.6% (I1), and 8.1% (I2). This was statistically significant (p<.0001). The LBP of intervention groups was about 2x more improved (odds ratio=2) than that of controls (p<.0001).	No info on mechanism of randomisation, no protocol
87	RCT	Watanabe et al. 2018 Omega-3 fatty acids for a better mental state in working populations - Happy Nurse Project: A 52-week randomized controlled trial	To examine the efficacy of omega-3 fatty acids for maintaining a better mental state.	Japan, inpatient wards at four general hospitals and at one psychiatric hospital in Tama area 3.25 months	N=80 nurses (40 in each group) (76 with majority of data) Mage=30.1 (8.4) No gender info	I = Omega-acid pills (1200 mg/day of eicosapentaenoic acid and 600 mg/day of docosahexaenoic acid) for 13 weeks C = placebo pills (rapeseed oil 47% soybean oil 25% olive oil 25% and fish oil 3%)	HADS (depression and anxiety) Incidence of a major depressive episode; Severity of depression, Anxiety, Insomnia, Burnout, Presenteeism (Health and Work Performance Questionnaire); utility scores; and adverse	The mean HADS score at baseline was 7.2. At 26 weeks, adjusted mean scores on the HADS were 6.32 (95% CIs of standard errors: 5.13, 7.52) in the intervention and 6.81 (5.57, 8.05) in the placebo groups, respectively. The coefficient of the group by time interaction was not statistically significant at 0.58 (−1.35, 2.50; P=0.557). Statistically significant superiority was observed in favour of the omega-3 PUFA group	19/21 Little info on randomisation

							events at 13, 26 and 52 weeks, Quality of life (EuroQol)	in terms of the total HADS score at 52 weeks (group by time interaction 1.52; 0.46, 2.58; P=0.005), the HADS-depression score at 52 weeks (1.50; 0.26, 2.73; P=0.018), the Insomnia Severity Index at 13 weeks (2.05; 0.34, 3.76; P=0.019), and absolute presenteeism at 26 weeks (−6.29; −12.56, 0.02; P=0.049). No significant superiority or inferiority was observed on the other outcomes.	
88	RCT	Onishi et al. 2016 The Effect of Complementary Therapy for Hospital Nurses with High Stress	To examine the effect of complementary therapy (CT) for nurses with high stress levels.	Japan, a university hospital 3 weeks	N=110 nurses (98 with full data) Mage=37.3 (10.5) 94% F	I = 20-min of varied therapies, 2x week, for 3 weeks (4 separate groups; music, stimulating meridian points, aromatherapy bath for feet, and practice of progressive muscle relaxation) C = rest on bed for 20min	Pulse rate Blood pressure The profile of mood states (POMS-SF) to measure anxiety/depression and other states	All groups showed reduction in stress (for pulse ps = 0.001–0.017; ns for blood pressure for most groups). Significant differences were observed in POMS-SF subscales from pre to post (P = 0.001–0.008) but four intervention groups were not more effective than non-intervention group (p= 0.213–0.899).	12/20 No power analysis, No much info on randomisation, or blinding, no baseline comparison of conditions, no effect sizes, limited discussion
89	RCT	Bukowska-Durawa et al. 2010 Plans Not Needed if You Have High and Stable Self-Efficacy:	To examine the effects of planning intervention on snack intake, and explore the role	UK, nurses attending postgraduate nutrition counseling courses	N=238 (but 182 nurses and midwives included in analysis (120 in I, 118 in C) 122	I = Dietary planning intervention (3 group meetings; setting action plans for lower	Self-efficacy Sweet and salty snack intake (intention.+ self-report of	An increase of efficacy beliefs over time augmented the effects of the planning intervention and resulted in the lowest	15/21 No Power analysis, not much info on randomisation,

Table S1. Data extraction for 136 included studies.

		Planning Intervention and Snack Intake in the Context of Self-Efficacy Trajectories	of self-efficacy.	4 months	with full data Age 19-50 Mage=28.73 (9.51) 89% F	unhealthy snack intake and coping plans) C = received some educational materials on food balance, nutrient recommendations, etc.	past behaviour)	snack intake (the enhancing effect of self-efficacy). Planning intervention also prompted lower unhealthy snacking if efficacy beliefs were decreasing (the protective effect of planning). Those who have stable-high self-efficacy were able to achieve low snack intake regardless of the group assignment (the buffering effect of self-efficacy). Participants of the intervention group consumed fewer sweet/salty snacks at T2 (M = 3.78, SD = 1.60) than those assigned to the control group (M = 5.22, SD = 1.66), F (1, 181) = 32.78, p < .001, η2 = .16.	blinding not present fully, No baseline data for each condition, generalisability not discussed
90	RCT	Palumbo et al., 2012 Tai Chi for older nurses: A workplace wellness pilot study	To assess the feasibility of a Tai Chi workplace wellness program as a cost-effective way of improving physical and mental health, reducing work related stress, and improving work productivity among older	A north-eastern academic medical centre in Thailand 15-week worksite Tai Chi program	N=14 nurses (7 in I, 7 in C); 11 with full data 49+ years 100% F	I = 15-weeks of Thai Chi classes, on-site classes 1x week, plus practice at home (4x 10min a week) C = no intervention	Health (SF-36 Heath Survey) Nursing Stress (NSS) Perceived Stress (PSS) Sit and reach test Isometric knee extentor	The Tai Chi had no significant effect on general health and mental health (+1.2% and +2.1% in SF36, respectively) when compared to the control group (−4.6% and −3.8%, respectively). There was also non-significant change in work stress (−20% in NSS in Thai Chi group, −8.5% in control, p =	13.5/23 No abstract, no power analysis, not much info on randomisation, or blinding, no effect sizes, no registration

| | | | nurses in a hospital setting. | | | | strength test

Functional Reach test

Nordic Musculoskeletal questionnaire

Work productivity (WLQ)

Work absenteeism | 0.89), and general stress (−23% in PSS in Thai Chi, −17.5% in control, p = 0.42).

The reduction in "lack of support" related stress nearly reached significant group effect (p=0.06).

There was a significant group difference in the Functional Reach test (p<0.01), with the Tai Chi group showing an improvement (+0.8%) and the control group showing a decline (−7.9%), Thai Chi group also showed a larger improvement in trunk flexibility (+6.4% in Sit-and-Reach test) than the control group (+1.2%).

The Tai Chi group showed a greater reduction in the Work Limitation Scale post intervention (−65%) than the control group (−60%; p=0.03)

Tai Chi group had no unscheduled combined time-off hours; whereas the control group lost a total of 49 hours during the 15-week intervention | |
|---|---|---|---|---|---|---|---|---|---|

