RESEARCH REPOSITORY

https://researchrepository.murdoch.edu.au/id/eprint/50493

Journal Pre-proof

Interventions to increase resilience in physicians: A structured literature review

Carly Moorfield , Dr. Vicki Cope

Please cite this article as: Carly Moorfield , Dr. Vicki Cope , Interventions to increase resilience in physicians: A structured literature review, *EXPLORE* (2019), doi: https://doi.org/10.1016/j.explore.2019.08.005

Highlights

- Results for effectiveness of training programs were mixed.

- Some group, online and coaching interventions were found to be effective.

- The percentage of physicians participating in these studies varied.

- It is not possible to generalize the results of these studies to physicians.

Highlights

Title

Interventions to increase resilience in physicians: A structured literature review

Author names and affiliations

Carly Moorfield[a] and Dr Vicki Cope[b]

[a] Graduate Diploma of Counselling student, Murdoch University, 90 South Street, Murdoch, Western Australia, Australia 6150. Email: carlymoorfield@yahoo.com

[b] Associate Professor Nursing; Academic Chair, College of Science, Health, Engineering and Education; Murdoch University, 90 South Street, Murdoch, Western Australia, Australia 6150. Email: v.cope@murdoch.edu.au

Corresponding author

Carly Moorfield

Email address: carlymoorfield@yahoo.com

Postal address: 116B Kimberley St, West Leederville, Western Australia, Australia, 6007

Abstract

Aims and objectives To critically appraise available literature on interventions to increase resilience in physicians.

Background The increasing rate of burnout in physicians has sparked interest in interventions that increase their resilience. Research on improving resilience among health professionals is still in its infancy, yet understanding what interventions are effective in counteracting burnout is vital to ensuring a resilient medical workforce.

Design A focused review of research literature.

Methods The review used key terms and Boolean operators across a five-year time frame in PsycINFO, MEDLINE, CINAHL and Google Scholar for relevant articles. Ten articles are included in the structured literature review.

Results Interventions were tested in eight of the 10 studies, with mindfulness a common theme. Results for effectiveness of training programs were mixed, with some studies reporting significant improvements in resilience and others not. Some group, online and coaching interventions were found to be effective in increasing resilience. The percentage of physicians participating in these studies varied, and results regarding physicians were not always reported separately.

Conclusions This review examined a range of interventions, with varying measures of effectiveness. Common limitations in the reviewed studies included self-selection bias, lack of a control group, and uncertainty over whether changes could be attributed to the intervention. The findings presented were not limited to physicians, but included a broader range of health professionals. It is not possible to generalize the results of these studies to physicians. Further research is needed to refine interventions and pinpoint precisely what increases resilience in physicians.

Keywords resilience, physician**,** coaching, mindfulness, self-care

Introduction

Resilience can be defined as "the ability to recover from adversity and setbacks" (Werneburg et al., 2018, p. 39). Resilience is especially relevant to physicians, who face high rates of distress (Sood, Sharma, Schroeder & Gorman, 2014) and burnout (Schneider, Kingsolver & Rosdahl, 2014). Burnout can be defined as "a loss of emotional, mental and physical energy due to continued job-related stress" (Fortney, Luchterhand, Zakletskaia,

Zgierska & Rakel, 2013, p. 412). The increasing rate of burnout in physicians has sparked

interest in interventions that increase their resilience (Fox et al., 2018; Schneider et al., 2014).

Research on improving resilience among health professionals is still in its infancy

(Gridley, 2018; Fox et al., 2018). Nevertheless, several studies have been conducted on this

topic. Rogers (2016) reviewed studies on educational interventions to improve health

professionals' resilience, including resilience workshops, individual and group reflection,

cognitive-behavioral strategies, and mentoring. Mindfulness-Based Stress Reduction is

another such intervention subject to research (Gridley, 2018). In a review of 22 studies, Fox et

al. (2018) found that mindfulness training and psycho-social skills training were the most

frequently used interventional strategies for physicians. Further and rigorous research is

needed to determine best practice for increasing resilience among physicians (Fox et al.,

2018).

Given the possible association between resilience and reduced burnout and stress in

physicians, the most important problem to be addressed was establishing whether any

interventions to increase resilience in this population had been found to be effective. The aim

of this review was to critically appraise the research literature and provide an overview of the

evidence for such interventions. Therefore the search question for this review was: "What is

the effectiveness of interventions to increase resilience in physicians?" This review follows a

structure set out by Kable, Pich and Maslin-Prothero (2012).

Search strategy

The databases MEDLINE, PsycINFO, Informit and CINAHL were searched in

September 2018 to find published research articles on the effectiveness of interventions to

increase resilience in physicians. A Google Scholar search was carried out to identify any

additional peer-reviewed articles; this search returned more than 17,000 results, and the first

100 results were reviewed. In addition, the reference lists of retrieved articles were manually searched.

