

Digital Appendix Systematic Cochrane Review and Meta-Analysis on Psychological Interventions to Foster Resilience in Healthcare Professionals

Appendix D11

Intervention Content of Included Studies Depending on Theoretical Foundation^a

Theoretical foundation (number of studies)	Studies	Characteristics of studies within theoretical foundation	Intervention content
Combined resilience interventions (19)	(Berger & Gelkopf, 2011; Bernburg et al., 2016; Bernburg et al., 2019; Calder Calisi, 2017; Fei, 2019; Gelkopf et al., 2008; Ireland et al., 2017; Lin et al., 2019; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mealer et al., 2014; Mistretta et al., 2018; Smith et al., 2019; Tierney & Lavelle, 1997; Varker & Devilly, 2012; West et al., 2014; Wild, 2016)	<ul style="list-style-type: none"> 15 combined resilience-training programs carried out face-to-face (Berger & Gelkopf, 2011; Bernburg et al., 2016; Bernburg et al., 2019; Calder Calisi, 2017; Fei, 2019; Gelkopf et al., 2008; Ireland et al., 2017; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Tierney & Lavelle, 1997; Varker & Devilly, 2012; West et al., 2014; Wild, 2016) Four with combined formats, with intervention facilitated by face-to-face sessions and CDs or USB/MP3 audio files (Mealer et al., 2014; Mistretta et al., 2018), a chat group on mobile phones (Lin et al., 2019), or by online modules (Smith et al., 2019), respectively 	<ul style="list-style-type: none"> Studies based on mindfulness and CBT or cognitive therapy (Mealer et al., 2009; Wild, 2016): <ul style="list-style-type: none"> Both studies included training in (formal and informal) mindfulness practices (e.g., body scan, sitting meditation and other MBSR techniques; partly facilitated by guided CDs). The cognitive or CBT component in these studies typically involved teaching the ABC (Activating Event, Belief, Consequence) model (i.e., cognitive restructuring) to change the process of thinking and challenging negative thoughts to promote cognitive reappraisal (e.g., Mealer et al., 2014). In addition, the multimodal resilience-training program in Mealer et al. (2014) educated the participants about types of psychological distress in intensive care units and self-care topics and included written exposure therapy; CBT-based counseling sessions were event-triggered (e.g., patient's death). The Mind's resilience intervention in Wild (2016) was based on Mind's model of resilience and five ways to well-being (e.g., be active, connect). Besides teaching CBT- and mindfulness-based coping skills, participants were encouraged to positive activities and to build social capital by joining social networks. Intervention length ranged from six 2.5-hour sessions (Wild, 2016) to 12 weeks (Mealer et al., 2014).

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			<ul style="list-style-type: none"> Studies based on MBSR and MBCT (Ireland et al., 2017; Lin et al., 2019); partly also including ACT (Ireland et al., 2017); or combination of mindfulness and ACT (Mistretta et al., 2018) <ul style="list-style-type: none"> Session topics across the three studies included, for example, the introduction to mindfulness, attentional training and (everyday) awareness of the body (e.g., mindful breathing) and in sports (e.g., mindfulness yoga), staying present (e.g., at work, in daily life), the importance/reality of thoughts, emotional and thought management by mindfulness (e.g., ABC's of MBSR), and issues related to self-care (e.g., self-compassion, self-kindness, self-criticism). The ACT component in Ireland et al. (2017) and Mistretta et al. (2018) referred to letting go of sensations and emotions, for example. In contrast with traditional MBSR and ACT, the Mindfulness-Based Resilience Training (MBRT) of Mistretta et al. (2018) included shorter meditation practices and a deeper review of the neurobiology of stress and resilience. Studies based on resiliency manuals for elementary school children: ERASE Stress (Berger & Gelkopf, 2011; Gelkopf et al., 2008) <ul style="list-style-type: none"> evaluated the ERASE Stress-based group training, with sessions focusing on identifying personal resources, teaching new coping skills, or building a social shield, for example. ERASE stress: cognitive-behavioral components, art therapy, body-oriented strategies, narrative therapy, and meditative practices Gelkopf et al. (2008), however, investigated the "Training the trainer" course based on ERASE Stress, with participants given the opportunity to experience the 12-session ERASE stress program themselves as well as to explore ways to effectively delivering the program to children.

