

Mindfulness-Based Interventions to Reduce Burnout and Stress in Physicians: A Systematic Review and Meta-Analysis

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Status Quo



Workload

Working hours

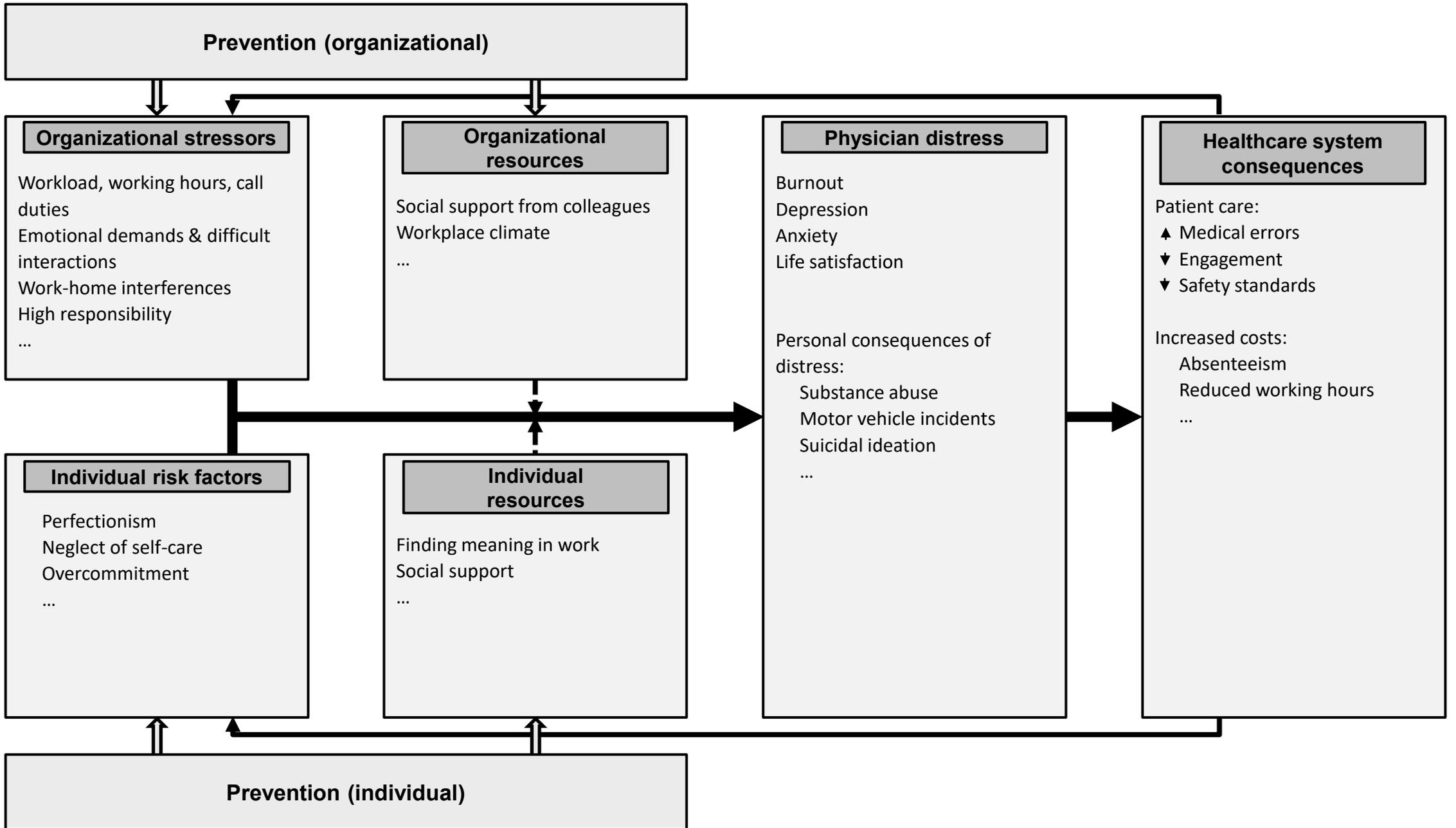
Economical pressure

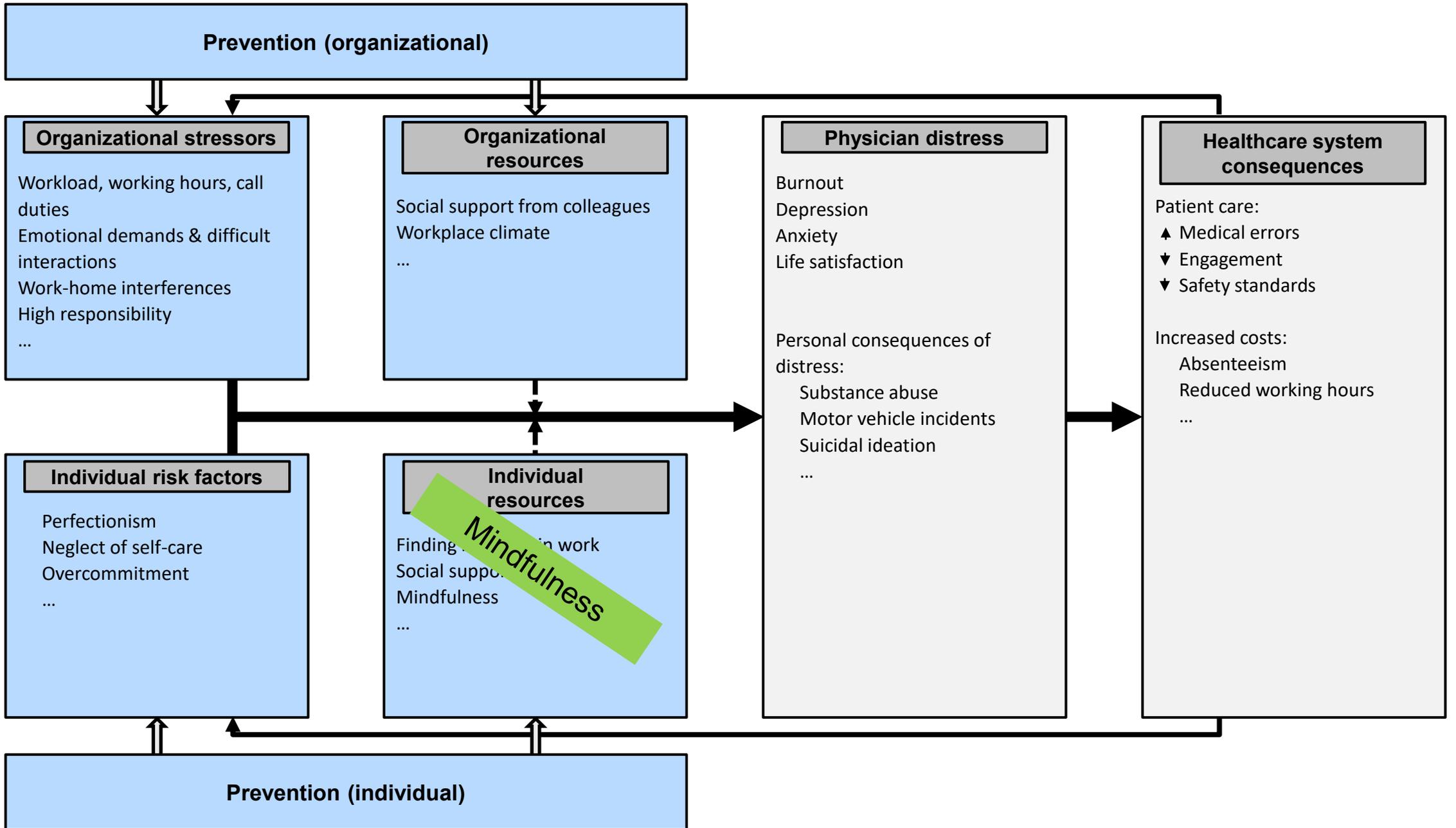
Responsibility/
Autonomy

Errors

Documentation







Mindfulness



Mindfulness: 1) present moment awareness, 2) accepting, without judgement



formal



informal

MBIs for physicians



ORIGINAL CONTRIBUTION

CLINICIAN'S CORNER

Original Research

Research
Hanne Verweij, Ruth C Waumans, Danique Smeijers, Peter LBJ Lucassen, A Rogier T Donders, Henriëtte E van der Horst and Anne EM Speckens

Association of a in Mindful Com Empathy, and At Primary Care I

Michael S. Krasner, MD
Ronald M. Epstein, MD
Howard Beckman, MD
Anthony L. Suchman, MD, MA
Benjamin Chapman, PhD
Christopher J. Mooney, MA
Timothy E. Quill, MD

Acad Psychiatry (2017) 41:646–650
DOI 10.1007/s40596-017-0768-3

IN BRIEF REPORT

Encouraging Mindfulness in Medical House Staff via Smartphone App: A Pilot Study

Louise Wen¹ · Timothy E. Sweeney¹ · Lindsay Welton¹ · Mickey Trockel¹ · Laurence Katznelson¹

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Abstract

Background Stress and burnout are increasingly recognized as urgent issues among resident physicians, especially given the concerning implications of burnout on physician well-being and patient care outcomes.

Background and objective: Stress and burnout impact resident physician study tests the hypothesis that a mindfulness-based resilience intervention and burnout in residents.

Methods: Resident physicians from the Departments of Family Medicine and Anesthesia at Duke University, Durham, NC, USA, participated in two of mindfulness-based resilience activities, which introduced mindfulness-based practical exercises for nurturing resilience. Anonymous surveys were completed by 47 residents) and after the intervention (both completed by 3 survey was distributed 1 month later (seven residents completed all th

increasing use of the smartphone app (PAS, 0.31 (95% CI 0.03–0.57); FMI, 0.38 (95% CI 0.11–0.66)), while the NAS did not show significant change.
Conclusions Study limitations include self-guided app usage, a homogenous study subject population, insufficient study

ABSTRACT

Introduction: Stress and burnout are highly prevalent among medical doctors, and are associated with negative consequences for doctors, patients, and organizations. The purpose of the current study was to examine the effectiveness of a mindfulness training intervention in reducing stress and burnout among medical practitioners, by means of a Randomised Controlled Trial design.

