



Organizational strategies to reduce physician burnout: a systematic review and meta-analysis

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Received: 10 August 2019 / Accepted: 21 September 2019
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Abstract

Background The growing “process” of burnout impair performance and quality of professional services, with consequences for physicians, healthcare care organization, and patient’s outcomes.

Aims We aim to evaluate which strategy of intervention, individual or organization directed, is more effective to reduce physician burnout and to provide management suggestions in terms of actual organizational strategies and intensity leading to reductions in physician burnout.

Methods The meta analysis was conducted according to the PRISMA guidelines. We included physicians of any specialty in the primary, secondary, or intensive care setting, including residents and fellows. Eligible interventions were any intervention designed to relieve stress and/or improve the performance of physicians and reported burnout outcomes, including physician-directed interventions and organization-directed interventions. The electronic search strategy applied standard filters for identification of the different studies. Databases searched were the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library), MEDLINE (from inception to September 2018), and EMBASE (from beginning to September 2018). Meta analysis was performed with mixed random effect using DerSimonian and Laird method. The standardized mean difference (SMD) and 95% CI for each outcome were separately calculated for each trial pooling data when needed, according to an intention-to-treat principle.

Results Pooled interventions were associated with small significant reductions in burnout (SMD = - 0.289; 95% CI, - 0.419 to - 0.159; I2 = 29%) (Fig. 2). Organization-directed interventions were associated with a medium reduction in burnout score (SMD = - 0.446; 95% CI, - 0.619 to - 0.274; I2 = 8%) while physician-directed interventions were associated with a moderate reduction in burnout score (SMD = - 0.178; 95% CI, - 0.322 to - 0.035; I2 = 11%).

Discussion This systematic review and meta-analysis showed that (1) organization-directed interventions were associated with moderate reduction in burnout score, (2) physician-directed interventions were associated with small reduction in burnout score, (3) organization-directed interventions reduced more the depersonalization than physician-directed interventions, (4) organization-directed interventions were related to a more improvement of the personal accomplishment than physician-directed interventions.

Conclusions This meta analysis found that physicians could gain important benefits from interventions to reduce burnout, especially from organizational strategies, by viewing burnout rooted in issues related to the working environment and organizational culture.

Keywords Physician burnout · Organizational-directed interventions · Meta-analysis · Systematic review · Wellbeing

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Introduction

The term “burnout” was first described by the psychoanalyst H.J. Freudenberger [1] as a mental illness of mental exhaustion often observed in health care workers caused by prolonged exposition to job-related stressors, and later defined as an occupational multi-dimensional syndrome (Burnout Syndrome–BOS).

Burnout is a major concern for physicians, who are interpersonally stressed and emotionally vulnerable [2]. Physicians confront the stress of government regulations, malpractice suits, increased clinical demands, less time with patients, a rapidly expanding knowledge base, and how to balance their personal and professional lives. Stresses reverberate through the organizational matrix to affect how physicians think about and perform their everyday clinical work [3, 4].

Physician burnout is a work-related syndrome, consisting of emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment [5]. “Emotional exhaustion” is the main component of burnout, resulting in mental and physical fatigue, loss of energy to complete tasks, and the sense of incapacity to renew energy. “Depersonalization”, a consequence of the emotional stress, refers to a cynical treatment of others (patients and colleagues) as an object. “Decreased personal accomplishment” refers to a reduced sense of personal competence and self-efficacy [6].

The growing “process” of burnout impair performance and quality of professional services, with consequences for physicians, healthcare care organization, and patient’s outcomes. Among physicians, the syndrome is related to lower job satisfaction, diminished interest in work context and personal relationships, reduction in the quality of patients’ care and elevated staff turnover [7–9]. Within health care organizations, burnout is associated with less productivity, high job turnover, and early retirement [10, 11]. Since burnout can also increase medical errors, reduce the quality of patient care, and patient satisfaction, physician well-being is importantly used as a quality indicator of health care [7, 12].

The most important causes of physician burnout include chronic occupational stress, excessive workloads, difficulty to conciliate work and family needs, and unbalance between job demand and job resources.

Job demands refer to stress-inducing factors in the work environment (e.g., time pressure, conflicting requirements of different tasks, the pace of work, workload, and backlog) requiring cognitive and emotional efforts or skills with consequent psychological costs [13]. That is why they can determine health impairments like exhaustion, psychosomatic health problems, and excessive strain, including burnout.

Differently, job resources refer to psychological, social, or organizational characteristics of the job to attain work objectives and to reduce job demands and consequent costs. Job resources include job control referring to skills and independence in decision-making about how to perform [14].

Demand-resource imbalance can occur when a person has to meet all the job demands while having no control over workload, schedules, and decision-making on how to meet the requirements [15].

The importance of the mentioned consequences for physicians, healthcare care organization, and patients has

led to increased attention to well-being in physicians and strategies to prevent or reduce burnout. Two typologies of strategies can be distinguished to reduce physician burnout: interventions directed at individuals and interventions directed at organizations [16]. Individual-directed interventions typically include cognitive behavioral techniques to enhance job competence and improve communication skills and personal coping strategies. Organization-directed interventions can include simple changes in schedule and reductions in the intensity of workload or more ambitious changes in the operation of practices and whole health care organizations.

Previous reviews have been conducted on the effectiveness of individual- and organization-directed interventions to reduce burnout of physicians, but with confusing results, limited focus on physicians, inconsistent adherence to modern methodological systematic review standards, and without management suggestions. Therefore, to fill this gap and to provide management suggestions to reduce physician burnout, we evaluate which strategy of intervention, individual- or organization-directed, is more effective.