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			<ul style="list-style-type: none"> • Six studies based on principles of CBT and solution-focused group work (Bernburg et al., 2016; Bernburg et al., 2019; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015), with some studies (Bernburg et al., 2016; Bernburg et al., 2019; Mache et al., 2016) also including mindfulness (and acceptance training; Bernburg et al., 2019) <ul style="list-style-type: none"> ○ Although named differently (e.g., Psychosocial competency training, “Multicomponent Mental Competency and Stress Management Training”, psychosocial resilience training), the six interventions included similar components, such as psychosocial skills for physicians (e.g., mindfulness, self-awareness), problem-solving, relaxation techniques, conflict handling, emotion regulation techniques, cognitive strategies and acceptance, communication, dealing with difficult decisions, social support, planning for the future, and organizational hospital culture (e.g., reporting mistakes). • Six combined training programs that could not be clustered further (Calder Calisi, 2017; Fei, 2019; Smith et al., 2019; Tierney & Lavelle, 1997; Varker & Devilly, 2012; West et al., 2014) <ul style="list-style-type: none"> ○ Smith et al. (2019) examined the multi-modal wellness intervention ARISE (Achieving Resilience in Acute Care Nurses) with a focus on resilience-focused and self-care techniques like yoga and stretching and stress relief using the senses and mindfulness (e.g., online mindfulness sessions by Zoom). ○ Tierney and Lavelle (1997) investigated a hardiness class as combination of stress inoculation, rational emotive techniques, assertiveness training, and relaxation. ○ The training program by Varker and Devilly (2012) incorporated aspects of SIT (Cameron & Meichenbaum, 1982) with serial approximation (Foa & Kozak, 1986). Besides educating participants about trauma, the intervention

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			<p>included thought stopping techniques and cognitive reappraisal.</p> <ul style="list-style-type: none"> ○ In the study by Calder Calisi (2017) the theory of human caring also provided the theoretical framework. The 8-week Relaxation Response (RR) tested here was described as complementary therapy supporting holistic self-care. Developed by Benson and Klipper (2000), it consists of diaphragmatic breathing pattern and a repetitive mental focus to break everyday thoughts. ○ The small-group curriculum examined by West et al. (2014) included a combination of mindfulness and stress management techniques (e.g., stress education, meaning in work, personal resources). ○ The latter were combined with rational emotional therapy in Fei (2019; chat group). Besides registering their emotions on a daily basis, core components of the emotional resilience training included recognizing and evaluating one's emotions, challenging irrational beliefs, and emotion regulation, for example.
Unspecific resilience interventions (11)	(Alexander et al., 2015; Cheung, 2014; Hosseinnajad et al., 2018; ISRCTN69644721; Khoshnazary et al., 2016; Luthar et al., 2017; Medisauskaite & Kamau, 2019; Mirzaeirad et al., 2019; NCT02603133; Poulsen et al., 2015; West et al., 2015)	<ul style="list-style-type: none"> • 11 interventions mostly delivered in a face-to-face group setting (Alexander et al., 2015; Cheung, 2014; Hosseinnajad et al., 2018; Luthar et al., 2017; Mirzaeirad et al., 2019; Poulsen et al., 2015; West et al., 2015), with the remaining training programs conducted in combined settings (ISRCTN69644721; Khoshnazary et al., 2016), online with 	<ul style="list-style-type: none"> • In one case, a Psychological First Aid (PFA) intervention was used (Cheung, 2014). According to Luthar et al. (2017), the Authentic Connections Group (ACG) was based on the structured Relational Psychotherapy Mothers' Group (RPMG) program (Luthar & Suchman, 2000; Luthar et al., 2007). Poulsen et al. (2015) examined a recovery training program adapted from Hahn et al. (2011), that was tailored for cancer care workers. The IG relevant for this review (IG4) in Medisauskaite and Kamau (2019) covered different theoretical approaches (e.g., Job Demands-Resources model, Kübler Ross stages of grief, Maslach burnout theory, Bakker & Demerouti, 2007; Kübler-Ross, 1997; Maslach & Jackson, 1981).