								The Tai Chi group also showed a 3% increase in work productivity as compared to the control group.	
91	Cluster RCT	Gärtner et al. 2013 The mental vitality @Work Study Effectiveness of a Mental Module for Workers' Health Surveillance for Nurses and Allied Health Care Professionals on Their Help-Seeking Behaviour	To study the effectiveness of a mental module for workers' health surveillance for health care workers.	One Dutch academic medical centre, Netherlands Duration not reported	N=379 nurses and allied health care professionals (225 with follow-up data, 240 used in analysis) Mostly females Mage=42	I = screening for work functioning impairments and mental health complaints. Positively screened workers were invited to visit their occupational physician. C = no intervention	Help-seeking behaviour Work functioning (NWFQ) Distress (Four Dimensional Symptoms Questionnaire, subscale) Need for recovery after work (Experience and Evaluation of Work Questionnaire) Risky drinking behaviour Depression and anxiety (Brief Symptom Inventory) PTSD (Impact of Events Scale)	Workers in the intervention group showed less work functioning impairments over time than the control group (p = 0.04). Workers in the I group showed statistically significant more improvement of work functioning over time than workers in the control group. 67% of the workers in the intervention group and 54% in the control group had consulted one or more caregivers. The occupational physician was visited most often in the I group (45%), compared with 6% in the control group at 3 months (p=.009). At 6-month follow-up, 48% of the workers in I group showed help-seeking behaviour, compared with 56% in the control group (p=.14). No significant differences were found between the study groups with respect to	18/23 No RCT in the title, no full blinding, no reasons for withdrawal, no effect sizes, no comments on generalizability, no funding info

								the intention to seek help (p=.8), informal help seeking (p=.4), or work as the focus of help-seeking (p=.5). Risky drinking behaviour was the only mental health complaint for which a statistically significant effect was found (p<.01). The p values for other outcomes were between .44 and .94.	
92	RCT	Chang et al. 2017 The Effects of Aromatherapy Massage on Sleep Quality of Nurses on Monthly Rotating Night Shifts.	To examine whether aromatherapy massage could improve sleep quality of nurses working with monthly rotating night shifts.	A medical centre in central Taiwan 4 weeks	N=50 nurses (27 in I, 23 in C) Mage=29.37 (5.37) 100% F	I = Aromatherapy massage (25-30 min) with background music, then rest for 30min, and drinking warm water, 1x per week for 4 weeks C = lying down in a room for 60 min, with background music, 1x per week, for 4 weeks	Pittsburgh sleep quality index (PSQI) Sleep quality measured via take-home sleep detector, Ezsleep (TX-EK3) Self-report on the beginning and end time of sleep, subjective sleep quality, and whether the total waking time after initially falling asleep exceeded 30 minutes.	The intervention group had significantly better sleep (PSQI) following the aromatherapy massage than before (p<.001). Specifically, improvement in subjective sleep quality (p=.001), sleep disturbance (p=.003), and daytime dysfunction (p<.001). The control group had no significant difference in the total PSQI, but a significant decrease in daytime dysfunction (p = 0.002). However, there were no significant difference in average PSQI change scores between the two groups before and after intervention (p=.57). When comparing sleep	15.5/23 Limited abstract, no power analysis, not much info on blinding, effect sizes not for all outcomes, limited discussion

								detector data, the intervention group demonstrated a significant increase in subjective sleep quality score (p = 0.009) while in the aromatherapy room, as well as a significant decrease in deep sleep duration (hours) (p = 0.026). No difference was observed in sleep onset, deep sleep, light sleep, wake/dream time, and AHI in control group. Intervention group as compared with control group showed a significant (p = 0.011) improvement in subjective sleep quality while at aromatherapy room. No significant changes were observed in sleep onset time, deep sleep, light sleep, wake/dreamtime, and AHI between the two groups, whether in the aromatherapy room or at home/dorm.	
93	RCT	Chesak et al. 2015	To assess feasibility and	The Mayo Clinic in	N=55 (I= 27, C= 28; 40 with	I = 90 minutes session, where	Stress (PSS)	Mindfulness and resilience scores	14/23

		Enhancing resilience among new nurses: Feasibility and efficacy of a pilot intervention	obtain preliminary estimates of efficacy of the stress management and resilience training (SMART) program on stress, mindfulness, anxiety, and resilience.	Rochester, USA

6 weeks | full data)

95% F

Mage=28.2 (8.2) | model of stress and resilience was presented, together with approaches to manage stress (e.g., practicing gratitude, compassion, acceptance, forgiveness, and higher meaning). Four weeks following the initial session, a 1-hour follow-up session was offered to address individual questions. Plus biweekly handouts on each of the topics via email.

C = Received a lecture that covered topics related to stress, including reality shock and work-life connectedness. | Mindfulness (MAAS)

Anxiety (GAD-7)

Resilience (CD-RISC) | improved in the intervention group and declined in the control group, while stress and anxiety scores decreased in the intervention group and increased in the control group (all non-significant though).

The between-group change in each outcome was not statistically significant (for PSS p=.14, for MAAS p=.37, for GAD-7 p=.24, for CD-RISC p=.30). | No power analysis, no blinding, no effect sizes, no funding info |
| 94 | Wait-list RCT | Lin et al. 2018

The Effects of a Modified Mindfulness-Based Stress Reduction Program for Nurses: A Randomized Controlled Trial | To evaluate the effects of a modified mindfulness-based stress reduction (MBSR) program on the levels of stress, affect, | Two hospitals in Dongguan, South China.

2 months | N=110 nurses (I=55; C=55; 90 with full data)

93% F

Mage=31.5 (6.79) | I = a modified 8-week MBSR program (8x 2h group meetings inc. guided practice, education and discussion, plus 20min of home | Perceived stress (PSS)

Positive and negative affect (PANAS)

Resilience (CD-RISC) | The intervention group showed decreases in stress and negative affect and increases in positive affect and resilience after the intervention. No improvement in job satisfaction was | 13.5/23

No power analysis, no info on blinding, no reasons for drop outs, no effect sizes, no discussion of |

			resilience, and job satisfaction among nurses in general hospitals in mainland China.			practice for 6 days a week, for 8 weeks). In addition, materials sent via mobile phone. C = wait-list (plus a connection with others via chat)	Job satisfaction (McCloskey/Mueller Satisfaction Scale, MMSS)	observed. Significant differences were found in perceived stress (p<.01), positive affect (p<.05), and negative affect (p<.01) between the two groups immediately after the intervention and at the 3-month follow-up (p < .05), and significant differences in resilience were found between the two groups but only at the 3-month follow-up (p < .05).	generalizability
95	RCT	Prado et al. 2018 Experimental and placebo auriculotherapy for stressed nurses: Randomized controlled trial	To compare the efficacy of experimental auriculotherapy and placebo auriculotherapy with sham points for the treatment of stress in nurses.	A charity hospital in São Paulo, Brazil 6 weeks	N=168 nurses (each group with 56 nurses; 133 with full data) 95% F Mean age=35 (8.4)	I1= auriculotherapy group (12 sessions, twice a week), with points indicated for stress I2 = Placebo, 12 sessions, twice a week of auriculotherapy, with sham points C = wait-list	Stress symptoms (Stress Symptoms List)	I1 achieved a 43% reduction in stress after eight sessions, maintained in the follow-up (after 15 days) evaluation (43%, p <0.001). I2 achieved a 26% reduction in stress, achieving a difference after 12 sessions (p<0.001), maintained in the follow-up (22%, p <0.05). The control group did not present significant stress reduction (-1%, and -4%, respectively).	13.5/23 No power analysis, no much info on blinding, no reasons for drop out, no effect sizes, limited discussion
96	RCT	Reed et al. 2018 The Impact of Web-Based Feedback on Physical Activity and	To examine the impact of an intervention providing participants with	A tertiary care cardiovascular institute at the University of Ottawa Heart	N=76 nurses (72 with full data) 97% F	I = Intervention groups took part in a PA challenge, and could monitor	Height Body mass Body fat	Weekly moderate-to-vigorous intensity PA (MVPA) changed over time (F = 4.022, df = 4.827,	19/23 No power analysis, no participant