Search limits

The search was limited to peer reviewed, English language articles published during 2013–2018.

Inclusion and exclusion criteria

In order to locate all relevant articles, the following inclusion criteria were used:

- English language articles published between 2013 and 2018

- original research studies

- peer reviewed articles

- resilience was measured.

Articles were excluded if:

- the sample was made up entirely of medical students

- a medical college could not feasibly carry out the intervention; for example, a hospital-wide culture-change program.

Literature reviews and systematic reviews were also excluded, as they were not primary sources of research.

Search process

Nine search terms were used to search the databases, including the article title, abstract and body. In addition, four subject index terms were used to search the databases. Prior to searching the databases, the search terms were tested in consultation with a librarian to ensure that they were retrieving literature that was relevant and in line with the inclusion criteria. The following search terms were used:

- Resilien* OR Wellbeing

- Intervention

- Educat*: used when 'intervention' retrieved too few results

- Train*: used when 'intervention' retrieved too few results

- Medical AND Specialist OR Physician OR Resident.

The subject index terms used were:

- PsycINFO: Resilience (Psychological) AND Health personnel

- MEDLINE: Resilience, psychological AND Health personnel

- CINAHL: Hardiness AND Medical education.

Search results

The search of the four databases resulted in the location of 10 articles. The Google Scholar search, where the first 100 results were reviewed, located no additional articles. Similarly, no new articles were found from manually searching the reference lists of articles found in the database searches. The 10 articles included eight quantitative studies (six cohort studies, one randomized controlled trial, one cross-sectional survey), one qualitative study and one mixed methods study. There were no duplicate articles. Of the 10 articles, nine were from the USA and one was from the Netherlands. The PRISMA diagram below evidences the search process (see Figure 1).

247 records identified through database searching

6 records identified through other sources (Google Scholar)

92 records after duplicates removed

92 records screened for relevance

78 records excluded

14 full-text articles assessed for eligibility

4 full-text articles excluded with reasons for exclusion

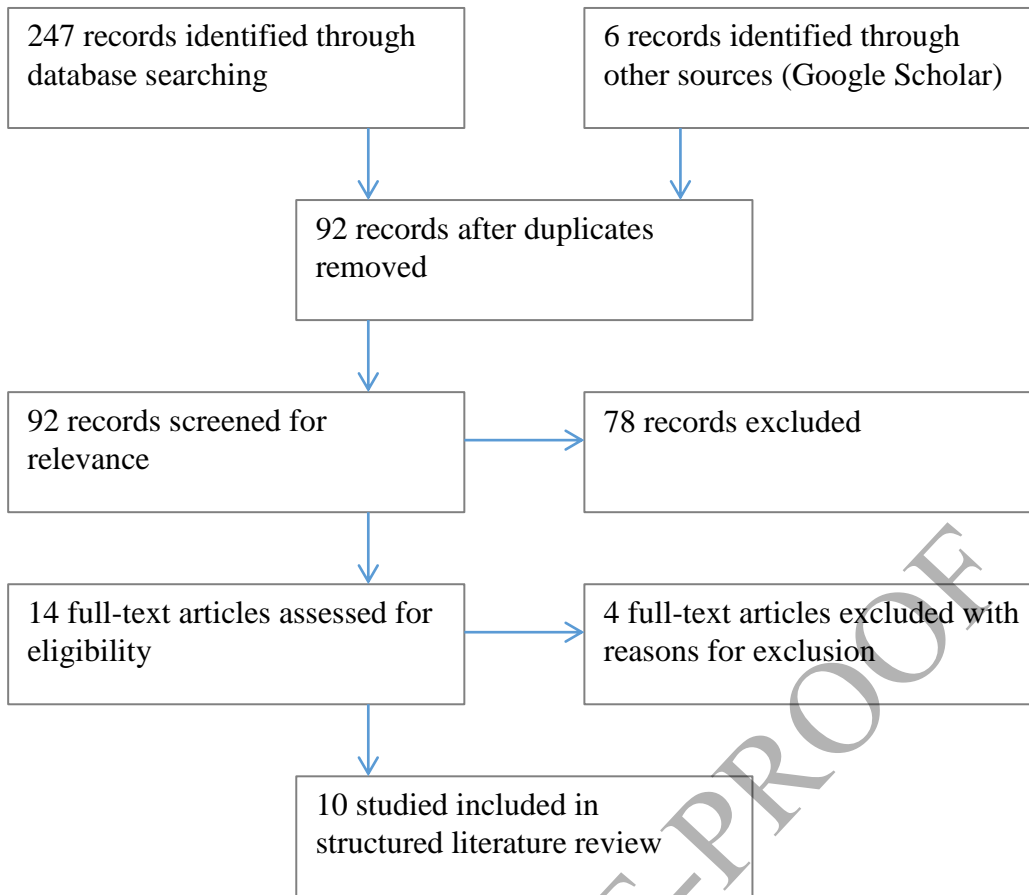10 studied included in structured literature review