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		<p>unclear setting (NCT02603133), or with unclear setting and delivery (Medisauskaite & Kamau, 2019)</p> <ul style="list-style-type: none"> • Treatment duration (unclear for Medisauskaite and Kamau (2019) ranged from weekly (e.g., 1- or 2-hour sessions of four to eight weeks (Alexander et al., 2015; Hosseinejad et al., 2018; ISRCTN69644721; Mirzaeirad et al., 2019), 1-day interventions (Cheung, 2014; Khoshnazary et al., 2016; Poulsen et al., 2015), partly with an additional weekly training (Khoshnazary et al., 2016), and one 10-day training (NCT02603133) to 12 biweekly sessions over 6 months (Luthar et al., 2017; West et al., 2015). • Some of the interventions were combined with homework assignments (e.g., Alexander et al., 2015); Khoshnazary et al. (2016) combined a workshop with a written training using educational pamphlets. 	<ul style="list-style-type: none"> • The training programs focused, for example, on defining resilience and resilience skills, emotion regulation, communication skills training, confidence and self-esteem building, problem-solving and goal setting, strengthening disaster response preparedness (e.g., connection with social supports, coping), self-awareness (e.g., becoming aware of daily activities with positive impact on health and well-being) and self-care tools, emotional intelligence enhancing skills (e.g., happiness, optimism), promoting self-efficacy (e.g., identify positive features of themselves), and social support (e.g., proactive mutual support in the workplace). • One intervention (Alexander et al., 2015) used a supervised yoga instruction (e.g., basic of postural assignment, monitoring the mind with meditations). • Besides many of the above-mentioned aspects (e.g., teaching about psychology of stress and burnout, emotion regulation, work-family balance), Medisauskaite and Kamau (2019) also included elements about how to deal with a patient's death (IG4). • The recovery training program of Poulsen et al. (2015) addressed four recovery experiences (e.g., psychological detachment, mastery) with an additional module on social support by peer monitoring. • Similarly, the resilience intervention combining digital-modules and face-to-face sessions in ISRCTN69644721 concentrated on four topics linked to maintaining resilience according to the authors (e.g., attention training, dealing with difficult emotions). • In the WISER (web-based implementation for the science of enhancing resilience) trial, NCT02603133 investigated an intervention including resilience tools, such as exercises on optimism ("three good things") and gratitude. • In one study (COMPASS groups (COLleagues Meeting to Promote And Sustain Satisfaction; West et al., 2015), self-formed groups discussed

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Mindfulness-based resilience interventions (5)	(Duchemin et al., 2015; Klatt et al., 2015; Lebares et al., 2019; Loiselle, 2018; Schroeder et al., 2016)	<ul style="list-style-type: none"> The five training programs were largely performed face-to-face (Klatt et al., 2015; Lebares et al., 2019; Loiselle, 2018; Schroeder et al., 2016) or included face-to-face elements (Duchemin et al., 2015). One study (Duchemin et al., 2015) combined a face-to-face delivery with a CD (e.g., guided meditation practice). All studies except one (Schroeder et al., 2016) reported having a homework component (e.g., daily guided meditations). Three studies included a mindfulness retreat (Klatt et al., 2015; Schroeder et al., 2016) or a “mindfulness hike” (Lebares et al., 2019). The intervention length of mindfulness-based programs varied from eight weekly sessions combined with daily homework (Duchemin et al., 2015); weekly sessions plus a mindfulness retreat/hike of several hours (Klatt et al., 2015; Lebares et al., 2019); 11 class instructions with daily practice 	<p>about an assigned topic relevant to the physician experience (e.g., resiliency, meaning in work).</p> <ul style="list-style-type: none"> Most training programs were based on MBSR (Lebares et al., 2019) or used a modified version of MBSR (e.g., MBSR combined with elements of compassion skills training; Duchemin et al., 2015; Klatt et al., 2015; Schroeder et al., 2016). Since it is categorized in the automatic self-transcending category of meditation practices, the Transcendental Meditation (TM) technique tested by Loiselle (2018) was also viewed as mindfulness-based. The mindfulness-oriented resilience interventions aimed to teach participants the principles of mindfulness (e.g., mindful awareness) and included the experiential practice of mindfulness meditations in group settings, in part combined with yoga and relaxation through music (e.g., Duchemin et al., 2015; Klatt et al., 2015).