Methods

Eligibility criteria

We included physicians of any speciality in the primary, secondary, or intensive care setting, including residents and fellows. Eligible interventions were any intervention designed to relieve stress and/or improve the performance of physicians and reported burnout outcomes, including physician-directed interventions and organization-directed interventions. Physician-directed interventions focused on individuals, whereas organization-directed interventions introduced changes in the resources, the working environment, and/or work tasks to decrease stress. Eligible comparisons included any type of control. The outcome was burnout measured using validated tools such as the Maslach Burnout Inventory (MBI) or other validated measures of burnout. Eligible study designs were quantitative intervention designs described in the Cochrane handbook, including randomized clinical trials, nonrandomized trials, controlled before-after studies, and interrupted time series.

Exclusion criteria

Interventional studies not reporting data on burnout outcomes but providing data on general stress, well-being, or job satisfaction were excluded.

Search strategy and data sources

The electronic search strategy applied standard filters for identification of the different studies. Databases searched were the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library), MEDLINE (from inception to September 2018), and EMBASE (from beginning to September 2018). We did not apply language restrictions. Our search included the following keywords: burnout, physicians, interventions, MBI.

Study selection and data extraction

Initial selection was performed by screening titles and abstracts by two pairs of independent reviewers. For detailed evaluation, a full-text copy of all possibly relevant studies was obtained. Data from each study were extracted independently using a pre-standardized data abstraction form. Another reviewer checked data extracted from the publications for accuracy. We used the Cochrane risk of bias tool to assess the quality of study design and the extent of potential bias [17] by considering the following domains: sequence generation, allocation concealment, blinding of participants, personnel and outcomes assessors, incomplete outcome data, selective outcomes reporting, baseline characteristics. Two reviewers independently used these criteria to abstract trial quality. We resolved any disagreements by discussion.

Risk of bias

To evaluate potential publication bias, a weighted linear regression was used, with the natural log of the odds ratio as the dependent variable and the inverse of the total sample size as the independent variable. This is a modified Macaskill's test, which gives more balanced type I error rates in the tail probability areas compared with other publication bias tests [18].

Quantitative analysis

The meta-analysis was conducted according to the PRISMA guidelines [19]. Meta-analysis was performed with mixed random effect using DerSimonian and Laird method. Results were graphically represented using Forest plot graphs. The standardized mean difference (SMD) and 95% CI for each outcome were separately calculated for each trial pooling data when needed, according to an intention-to-treat principle. τ^2 defined the between-studies variance. The difference in estimates of treatment effect between the treatment groups for each hypothesis was tested using a two-sided Z test with statistical significance considered at *P* value of less than 0.05. The homogeneity assumption was checked with a *Q* test with a degree of freedom (*df*) equal to the number of

analyzed studies minus one. The heterogeneity was measured by the I^2 metric, which describes the percentage of total variation across studies that is due to heterogeneity rather than chance. I^2 was calculated as $I^2 = 100\% \times (Q - df)/Q$, where *Q* is Cochran's heterogeneity statistic, and *df* is the degrees of freedom. A value of 0% indicates no observed heterogeneity, and larger values show increasing heterogeneity. Analyses were conducted with Open Meta Analyst (version 6) and SPSS version 20 (IBM SPSS). To evaluate potential publication bias, a weighted linear regression was used, with the natural log of the RR as the dependent variable and the inverse of the total sample size as the independent variable.

Data synthesis and analysis

We evaluated the effects of pooled interventions (organizational + physician directed interventions) on Burnout score. We further analyzed the effects of each intervention on burnout score. We evaluated the impact of each intervention on the single domain of Burnout score as depersonalization (DP) and personal accomplishment (PA).

Results

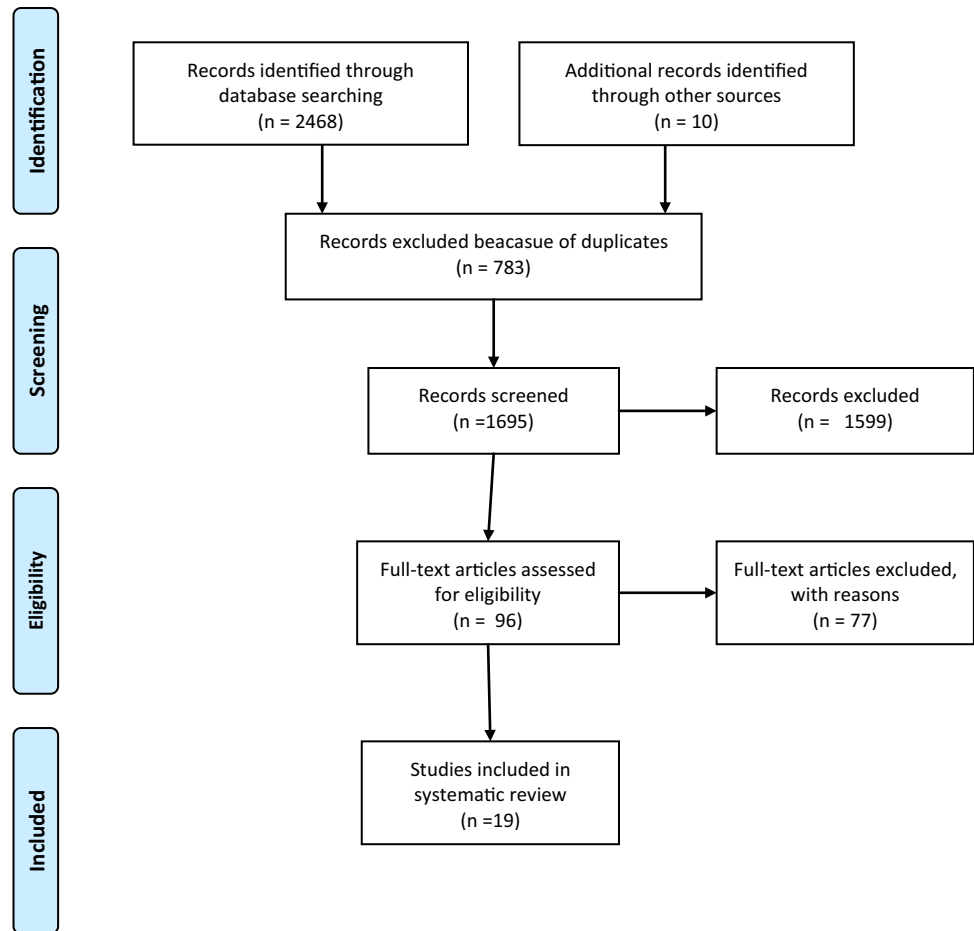
Figure 1 showed the PRISMA flow chart evaluated studies. The search strategy yielded 2478 articles.

