

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

## Appendix D10

### Summary Description of Included Studies

Key characteristics of included studies	Number of included studies with respective references
Location	<ul style="list-style-type: none"> <li>USA: 19 studies (Alexander et al., 2015; Calder Calisi, 2017; Chesak et al., 2015; Clemow et al., 2018; Duchemin et al., 2015; Klatt et al., 2015; Lebares et al., 2019; Loiselle, 2018; Luthar et al., 2017; Mealer et al., 2014; Mistretta et al., 2018; NCT02603133; Schroeder et al., 2016; Sood et al., 2011; Sood et al., 2014; Stetz et al., 2007; Tierney &amp; Lavelle, 1997; West et al., 2014; West et al., 2015)</li> <li>Germany: six studies (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)</li> <li>China: four studies (Cheung, 2014; Fei, 2019; Lin et al., 2019; NCT03645798)</li> <li>Australia: three studies (Ireland et al., 2017; Poulsen et al., 2015; Varker &amp; Devilly, 2012)</li> <li>Iran: three studies (Hosseinnejad et al., 2018; Khoshnazary et al., 2016; Mirzaeirad et al., 2019)</li> <li>UK: three studies (ISRCTN69644721; Medisaukaite &amp; Kamau, 2019; Wild, 2016)</li> <li>Canada: one study (Smith et al., 2019)</li> <li>The Netherlands: one study (Strijk et al., 2011)</li> <li>Israel: one study (Berger &amp; Gelkopf, 2011)</li> <li>Italy: one study (Villani et al., 2013)</li> <li>Poland: one study (Cieslak et al., 2016)</li> <li>Sri Lanka: one study (Gelkopf et al., 2008)</li> </ul>
Settings (venue or implementation sites of interventions)	<ul style="list-style-type: none"> <li>Clinics or specific hospital departments (e.g., Department of Radiology): 24 studies (Alexander et al., 2015; Berger &amp; Gelkopf, 2011; Bernburg et al., 2016; Calder Calisi, 2017; Chesak et al., 2015; Clemow et al., 2018; Duchemin et al., 2015; Fei, 2019; Klatt et al., 2015; Loiselle, 2018; Luthar et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mealer et al., 2014; Mirzaeirad et al., 2019; Mistretta et al., 2018; Poulsen et al., 2015; Schroeder et al., 2016; Sood et al., 2011; Sood et al., 2014; Strijk et al., 2011; Tierney &amp; Lavelle, 1997; West et al., 2014)</li> <li>Intervention site not further specified: 11 studies (Bernburg et al., 2019; Hosseinnejad et al., 2018; Ireland et al., 2017; Lebares et al., 2019; Lin et al., 2019; Mache et al., 2017; Medisaukaite &amp; Kamau, 2019; Smith et al., 2019; Varker &amp; Devilly, 2012; West et al., 2015; Wild, 2016)</li> <li>Online or mobile interventions with no concrete venue: four studies (Cieslak et al., 2016; NCT02603133; NCT03645798; Villani et al., 2013)</li> <li>Laboratory: one study (Stetz et al., 2007)</li> <li>Mixed settings (e.g., online training plus face-to-face sessions with implementation site not further specified): two studies (ISRCTN69644721; Khoshnazary et al., 2016)</li> <li>Other intervention sites: Chinese Auxiliary Medical Service (Cheung, 2014) and a non-governmental organization (Gelkopf et al., 2008)</li> </ul>