Methods: Participants were 44 intern doctors completing an emergency department rotation in a major Australian hospital. Participants were randomly assigned to either an active control (one hour extra break per week) or the 10-week mindfulness training intervention. Measures of stress and burnout were taken pre-, mid- and post intervention.

Results: Participants undergoing the 10-week mindfulness training program reported greater improvements in stress and burnout relative to participants in the control condition. Significant reduction in stress and burnout was observed for participants in the mindfulness condition. No such reductions were observed for participants in the control condition.

Conclusions: Mindfulness interventions may provide medical practitioners with skills to effectively manage stress and burn-

Acceptability and Effectiveness of a Long-Term Educational Intervention to Reduce Physicians' Stress

BRIEF REPORT

Interventions

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Mindfulness-Based Stress Reduction for Residents: A Randomized Controlled Trial

Hanne Verweij, PhD¹, Hiske van Ravesteijn, MD, PhD¹, Madelon L. M. van Hooff, PhD², Antoine L. M. Lagro-Janssen, MD, PhD³, and Anne E. M. Speckens, MD, PhD¹

¹Department of Psychiatry, Radboud University Medical Center, Nijmegen, The Netherlands; ²Behavioural Science Institute, Radboud University, Nijmegen, The Netherlands; ³Department of Primary and Community Care, Unit Gender and Womens' Health, Radboud University Medical Center, Nijmegen, The Netherlands.

BACKGROUND: Burnout
Pilot Co No randomized control



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less to reduce stress and burnout

rgan^d, Angela O'Connor^d and Lyndall Spencer^e

nd, Springfield, Australia; ^bInstitute for Resilient Regions, Department, Princess Alexandra Hospital, Woolloongabba, Queensland, Australia; ^cQueensland Health Forensic and Scientific

Brief Mindfulness-Based Intervention for Primary Care Physicians: A Pilot Randomized Controlled Trial

physicians
'burnout,
bed quality
care, and
bis randomized
nary aim

Although the MMC had no impact on patient-reported DCC or ODR, among the entire sample at baseline, DCC and ODR were significantly correlated with several physician outcomes, including resilience and personal achievement.

patients.^{4,5} Furthermore, burnout is linked to lower productivity, early retirement, and higher rates of turnover, which have profound financial impacts,^{6,7} replacement costs are approximately \$250,000 per physician.⁸ Therefore, there



Intervention for GPs:
in Dutch primary care

in the 1970s as an 8-week, group-based programme called mindfulness-based stress reduction (MBSR). MBSR was initially offered to patients with both chronic and somatic illnesses, such as chronic pain¹³ and psoriasis,¹⁴ and psychological symptoms, such as anxiety disorders¹⁵

David A. Schroeder, MD, FACC, Elizabeth Stephens, MD, FACP, Dharmakaya Colgan, MS, Matthew Hunsinger, PhD, Dan Rubin, PsyD, and Michael S. Christopher, PhD