		Cardiovascular Health of Nurses Working in a Cardiovascular Setting: A Randomized Trial	feedback from an activity monitor coupled with a web-based individual, friend or team physical activity challenge (PA) on the PA and cardiovascular health of nurses working in a cardiovascular setting.	Institute (UOHI), Canada 6 weeks	Mage=46.3 (10.9)	their distance (km), steps (number), active time (minutes) and calories (kcal) expended on an hourly, daily, weekly, and monthly basis (I1 = individual challenge). Apart from that participants' PA levels were displayed to others in their group (to a partner = I2, or a team = I3) as a means to enhance motivation to perform well.	percentage Waist circumference Resting blood pressure (BP) Heart rate Body mass index (BMI) Physical activity (measured with activity monitor)	$p = 0.002$), and was greater during intervention week 2 when compared to intervention week 6 ($p = 0.011$). Daily steps changed over time ($F = 7.668$, $df = 3.910$, $p < 0.001$), and were greater during baseline and intervention weeks 1, 2, 3, and 5 when compared to intervention week 6 ($p < 0.05$). No differences in weekly MVPA or daily steps were observed between groups ($p > 0.05$). No changes in body mass, BMI or waist circumference were observed within or between groups ($p > 0.05$). Significant decreases in body fat percentage ($p=.015$) and resting systolic BP ($p=.019$) were observed within 1week post-intervention when compared to baseline. There was also a trend for waist circumference drop between baseline and follow-up ($p=.06$). No significant differences in changes in cardiovascular health indicators were	numbers for each analysis, no registration

Table S1. Data extraction for 136 included studies.

								observed between groups (p > 0.05).	
97	RCT	Sajadi et al. 2017 Benson's Relaxation Effect in Comparing to Systematic Desensitization on Anxiety of Female Nurses: A Randomized Clinical Trial	To compare the effectiveness of Benson's relaxation and systematic desensitisation for decreasing the anxiety of nurses.	Borujerd, Iran 3 days	N=84 (72 randomised) Mage= 34.5 (5.3) No gender info	I1 = Benson's relaxation method (guidelines of muscular relaxation were delivered via headphones and applied in three sessions of 20min) I2 = systematic desensitisation (skilled and trained therapists arranged 3 sessions, each 20min long) C = no intervention	State and trait anxiety (STAI)	There was a significant difference in both state and trait anxiety after the intervention between three groups (p<.05). There was no difference between two intervention groups (p>.05), but they were both significantly different from the control group (for trait: Benson's method p=.013, desensitisation p=.023; for state: Benson's p=.007, desensitisation p=.008). They both resulted in reduced anxiety.	12/23 No randomisation info, No info on blinding, not much flow info, no effect sizes, limited discussion
98	RCT	Nazari et al. 2015 The effect of massage therapy on occupational stress of Intensive Care Unit nurses	To determine the effects of the massage therapy on occupational stress of ICU nurses.	Intensive care units in hospitals affiliated to Isfahan University of Medical Sciences in Iran 4 weeks	N=80 nurses (66 with full data) (33 in I, 33 in C) Mage=34.4 (6.3) 58% F	I = received Swedish massage for 4 weeks (2 times a week for 25 minutes) in a warm quiet room with efficient light, temperature and ventilation, plus 3-5min relaxing on a chair; coconut scented lotion used for massage	Occupational stress Inventory (OSI)	Immediately after and 2 weeks after the intervention, the mean score of occupational stress in the intervention group was significantly lower than that in the control group (p < .001)	10.5/23 No randomisation info, no blinding info, no effect sizes, limited discussion

Supplementary material

Table S1. Data extraction for 136 included studies.

						C = no intervention			
99	RCT	Gollwitzer et al. 2018 Promoting the Self-Regulation of Stress in Health Care Providers: An Internet-Based Intervention	To examine whether healthcare professionals can autonomously down-regulate the stress they experience at their workplace, using Mental Contrasting with Implementation Intentions (MCII) tool.	Various health institutions in Germany 3 weeks	N=129 nurses (41 in I1, 47 in C1, 41 in I2; 105 with full data) 82% F Mage=40.22 (10.18)	I1 = MCII delivered via email (participants repeatedly engaged in a mental exercise that required specifying a wish to reducing stress, identifying and imagining its most desired positive outcome, imagining obstacles, and creating a plan of overcoming them. 3 weeks of daily exercise.) I2 = a modified MCII (participants were asked to furnish the goal to engage in daily MCII exercises, assigned by the experimenter, with an implementation intention that specified when and where they planned to execute these MCII exercises.)	Perceived stress (Perceived Stress Questionnaire, PSQ-20) Stress-related physical symptoms (Burnout Screening Scale, BOSS-II) The two above were combined into overall stress score. Work engagement (Utrecht Work Engagement Scale-9)	The intervention group I1 showed reduced stress level (p=.019) and an enhanced work engagement (p=.046), as compared to the control group. I1 showed more improved work engagement than I2 (p=.029) as well. The stress level of I2 was not different from I1 (p=.20) or control (p=.28). The work engagement level was not different between I2 and control group (p=.82).	9.5/23 No eligibility criteria, no power analysis, no info on randomisation or blinding, no participant numbers in denominators, limited discussion

Supplementary material

Table S1. Data extraction for 136 included studies.

						C = no intervention, only asked to explore their wishes regarding achieving less stress.				
100	Wait-list RCT	Oman et al. 2010 Does passage meditation foster compassionate love among health professionals?: A randomised trial	To examine if the passage meditation training will increase compassionate love and related constructs.	A large hospital in Colorado, USA 2 months	N=61 health care staff (30 in I, 31 in C; 58 with full data) 86% F Age 26-70	I = 8-week programme (2h per week) using non-sectarian, spiritually based, self-management tools of passage meditation (e.g., repetition of mantram, slowing down, putting others first, inspirational reading) C = wait-list	Compassionate love Empathy (IRI) Altruism Forgiveness (MMRS)	Favourable average treatment effects (p<0.05) were found for compassionate love (d=0.49, p=.04), altruistic actions (d=0.33, p=.008), perspective-taking (d=0.42, p=.04), and forgiveness (d=0.6, p=.008). There was not a significant effect on empathic concern (p=.27), or personal distress (p=.25).	12.5/23 No power analysis, no info on randomisation or blinding	
101	Pre-post wait-list controlled	Slatyer et al. 2018 Evaluating the effectiveness of a brief mindful self-care and resiliency (MSCR) intervention for nurses: A controlled trial	To examine the effectiveness of a brief mindful self-care and resiliency intervention for nurses.	A tertiary hospital in Australia 4 weeks	N=91 nurses (65 in I, 26 in C; 76 with full data) 91% of known-gender participants F Mage=47.6 (10.40)	I = MSCR intervention (1-day workshop comprised of 4 sessions, 1.5 hour each, followed by 3 weekly mindfulness practice sessions, 1.75 hours each; education about compassion fatigue resiliency, and mindfulness concepts; copy of the manual for	Compassion satisfaction and fatigue, burnout (ProQol5) Depression, anxiety and stress (DASS21) Resilience (CD-RISC 10) Self-efficacy (GSES)	Compared to the control group, the intervention group had significant reductions in burnout (p=.003) and depressed mood (p=.007) upon completion of the MSCR. Follow-up data indicated that these reductions persisted at 6-month post-MSCR for the intervention group. Follow-up analysis	15.5/20 Non-random, no blinding info, no effect sizes, limited discussion	

Table S1. Data extraction for 136 included studies.