Key characteristics of included studies	Number of included studies with respective references
Participants - number randomized	<ul style="list-style-type: none"> <li>• 100 or more participants: 11 studies (Cheung, 2014; Cieslak et al., 2016; Fei, 2019; ISRCTN69644721; Lin et al., 2019; Medisauskaite &amp; Kamau, 2019; NCT02603133; NCT03645798; Strijk et al., 2011; West et al., 2015; Wild, 2016)</li> <li>• 30 participants or less: five studies (Lebares et al., 2019; Mealer et al., 2014; Smith et al., 2019; Sood et al., 2014; Villani et al., 2013)</li> </ul>
Participants - age	<ul style="list-style-type: none"> <li>• Three studies reporting only age range: included participants aged 27–60 years (Calder Calisi, 2017: 27–60 years; Hosseinnejad et al., 2018: 24–45 years; Khoshnazary et al., 2016: 24–55 years)</li> <li>• Three studies reporting alternative information on age: <ul style="list-style-type: none"> <li>○ Stetz et al. (2007): 60% of the sample to be under 30 years of age</li> <li>○ Mirzaeirad et al. (2019): 42 participants under 31 years of age and 28 participants aged 31 years and older</li> <li>○ Poulsen et al. (2015): participants between 25 and over 45 years of age</li> </ul> </li> <li>• Age of the sample not further specified or is unclear: eight studies (ISRCTN69644721; Klatt et al., 2015; Mealer et al., 2014; NCT02603133; NCT03645798; Tierney &amp; Lavelle, 1997; West et al., 2014; West et al., 2015) <ul style="list-style-type: none"> <li>○ Mealer et al. (2014): mean duration of practicing in intensive care unit of 5.35 years (<i>SD</i> 5.94)</li> <li>○ Tierney and Lavelle (1997): inclusion of staff nurses who had been employed between six months and 2.5 years at a hospital</li> </ul> </li> </ul>
Participants - gender	<ul style="list-style-type: none"> <li>• Women outnumbered men: in 23 studies (Alexander et al., 2015; Bernburg et al., 2016; Bernburg et al., 2019; Chesak et al., 2015; Cheung, 2014; Clemow et al., 2018; Duchemin et al., 2015; Hosseinnejad et al., 2018; Ireland, 2019; Khoshnazary et al., 2016; Lin et al., 2019; Loiselle, 2018; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mealer et al., 2014; Mirzaeirad et al., 2019; Mistretta et al., 2018; Poulsen et al., 2015; Schroeder et al., 2016; Smith et al., 2019; Strijk et al., 2011). Female participants were also in the majority in one study evaluating a resilience-training program in volunteers in the general population (Varker &amp; Devilly, 2012)</li> <li>• Male participants outnumbered women: five studies (Lebares et al., 2019; Medisauskaite &amp; Kamau, 2019; Sood et al., 2014; Stetz et al., 2007; West et al., 2014)</li> <li>• Only women: four studies (Berger &amp; Gelkopf, 2011; Calder Calisi, 2017; Luthar et al., 2017; Villani et al., 2013)</li> <li>• Comparable gender distribution across two arms: one study (Sood et al., 2011)</li> <li>• Gender unclear: six studies (Fei, 2019; Klatt et al., 2015; NCT02603133; NCT03645798; Tierney &amp; Lavelle, 1997; West et al., 2015). For example, Fei (2019) investigated nurses but did not indicate whether or not male nurses were also considered. The same applied to Tierney and Lavelle (1997).</li> <li>• Studies with mixed samples (four studies): <ul style="list-style-type: none"> <li>○ women outnumbered men: three studies (Cieslak et al., 2016; Gelkopf et al., 2008; Wild, 2016)</li> <li>○ gender unclear: one study (ISRCTN69644721)</li> </ul> </li> </ul>
Participants - target group	<ul style="list-style-type: none"> <li>• Nurses: 15 studies (Alexander et al., 2015; Berger &amp; Gelkopf, 2011; Bernburg et al., 2019; Calder Calisi, 2017; Chesak et al., 2015; Fei, 2019; Hosseinnejad et al., 2018; Khoshnazary et al., 2016; Lin et al., 2019; Mealer et al., 2014; Mirzaeirad et al., 2019; NCT03645798; Smith et al., 2019; Tierney &amp; Lavelle, 1997; Villani et al., 2013)</li> <li>• Physicians: 14 studies (Bernburg et al., 2016; Ireland et al., 2017; Lebares et al., 2019; Loiselle, 2018; Luthar et al., 2017; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015;</li> </ul>