Figure 1: PRISMA diagram (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009)

Assessment of retrieved articles for relevance

Fourteen articles appeared to meet the inclusion criteria, based on the abstract. These articles were then assessed for relevance by reading the entire article in reference to the inclusion and exclusion criteria. After reviewing the 14 articles, four articles were removed because they were either not original research studies (two articles) or they did not measure resilience (two studies). The remaining 10 articles are summarized in Table 1, which follows a structure set out by Kable, Pich and Maslin-Prothero (2012). Articles were recorded throughout the search process to avoid duplicating search findings.

No.	Author (year) country	Type of study	Purpose	Sample (size and sites)	Data collection	Key findings	Quality appraisal: include/ exclude
1	Kemper, K. J., Mo, X., & Khayat, R. (2015) United States of America (USA)	Quantitative: cross-sectional survey	To describe the relationship between trainable qualities (mindfulness and self-compassion) and factors conceptually related to burnout and quality of care (sleep and resilience) in young health professionals and trainees	213 clinicians (76% trainees) at a large academic health centre Physicians: 38% (includes trainee physicians) Female: 73% Average age: 28	Online survey using scales	Resilience was strongly and significantly correlated with less stress and better mental health, more mindfulness, and more self-compassion. Results for physicians were not reported separately.	Include

2	Kemper, K. J., & Rao, N. (2017) USA	Quantitative: prospective cohort study	To answer: 1. Which health professionals and trainees enrol in online training in focused attention meditation? 2. Is completing an online module associated with any immediate changes in relaxation, resilience, stress, positive or negative affect, or overall flourishing?	379 health professionals (21% physicians) from a large academic health centre	Online survey using standardised measures	Brief, online training was associated with small but significant improvements in factors related to burnout and resilience in health professionals. Results for physicians were not reported separately.	Include
3	Place, S., & Talen, M. (2013) USA	Exclude: not original research study					
4	Gridley, K. (2018) United Kingdom	Exclude: not original research study					
5	Benson, N., Chaukos, D., Vestal, H., Chad-Friedman, E. F., Denninger, J. W., & Borba, C. (2018) USA	Exclude: resilience not measured					
6	Chaukos, D., Chad-Friedman, E., Mehta, D. H., Byerly, L., Celik, A., McCoy Jr, T. H., & Denninger, J. W. (2017) USA	Exclude: resilience not measured					

| 7 | Werneburg, B. L., Jenkins, S. M., Friend, J. L., Berkland, B. E., Clark, M. M., Rosedahl, J. K., ... Sood, A. (2018) USA | Quantitative: cohort study | To examine the impact of a 12-week worksite resiliency training program on improving resiliency and health behaviours in healthcare employees | 137 employees of an academic medical centre (proportion of physicians not specified) | Five study questionnaires, completed at baseline, end of intervention phase (12 weeks) and at 3 months follow-up | Statistically significant improvements at the end of intervention and extending to 3 months follow-up for resiliency, perceived stress, anxiety level, quality of life, and health behaviours. Largest effects sizes from baseline to 3-month follow-up for resiliency and perceived stress. | Include |
| 8 | Kemper, K. J., Rao, N., Gascon, G., & Mahan, J. D. (2017) USA | Quantitative: cohort study | Do participants in online mind-body skills training report any changes in their personal self-care or professional behaviour 1 year later? Is there a relationship between the frequency of mind-body practice and stress, burnout, and missing work, and mindfulness, resilience, and confidence providing compassionate care? | 149 health professionals (21% physicians) affiliated with a large academic health centre | Online survey completed one year after registering in the program | Most participants (78%) engaged in one or more mind-body practices in the 30 days before the survey; 79% reported changes in self-care. Greater practice frequency was associated with improvements in stress, mindfulness, and resilience, which were associated with increased confidence in providing compassionate care. Results for physicians were not reported separately. | Include |

| 9 | Lee, K. J., Forbes, M. L., Lukasiewicz, G. J., Williams, T., Sheets, A., Fischer, K., & Niedner, M. F (2015)

USA | Mixed methods: two-phase descriptive study | To describe the availability, use, and helpfulness of resilience-promoting resources.

To identify an intervention to implement across multiple pediatric intensive care units. | Leadership survey: teams from 20 pediatric intensive care units

Staff survey: 1066 staff members (13% physicians) | Surveys distributed electronically

Leadership survey created for the study: Likert scales and open-ended questions

Staff survey: validated instruments to assess resilience and teamwork climate and open-ended questions | Overall, the two most used and impactful resources were 1-on-1 discussions with colleagues and informal social interactions with colleagues out of the hospital.