Following the removal of duplicates (783 articles), 1695 articles were retained for title, and abstract screening. Of these, 96 were relevant for full-text screening and 19 studies were included in analysis [20–39].

Table 1 reported the characteristics of included studies and Table 2 reported the risk of bias.

Physician-directed interventions comprised mindfulness-based stress reduction techniques, educational interventions targeting physicians' self-confidence and communication skills, exercise, or both these features. Organization-directed interventions included workload interventions that focused on rescheduling hourly shifts and reducing workload, discussion meetings to enhance teamwork and leadership, structural changes, communication skills training, and mindfulness. The duration of the interventions ranged from 2 weeks to 9 months.

Pooled interventions were associated with small significant reductions in burnout (SMD = -0.289; 95% CI -0.419 to -0.159; $I^2 = 29\%$) (Fig. 2). Organization-directed interventions were associated with a medium reduction in burnout score (SMD = -0.446; 95% CI -0.619 to -0.274; $I^2 = 8\%$) while physician-directed interventions were associated with a moderate reduction in burnout score (SMD = -0.178; 95% CI -0.322 to -0.035; $I^2 = 11\%$) (Fig. 3).

Fig. 1 PRISMA flow chart of included

Pooled interventions had small significant effect of depersonalization domain of MBI (SMD = -0.212 ; 95% CI, -0.360 to -0.065 ; $I^2 = 29\%$) (Fig. 4). Organization-directed interventions had more effects than physician-directed interventions on the depersonalization domain of MBI (Organization-directed intervention SMD = -0.337 ; 95% CI -0.659 to -0.015 ; $I^2 = 41\%$. Physician-directed intervention SMD = -0.169 ; 95% CI -0.343 to -0.005 ; $I^2 = 27\%$) (Fig. 5).

Pooled intervention had moderate improvement of personal accomplishment domain of MBI (SMD = -0.300 ; 95% CI -0.146 to -0.453 ; $I^2 = 0\%$) (Fig. 6). Organization-directed interventions were associated to more improvement than physician-directed interventions of personal accomplishment domain of MBI (Organization-directed intervention SMD = -0.324 ; 95% CI -0.056 to -0.591 ; $I^2 = 0\%$. Physician-directed intervention SMD = -0.288 ; 95% CI -0.101 to -0.475 ; $I^2 = 0\%$) (Fig. 7).

Discussion

This systematic review and meta-analysis showed that (1) organization-directed interventions were associated with moderate reduction in burnout score, (2) physician-directed interventions were associated with small reduction in burnout score, (3) organization-directed interventions reduced more the depersonalization than physician-directed interventions, (4) organization-directed interventions were related to a more improvement of the personal accomplishment than physician-directed interventions.

The findings of this meta-analysis showed that organization-directed interventions were associated with higher treatment effects compared with physician-directed interventions, by supporting the view that burnout is linked to the organizational coherence of the health care system.