Advances in Medical Education

Open Access Full Text Article

Stress and burnout mindfulness-based

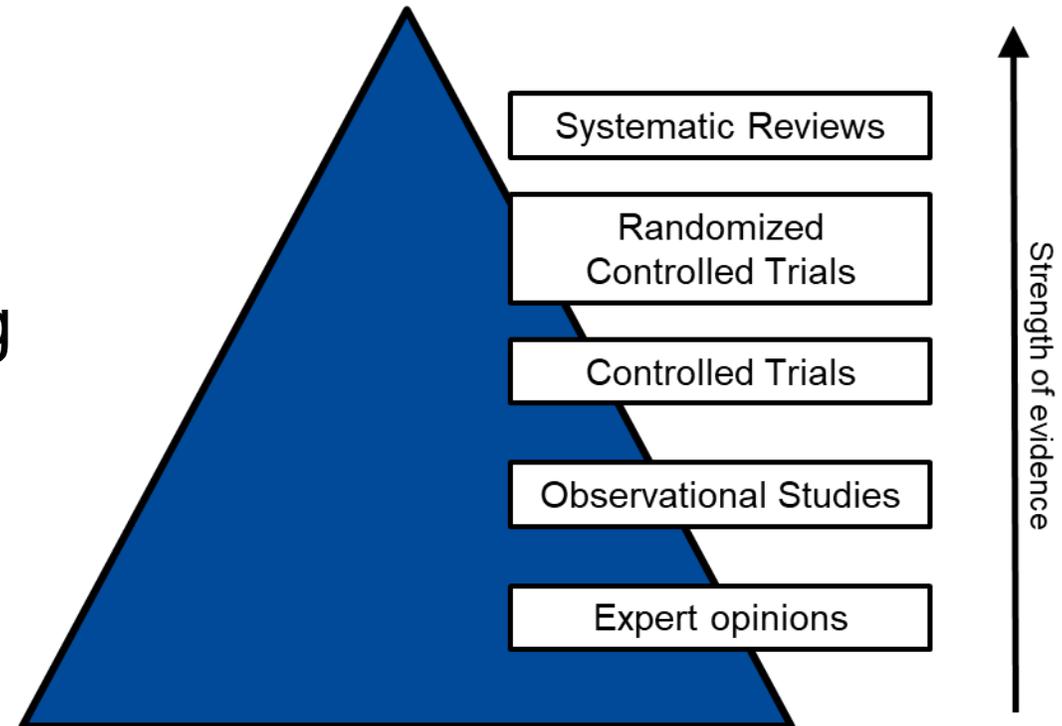
Brian E Goldhagen¹
Karen Kingsolver²
Sandra S Stinnett¹
Julia A Rosdahl¹

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Research question



How effective are **mindfulness-based interventions** in reducing **burnout and stress** among **physicians**?



Research question



Population: Physicians



Intervention: Interventions explicitly based on mindfulness



Comparator:

- Intervention-control difference (between-group)
- Pre-post (within-group)

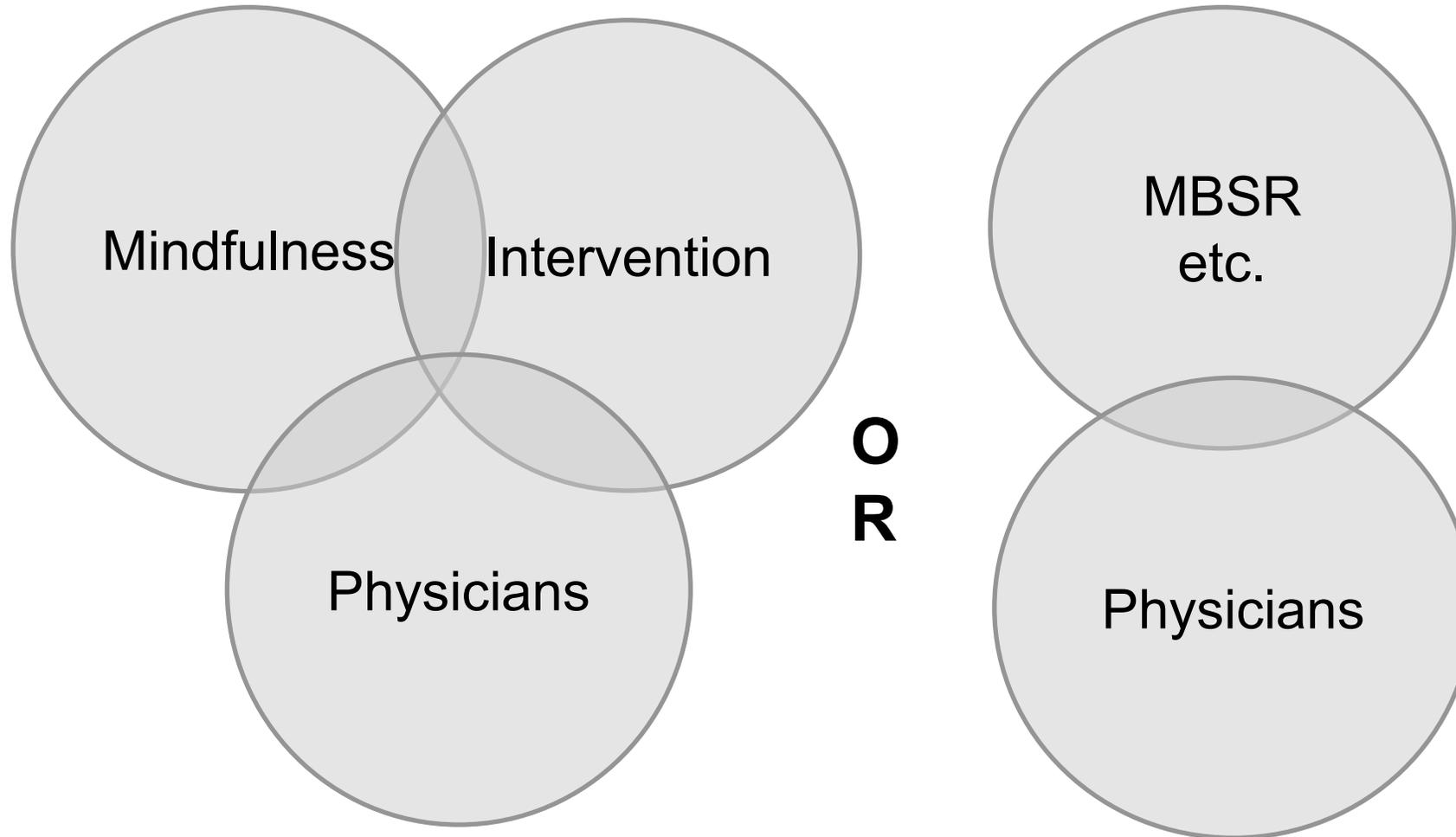


Outcome: Burnout & Stress



Study Design: RCTs; NRTs & NCBAs

Search Strategy



((Mindfulness AND Intervention) OR MBSR) AND Physicians

Search Strategy - Web of science Core Collection



	Searches
#1	TS=(mindfulness OR mindfulness-based OR mindful)
#2	TS=(intervention* OR training* OR program* OR RCT OR “randomized control trial” OR “randomized controlled trial” OR course* OR curricular* OR trial* OR session*)
#3	#1 AND #2
#4	TS=(MBSR OR “mindfulness-based stress reduction” OR MBCT OR “mindfulness-based cognitive therapy” OR MBST OR “mind-body skill training”)
#5	#3 OR #4
#6	TS=(physician* OR doctor* OR practitioner* OR clinician* OR “medic* intern*” OR resident OR residents OR residency OR “post-graduate year” OR PGY OR PGY-1 OR PGY-2 OR PGY-3 OR “foundation year” OR F1 OR FY1 OR F2 OR FY2 OR SpR OR “house officer*” OR PRHO OR SHO OR anesthesiologist* OR cardiologist* OR dermatologist* OR endocrinologist* OR gastroenterologist* OR “general practitioner*” OR GPs OR gynecologist* OR hematologist* OR hepatologist* OR immunologist* OR internist* OR nephrologist* OR neurologist* OR obstetrician* OR oncologist* OR ophthalmologist* OR otorhinolaryngologist* OR pathologist* OR pediatric* OR podiatrist* OR psychiatrist* OR pulmonologist* OR radiologist* OR respirologist* OR rheumatologist* OR surgeon* OR urologist*)
#7	#5 AND #6