								C = wait-list	Self-compassion (SCS-SF) Quality of life (WHO Five)	each participant)	revealed significant improvements in compassion satisfaction (p=.026), self-compassion (p=.001) and subjective quality of life (p<.001) for nurses completing the intervention, when compared with their pre-scores.	
102	RCT	Gunusen & Ustun 2010 An RCT of coping and support groups to reduce burnout among nurses	To evaluate the effects of coping and support group interventions to reduce burnout among nurses. scores.	A University hospital in Izmir, Turkey 7 weeks	N=108 nurses (36 in coping group, 36 in social support group, 36 in control group; only 28 nurses completed either of the interventions) Age 19-34+ No gender info	I1 = Coping group (7 sessions of 1.5–2h; participants split in 2 groups). Training in cognitive coping with stress and the problem-solving. I2 = Support group (7 sessions of 1.5–2h, participants split into 3 groups), with the aim of providing support, creating sense of belonging, a place to share experiences. Methods of reflection on stressful event used. C = no intervention	Burnout (MBI)	Right after the intervention, there was an immediate reduction in emotional exhaustion dimension of burnout in both intervention groups (p<.001). However, in 6 months, scores were increased again. No significant difference was noted between groups after the intervention in terms of depersonalization (p=.54) or personal accomplishment (p=.59).	13/23 No blinding info, no effect size, limited discussion

Supplementary material

Table S1. Data extraction for 136 included studies.

| 103 | Pre-post not controlled | Pipe et al. 2012

Building Personal and Professional Resources of Resilience and Agility in the Healthcare Workplace | To evaluate the personal and organizational impact of an educational intervention on the stress of health team members. | An inpatient hospital unit in the USA

7-month follow up

2 days | N1=63 oncology staff (36 with follow-up data, only 29 matched)

94% F

Age 21-60

N2=37 clinical managers (24 with follow-up data; only 15 matched)

78% F

Age 21-60 | I = educational programme designed to teach individuals to recognize their stress symptoms and to use learned skills to counteract the negative effects of stress (Institute of HeartMath, IHM®). Two workshop sessions (7h in total), 3 weeks apart, separate for both samples. | The Personal and Organizational Quality Assessment-Revised (POQA-R) – stress symptoms, resilience, emotional competencies, work performance. | For oncology staff: statistically significant differences (p < 0.001) were found between pre and post scores for each of the personal indicators (positive outlook, gratitude, motivation, calmness, fatigue, anxiety, depression, anger management, resentfulness and stress symptoms; ps <.001).

For the organisational outcomes, although all of the indicators trended in the expected direction, statistically significant differences were found in the indicators of goal clarity (p < 0.01), productivity (p < 0.001), communication effectiveness (p < 0.001) and time pressure (p<0.001).

For clinical managers: statistically significant differences were found in the personal indicators of gratitude (p< 0.001), fatigue (p< 0.01), depression (p < 0.05), anger management (p<0.01), resentfulness (p<0.001) and stress | 12.5/18

Limited info in abstract, limited intervention description, no power analysis, limited discussion |

								symptoms (p<0.01), when comparing pre and post scores. For organisational outcomes, statistically significant differences between baseline and 7-month post-intervention were found on the indicators of manager support (p < 0.05) and value of contribution (p < 0.05).	
104	Pre-post controlled	Tucker et al. 2011 Effects of a Worksite Physical Activity Intervention for Hospital Nurses Who Are Working Mothers	To develop and pilot test an innovative worksite physical activity intervention integrated into the work flow of hospital-based nurses who are mothers of 1- to 16-year-old children.	3 medical-surgical nursing units in USA 10 weeks	N=58 nurses (I= 30, C=28; 50 with full data) 100% F Mage=35 (6.91)	I = 10-week worksite PA intervention, with introduction session (30-60min). Participants asked to increase their overall physical activity for 10 weeks by 1 hour each workday, 30 minutes of which were to be through walking. PA options included walking treadmill workstations, standing workstations, walking nursing rounds and meetings,	PA (steps, measured with ankle worn walking monitoring device) Body composition (dual-energy x-ray absorptiometry)	No significant effects were found for physical activity; both groups increased steps from baseline to post-intervention, with control participants averaging an increase of 1,358 daily steps (SD = 3,089) and intervention participants averaging 1,424 daily steps (SD =2,985). Significant differences were found in change over time for fat index (p < .027), fat mass (p < .028), and percent fat mass (p < .035), all favouring the intervention participants. There was	15.5//20 No power analysis, no info on blinding, no effect sizes,

| | | | | | | Nintendo®Wii™ game tools, cues for taking stairs and walking breaks, and 3Minute Energy Burst video clips). Participants also given a water bottle, bailer bag, tote bag, research-grade pedometer, resistance band, relaxation ball, relaxation CD, DVD of Energy Bursts, nutrition and physical activity tips brochure, nutritious snack, walking meeting tag, Frisbee®, and wellness journal.

C = no intervention | | no difference in lean mass though (p=.38). | |
| 105 | Pre-post not controlled | Hrabe et al. 2017

Effects of the Nurse Athlete Program on the Healthy Lifestyle Behaviours, Physical Health, and Mental Well-being of New Graduate Nurses | To test the preliminary effects of a health-oriented workshop 'Nurse Athlete' program on healthy lifestyle beliefs and behaviours, depressive and | A University medical centre in USA

2 days | N=61 nurses (40 with follow-up)

88.5% F

Mage=25.6 (4.5) | I = 2-day health promotion workshop focused on energy management through examination of goals and values in relation to | General Anxiety (GAD-7)

Depressive symptoms (Patient Health Questionnaire-9)

Health lifestyle | There was a statistically significant decrease in the participants' weight (-2.81 lb, p=.02), body fat percentage (-1.61, p<.01), and BMI (-0.57, p<.01) from baseline to the 6-month follow-up assessment. | 11/18

Limited info on intervention, no power analysis, limited discussion |

			anxiety symptoms, as well as health outcomes of new graduate nurses over a 6-month period.			one's spiritual, mental, emotional, and physical development, plus practical strategies to improve self-care.	beliefs Healthy lifestyle behaviours Height, weight and body fat percentage	There was no evidence of change in healthy lifestyle beliefs (p=.72) across time, nor in healthy behaviours (p=.17). Although there was relatively no change in anxiety (p=.86) from baseline to follow-up assessment, there was a statistically significant decline in depressive symptoms (p=.01) over time.	
106	Pre-post not controlled	Kozak et al. 2017 Evaluation of a Training Program to Reduce Stressful Trunk Postures in the Nursing Professions: A Pilot Study	To evaluate the effectiveness of a training program on the reduction of stressful trunk postures in geriatric nursing professions.	6 nursing homes (each with 2 wards) in Germany 4 days	N=23 nurses (19 with complete data) 100% F Majority < 49 years	I = A training program (2-day seminar, 2 half-day practice sessions), consisting of instruction on body postures in nursing, practical ergonomic work methods at the bedside or in the bathroom, reorganization of work equipment, and physical exercises (back muscles).	All movements and trunk postures (The Computer-Assisted Recording and Long-Term Analysis of Musculoskeletal Loads) Care intensity	The mean basic care intensity score was nearly identical for the two time points (21 points). The time spent in sagittal inclinations at an angle of >20° was significantly reduced (by 29% less inclinations per shift) 6 months after the intervention, p < 0.001). Very pronounced inclinations exceeding 60° (p = 0.002] and static inclinations of over 20° for >4 s, p < 0.001] were significantly reduced, by 60% and 22%, respectively. Video analysis showed	13/18 No power analysis, limited discussion, no denominated for each analysis

								that in 49% of care situations, ergonomic measures were implemented properly, either at the bedside or in the bathroom. All participants reported that they were more conscious of adopting awkward postures during work.	
107	Pre-post not controlled	Kamiisslii & Öz 2011 Evaluation of a Smoking Cessation Psychoeducational Program for Nurses	To investigate the effects of smoking cessation behaviours among nurses through a psychoeducational program.	Hacettepe hospital, Turkey 6 weeks	N=52 nurses Age 20-41+ No gender info	I = psychosocial and behavioural counselling (10 sessions run with 5 groups; twice a week) on nicotine dependence, preparing to quitting, coping methods, etc.	Carbon monoxide level Smoking cessation status Depression/ Anxiety (Brief Symptom Inventory) Self-efficacy (SSQ) Coping with stress (Stress Coping Scale)	After the treatment, results indicated that self-efficacy (p<.001) and stress management (p=.03) increased significantly while depression/ anxiety (p=.01) significantly decreased. In addition, at the end of the intervention, 48.1% of the participants were successful in smoking cessation, but this dropped to 36.5% at the last follow-up. Carbon levels not reported	13/18 No power analysis, no software info, no effect sizes, limited discussion
108	Pre-post controlled	Poulin et al. 2008 (study 1) Mindfulness training as an evidenced-based approach to reducing stress and promoting well-being among	To explore whether the brief mindfulness-based intervention was superior to traditional relaxation	A geriatric hospital in Canada Duration not reported	N=40 nurses and nursing aids (MBSR=16, IPMR= 10, Control=14) Mage=46.5 (8.8)	I1= brief Mindfulness-based Stress Reduction (bMBSR), four 30min sessions, introducing mindfulness and	Burnout (MBI) Satisfaction with life (SWLS) Propensity to experience	Both interventions significantly improved Relaxation (p<.05) and life satisfaction (p<.05), with mindfulness participants exhibiting a trend toward particular improvements in	11.5/20 Limited abstract, limited intervention info, no power analysis, no blinding, no