Table 1 Characteristics of included studies

Study/year	Health care setting	Male sex, proportion (%)	Age, Mean (year)	Type of study	Intervention
Ali [20]	Intensive care	24/45 (54)	41	RCT	Organization-directed (focused on workload or schedule): two intensivist staffing schedules were compared: continuous and interrupted (rotations every 2 weeks) for 14 months
Amutio [21]	Physicians with different specialties	18/42 (43)	43	RCT	Physician-directed: A 2-month mindfulness-based stress reduction program that involved a weekly presentation of stressful topics related to the medical profession, a weekly 45-min mindfulness exercise, a weekly 60-min group reflection about the weekly topic, and the mindfulness exercise
Asuero [22]	Primary care	6/68 (8)	47	RCT	Physician-directed: 2 months (8 sessions of 2.5 h/week plus a 1 day session of 8 h) of contemplation-meditation exercises such as mindfulness meditation
Bragard [23]	University hospital	34/96 (35)	28	RCT	Physician-directed: a 30-h communication skills training and a 10-h stress management skills training in small groups
Butow [25]	Oncology unit	15/30 (50)	44	RCT	Physician-directed: 1.5-day intensive face-to-face workshop with role play practice, followed by monthly videoconferences incorporating role play of physician-generated scenarios
Butow [24]	Cancer units	26/62 (42)	45	RCT	Physician-directed: A 7-h interactive face-to-face workshop training with a follow-up telephone call 1 month.
Garland [26]	Intensive care	27/34 (80)	50	RCT	Organization-directed (focused on workload): shift work staffing in which there was 24/7 intensivist presence. The same pool of intensivists supplied day shift and night shift coverage. In any given week, a single intensivist was responsible for all 7 day shifts (8 AM–5:30 PM, 8 AM–3 PM on weekends), whereas two different intensivists alternated the seven night shifts.
Gunasingam [27]	Teaching hospital	16/31 (52)	27	RCT	Physician-directed: debriefing sessions and a focus group that explored themes around work-related stressors, coping mechanisms, and potential strategies to improve junior medical officer well-being
Ireland [39]	Primary care	16/44 (36)	27	RCT	Physician-directed: ten sessions of mindfulness-based stress reduction, mindfulness-based cognitive therapy, and acceptance and commitment therapy
Linzer [28]	Primary care	80/166 (48)	46	RCT	Organization-directed (focused on communication, teamwork, and quality improvement): targeted quality improvement projects, improved communication, and changes in workflow
Lucas [29]	General medicine	32/62 (52)	38	RCT	Organization-directed (focused on workload or schedule): assignment to random sequences of 2-week shift rotations
Margalit [30]	Primary care	22/44 (50)	–	RCT	Physician-directed: daily workshop for a total of 12 weeks. Interactive teaching intervention aiming to impart the knowledge, attitudes, and skills needed for adapting to the task of a physician in a busy community clinic
Martins [31]	Tertiary hospital	14/74 (19)	27	RCT	Physician-directed: Brief self-care workshops coordinated by mental health professionals, who addressed aspects of burnout syndrome such as identification of risk factors, coping behaviors, preventive behaviors, and self-care

Table 1 (continued)

Study/year	Health care setting	Male sex, proportion (%)	Age, Mean (year)	Type of study	Intervention
Milstein [32]	Primary care	7/15 (47)	–	RCT	Physician-directed: 45-min stress reduction intervention in which one reflects (1) on the background and troublesome of the stressful situation and on (2) how one handled the situation
Parshuram [33]	Intensive care unit	25,747 (53)	–	RCT	Organization-directed (focused on workload or schedule): Residents in two university-affiliated ICUs were randomly assigned to in-house overnight schedules of 12 h
Ripp [34]	Internal medicine	20/39 (51)	–	RCT	Physician-directed: 1-h bimonthly groups who met regularly with trained discussion group leaders to discuss topics related to stress, balance, and job satisfaction
Shea [35]	Internal medicine	59/106 (56)	28	RCT	Organization-directed (focused on workload or schedule): a 5-h period of protected time in which interns were expected to sleep for 4 weeks
Verweij [36]	Primary care	28/43 (65)	55	RCT	Physician-directed: 8 weekly sessions each lasting 2.5 h, and a 1-day silent retreat between the sixth and seventh session focused on mindfulness
Weight [37]	Secondary care	368/628 (59)	31	RCT	Physician-directed: 12-week, self-directed and team-based incentivized exercise program including self-reported exercise and gym attendance
West [38]	General medicine	49/74 (65)	–	RCT	Organization-directed (components from physician-directed interventions): 19 biweekly facilitated discussion groups incorporating elements of mindfulness, reflection, shared experience, and small-group learning for 9 months

It has been suggested that the reducing risk of burnout in physicians requires mainly change in organizations, rather than support for individual physicians. Elements of the physician-directed interventions (e.g., mindfulness, communicational, educational components) can be effective only if supported by organizational approaches.

If burnout is a problem of whole health care organization, it requires an organization-embedded approach. Physicians might view physician-directed interventions as a personal responsibility, rather than as a shared resource to create a flourishing health care environment. It's important to emphasize organizational culture by creating a safe space for staff to acknowledge and decrease stress [40].

Organization-directed interventions involved reductions in the intensity of workload or schedule changes, structural changes, enhanced communication between organizational members, and fostering a sense of teamwork and leadership through team meeting. Interventions focused on enhancing teamwork, mentoring, and leadership skills might be particularly suitable for young physicians and for physicians dealing with intense workload and patients with complex care needs. Young physicians are at higher risk for burnout compared with experienced physicians.

Leading drivers of burnout include excessive workload, imbalance between job demands and skills, a lack of job control, and prolonged work stress. Organization-directed interventions were more likely to lead to reduction in burnout, but there were significant variations in terms of actual strategies [16]. These usually involve improved teamwork, changes in professional assessment, enhancement of job resources, including supervision (job control) to reduce job demand. However, as emerges from this analysis, most of the organizational strategies leading to reductions in burnout involved reductions in the workload or schedule changes, rather than complex and major health care system changes, probably because of their implementation and delivery costs. In fact, the most of the studies on the effectiveness of organizational strategies for physician burnout, referred to reducing workload, shift rotation, giving to physician a period of protected time expected to sleep or rest; while, only a few of them focused on targeted quality improvement projects, improve communication and teamwork, and changes in workflow.