Notes: TS: topic (Title, Abstract, Authors Keywords, Keywords Plus®)

Implemented in:

Medline

Embase

PsycINFO

PSYINDEX

CINAHL

CENTRAL

Web of Science

Research question



Table 1 Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Population	Practicing physicians and resident physicians	Medical students, healthcare providers other than physicians, mixed samples
Intervention	Interventions explicitly based on mindfulness	Interventions without explicit focus on mindfulness
Comparator	Randomised controlled trials, non-randomised trials, non-controlled before-after studies	Case-control studies, systematic reviews, meta-analyses, clinical case studies, qualitative studies, editors' letters
Outcome	Burnout or stress measured using validated self-report questionnaires, pre and post intervention	Self-report questionnaires without validation
Language	All languages	None
Publication date	All dates	None

Data Extraction



Study:

- authors - publication date
- country - experimental design
- content of control (waitlist etc.)

Population:

- sample size (TG/ CG) - Mean age - sex proportion (%) - dropout
- career stage (resident/ practicing physician) - specialist field [...]

Intervention:

- delivery format (online/ offline/ mixed)
- duration of an average single session - total number of sessions
- exposure (time under professional & personal guidance)
- home practice - group size
- theoretical background (MBSR/ adapted MBSR/ other MBIs),

Primary and secondary outcomes:

- means & SDs for burnout, stress and mindfulness (pre/ post/ follow-up)

Preregistration & Study protocol



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Open access

Protocol

BMJ Open Mindfulness-based interventions to reduce burnout and stress in physicians: a study protocol for a systematic review and meta-analysis

Johannes Caspar Fendel ¹, Johannes Julian Bürkle,^{1,2} Anja Simone Göritz¹

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► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2019-032295>).

JCF and JJB contributed equally.

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ABSTRACT

Introduction Physicians often suffer from burnout and stress, not only affecting themselves, but also their patients and the healthcare system in general. An increasing number of studies suggest that mindfulness-based interventions improve physicians' well-being as well as the quality of care they deliver. However, the evidence is scattered, and a systematic review and meta-analysis are lacking. To the best of our knowledge, this systematic review and meta-analysis will be the first to assess the effectiveness of mindfulness-based interventions in reducing burnout and stress among physicians. Further, it aims to uncover potential moderators of intervention effectiveness.

Methods and analysis MEDLINE, Embase, PsycINFO, PSYINDEX, Web of Science, CINAHL and the Cochrane Central Register of Controlled Trials will be screened without language or publication date restrictions. In addition, backward and forward citation searches of included studies and relevant reviews will be conducted. Studies examining the effect of interventions for physicians explicitly based on mindfulness will be included. Primary outcomes will be pre-post changes in burnout and stress if assessed with validated measures. Two reviewers independently search, select and extract data, and rate the methodological quality of the studies. Both controlled and uncontrolled studies will be included. Randomised controlled trials will be meta-analysed separately using between-group effect. In addition, non-randomised trials including non-controlled before-after studies will be meta-analysed using within-group effect. Potential moderators and sources of between-study heterogeneity will be tested using meta-regression and subgroup analyses. Furthermore, a narrative synthesis will be pursued. The Grading of Recommendations Assessment, Development and Evaluation system will be used to assess the quality of the cumulated evidence.

Ethics and dissemination Ethical approval is not required. Results will be published in a peer-reviewed journal and presented at international conferences.
PROSPERO registration number CRD42019133077.

INTRODUCTION

Rationale

Medicine is a rewarding and at the same time highly demanding and stressful profession.

Strengths and limitations of this study

- We conduct the first systematic review and meta-analysis on the effectiveness of mindfulness-based interventions in reducing burnout and stress among physicians, using a fine-meshed yet comprehensive literature search.
- We follow the Preferred Reporting Items for Systematic Review and Meta-analysis Protocols guidelines.
- Limitations of the quality of evidence will be assessed using the Grading of Recommendations Assessment, Development and Evaluation system.
- We consider all relevant evidence by separately providing effect estimates for randomised controlled trials and non-randomised trials including non-controlled before-after studies.
- The diversity of intervention formats and designs of included studies might lead to considerable heterogeneity among studies.

Physicians are exposed to human suffering, need to take on tremendous responsibility and face expectations of faultless performance. They need to deal with excessive workloads and long working hours and often struggle to balance professional and personal life.¹ Among the stages of a physician's career, medical residency is a particularly demanding period. At the beginning of their career, resident physicians often experience role transition and relocation, resulting in fewer available support systems and feelings of isolation.² A lack of supervisory support, restricted autonomy and the frequent confrontation with unfamiliar and difficult job demands have deleterious impact on resident physicians' well-being.^{3,4} Consequently, in comparison to the general population and other healthcare professions, physicians and especially resident physicians have higher prevalences of burnout and stress.⁵⁻⁷