Table S1. Data extraction for 136 included studies.

		human services professionals	intervention for nursing staff.		91% F	ways of practicing it in daily life (practice of breathing, sitting meditation, body scanning, + CD, and goal of practicing 15-20min every day) I2 = brief Imagery and Progressive Muscle Relaxation (bIPMR); four 30min sessions, focused on the impact of stress, relaxing, creative visualisation, relaxation exercises (breathing, muscle relaxation, imagery). Asked to practice daily. C = no intervention	relaxation (SRDI)	emotional exhaustion. No other significant differences observed.	software info, limited flow info, no effect sizes,
109	Pre-post controlled	Saedpanah et al. 2016 The Effect of Emotion Regulation Training on Occupational Stress of Critical Care Nurses	To assess the impact of emotion regulation training on occupational	Two teaching hospitals in Sanandaj, Iran 3 weeks	N=60 (30 in I, 30 in C) Mage=31 (5.6) 80% F	I = Emotion regulation training on effects of emotions, communication	Stress (Expanded Nursing Stress Scale)	Occupational stress dimensions including; conflict with physicians, problems with peers, workload, uncertainty concerning treatment	13/20 No info on blinding, no flow info, no effect sizes, limited

Table S1. Data extraction for 136 included studies.

				stress of critical care nurses.			of emotions, conflict solving, coping with emotions etc. (8 lectures of two hours, for 3 weeks) C = no intervention		and problems related to patients and their families in the intervention group was significantly lower after the intervention (ps=.001). The control group did not show any changes (p>.16).	discussion
110	Quasi RCT	Sabzianpoor et al. 2015 The impact of teaching psychological welfare on marital satisfaction and self-efficacy in nurses	To examine the effect of teaching psychological welfare on marital satisfaction and self-efficacy in nurses.	Tehran's Imam Khomeini Hospital, Iran Duration not reported	N= 48 nurses (24 in I, 24 in C) Mage=34.15 (7.36) No gender info	I = group lessons on psychological welfare (10 sessions) C= no intervention	Self-efficacy Marital Satisfaction	Teaching psychological welfare significantly increased marital satisfaction (p=.005) and self-efficacy (p=.001) in the intervention group when compared to control group.	7.5/23 Not much info on intervention, no flow info, limited info on assignment, no blinding, limited presentation of results and discussion
111	RCT	Ploukou & Panagopoulou 2018 Playing music improves well-being of oncology nurses	To examine the effects of a music intervention (percussion playing) on anxiety, depression, and psychosomatic symptoms of oncology nurses.	A cancer hospital in northern Greece 4 weeks	N=48 nurses (I= 22, C= 26, all completed) 96% F No gender info	I = attending 4 consecutive weekly 1-hour supervised music classes, playing and improvising music with percussion instruments (both group-play and individual, with varied difficulty) C = no intervention	Depression (HADS) Anxiety (HADS) Psychosomatic symptoms (PILL; the Pennebaker Inventory of Limbic Languidness)	Anxiety (p=.007), depression (p=.019) and psychosomatic symptoms (p=.005) significantly reduced for the intervention group at the end of the study. No statistically significant change was observed for the control group in any of the three outcomes.	12/23 No power analysis, limited info on randomisation, no effect sizes, limited discussion
112	Pre-post	Pahlevani et al. 2015	To investigate the	Imam	N=40 (20 in I,	I = training on	Psychological	The stress management	8.5/20

	controlled	Effectiveness of stress management training on the psychological wellbeing of the nurses	effect of stress management training on the psychological wellbeing of nurses.	Khomeini Hospital, Iran Duration not reported	20 in C) Mage=33.25 (5.39) No gender info	stress management skills, 10 sessions (topics included nature of stress coping with stress, cognitive distortions, etc). C = no intervention	wellbeing (PWB)	training significantly increased the psychological well-being of nurses in intervention group when compared to control group (ps < 0.001; both the total score and individual scores of different subscales).	Limited info on intervention, assignment method, or flow. No baseline demographics for each condition, limited analysis and discussion.
113	Pre-post controlled	Motamed-Jahromi et al. 2017 Effectiveness of Positive Thinking Training Program on Nurses' Quality of Work Life through Smartphone Applications	To determine the effect of positive thinking via social media applications on the nurses' quality of work life.	Two hospitals in Fasa University of Medical Sciences in the south of Iran 3 months	N=100 (I= 50 C= 50) Mage=30 82% F	I = Positive thinking training via telegrams (social networking app), included video, audio, and picture messages, positive quotes (mean=16 messages daily). C = Access to books on positive thinking in the hospital in free time	Work-life quality (Brooks and Anderson's scale)	The intervention group improved significantly on quality of work life (p < 0.001) and in dimensions of work life quality: work design (p < 0.001), work context (p < 0.001), and work world (p = 0.003). There was a small decrease in home life in this group (p < 0.001). The control group showed no significant changes, apart from a small improvement on work context (p=.026).	14.5/20 Little info on assignment method, no info on flow, no effect sizes, somewhat limited discussion
114	Pre-post not controlled	Mehrabi et al. 2012 The effect of yoga on coping strategies among intensive care unit nurses	To investigate the effect of Yoga on stress coping strategies among nurses working in intensive care units.	AlZahra hospital in Iran 2 months	N=36 nurses (34 with full data) Mage=33.53 (7.69) No gender info	I = Yoga classes twice a week (each session 1 hour) for 8 weeks.	Coping skills (Coping Stress Revise; CS-R)	There was a significant difference in the coping strategies of problem focus (p<.001), emotion focus (p=.014), and ineffectiveness (p<.001) after Yoga exercises compared with before the yoga sessions.	11.5/20 No power analysis, no info on assignment method, little baseline data, no effect sizes, limited discussion

Supplementary material

Table S1. Data extraction for 136 included studies.