Organization-directed on workload and schedule (e.g., shift rotation, alternation of night and day, redefining staff schedules) were more important to reduce

Table 2 Quality analysis of included studies

Study	Sequence generation	Allocation concealment	Blinding of participants	Personnel and outcomes assessors	Incomplete outcome data	Selective outcomes reporting	Baseline characteristics
Ali [20]	+	+	?	+	+	+	+
Amutio [21]	?		?	+	+	+	+
Asuero [22]	?		?	+	+	+	+
Bragard [23]	+	+	?	+	+	+	+
Butow [25]	+	+	?	+	+	+	+
Butow [24]	+	+	?	+	+	+	+
Garland [26]			?	+	+	+	+
Gunasingam [27]	+	+	?	+	+	+	+
Ireland [39]			?	+	+	+	+
Linzer [28]	?	+	?	+	+	+	+
Lucas [29]	+	+	?	+	+	+	+
Margalit [30]			?	+	+	+	+
Martins [31]	?	?	?	+	+	+	+
Milstein [32]	?	?	?	+	+	+	+
Parshuram [33]	?	?	?	+	+	+	+
Ripp [34]	?	?	?	+	+	+	+
Shea [35]			?	+	+	+	+
Verweij [36]	?	?	?	+	+	+	+
Weight [37]	?	?	?	+	+	+	+
[38]	+	+	?	+	+	+	+

+ low, ? unknown

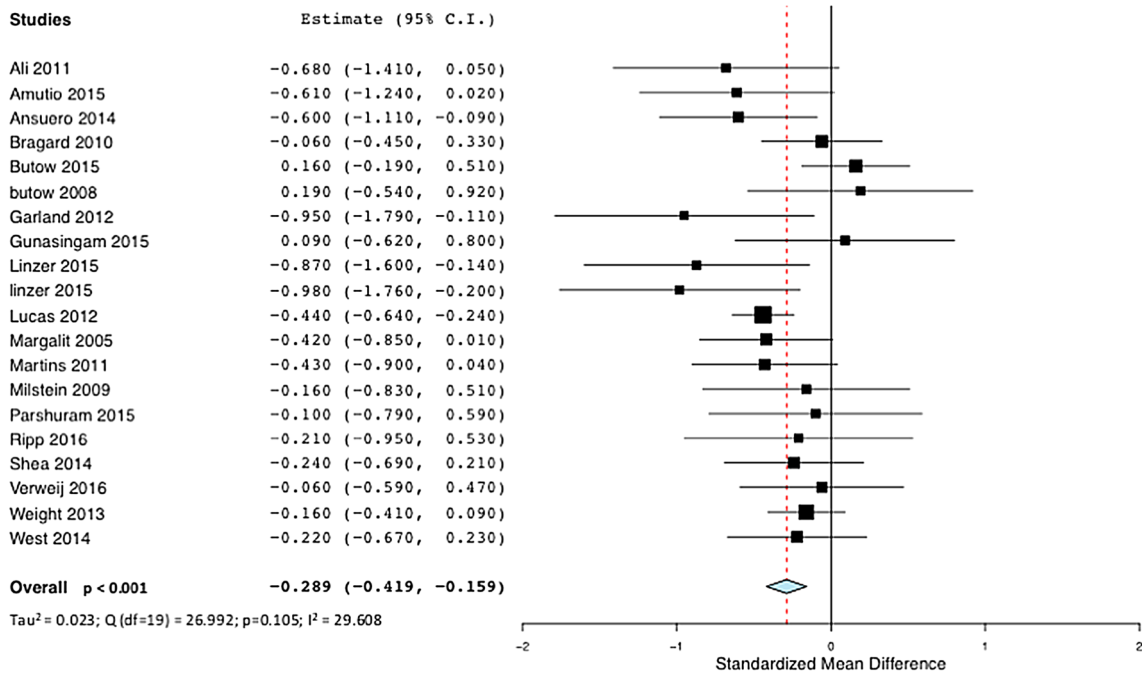


Fig. 2 Forest plot of the effects of interventions on Burnout Scores. Weights: Ali: 2.718%, Amutio: 3.481%, Ansuero: 4.849%, Bragard: 7.032%, Butow: 8.022%, butow: 2.718%, Garland: 2.126%, Gunasingam: 2.850%, Linzer: 2.718%, linzer: 2.423%, Lucas: 13.200%,

Margalit: 6.186%, Martins: 5.465%, Milstein: 3.143%, Parshuram: 2.992%, Ripp: 2.655%, Shea: 5.811%, Verweij: 4.576%, Weight: 11.224%, West: 5.811%