Burnout is a work-related syndrome characterised by emotional exhaustion, often

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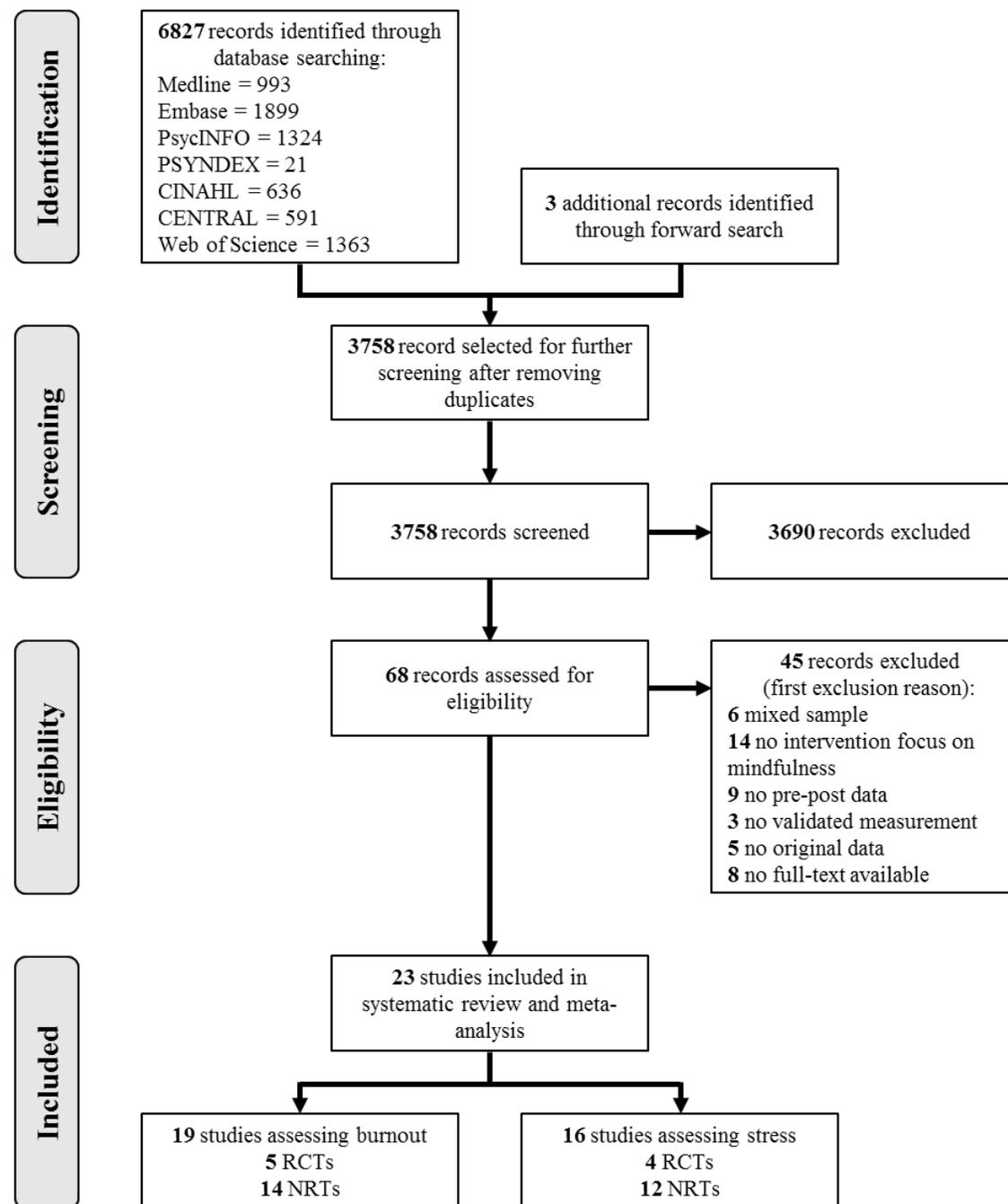
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CRD42019133077

Go



■ Studies:

- 6 RCTs, 19 NRTs (16 NCBA, 3 CBA)
- n = 925 (714 MBI, 211 control)
- samples: 7-148 (Median = 31)
- age = 38 (10.1), female = 63%
- mixed specialities

■ Interventions:

- 18 face to face, 5 mixed, 2 online
- 2 days to three months; Median = 16,8h
- 4 MBSR, 10 adapted MBSR, 6 self-developed, 2 MBST, 2 Headspace, 1 adapted MBCT

Burnout (meta-analyses)

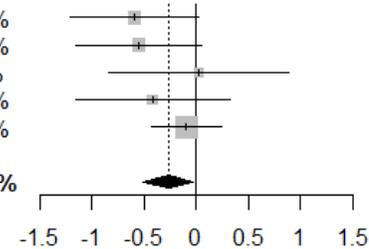


Burnout (between-group analysis) SMD 95% CI weight

Amutio et al. (2015)	-0.59	[-1.21; 0.03]	15.0%
Ireland et al. (2017)	-0.55	[-1.16; 0.05]	15.7%
Lebares et al. (2019)	0.02	[-0.84; 0.89]	7.6%
Schroeder et al. (2016)	-0.42	[-1.15; 0.32]	10.5%
Verweij et al. (2018)	-0.09	[-0.43; 0.24]	51.2%

Overall effect -0.26 [-0.50; -0.03] 100.0%

Heterogeneity: $I^2 = 0\%$ [0%; 76%], $p = 0.47$
 Test for overall effect: $z = -2.17$ ($p = 0.03$)

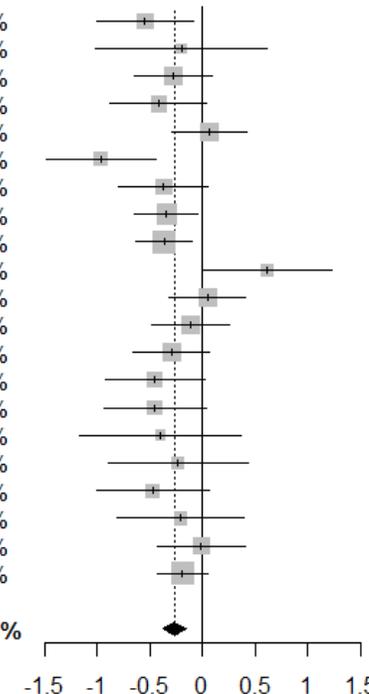


Burnout (pre-post analysis) SMD 95% CI weight

Amutio et al. (2015)	-0.54	[-1.00; -0.09]	4.3%
Bentley et al. (2018)	-0.20	[-1.01; 0.61]	1.6%
Fendel et al. (2020)	-0.28	[-0.65; 0.09]	5.7%
Forbes et al. (2020)	-0.42	[-0.88; 0.04]	4.3%
Goldhagen et al. (2015)	0.07	[-0.29; 0.42]	6.1%
Hamilton-West et al. (2018)	-0.96	[-1.48; -0.45]	3.5%
Ireland et al. (2017)	-0.37	[-0.79; 0.05]	4.8%
Kersemakers et al. (2020)	-0.34	[-0.64; -0.04]	7.5%
Krasner et al. (2009)	-0.36	[-0.63; -0.10]	8.7%
Lebares et al. (2019)	0.61	[0.00; 1.23]	2.7%
Montero-Marín et al. (2018)	0.05	[-0.31; 0.40]	6.1%
Montero-Marín et al. (2018)	-0.11	[-0.48; 0.26]	5.8%
Nguyen et al. (2020)	-0.30	[-0.66; 0.06]	6.0%
Pflugeisen et al. (2016)	-0.45	[-0.92; 0.02]	4.1%
Razzaque and Wood (2016)	-0.45	[-0.94; 0.03]	3.9%
Romcevič et al. (2018)	-0.40	[-1.17; 0.37]	1.8%
Runyan et al. (2016)	-0.24	[-0.90; 0.43]	2.3%
Schroeder et al. (2016)	-0.47	[-1.00; 0.06]	3.4%
Taylor et al. (2016)	-0.21	[-0.81; 0.39]	2.8%
Verweij et al. (2016)	-0.01	[-0.43; 0.40]	4.9%
Verweij et al. (2018)	-0.19	[-0.42; 0.04]	9.7%