Results for subset of physicians (n=136) and advanced practice professionals (n=37) were reported separately. The two most impactful resources were 1-on-1 discussions with colleagues and informal social interactions with colleagues out of the hospital. | Include, except for leadership survey (see 'Quality appraisal of retrieved literature' section) |

10	Kemper, K. J., & Khirallah, M. (2015) USA	Quantitative: prospective cohort study	1. Will health professionals and trainees enrol in free elective online Mindfulness-Based Stress Reduction and complete at least 1 hour of training? 2. How does enrolees' scores of stress, resilience and burnout compare to previous studies? 3. Are there any acute changes associated with completing a 1-hr module in enrolees' stress, mindfulness, resilience or empathy?	513 health professionals completed one or more modules. Registrants for five most popular modules included 15-20% physicians/ physician assistants (including trainees) Site: a large academic health centre	Data collected at the start and end of each module. Data analysed from modules that had more than 100 enrolees.	Most enrolees met threshold criteria for burnout and reported moderate to high stress levels. Completing 1-hour modules was associated with significant acute improvements in stress, mindfulness, empathy and resilience. Results for physicians / physician assistants were not reported on separately.	Include
11	Fortney, L., Luchterhand, C., Zakletskaia, L., Zgierska, A., & Rakel, D. (2013) USA	Quantitative: pilot cohort study	To investigate whether an abbreviated mindfulness group intervention could increase job satisfaction, quality of life and compassion among primary care clinicians	30 primary care clinicians in three university medical departments (87% physicians)	Four surveys taken at baseline, and at 1 day, 8 weeks and 9 months post-intervention	Significant reductions at 9 months follow-up for burnout, depression, anxiety and stress. No significant changes on resilience and compassion scales. Results for physicians were not reported separately.	Include

12	Sood, A., Sharma, M. D., Schroeder, D. S., & Gorman, B. (2014) USA	Quantitative: randomised controlled trial	To test the efficacy of a Stress Management and Resiliency Training (SMART) program for decreasing stress and anxiety and improving resilience and quality of life among radiology physicians	26 radiology physicians at a practicing tertiary care centre	Four instruments tested at baseline and 12 weeks	Resilience improved in active arm, but changes were not statistically significant when compared to control arm. Statistically significant and clinically meaningful improvement in anxiety, stress, quality of life, and mindful attention.	Include
13	Schneider, S., Kingsolver, K., & Rosdahl, J. (2014) USA	Qualitative: semi-structured interviews	To evaluate the perceived impact of physician wellbeing coaching on physician stress and resiliency	11 physicians working at a major medical centre	Semi-structured interviews	Physician wellbeing coaching helped participants increase resilience via developing skill and awareness in: 1) boundary setting 2) self-care 3) self-awareness.	Include
14	Mehta, D. H., Perez, G. K., Traeger, L., Park, E. R., Goldman, R. E., Haime, V. ... Jackson, V. A. (2016) Netherlands	Quantitative: pilot cohort study	To test the feasibility of the Relaxation Response Resiliency Program for palliative care clinicians (program targeted to decrease stress and increase resiliency)	A multi-disciplinary team of 15 palliative care clinicians at a major academic medical centre, including 6 physicians (40%)	Data collected 1 week before the 2-month program and 2 months after completion of program	A team-based resiliency intervention based on eliciting the relaxation response is feasible and may help promote resiliency in palliative care clinicians. Exploratory analysis showed small effect sizes for improvements in self-efficacy (resilience). Results for physicians were not reported separately.	Include

Table 1: Summary table of articles – resilience interventions for medical specialists, residents or physicians

Quality appraisal of retrieved literature

A quality appraisal of the 10 retrieved articles was carried out. The quality of each article was examined using a recognized tool appropriate to the particular type of study. The following tools were used to conduct the quality appraisals:

- cohort studies: *Critical Appraisal Skills Programme (CASP) Cohort Study Checklist*, consisting of 12 questions covering three sections: 1. Are the results of the study valid? 2. What are the results? 3.Will the results help locally? (CASP, 2018a). The authors did not suggest a scoring system, as the checklist was designed as an educational tool, but rather encouraged reviewers to consider the three issues above when appraising a cohort study (CASP, 2018a)

- randomized controlled trial: *CASP Randomised Controlled Trial Checklist*, consisting of 11 questions covering the three sections listed in the previous point (CASP, 2018c). Again, the authors did not suggest a scoring system (CASP, 2018c)

- cross-sectional survey: *Checklist for Analytical Cross-Sectional Studies*, consisting of eight questions (The Joanna Briggs Institute, 2018). The author answered 'yes' or 'not applicable' to all questions and chose to include the study