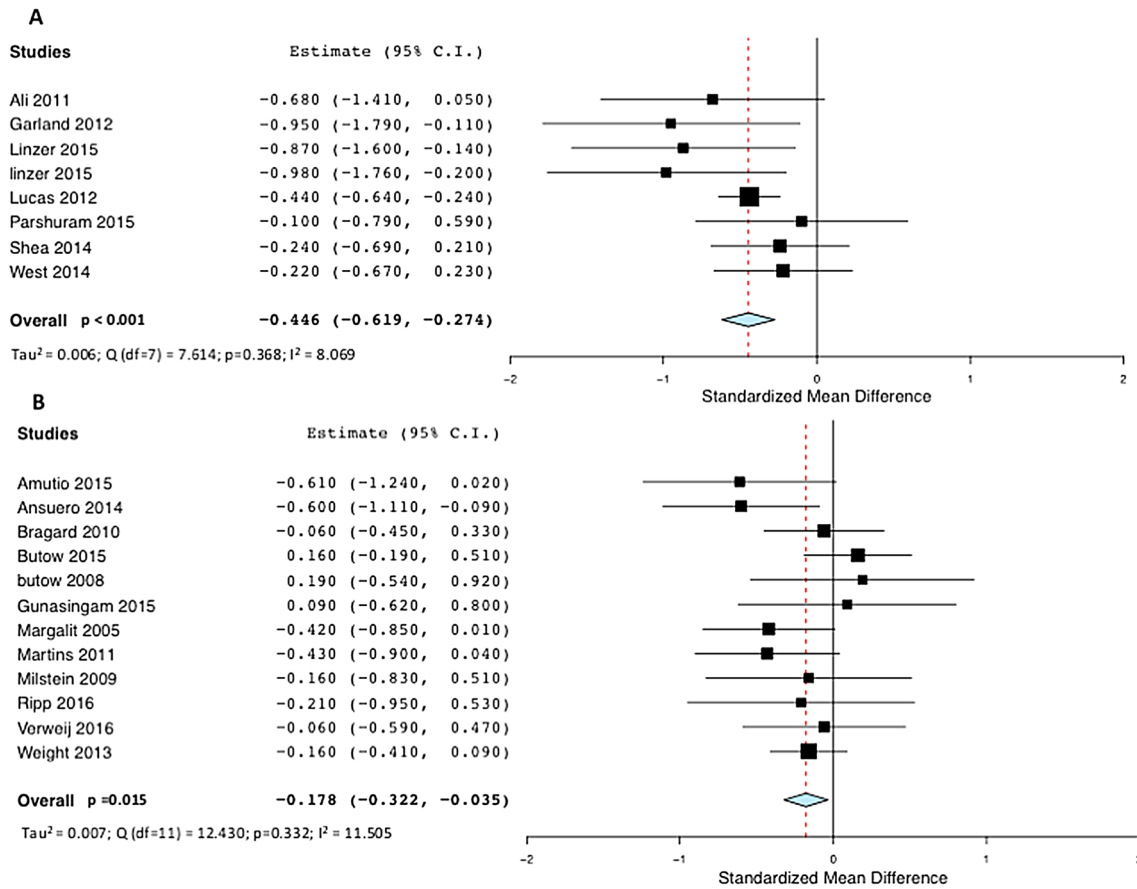


Fig. 3 Panel **a**: forest plot of the organizational-directed interventions on Burnout scores. Weights: Ali: 5.358%, Garland: 4.086%, Linzer: 5.358%, linzer: 4.717%, Lucas: 48.016%, Parshuram: 5.970%, Shea: 13.247%, West: 13.247%. Panel **b**: forest plot of the physician-

directed interventions on Burnout scores. Weights: Amutio: 4.855%, Ansuero: 7.158%, Bragard: 11.444%, Butow: 13.691%, butow: 3.679%, Gunasingam: 3.878%, Margalit: 9.684%, Martins: 8.285%, Milstein: 4.326%, Ripp: 3.585%, Verweij: 6.677%, Weight: 22.739%

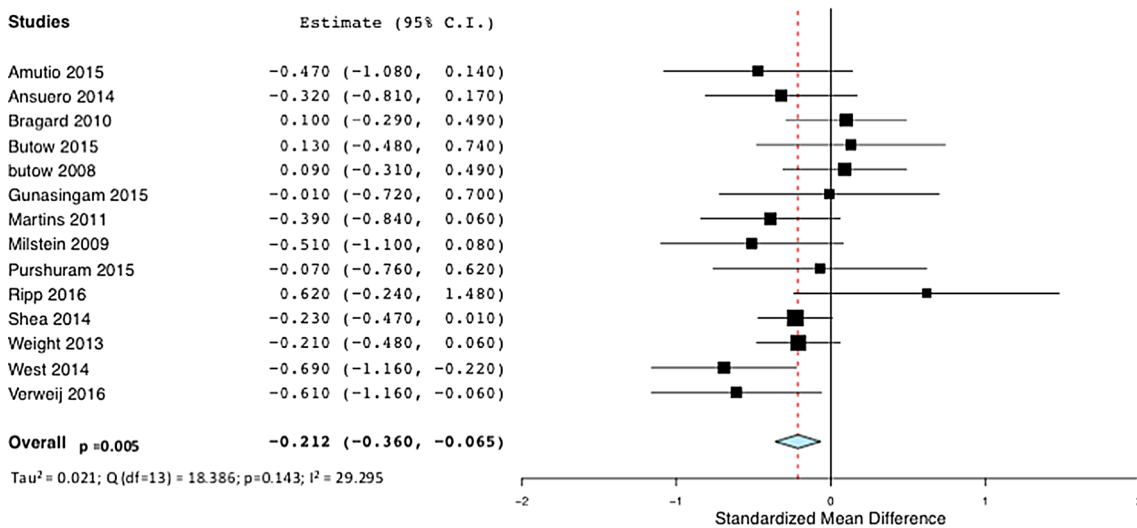


Fig. 4 Forest plot of the effects interventions on depersonalization domain of maslach burnout inventory. Weights: Amutio: 4.791%, Ansuero: 6.753%, Bragard: 9.288%, Butow: 4.791%,

butow: 8.985%, Gunasingam: 3.713%, Martins: 7.645%, Milstein: 5.059%, Purshuram: 3.899%, Ripp: 2.649%, Shea: 15.561%, Weight: 14.027%, West: 7.181%, Verweij: 5.658%