Overall effect -0.26 [-0.37; -0.15] 100.0%

Heterogeneity: $I^2 = 29\%$ [0%; 58%], $p = 0.11$
 Test for overall effect: $z = -4.69$ ($p < 0.01$)



MBIs can be **effective in reducing physician's burnout**

Stress (meta-analyses)

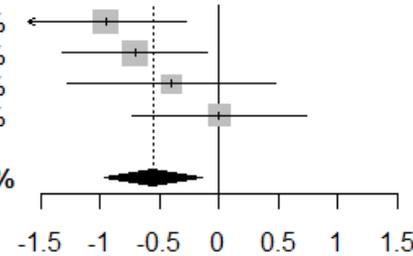


Stress (between-group analysis) SMD 95% CI weight

Franco Justo (2010)	-0.95	[-1.62; -0.28]	27.1%
Ireland et al. (2017)	-0.71	[-1.32; -0.10]	31.1%
Lebares et al. (2019)	-0.40	[-1.27; 0.48]	17.9%
Schroeder et al. (2016)	0.00	[-0.73; 0.73]	23.9%

Overall effect -0.55 [-0.95; -0.14] 100.0%

Heterogeneity: $I^2 = 24\%$ [0%; 88%], $p = 0.27$
 Test for overall effect: $z = -2.65$ ($p < 0.01$)

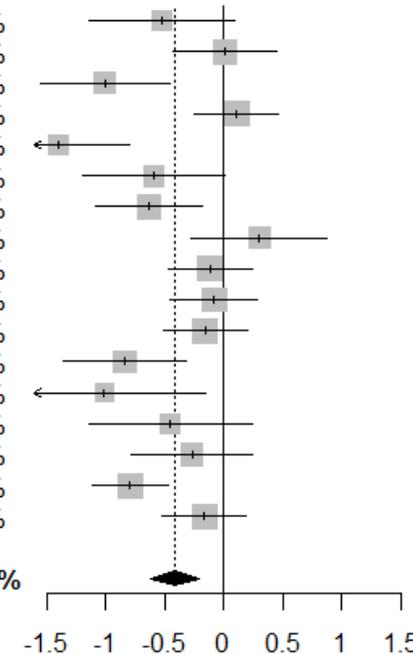


Stress (pre-post analysis) SMD 95% CI weight

Fendel et al. (2020)	-0.52	[-1.14; 0.10]	4.9%
Forbes et al. (2020)	0.01	[-0.43; 0.45]	6.4%
Franco Justo (2010)	-1.00	[-1.56; -0.45]	5.4%
Goldhagen et al. (2015)	0.11	[-0.25; 0.47]	7.0%
Hamilton-West et al. (2018)	-1.40	[-2.00; -0.80]	5.0%
Hoenders et al. (2016)	-0.59	[-1.20; 0.02]	5.0%
Ireland et al. (2017)	-0.63	[-1.08; -0.18]	6.3%
Lebares et al. (2019)	0.30	[-0.28; 0.88]	5.2%
Montero-Marin et al. (2018)	-0.11	[-0.47; 0.24]	7.0%
Montero-Marin et al. (2018)	-0.08	[-0.45; 0.29]	6.9%
Nguyen et al. (2020)	-0.16	[-0.51; 0.20]	7.1%
Pflugeisen et al. (2016)	-0.83	[-1.36; -0.31]	5.7%
Romceovich et al. (2018)	-1.01	[-1.86; -0.16]	3.5%
Runyan et al. (2016)	-0.45	[-1.13; 0.24]	4.5%
Schroeder et al. (2016)	-0.27	[-0.78; 0.25]	5.7%
van Wietmarschen et al. (2018)	-0.79	[-1.11; -0.47]	7.3%
Wen et al. (2017)	-0.17	[-0.53; 0.19]	7.0%

Overall effect -0.41 [-0.61; -0.20] 100.0%

Heterogeneity: $I^2 = 69\%$ [49%; 81%], $p < 0.01$
 Test for overall effect: $z = -3.92$ ($p < 0.01$)



MBIs can be **effective in reducing physician's stress**

Burnout (subgroup analyses)



Comparison	Moderator	Subgroup	k	SMD	95% CI	p	I ² (%)	Q
Between-group	Career stage	All	5	-0.26	[-0.50; -0.03]	.03	0	3.54
		Practicing physicians	2	-0.52	[-0.90; -0.04]	.03	0	0.12
		Resident physicians	3	-0.18	[-0.45; 0.10]	.21	0	1.94
		Difference				.22		
	Intervention type	Adapted MBSR	3	-0.38	[-0.79; 0.03]	.07	0	1.15
		MBSR	2	-0.27	[-0.74; 0.20]	.26	48	1.92
		Difference				.73		
	Intervention format	Offline	5	-0.26	[-0.50; -0.03]	.03	0	3.54
		Type control						
	Type control	Active	2	-0.35	[-0.89; 0.18]	.20	12	1.14
		Waitlist	3	-0.25	[-0.55; 0.05]	.10	9	2.19
		Difference				.74		
Pre-post	Career stage	All	21	-0.26	[-0.37; -0.15]	< .001	29	28.19
		Mixed	4	-0.51	[-0.78; -0.23]	< .001	31	4.37
		Practicing physicians	7	-0.25	[-0.41; -0.09]	.02	22	7.67
		Resident physicians	10	-0.17	[-0.33; -0.02]	.03	15	10.62
		Difference				.12		
	Intervention type	Adapted MBSR	8	-0.17	[-0.37; 0.02]	.08	38	11.30
		Adapted MBCT	1	-0.96	[-1.48; -0.45]	< .001	-	-
		MBSR	3	-0.22	[-0.47; 0.02]	.07	31	2.92
		MBST	2	-0.31	[-0.64; 0.01]	.06	0	0.06
		Mindfulness App	1	-0.21	[-0.81; 0.39]	.49	-	-
		Other forms	6	-0.29	[-0.46; -0.13]	< .001	6	5.31
		Difference					.15	
	Intervention format	Mixed	5	-0.19	[-0.37; 0.00]	.046	0	3.64
		Offline	15	-0.28	[-0.42; -0.14]	< .001	41	23.83
		Online	1	-0.21	[-0.81; 0.39]	.49	-	-
		Difference					.72	
	Study design	CBA	3	-0.27	[-0.49; -0.05]	.02	3	2.06
NCBA		13	-0.27	[-0.41; -0.13]	< .001	24	15.74	
RCT		5	-0.23	[-0.53; 0.08]	.14	61	10.30	
Difference						.97		



Burnout reduction was
**independent of
moderators**

Stress (subgroup analyses)