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Attention and Interpretation Therapy (3)	(Chesak et al., 2015; Sood et al., 2011; Sood et al., 2014)	<p>over several months (Loiselle, 2018) to a weekend training program with follow-up sessions (Schroeder et al., 2016).</p> <ul style="list-style-type: none"> In all studies, the intervention consisted of a single 90-minute session in individual (Sood et al., 2011) or group settings (Chesak et al., 2015; Sood et al., 2014), combined with optional follow-up sessions (Chesak et al., 2015; Sood et al., 2011; Sood et al., 2014) and phone calls (Sood et al., 2014). 	<ul style="list-style-type: none"> All studies used stress management and resiliency training (SMART); SMART, as abbreviated adaptation of AIT developed at Mayo Clinic, teaches learners to focus their attention on novel aspects of the world and to delay judgements (Sood et al., 2011; Sood et al., 2014) Based on five higher-order principles (e.g., acceptance), participants are taught to cultivate and guide their interpretations by these principles. Two studies also conducted brief structured relaxation techniques (Sood et al., 2011; Sood et al., 2014).
Stress inoculation (2)	(Stetz et al., 2007; Villani et al., 2013)	<ul style="list-style-type: none"> SIT component either implemented by virtual reality (VR) scenarios and games (VR-SIT; Stetz et al., 2007) or mobile-based (M-SIT: audio-video clips of oncology patients; Villani et al., 2013) Both studies with low training intensity 	<ul style="list-style-type: none"> Besides SIT component, both studies taught coping strategies for stressful situations (e.g., relaxation techniques like controlled breathing; Stetz et al., 2007), partly before being exposed to the SIT part of training (Villani et al., 2013).
Cognitive-Behavioral Therapy (2)	(Cieslak et al., 2016; Clemow et al., 2018)	<ul style="list-style-type: none"> Two moderate-intensity interventions While one intervention included weekly face-to-face sessions delivered at the workplace (Clemow et al., 2018), the other was web-based and asked 	<ul style="list-style-type: none"> Interventions named as self-efficacy enhancement module (Cieslak et al., 2016) and LifeSkills workshop (also named stress and anger management intervention or workshop on cognitive-behavioral coping skills; Clemow et al., 2018) Cieslak et al. (2016) focused on strengthening the resilience factor self-efficacy by using CBT techniques (e.g., gain self-efficacy from own past mastery experiences)

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		<ul style="list-style-type: none"> participants to read the content and do exercises within a specific time period (Cieslak et al., 2016). In Clemow et al. (2018), each session was adjuncted by a video with a facilitator leading participants through the taught skills. 	<ul style="list-style-type: none"> Clemow et al. (2018) taught a broad range of cognitive-behavioral skills to deal with anger- and stress-inducing situations (e.g., self-monitoring of thoughts/behaviors, problem-solving, communication skills, building positive relationships)
Positive Psychology (1)	(NCT03645798)	<ul style="list-style-type: none"> High-intensity wechat-based intervention Combined setting with daily records either being open to others or only to researcher 	<ul style="list-style-type: none"> “Three good things” positive psychotherapy asked participants to record three good things for each day in the wechat friends cycle in order to maintain the emphasis on the positive experience and to answer the question “Why did this good thing happen?”.
Coaching approaches (1)	(Strijk et al., 2011)	<ul style="list-style-type: none"> Face-to-face guided group sessions along with aerobic exercising and individual coaching sessions High-intensity intervention with approximately 77 sessions in total 	<ul style="list-style-type: none"> Written information about a healthy lifestyle along with the 6-month vital@work intervention, including yoga and workout sessions, and three coach visits aimed to change the healthcare workers' lifestyle behavior (e.g., goal setting, problem-solving)

Note. ^a None of the training programs was solely based on problem-solving training or Acceptance and Commitment Therapy; ACT = Acceptance and Commitment Therapy; CBT = Cognitive-Behavior Therapy; CD = compact disc; ERASE stress = Enhancing resiliency among students experiencing stress; IG = intervention group; MBCT = Mindfulness-based Cognitive Therapy; MBSR = Mindfulness-based Stress Reduction; MP3 = MPEG (moving picture experts group) audio layer-3; SIT = stress inoculation training; USB = universal serial bus.

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