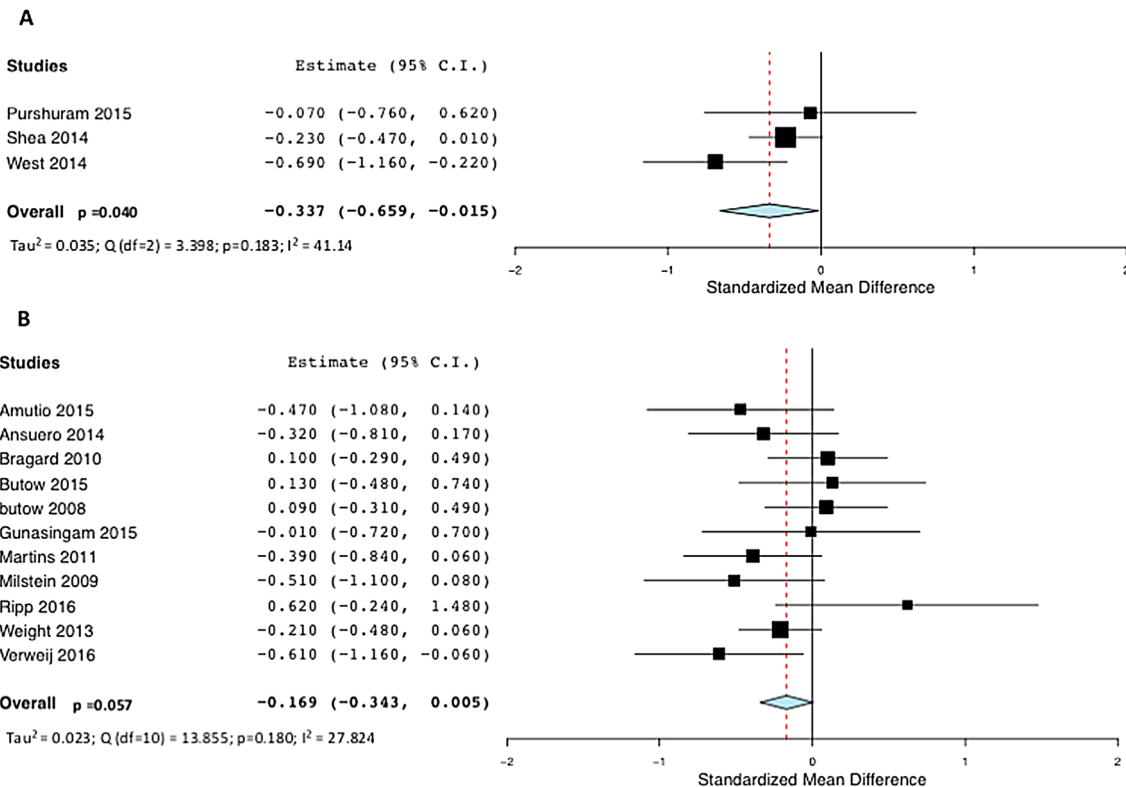


Fig. 5 Panel a: forest plot of the organization-directed interventions on depersonalization domain of Maslach Burnout Inventory. Weights: Purshuram: 16.963%, Shea: 53.897%, West: 29.140%. Panel b: forest plot of the physician-directed interventions on depersonalization

domain of Maslach Burnout Inventory. Weights: Amutio: 6.590%, Ansuero: 9.238%, Bragard: 12.618%, Butow: 6.590%, butow: 12.216%, Gunasingam: 5.122%, Martins: 10.432%, Milstein: 6.953%, Ripp: 3.666%, Weight: 18.810%, Verweij: 7.764%

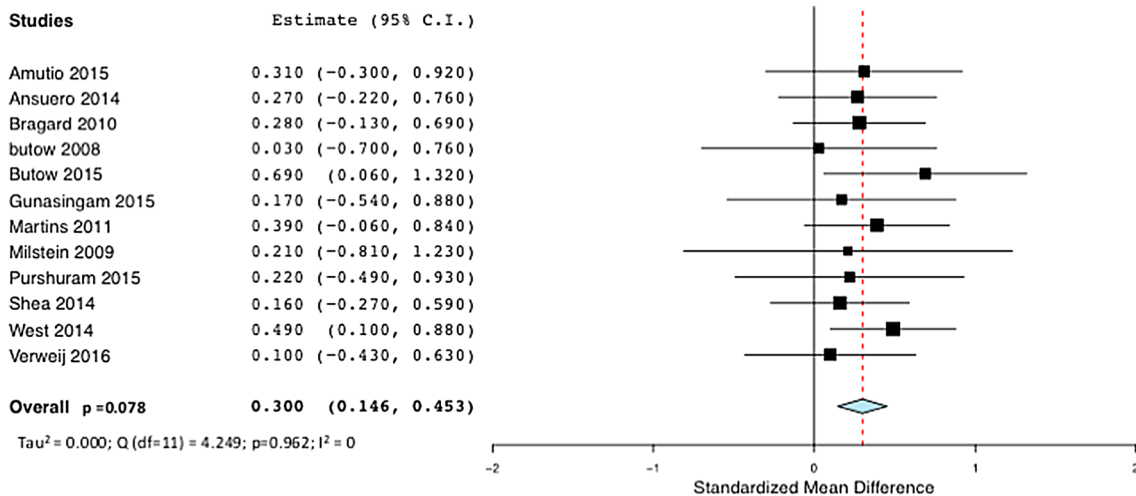


Fig. 6 Forest plot of the effects interventions on personal accomplishment domain of maslach burnout inventory. Weights: Amutio: 4.791%, Ansuero: 6.753%, Bragard: 9.288%, Butow: 4.791%,

butow: 8.985%, Gunasingam: 3.713%, Martins: 7.645%, Milstein: 5.059%, Purshuram: 3.899%, Ripp: 2.649%, Shea: 15.561%, Weight: 14.027%, West: 7.181%, Verweij: 5.658%

depersonalization and improve personal accomplishment, than those ones including quality improvement projects, structural changes, enhancing communication and a sense

of teamwork and job control. In addition to organization-directed interventions (e.g., shift rotation, alternation of night and day, redefining staff schedules), implications