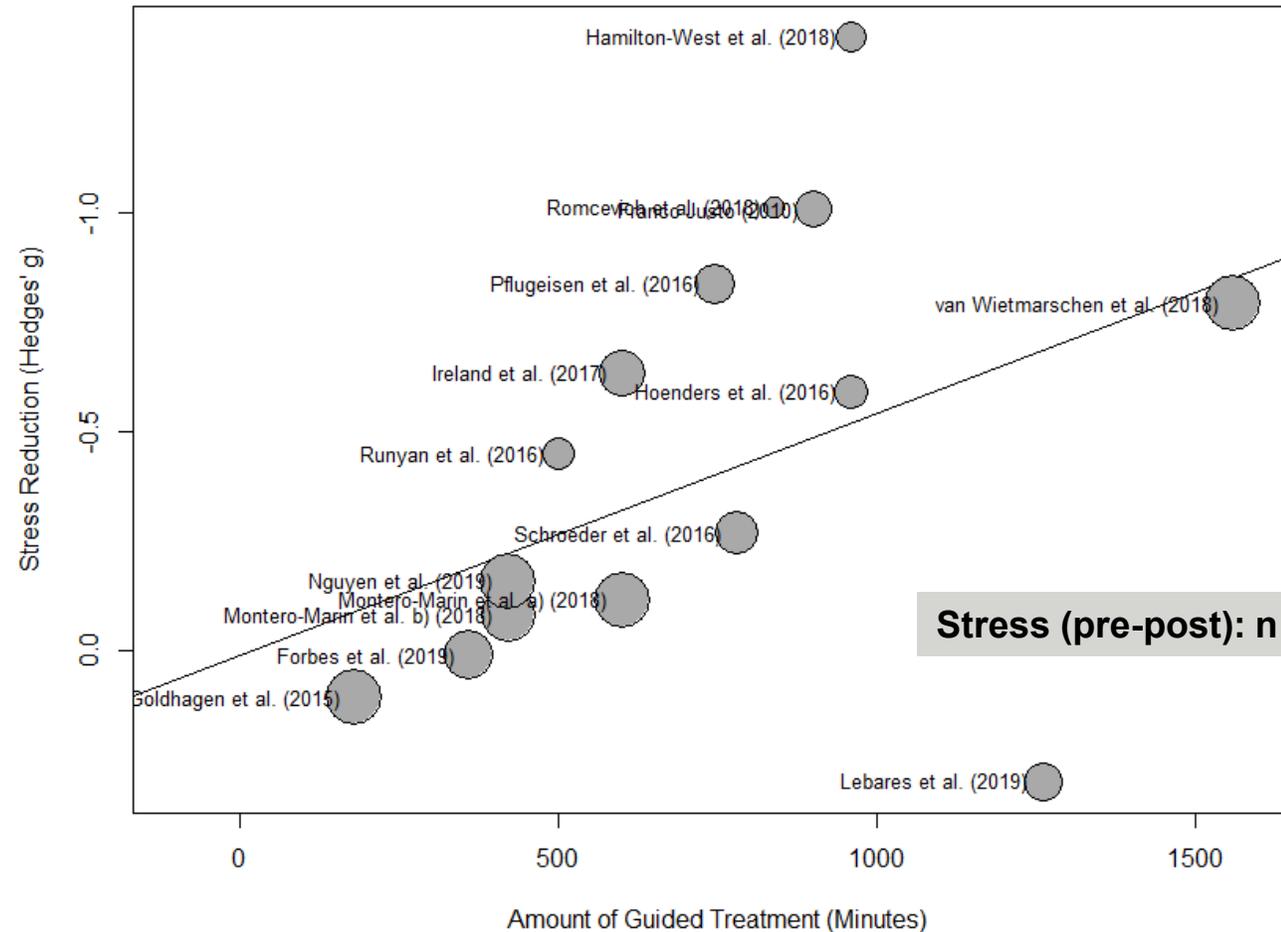


Comparison	Moderator	Subgroup	k	SMD	95% CI	p	I ² (%)	Q
Between-group	Career stage	All	4	-0.55	[-0.95; -0.14]	.01	24	3.94
		Practicing physicians	2	-0.49	[-1.42; 0.45]	.31	72	3.55
		Resident physicians	2	-0.60	[-1.10; -0.10]	.02	0	0.32
			Difference			.83		
	Intervention type	Adapted MBSR	4	-0.55	[-0.95; -0.14]	.01	24	3.94
	Intervention format	Offline	4	-0.55	[-0.95; -0.14]	.01	24	3.94
	Type control	Active	2	-0.60	[-1.10; -0.10]	.02	0	0.32
		Waitlist	2	-0.49	[-1.42; 0.45]	.31	72	3.55
		Difference				.83		
	Pre-post	Career stage	All	17	-0.41	[-0.61; -0.20]	< .001	69
Mixed			3	-0.77	[-1.49; -0.04]	.04	85	13.47
Practicing physicians			5	-0.44	[-0.80; -0.07]	.02	75	15.74
Resident physicians			9	-0.26	[-0.51; -0.02]	.04	52	16.76
Difference						.38		
Intervention type		Adapted MBSR	8	-0.39	[-0.68; -0.11]	< .01	69	22.58
		Adapted MBCT	1	-1.40	[-2.00; -0.80]	< .001	-	-
		MBSR	1	-0.59	[-1.20; 0.02]	.06	-	-
		MBST	2	-0.49	[-1.31; 0.32]	.24	70	3.28
		Mindfulness App	1	-0.17	[-0.53; 0.19]	.37	-	-
		Other forms	4	-0.25	[-0.69; 0.18]	.26	69	9.81
		Difference				.02		
Intervention format		Mixed	5	-0.33	[-0.64; -0.02]	.03	58	9.46
		Offline	11	-0.46	[-0.76; -0.17]	< .01	74	39.08
		Online	1	-0.17	[-0.53; 0.19]	.37	-	-
		Difference				.45		
Study design		CBA	1	0.01	[-0.43; 0.45]	.96	-	-
		NCBA	12	-0.44	[-0.69; -0.20]	< .001	71	37.5
		RCT	4	-0.41	[-0.92; 0.10]	.11	74	11.4
		Difference				.20		