- qualitative study: *CASP Qualitative Study Checklist*, consisting of 10 questions covering the three sections listed in the first bullet point; as above, the authors did not suggest a scoring system (CASP, 2018b)

- mixed methods study: *Proposal: A mixed methods appraisal tool for systematic mixed studies reviews,* consisting of three sections of three questions each, appraising the qualitative, quantitative and mixed methods components of a study (Pluye et al., 2011). When assessing studies, the authors of the tool noted that an overall quality score may be not informative (Pluye et al., 2011). The article by Lee et al. (2015) was considered for exclusion, because the tool stipulated 60 per cent as an acceptable

response rate for surveys (Pluye et al., 2011). The leadership survey in this study had a 30 per cent response rate; the staff survey had a 51 per cent response rate (Lee et al., 2015). It was decided to include this article, but exclude the leadership survey results. The staff survey received 1066 responses, and although this was below the 60 per cent threshold, it was the highest number of survey responses in the retrieved articles, and was therefore deemed as valuable to this review. As a result of this decision, all 10 articles were found to be of acceptable quality and were included.

Discussion and key themes from the literature

Study designs.

The 10 articles included eight quantitative studies (six cohort studies, one randomized controlled trial and one cross-sectional survey), one qualitative study and one mixed methods study. The most common study design was a cohort study; all cohort studies in this review were uncontrolled. All but one of the cohort studies (Kemper, Rao, Gascon & Mahan, 2017b) used a pre-post design.

Interventions.

Interventions were tested in eight of the 10 studies, with mindfulness a common theme. The most researched intervention was a training program, tested in all six cohort studies and the randomized controlled trial by Sood, Sharma, Schroeder and Gorman (2014). Schneider et al.'s (2014) intervention of one-on-one coaching stands apart from the training interventions, as it involved supporting clients to change, rather than imparting knowledge. Two studies did not test an intervention: Lee et al. (2015) sought to identify a resilience intervention by surveying health professionals on the relevant resources on offer, and Kemper, Mo and Khayat (2015a) explored the relationships between trainable qualities and resilience.

Online interventions.

Kemper led a number of studies of online modules in mind-body skills training. Kemper and others used a module, 'Introduction to stress, resilience and the relaxation response' to measure for changes in resilience (Kemper & Khirallah, 2015b; Kemper & Rao, 2017a). Kemper et al. (2017b) also conducted a one-year follow-up study for health professionals who completed an online module in integrative therapies.

Group interventions.

Mehta et al. (2016) also examined mind-body skills training, testing the feasibility of a team-based, 12-hour training program – based on invoking the relaxation response and cognitive behavioral strategies – to increase resilience in palliative care clinicians. Sood et al. (2014) and Werneburg et al. (2018) researched interventions based on Stress Management and Resiliency Training (SMART). In contrast to the aforementioned studies, SMART was not explicitly framed as a mind-body program; rather, it focused on attending to the external world and avoiding making snap judgements on situations (Sood et al., 2014). Sood et al. (2014) tested one 90-minute small group session as an intervention; Werneburg et al. (2018) tested a more intensive 12-week small group program, consisting of one 60-90 minute session per week. The intervention studied by Fortney, Luchterhand, Zakletskaia, Zgierska and Rakel (2013) was an abbreviated version of Mindfulness-Based Stress Reduction, also delivered to a small group. The program taught basic mindfulness meditation and ways to practice mindfulness at work; participants received 18 hours of training over one weekend and two follow-up sessions (Fortney et al., 2013).

One-on-one intervention.

Schneider et al. (2014) researched the effect of one-on-one coaching on physician resilience. Participants received 3–8 sessions, with coaches using motivational

interviewing techniques and mindful awareness to build clients' internal motivation to change (Schneider et al., 2014).

Outcome measures.

Researchers used different scales to measure resilience. Studies of online training used Smith's 6-item Brief Resilience Scale, which is a standardized and reliable instrument (Kemper et al., 2015a; Kemper et al., 2017b; Kemper & Khirallah, 2015b). Two studies employed the 25-item Connor-Davidson Scale for Resilience, which has been evaluated for validity and reliability (Sood et al., 2014; Werneburg et al., 2018). Mehta et al. (2016) used the 10-item General Self-Efficacy Scale; the author did not state whether scale was validated. Two further studies used the validated 14-item Resilience Scale (Fortney et al., 2013; Lee et al., 2015).

Sampling.