115	Pre-post not controlled	Ketelaar et al. 2014 Improving work functioning and mental health of health care employees using an e-mental health approach to workers' health surveillance: Pretest - posttest study	To assess if the e-mental health (EMH) approach to work health surveillance (WHS) improves work functioning, stress and work-related fatigue in hospital nurses and allied health professionals.	One academic hospital in Netherlands Duration not reported	N=295 nurses and health professionals (128 with follow up data) 77% F Mage=40 (12)	I = Screening of participants on mental health, personal feedback, invitation to EMH program (self-help intervention for improving wellbeing, based on advise, assignments and chat option)	Work functioning (NWFQ) Stress (4DSQ) Work-related fatigue (Experience and Evaluation of Work)	Significant improvements were found on work functioning (p=0.01) and work-related fatigue (p < 0.01). Work functioning had relevantly improved in 30% of participants. There was no significant difference in level of stress after the intervention (p=.10).	14.5/18 No power analysis, limited discussion
116	Pre-post controlled	HemmatiMaslakpak et al. 2016 The effect of neuro-linguistic programming on occupational stress in critical care nurses	To determine the effects of implementation of neuro-linguistic programming (NLP) strategies on job stress among ICU nurses.	Critical care units of Urmia Imam Khomeini and Motahari educational therapeutic centres, Iran 6 months	N=60 nurses (I=30, C=30) Mage=33.9 (6.8) No gender info	I = NLP training programme lasting 18 three-hour sessions (6-months) held by a trained person. Includes goal setting, time management, assertiveness, etc. C = no intervention	Stress (Expanding Nursing Stress Scale; ENSS)	The level of job stress decreased in the intervention group while that of control group remained relatively unchanged. The difference in the level of stress at follow-up between the two groups was statistically significant (p<.001). All subscales of stress (e.g., due to workload) also showed significant differences between the groups at follow-up (ps<.05).	10.5/20 No power analysis, little info on assignment, no flow info, limited results and discussion
117	Pre-post not controlled	Yilmaz et al. 2018 Effect of a nurse-led intervention programme on professional quality of life and post-traumatic growth in oncology	To evaluate the effects of a nurse-led intervention programme on compassion fatigue, compassion satisfaction, and	University hospital in Izmir, Turkey 6 weeks	N=43 nurses Mage=35.4 (6.8) 98% F	I = 2 face-to-face sessions for expressing emotions (including lecture, background reading, baksi	Compassion satisfaction, fatigue and burnout (ProQOL-IV) Post-traumatic growth (PTGI)	After the intervention compassion fatigue (p <.01) and burnout (p<.01) decreased, while compassion satisfaction (p<.01) and all subscales of post-traumatic growth	15.5/18 No effect sizes. Somewhat limited discussion

Table S1. Data extraction for 136 included studies.

		nurses	burnout of oncology nurses.			dance, mandala painting, motivational texts) and 2 counselling follow-up sessions by phone (5 weeks)		inventory increased (ps<.01).	
118	Pre-post not controlled	Torquati et al. 2018 Changing Diet and Physical Activity in Nurses: A Pilot Study and Process Evaluation Highlighting Challenges in Workplace Health Promotion	To evaluate a workplace intervention to promote PA and healthy diet for nurses, using Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) framework.	Public and private hospitals in metropolitan Brisbane, Australia 3 months	N=47 nurses (27 with follow-up 3months data, 12 with 6months data) 87% F Mage=41.4 (12.1)	I = PA and diet intervention, includes self-monitoring, goal setting for changes in diet and PA, and social support (pedometers, a smartphone app, and a dedicated Facebook group).	Diet quality (Food frequency questionnaire) PA (accelerometer; moderate to vigorous PA) Steps (pedometer) Health (1-item) Self-efficacy Social support Weight, BMI, Waist circumference, Blood pressure	At the end of intervention, fruit and vegetable intake significantly increased (p= .04), but decreased slightly at 6 months. Unfortunately, moderate to vigorous physical activity and daily steps decreased slightly at 3 months (p = .01 and p=.04, respectively), with MVPA further decreasing at 6 months. There were nonsignificant changes in BMI, waist circumference, and self-efficacy/social support at 3 and 6 months (ps>.05).	15/18 No power analysis, no effect sizes
119	Pre-post not controlled	Bazarko et al. 2013 The Impact of an Innovative Mindfulness-Based Stress Reduction Program on the Health	To measure whether the alternative delivery of mindfulness based stress reduction	A large, multisite healthcare organisation, USA 8 weeks	N=41 nurses (36 with full data) 100% F Mage=52.2	I = 8-week, group telephonic MBSR (both classroom and telephonic delivery, full day retreat at the beginning and	Health (SF-12) Stress (PSS) Burnout (Copenhagen Burnout	At the end of the intervention, participants showed improvement in general health (p < .01), decreased stress, (p < .001), decreased work	14/18 No power analysis, no effect size, no denominator

		and Well-Being of Nurses Employed in a Corporate Setting	(MBSR) program - a group telephonic MBSR (tMBSR) could improve the health and wellbeing of nurses.			end of the program, with 6 weekly 1.5h group teleconference sessions in between, additionally email contact with the instructor; included mindfulness practice, yoga, CDs, books, DVDs for home practice).	Inventory; CBI) Self-compassion Serenity Empathy	burnout (p < .001), and improvement in serenity (p<.001), empathy (p<.001), and self-compassion (p<.001). These improvements were sustained 4 months later.	
120	Pre-post not controlled	Ceravolo & Raines 2018 The impact of a mindfulness intervention for nurse managers	To examine the impact of mindfulness interventions on nurse managers' quality of life, burnout, and wellness.	Sisters of charity hospital, an acute care hospital with two campuses, USA. 8 weeks	N=13 nurse managers (12 with complete data) No age info No gender info	I = mindfulness workshop (weekly 60min session, for 8 weeks) based on MBSR, with lectures, discussions, activities related to mindfulness	Burnout (ProQOL) Burnout (CBI) Perceived wellness scale	At the end of the intervention there were significant changes in compassion satisfaction (p=.002), risk for burnout (p=.016), personal burnout (p = .023) and work-related burnout (p = .029), but not in compassion fatigue (p=.85), perceived wellness (p=.49), or client-related burnout (p=.59). The changes stayed similar at 3-month follow-up.	13.5/18 No effect sizes, no power analysis, somewhat limited discussion
121	Pre-post controlled	Freimann et al. 2015 Effects of a home-exercise therapy programme on cervical and lumbar range of motion among nurses	To investigate the effects of a home-exercise therapy programme on cervical and lumbar range of motion among	Tartu University hospital in Estonia 8 weeks	N=33 nurses (24 completed, 13 in I, 11 in C) Mage=30.15 (5.1)	I = 8-weeks of home exercise therapy (6 days a week, from 20 to 60min a day; effective stretching and	Cervical and lumbar range of motion (digital goniometer)	After the home-exercise therapy, there was a significant increase in cervical range of motion in flexion (p<.001), extension (p=.002), lateral flexion (ps≤.012)	15/20 No power analysis, not much info on assignment, no denominated, no

					No gender info	strengthening exercises for cervical and lumbar region; intensity increasing every 2 weeks). Pre-intervention guidance on exercises by physiotherapist included, plus written materials on correct ways of exercising. C = no intervention		and rotation (ps≤.01), as well as in lumbar range of motion in lateral flexion (ps≤.009) in the intervention group. Cervical range of motion in flexion was significantly higher (p=.004) in the experimental group compared to the control group after therapy, other outcomes were non-significantly different (ps>.05).	effect sizes, somewhat limited discussion
		with neck and lower back pain: A quasi-experimental study	intensive care unit nurses who had experienced mild to moderate musculoskeletal pain in the neck and or lower back during the previous six months.						
122	Pre-post not controlled	Delaney 2018 Caring for the caregivers: Evaluation of the effect of an eight-week pilot mindful self-compassion (MSC) training program on nurses' compassion fatigue and resilience	To assess the effect of eight-week self-compassion intervention on nurses' compassion, fatigue and resilience.	A university hospital in Ireland 8 weeks	N=18 nurses (13 with full data) Mage=44 100% F	I = a pilot 8-week MSC training (2.5h a week + half-day retreat, focused on core principles and practices of responding to difficult moments in life with kindness, care and understanding; practicing self-compassion and mindfulness on daily basis with CDs)	Mindfulness (FMI) Self-compassion Scale Secondary traumatic stress, Burnout, Compassion satisfaction (ProQOL) Resilience (CD-RICS)	The level of secondary traumatic stress and burnout declined significantly after training, whereas resilience, mindfulness, self-compassion and compassion satisfaction increased significantly.	14/18 No eligibility criteria, no power analysis, no software info, little info on flow
123	Pre-post not controlled	Mahon et al. 2017 Nurses' perceived stress and compassion	To determine if mindfulness meditation and self-compassion	Three university teaching hospitals in the	N=90 nurses (64 with follow-up)	I = Mindfulness intervention (2h each week in the evening, after	Perceived stress (PSS) Compassion	The nurses' perceived stress was significantly reduced after the intervention (ps<.001).	14/18 No power analysis, no effect