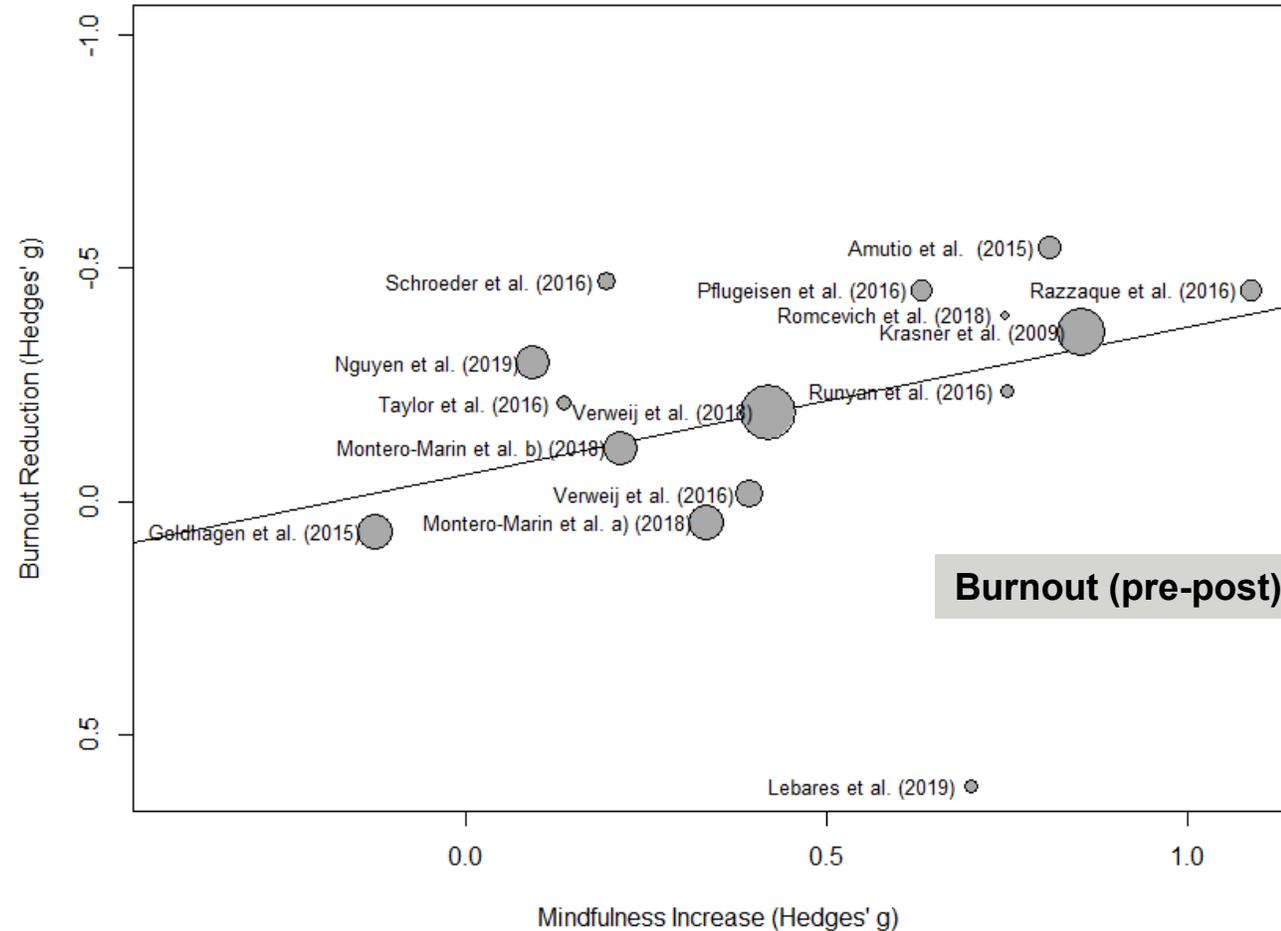
Established MBIs showed higher effectiveness in reducing stress

Stress (meta-regression)



Hours of guided treatment was associated with stress reduction

Burnout (meta-regression)



Sensitivity analyses (follow-up)



Outcome	Comparison	k	SMD	95% CI	p	I ² (%)	Q
Burnout	Between	5	-0.26	[-0.50; -0.03]	.03	0	3.54
	Between (fu)	2	-0.58	[-1.70; 0.53]	.30	71	3.46
	Pre-post	21	-0.26	[-0.37; -0.15]	< .001	29	28.19
	Pre-fu	9	-0.46	[-0.80; -0.11]	.01	71	28.01
Stress	Between	4	-0.55	[-0.95; -0.14]	.01	24	3.94
	Between (fu)	3	-0.78	[-1.43; -0.12]	.02	53	4.21
	Pre-post	17	-0.41	[-0.61; -0.20]	< .001	69	52.01
	Pre-fu	9	-0.56	[-1.02; -0.10]	.02	80	40.56



Reductions were **maintained over the follow-up period**

In a nutshell



MBIS ARE **EFFECTIVE**
IN REDUCING
PHYSICIAN'S **BURNOUT**
& **STRESS**



INTERVENTION EFFECT
WAS **INDEPENDENT OF**
VARIOUS
MODERATORS



REDUCTIONS WERE
MAINTAINED OVER THE
FOLLOW-UP PERIOD



ESTABLISHED MBIS
SHOWED **HIGHER**
EFFECTIVENESS IN
REDUCING STRESS

Between-group (RCT):

- Stress: (n = 4; g = **-0.55**; 95% CI [-0.95; -0.14]; p = < 0.01; I² = 24%)
- Burnout: (n = 5; g = **-0.26**; 95% CI [-0.50; -0.03]; p = 0.03; I² = 0%)

Pre-Post (all):

- Stress: (n = 17; g = **-0.41**; 95% CI [-0.61; -0.20]; p < 0.01; I² = 69%)
- Burnout: (n = 21; g = **-0.26**; 95% CI [-0.37; -0.15]; p < 0.01; I² = 29%)

Meta-regression:

- Mindfulness → Burnout reduction (pre-post): n = 17, b = -0.31, SE = 0.17, p = 0.07
- Guidance → Stress reduction (pre-post): n = 16, b = -0.03, SE = 0.01, p = 0.04
- Guidance → Mindfulness increase (pre-post): n = 16, b = 0.004, SE = 0.0001, p = < 0.01)

- **Methods:**
 - ✓ All designs (limitation?)
 - ✓ Preregistration and publication
 - ✓ Methodological objectivity
 - ✓ Sensitive literature search
- **Results:**
 - ✓ Significant burnout and stress reduction
 - ✓ Significant moderators
 - ✓ Low/ moderate heterogeneity
 - ✓ Robust results (sensitivity analyses)
 - ✓ Low/ moderate signs for publication bias

- **Methods:**
 - All designs (strength?)
- **Results:**
 - Only six RCTs
 - Rarely follow-up data

Related Publications

Fendel, J. C., Bürkle, J. J., & Göritz, A. S. (2021). Mindfulness-based interventions to reduce burnout and stress in physicians: a systematic review and meta-analysis. *Academic Medicine*, 96(5), 751-764. <https://doi.org/10.1097/acm.0000000000003936>

Fendel, J. C., Bürkle, J. J., & Göritz, A. S. (2019). Mindfulness-based interventions to reduce burnout and stress in physicians: a study protocol for a systematic review and meta-analysis. *BMJ open*, 9(11), e032295. <http://dx.doi.org/10.1136/bmjopen-2019-032295>

Thank you for your attention!

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