Sample sizes and populations varied in the reviewed studies. Sample sizes ranged from 11 participants for a qualitative study to 1066 respondents to an online survey (Lee et al., 2015; Schneider et al., 2014). For online interventions, sample sizes were between 149 and 513 people, with physicians making up around 20 per cent of samples (Kemper et al., 2017b; Kemper & Khirallah, 2015b; Kemper & Rao, 2017a). Group interventions involved fewer participants, and the proportion of physicians varied. Werneburg et al. (2018) studied 137 employees of an academic medical centre; it was not stated how many participants were physicians. Of the 30 primary care clinicians that Fortney et al. (2013) studied, 26 (87%) were physicians. The 26 participants in the study by Sood et al. (2014) were all physicians specialising in radiology. Mehta et al. (2016) had the smallest sample of the group studies: 15 palliative care clinicians, six of whom were physicians. While the staff survey issued by Lee et al. (2015) received more than 1000 responses from health professionals, only 13 per cent were physicians

or physician assistants. The coaching intervention was tested on 11 participants, all physicians (Schneider et al., 2014). The studies by Fortney et al. (2013), Schneider et al. (2014) and Sood et al. (2014) had the highest proportion of physicians in their samples, making their findings particularly relevant to the search question.

Results.

Online training programs.

Kemper and Khirallah (2015b) measured immediate changes in resilience upon completing various 1-hour online modules, finding that resilience scores increased significantly for the participants who completed the module, 'Mindfulness in daily life'. In the same study, Kemper and Khirallah (2015b) found that resilience scores did not improve significantly upon completing the module, 'Introduction to stress, resilience and the relaxation response'; however, in a later study, Kemper and Rao (2017a) found that scores improved 'modestly but significantly' for the same module. In another study, Kemper et al. (2017b) examined the relationship between the number of hours of online mind-body skills training and outcomes one year later. Kemper et al. (2017b) found that the more hours of training participants completed, the more frequently participants practiced mind-body skills one year later. Importantly, Kemper et al. (2017b) reported that greater frequency of practice was associated with improvements in resilience. The percentage of physicians participating in these studies ranged from 21 per cent to 38 per cent; results for physicians were not reported separately. Kemper's studies demonstrated that even brief, online interventions can have immediate and long-term positive effects for stressed health professionals (Kemper et al., 2017b; Kemper & Rao, 2017a).

Group interventions.

The results of group interventions varied. Mehta et al. (2016) found that a mind-body skills program was feasible and may help to promote resilience in palliative care clinicians. While the analysis showed small effect sizes for increases in self-efficacy, further research is needed to substantiate this finding. Sood et al. (2014) found that upon physicians completing a 90-minute SMART program intervention, changes in resilience in the active arm were not statistically significant compared to the control arm. In contrast to these findings, Werneburg et al. (2018) found significant improvements for resilience at the end of a 12-week SMART program intervention, extending to three months follow-up; the proportion of physicians participating in this study was not specified. Fortney et al. (2013) found no significant changes in resilience in primary care clinicians upon completion of 18 hours of training in Mindfulness-Based Stress Reduction or at nine months follow-up, although scores trended towards improvement. In group studies that included a range of health professionals, the results for physicians were not reported separately.

One-on-one intervention.

Schneider et al. (2014) found that the coaching model helped physicians increase resilience by developing skills in setting boundaries, self-compassion and self-care, and self-awareness.

Other studies.

In a cross-sectional survey, Kemper et al. (2015a) examined the relationship between the trainable qualities of mindfulness and self-compassion, and resilience and sleep. Kemper et al. (2015a) found that, after controlling for stress and mental health, self-compassion stood as a significant predictor of resilience (results for physicians were not reported separately). The mixed methods study by Lee et al. (2015) sought to

identify a resilience-promoting intervention that could be implemented in pediatric care units. Lee et al. (2015) surveyed more than 1000 staff across 20 pediatric intensive care units, asking respondents to rate the availability, uptake and effectiveness of several resources. The researchers found that the two most used and impactful resources were one-on-one discussions with peers and informal social interactions with peers outside of the hospital environment (Lee et al., 2015). Results for the subset of physicians (n=136) and advanced practice professionals (n=37) were reported separately: the two most impactful resources were also one-on-one discussions with colleagues and informal social interactions with colleagues out of the hospital (Lee et al., 2015).

Limitations

Common limitations in the reviewed studies included self-selection bias, lack of a control group, and uncertainty over whether changes could be attributed to the intervention. Participants elected to participate in many of the studies, creating the possibility of self-selection bias (Kemper et al., 2015a; Kemper & Khirallah, 2015b; Kemper & Rao, 2017a). Kemper et al. (2017b) considered whether online modules in mind-body skills attracted health professionals who already practiced mindfulness and were less stressed. On the other hand, Kemper and Khirallah (2015b) pointed out that participants reported high levels of burnout and stress at baseline, indicating that the training program was not "preaching to the choir" of professionals who were already resilient (p. 250). For group interventions, it was possible that self-selecting participants found meditation more appealing than their colleagues and were therefore more motivated, limiting the generalizability of the results (Fortney et al., 2013; Sood et al., 2014). Tied in with self-selection bias was the lack of a control group, reported in several studies as a limitation (Fortney et al., 2013; Kemper & Khirallah, 2015b; Werneburg et al., 2018).