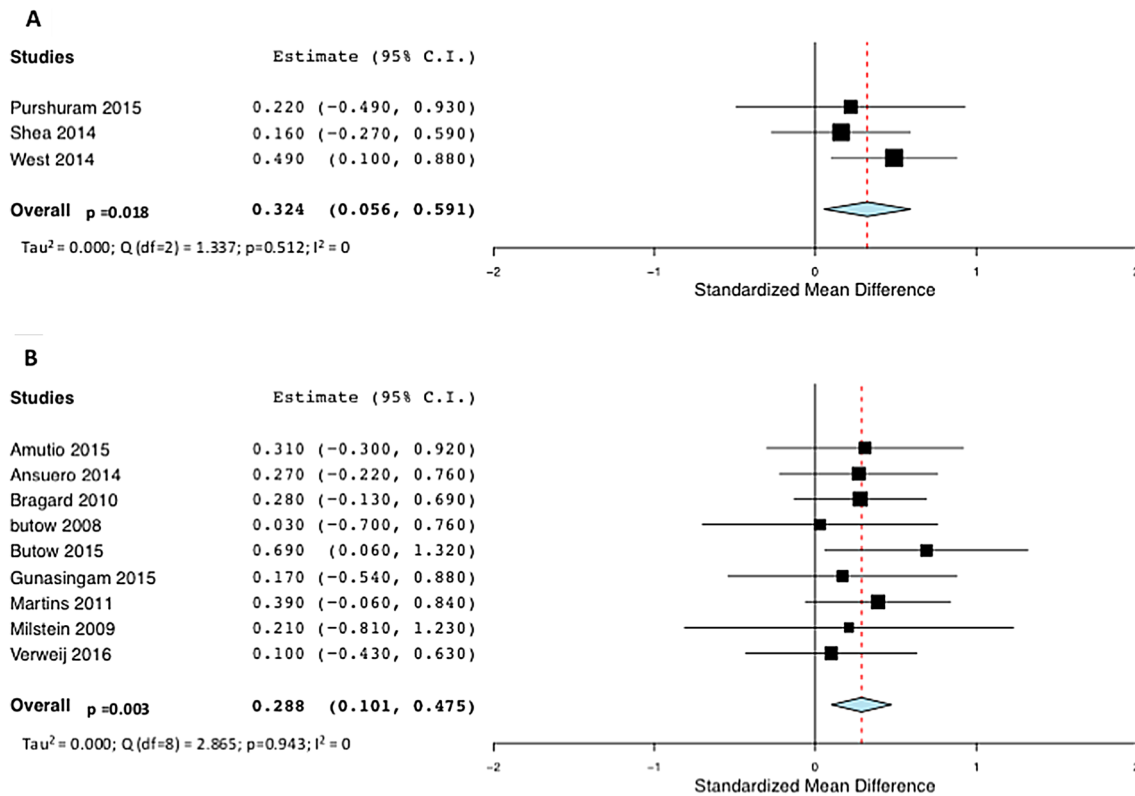


Fig. 7 Panel a: forest plot of the effects organizational-directed interventions on personal accomplishment domain of maslach burnout inventory. Weights: Purshuram: 14.203%, Shea: 38.723%, West: 47.074%. Panel b: forest plot of the effects physician-directed inter-

ventions on personal accomplishment domain of maslach burnout inventory. Weights: Amutio: 9.383%, Ansuero: 14.542%, Bragard: 20.771%, butow: 6.552%, Butow: 8.797%, Gunasingam: 6.926%, Martins: 17.242%, Milstein: 3.356%, Verweij: 12.430%

for management also include enhancing job resources (e.g. social support, autonomy, performance feedback, and opportunities for development) that can moderate the influence of workload on burnout [13, 14]. Workers having many job resources, including job autonomy can run better demands at work and encourage the development of their resources [41].

Limitations

This study has limitations that need to be addressed. First, we included in our search strategy only the MBI as diagnostic tool for burnout. Different tools are nowadays used to evaluate burnout as Melamed Burnout Questionnaire (SMBQ), Oldenburg Burnout Inventory (OLBI), Copenhagen Burnout Inventory (CBI) and School Burnout Inventory (SBI). However, by using MBI burnout simulators can be identified [42]. Second, the studies we included in this analysis were mainly performed in acute care setting.

Conclusions

Burnout is associated with serious risks to both physicians and patients, and it is imperative that physicians have access to evidence-based interventions that reduce the risk for burnout.

This meta-analysis found that physicians could gain important benefits from interventions to reduce burnout, especially from organizational strategies, by viewing burnout rooted in issues related to the working environment and organizational culture.

Future research into organizational interventions to reduce physician burnout should address the optimal approaches to development and implementation of burnout reduction strategies.

Funding This work was supported by the National Research Council of Italy (CNR), Research Project “Aging: molecular and technological innovations for improving the health of the elderly population” (Prot. MIUR 2867 25.11.2011)”

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval Not required since this a systematic review.

Human and animal rights All procedures performed in the included studies involving human participants were in accordance with the ethical standard.

Informed consent Not required since this a systematic review.

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