		following a mindfulness meditation and self-compassion training	training have an effect on nurses' perceived stress and compassion, and to compare if there are any differences in the nurses' responses who tool a 6-week versus an 8-week course.	west of Ireland 8 weeks (hospital 1 and 3) 6 weeks (hospital 2)	99% F Mage=44.16 (8.26)	shifts ended; 6weeks vs. 8 weeks)	(Compassion Scale)	Notably, compassion increased after the intervention, but this was significant for nurses working only at one of the hospitals (p<.001). There were no significant differences between results from a 6-week and an 8-week mindfulness intervention.	sizes, limited discussion
124	Pre-post controlled (cross-over)	Lee et al. 2014 Home-based behavioural sleep training for shift workers: A pilot study	To evaluate the effects of the home-based sleep training program in a sample of shift working nurses using both objective (actigraphy) and subjective measures of sleep.	University of California, San Francisco Medical Centre, USA 4 weeks each	N=34 nurses (21 included in analysis) 95% F Mage=45.5 (12.5)	I1 = home-based cognitive-behavioural, 4-week sleep enhancement training system for shift workers; SETS-SW; CBT for insomnia; guidebook with weekly readings, auditory program for listening before bed, 15min long in 1st week, 45min long afterwards, focused on relaxation; plus a sleep diary) I2 = 4-week active control intervention (sleep diary, weekly booklet readings)	Sleep quality (PSQI; Pittsburgh Sleep Quality Index) Sleep disturbance (GSDS; General Sleep Disturbance Scale) Circadian rhythms (wrist actigraphy) Depressive symptoms (Centre for Epidemiologic Studies-Depression Scale) Health (SSI; Standard Shift-work Index)	After the SETS-SW intervention, participants reported better sleep quality (p=.001), less sleep disturbance (p=.001), and less participants reported poor sleep (p<.001) although no change in actigraphy outcomes was observed (ps>.05). There were no sleep improvements after active control phase. Some of the health outcomes improved after the SETS-SW intervention (ps<.05), and also after the active control phase. The same was the case for depressive symptoms (p<.001).	15/17 No power analysis, crossover trial, no 95% CIs,
125	RCT	Villani et al. 2013	To test the short-term effects of an	6 oncology hospitals in	N=30 nurses (15 in I, 15 in C)	I = stress inoculation	State and trait anxiety (STAI)	The findings showed psychological	9/23

Table S1. Data extraction for 136 included studies.

		Self-Help Stress Management Training Through Mobile Phones: An Experience With Oncology Nurses	innovative self-help stress management training for oncology nurses supported by mobile tools.	Milan, Italy 4 weeks	Mage=43 (8.80) 100% F	training (SIT; relaxation techniques, coping techniques) delivered via mobile phones; plus watching 8 video clips with a narrative based on SIT; twice a week for 4 weeks; 15min per session C = same as above, but the videos were showing neutral stimuli	Coping skills (Brief Coping Orientation to Problems Experienced; COPE)	improvement in the intervention group in terms of anxiety state (ps<.05), anxiety trait reduction (p=.04), and coping skills acquisition (active coping increased, denial decreased; ps<.05). The control group did not show any significant improvements (ps>.05).	No power analysis, not much basic demographics info, no denominated, no effect sizes, limited discussion
126	RCT	Moody et al. 2013 Helping the helpers: Mindfulness training for burnout in paediatric oncology - A pilot program	To explore the effect of a mindfulness-based course (MBC) on burnout.	Two urban academic paediatric haematology/ oncology hospitals in USA and Israel 8 weeks	N=48 hospital staff (I=24, C=24; 45 with data) 80% F No age info	I = 8 weekly mindfulness sessions (15h in total) in a group setting, based on skills-training according to MBSR (initial 6h session, followed by 1h sessions, and 3h end session); CD for home practice, and daily journal C = no intervention	Burnout (MBI) Depression (Beck Depression Inventory) Perceived stress (PSS)	Unfortunately, the mindfulness course did not result in any significant improvement in burnout, perceived stress or depression (ps>.05).	14.5/23 No power analysis, no blinding, no effect sizes, no registration
127	Pre-post controlled	Hilliard 2006 The effect of music therapy sessions on	To evaluate the effects of two different types of music therapy	A hospice in USA	N=17 hospice staff 65% F	I1 = ecological music therapy for 6 weeks (1h a week, non-	Compassion fatigue (CFS) Team building	The results showed a significant improvement in team building in both groups (ps<.05), with a	11.5/18 No power analysis, no flow

		compassion fatigue and team building of professional hospice caregivers	(ecological and didactic) on compassion fatigue and team building of professional hospice caregivers.	6 weeks	Age 28-60	structured, live experience of instrumental improvisation, with toning and chanting) I2 = didactic music therapy for 6 weeks (1h a week; structured intervention, planned a priori; guided meditation with live music, lyric analyses, music and movement)	(Team Building Questionnaire)	higher increase in didactic music group (p<.05), but there were no significant differences in compassion fatigue in either group (ps>.05).	info, no effect sizes, limited discussion
128	Wait-list RCT	Steinberg et al. 2017 Feasibility of a mindfulness-based intervention for surgical intensive care unit personnel	To evaluate the feasibility of a workplace intervention for increasing resilience to stress.	A large academic medical centre in USA 8 weeks	N=32 intensive care unit staff (31 completed) 88% F Mage=44 (11.5)	I = Mindfulness intervention (discussion, meditation, mild yoga movement, and music; 1h a week for 8 weeks; plus home practice 20min a day with CD; at least 5 days a week) C = wait-list	Work satisfaction (UWES) Burnout (MBI) Stress (ProQOL) Biological markers of stress Satisfaction with life (4-items) Missed or less effective days at work	Work satisfaction increased significantly in the intervention group (p=.006) with no change in the control group (p=.30). There were no changes in satisfaction with life for neither group (ps>.50), neither in stress (ps>.20), or missed days at work (ps>.05). The results for burnout and biological markers are not reported.	15/23 Little info on randomisation, or blinding, no flow data, no effect sizes
129	Pre-post not controlled	Lan et al. 2014 The effects of	To evaluate the effectiveness of a brief	Critical care units of a tertiary referral	N=41 nurses (37 completed)	I = brief version of mindfulness-based cognitive	Perceived stress (PSS)	After completing the program, the participants reported	13.5/18 No 95% CIs,

Table S1. Data extraction for 136 included studies.