Several group studies considered whether observed changes were due to factors other than the intervention, such as normalizing trends (Fortney et al., 2013), spending time with colleagues in a social space (Werneburg et al., 2018; Mehta et al., 2016) or spending time away from work duties (Mehta et al., 2016). The findings presented in several studies were not limited to physicians, but included a broader range of health professionals. These limitations highlight gaps in the research on interventions to increase resilience in doctors, and point to the direction of future research in this area.

Conclusion

Of the 10 studies reviewed, eight were quantitative studies, with a cohort study the most common design. Interventions were tested in eight studies; the most frequently researched intervention was a training program, offered online or in small groups. Mindfulness or mind-body skills were key components of most programs. Researchers used different scales to measure resilience, not all of them validated. Sample sizes varied considerably, as did the proportion of physicians within samples. The findings presented were not limited to physicians, but included a broader range of health professionals. As a result, it is not possible to generalize the results of these studies to physicians.

Results for effectiveness of training programs were mixed, with some group studies reporting significant improvements in resilience and others not. Kemper and Khirallah (2015b) found that even brief online interventions may increase resilience. A qualitative study of a coaching intervention also showed improvements in resilience (Schneider et al., 2014). Kemper et al. (2015a) found that self-compassion was a significant predictor of resilience, and recommended that future resilience training programs teach self-compassion skills. Lee et al. (2015) identified one-on-one discussions with peers and informal social interactions as highly used and impactful resources. Common limitations were self-selection

bias, lack of a control group and uncertainty about whether interventions were responsible for changes.

Further research and relevance to clinical practice

Researchers recommended carrying out further studies to replicate findings in other settings and improve generalizability (Kemper et al., 2017b; Kemper & Khirallah, 2015b; Kemper & Rao, 2017a). Several studies suggested conducting randomized controlled trials to address self-selection bias (Fortney et al., 2013; Kemper et al., 2017b; Mehta et al., 2016; Werneburg et al., 2018). Future intervention trials could also explore causality between factors, to fill in gaps in the understanding of resilience (Kemper et al., 2015a). Several researchers suggested longer follow-ups to confirm the duration of observed changes (Kemper & Rao, 2017a; Sood et al., 2014; Werneburg et al., 2018). Using a validated tool to measure resilience would also be recommended.

This review examined a range of interventions, with varying measures of effectiveness. Further research is needed to refine interventions and pinpoint precisely what increases resilience in physicians. Nevertheless, several interventions outlined in this review – including coaching, online and group interventions – have been found to be effective in increasing resilience in health professionals. Given the increasing rate of burnout among health professionals, effective resilience interventions will likely play a central role in supporting the wellbeing of this population.

Funding

References

Benson, N., Chaukos, D., Vestal, H., Chad-Friedman, E. F., Denninger, J. W., & Borba, C. (2018). A qualitative analysis of stress and relaxation themes contributing to burnout in

first-year psychiatry and medicine residents. *Academic Psychiatry,* May 2018, 1-6.

doi:10.1007/s40596-018-0934-2

Chaukos, D., Chad-Friedman, E., Mehta, D. H., Byerly, L., Celik, A., McCoy Jr, T. H., &

Denninger, J. W. (2017). Risk and resilience factors associated with resident burnout.

Academic Psychiatry, 41(2), 189-194. doi:10.1007/s40596-016-0628-6

Critical Appraisal Skills Programme. (2018a). *CASP Cohort Study Checklist.* Retrieved from

https://casp-uk.net/casp-tools-checklists/ on 26 September 2018

Critical Appraisal Skills Programme. (2018b). *CASP Qualitative Study Checklist.* Retrieved

from https://casp-uk.net/casp-tools-checklists/ on 26 September 2018

Critical Appraisal Skills Programme. (2018c). *CASP Randomised Controlled Trial Checklist.*

Retrieved from https://casp-uk.net/casp-tools-checklists/ on 26 September 2018

Fortney, L., Luchterhand, C., Zakletskaia, L., Zgierska, A., & Rakel, D. (2013). Abbreviated

mindfulness intervention for job satisfaction, quality of life, and compassion in primary

care clinicians: A pilot study. *Annals of Family Medicine, 11*(5), 412-420.

doi:10.1370/afm.1511

Fox, S., Lydon, S., Byrne, D., Madden, C., Connolly, F., & O'Connor, P. (2018). A

systematic review of interventions to foster physician resilience. *Postgraduate Medical

Journal, 94*(1109), 162-170. doi:10.1136/postgradmedj-2017-135212

Gridley, K. (2018). Resilience training is just a band-aid solution for doctor well-being: No.

*Emergency Medicine Australasia, (30)*2, 261-262. doi:10.1111/1742-6723.12953

Kable, A. K., Pich, J., & Maslin-Prothero, S. E. (2012). A structured approach to

documenting a search strategy for publication: A 12 step guideline for authors. *Nurse

Education Today, (32)*8, 878-886. doi:10.1016/j.nedt.2012.02.022.

Kemper, K. J., Mo, X., & Khayat, R. (2015a). Are mindfulness and self-compassion associated with sleep and resilience in health professionals? *The Journal of Alternative and Complementary Medicine, 21*(8), 496-503. doi:10.1089/acm.2014.0281

Kemper, K. J., & Khirallah, M. (2015b). Acute effects of online mind–body skills training on resilience, mindfulness, and empathy. *Journal of Evidence-Based Complementary & Alternative Medicine, 20*(4), 247-253. doi:10.1177/2156587215575816

Kemper, K. J., & Rao, N. (2017a). Brief online focused attention meditation training: Immediate impact. *The Journal of Alternative and Complementary Medicine, 22*(3), 395-400. doi:10.1177/2156587216663565

Kemper, K. J., Rao, N., Gascon, G., & Mahan, J. D. (2017b). Online training in mind-body therapies: Different doses, long-term outcomes. *Journal of Evidence-Based Complementary & Alternative Medicine, 22*(4), 696-702. doi:10.1177/2156587217701857

Lee, K. J., Forbes, M. L., Lukasiewicz, G. J., Williams, T., Sheets, A., Fischer, K., & Niedner, M. F. (2015). Promoting staff resilience in the pediatric intensive care unit. *American Journal of Critical Care, 24*(5), 422-430. doi:10.4037/ajcc2015720

Mehta, D. H., Perez, G. K., Traeger, L., Park, E. R., Goldman, R. E., Haime, V. ... Jackson, V. A. (2016). Building resiliency in a palliative care team: A pilot study. *Journal of Pain and Symptom Management, 51*(3), 604-608. doi:https://doi.org/10.1016/j.jpainsymman.2015.10.013

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, *6*(7), e1000097-e1000097. doi:10.1371/journal.pmed.1000097

Place, S., & Talen, M. (2013). Creating a culture of wellness: Conversations, curriculum, concrete resources, and control. *The International Journal of Psychiatry in Medicine, 45*(4), 333-344. doi: http://dx.doi.org/10.2190/PM.45.4.d

Pluye, P., Robert, E., Cargo, M., Bartlett, G., O'Cathain, A., Griffiths, F. … Rousseau, M. C. (2011). *Proposal: A mixed methods appraisal tool for systematic mixed studies reviews.* Retrieved from http://binarystore.wiley.com/store/10.1111/jep.12884/asset/supinfo/JEP_12884-sup-0001-MMAT.pdf?v=1&s=50f690910f5c02d1437850b8bd611eb42f75d58f on 26 September 2018

Robertson, H. D., Elliot, A. M., Burton, C., Iversen, L., Murchie, P., Porteous, T., & Matheson, C. (2016). Resilience of primary healthcare professionals: A systematic review. *British Journal of General Practice, 66*(647). doi:10.3399/bjgp16X685261

Rogers, D. (2016). Which educational interventions improve healthcare professionals' resilience? *Medical Teacher, 38*(12), 1236-1241. doi:10.1080/0142159X.2016.1210111

Schneider, S., Kingsolver, K., & Rosdahl, J. (2014). Physician coaching to enhance well-being: A qualitative analysis of a pilot intervention. *Explore: The Journal of Science and Healing, 10*(6), 372-379. Retrieved from https://doi-org.libproxy.murdoch.edu.au/10.1016/j.explore.2014.08.007 on 26 September 2018

Sood, A., Sharma, M. D., Schroeder, D. S., & Gorman, B. (2014). Stress management and resiliency training (SMART) program among Department of Radiology faculty: A pilot randomized clinical trial. *Explore: The Journal of Science and Healing, 10*(6), 358-363. doi:https://doi.org/10.1016/j.explore.2014.08.002

The Joanna Briggs Institute. (2018). *Checklist for Analytical Cross-Sectional Studies.* Retrieved from http://joannabriggs.org/research/critical-appraisal-tools.html on 26 September 2018

Werneburg, B. L., Jenkins, S. M., Friend, J. L., Berkland, B. E., Clark, M. M., Rosedahl, J. K., ... Sood, A. (2018). Improving resiliency in healthcare employees. *American Journal of Health Behaviour, 42*(1), 39-50. doi:https://doi.org/10.5993/AJHB.42.1.4