		mindfulness training program on reducing stress and promoting well- being among nurses in critical care units	mindfulness-based training program in reducing stress and promoting well-being among critical care nurses.	public hospital in Malaysia 5 weeks	100% F Mage=29.19 (5.35)	therapy (bMBCT); 5 weeks of 2h per week, based on MBSR and MBCT; various exercises to practice being present, calm and grateful; CD and booklet provided for home practice (5-10min a day)	Depression, stress and anxiety (DASS) Wellbeing (Subjective Happiness Scale) Mindfulness (MAAS)	significant improvement in perceived stress (p< .001), stress (p=.002), anxiety (p<.001), depression (p<.001), mindfulness (p<.001), and happiness (p=.028), with a moderate to large effect size.	limited discussion
130	Pre-post controlled	Sarid et al. 2010 The impact of cognitive behavioural interventions on SOC, perceived stress and mood states of nurses	To investigate the effects of cognitive behavioural interventions (CBI) on nurses' sense of coherence (SOC), perceived stress and mood states.	A hospital in Israel 4 months	N=36 nurses (I=20, C=16) Mage= 50.6 (10.7) No gender info	I = CBI course (16 meetings, 4h each, 10 on cognitive interventions, 6 on stress reducing behavioural skills; focus on stress and coping with stress, such as relaxation, cognitive restructuring) C = no intervention	Sense of coherence (SOC) Perceived stress (PSS) Mood states (Profile of Mood States)	In the intervention group, there was a statistically significant change in four of the psychological measures: the SOC and vigour mood state increased, while perceived stress and fatigue mood state significantly decreased (ps<.05). No such changes were observed in the control group.	10/20 No power analysis, no software info, no blinding info, no baseline comparison, no effect sizes, limited discussion
131	Pre-post not controlled	Kooshalshah et al. 2015 Effect of positive thinking intervention on the nurses' job stress	To study the effect of positive thinking intervention on nurses' job stress.	One hospital affiliated with Tehran Medical Science University, Iran 1 week	N=105 nurses 100% F No age info	I = One 2h lecture session on positive thinking in small groups with Q&A, plus 6 posters posted on wards' notice boards for 5 days containing inspiring words,	Job stress (Nursing Stress Scale)	There was a significant decrease in job stress after the intervention (-9.29 points, p<.001).	12.5/18 No power analysis, not much info on participant flow, no effect sizes, limited discussion

Table S1. Data extraction for 136 included studies.

							participants received a booklet on positive thinking		
132	Wait-list RCT	Fillion et al. 2009

Impact of a meaning-centred intervention on job satisfaction and on quality of life among palliative care nurses | To evaluate the efficiency of meaning centred intervention on improving job satisfaction and quality of life of nurses providing palliative care (PC). | PC nurses in three regional districts in Quebec Province, Canada

4 weeks | N=121 nurses (I=60, C= 61; 109 with full data)

Mage=44.07 (10.59)

99% F | I = meaning-centred intervention (MCI, includes guided reflections, experiential exercises, and education based on themes of Viktor Frankl's logotherapy; exploration of meaning in life and work, linking suffering with meaning; 4 weekly meetings; each participant received a book)

C = wait-list | Job satisfaction (Job Diagnostic Survey)

Benefits of working in PC (BEN instrument, adapted)

Spiritual (FACIT-Sp) and emotional (POMS) quality of life | The nurses in the intervention group reported more perceived benefits of working in PC after the intervention (p=.01) and at follow-up (p=.01) when compared to control group.

Spiritual (p=.73) and emotional (p=.57) quality of life remained unaffected by the intervention.

There was no effect of the intervention of job satisfaction (p=.96). | 14/23

Not much info on randomisation, no effect sizes or 95% CIs, no denominated in tables |
| 133 | Pre-post not controlled | Flanagan et al. 2017

The Feasibility, Safety, and Efficacy of Using a Wireless Pedometer to Improve the Activity Level in a Cohort of Nurses | To test the feasibility, safety, and efficacy of using a wireless pedometer aimed at increasing the number of steps walked, flights of stairs climbed, daily activity level, and perception of health among nurses. | A large hospital in the north-eastern part of USA

3 months | N=30 nurses

90% F

Mage=58.7 | I = use of a wireless pedometer, meeting with researcher to review how to safely increase PA | Self-perception of number of steps walked, flights of stairs climbed, and activity level (self-report, own scale)

Health (1-item) | There was a significant increase from baseline to the end of the intervention in the self-perception of steps walked (p<.001), flights of stairs climbed (p=.002), self-perception of daily activity (p<.001).

The change in self-perception of health was | 14.5/18

No power analysis, no effect sizes, no denominated in analyses |

								also significant (p=.034)* *Authors suggest that this change is non-significant, but conventional p value suggests otherwise.	
134	Pre-post controlled	Patel & Yadav 2013 Comparison of Static Stretching Versus Eccentric Training to Increase Flexibility of Hamstring Muscle in Healthy Hospital Nurses	To compare the effect of static stretching versus eccentric training in increasing hamstring muscle flexibility in healthy hospital nurses.	A tertiary Care Hospital in India 1 week	N=30 nurses (15 in each group) 100% F Mage=24.13 (1.09)	I1 = Static stretching for 1 week (participant in supine lying position with hip and knee in 90 degrees of flexion; the therapist passively and gradually extended the knee in active knee extension test position till the participant felt a stretch in hamstring muscle. 3 repeats, with 30 seconds holding in position and10 seconds rest) I2 = Eccentric training for 1 week (participant in supine lying position with leg fully extended. A Theraband was wrapped around the heel and participant held	Popliteal angle (active knee extension test with goniometer)	After the intervention phase both groups showed statistically significant increase in popliteal angle (p=.017), with group I1improving significantly more than group I2 (p<.001).	12.5/20 No power analysis, no software info, no blinding, no discussion

Table S1. Data extraction for 136 included studies.

							the ends of the theraband in each hand. They were instructed to bring the test hip into full flexion by pulling on the theraband attached with foot and both arms, making sure that the knee remains locked in full extension at all times. They were asked to pull the hip into full flexion with the arms, simultaneously resisting the hip flexion by eccentrically contracting the hamstring muscle during the entire range of hip flexion; 6 repeats with 5 seconds holding in position time)			
135	Pre-post not controlled	Murphy et al. 2000 (study 2) Telephone support for Canadian nurses in HIV/AIDS care	To examine the effectiveness of an intervention designed to enhance social support, promote the use of certain coping strategies for managing occupational stress, and	Canada, Community settings (community health, public health, VON, home care, visiting nursing, community-based	N=30 nurses (only 15 with complete data) Mage=40.5 93% F	I = Telephone support groups facilitated by an expert (max 8 participants per group; 60-90min long sessions, 12 sessions; 6 months, focused on emotional, informational,	Qualitative interviews Stress (AIDS Impact Scale) Coping (Ways of Coping Questionnaire) Social support	The intervention enhanced nurses' coping, confidence, relationships, client care, and connections to the HIV/AIDS nursing community, according to qualitative reports. However, there were no significant changes to	14.5/18 No power analysis, no eligibility criteria, no statistics presented.

			prevent burnout in nurses.	organizations, private agencies, walk-in clinics, hospice in the home) and institutional settings (acute care, ambulatory care, outpatient clinics, clinical trials, palliative care units, psychiatric settings, hospices, hospital occupational health departments) in the three sites of Toronto, Ontario; Calgary, Alberta; and Vancouver, British Columbia 6 months		and affirmational support specific to stressful situations encountered by nurses working in HIV/AIDS care)	(Arizona Social Support Interview Schedule) Job satisfaction (Nursing Job Satisfaction Scale) Burnout (MBI)	any outcomes measured quantitatively (no statistics provided).	
136	Pre-post not controlled	Anderson & Gustavson 2016 The impact of a Knitting Intervention on Compassion Fatigue in Oncology Nurses	To explore the impact of a knitting education program and the related incidence of compassion fatigue in oncology nurses.	A University hospital in Washington, DC, USA 6 weeks	N=39 nurses Mage=32 No gender info	I = participants worked with knit-ting instructors from Project Knitwell for 6 weeks; volunteers taught nurses how to knit; knitting materials provided in rest rooms; nurses	Compassion satisfaction, burnout, secondary stress (ProQoL)	A significant change was observed in burnout and secondary stress. There was a trend in compassion satisfaction change (No statistical data provided).	8/18 No abstract, no statistics presented, no info on flow of participant, no power analysis, limited discussion.

Supplementary material

Table S1. Data extraction for 136 included studies.

						could use them during breaks, lunch etc. Includes group knitting and chat about stressful situations. Knitted outputs were joined and displayed at the end.			

Note: F=female.