Key characteristics of included studies	Number of included studies with respective references
Participants - mental health assessment at baseline	<p>Medisauskaite &amp; Kamau, 2019; Schroeder et al., 2016; Sood et al., 2011; West et al., 2014; West et al., 2015)</p> <ul style="list-style-type: none"> <li>• Hospital personnel (e.g., physicians and other hospital personnel): eight studies (Clemow et al., 2018; Duchemin et al., 2015; Klatt et al., 2015; Mistretta et al., 2018; NCT02603133; Poulsen et al., 2015; Sood et al., 2014; Strijk et al., 2011)</li> <li>• General medical personnel (e.g., military medical personnel): two studies (Cheung, 2014; Stetz et al., 2007)</li> <li>• Studies with mixed samples (four studies): <ul style="list-style-type: none"> <li>○ that is, healthcare professionals combined with other individuals such as ambulance personnel and other emergency services including the police (Cieslak et al., 2016; Gelkopf et al., 2008; ISRCTN69644721; Wild, 2016)</li> <li>○ Relevant subgroups within these studies: health service professionals (Cieslak et al., 2016); mental health workers (Gelkopf et al., 2008) and ambulance service personnel (ISRCTN69644721; Wild, 2016)</li> </ul> </li> <li>• General population: one study (Varker &amp; Devilly, 2012, proof of concept study); considered for this review as resilience intervention was developed for emergency services personnel</li> <li>• Mental health assessment at baseline: 29 studies (Alexander et al., 2015; Berger &amp; Gelkopf, 2011; Calder Calisi, 2017; Chesak et al., 2015; Cheung, 2014; Cieslak et al., 2016; Clemow et al., 2018; Duchemin et al., 2015; Ireland et al., 2017; ISRCTN69644721; Lebares et al., 2019; Loiselle, 2018; Luthar et al., 2017; Mache et al., 2017; Mealer et al., 2014; Medisauskaite &amp; Kamau, 2019; Mistretta et al., 2018; NCT02603133; NCT03645798; Schroeder et al., 2016; Smith et al., 2019; Sood et al., 2011; Sood et al., 2014; Stetz et al., 2007; Varker &amp; Devilly, 2012; Villani et al., 2013; West et al., 2014; West et al., 2015; Wild, 2016)</li> <li>• All studies measuring mental health used self-report (screening) measures covering one or a small number of mental dysfunctions (e.g., Beck Depression Inventory [BDI]), e.g., Luthar et al. (2017); Post-Traumatic Stress Disorder Checklist [PCL], e.g., Stetz et al. (2007); Depression Anxiety and Stress Scales-21 [DASS-21], e.g., Mistretta et al. (2018); Maslach Burnout Inventory [MBI], e.g., West et al. (2014); General Anxiety Disorder-7 [GAD-7], e.g., Chesak et al. (2015); General Health Questionnaire-28 [GHQ-28], Cheung (2014)).</li> <li>• None of the studies conducted comprehensive baseline diagnostics by the use of a structured interview (e.g., Mini-International Neuropsychiatric Interview; MINI).</li> <li>• No data about the mental health status of the sample: 15 studies (Bernburg et al., 2016; Bernburg et al., 2019; Fei, 2019; Gelkopf et al., 2008; Hosseinnajad et al., 2018; Khoshnazary et al., 2016; Klatt et al., 2015; Lin et al., 2019; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mirzaeirad et al., 2019; Poulsen et al., 2015; Strijk et al., 2011; Tierney &amp; Lavelle, 1997)</li> <li>• Unclear mental health status despite baseline assessment: three unpublished trials (ISRCTN69644721; NCT02603133; NCT03645798) and one study published as conference abstract (Smith et al., 2019)</li> <li>• Eligibility criteria concerning mental health: <ul style="list-style-type: none"> <li>○ Five studies: only mentally healthy participants (Chesak et al., 2015; Cheung, 2014; Sood et al., 2011; Sood et al., 2014) or participants showing symptoms below a cut-off on a screening instrument (Stetz et al., 2007)</li> <li>○ Lin et al. (2019) (no mental health assessment specified) did not consider participants taking mood-modulating drugs</li> </ul> </li> </ul>

Key characteristics of included studies	Number of included studies with respective references
	<ul style="list-style-type: none"> <li>○ For Mirzaeirad et al. (2019), the lack of mental stress (not further specified) was an inclusion criterion</li> </ul>
Intervention - setting	<ul style="list-style-type: none"> <li>• Group setting: 30 studies (Alexander et al., 2015; Berger &amp; Gelkopf, 2011; Bernburg et al., 2016; Bernburg et al., 2019; Chesak et al., 2015; Cheung, 2014; Clemow et al., 2018; Duchemin et al., 2015; Fei, 2019; Gelkopf et al., 2008; Hosseinnejad et al., 2018; Ireland et al., 2017; Klatt et al., 2015; Lebares et al., 2019; Lin et al., 2019; Luthar et al., 2017; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mirzaeirad et al., 2019; Mistretta et al., 2018; Poulsen et al., 2015; Schroeder et al., 2016; Smith et al., 2019; Tierney &amp; Lavelle, 1997; Varker &amp; Devilly, 2012; West et al., 2014; West et al., 2015; Wild, 2016)</li> <li>• Variety of training settings: eight studies (Calder Calisi, 2017; ISRCTN69644721; Khoshnazary et al., 2016; Loiselle, 2018; Mealer et al., 2014; NCT03645798; Sood et al., 2014; Strijk et al., 2011)</li> <li>• Individual-setting interventions: four studies (Cieslak et al., 2016; Sood et al., 2011; Stetz et al., 2007; Villani et al., 2013)</li> <li>• Unclear setting: two studies (Medisaukaite &amp; Kamau, 2019; NCT02603133)</li> </ul>
Intervention - delivery format	<ul style="list-style-type: none"> <li>• Face-to-face: 29 studies (Alexander et al., 2015; Berger &amp; Gelkopf, 2011; Bernburg et al., 2016; Bernburg et al., 2019; Calder Calisi, 2017; Cheung, 2014; Clemow et al., 2018; Fei, 2019; Gelkopf et al., 2008; Hosseinnejad et al., 2018; Ireland et al., 2017; Klatt et al., 2015; Lebares et al., 2019; Loiselle, 2018; Luthar et al., 2017; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mirzaeirad et al., 2019; Poulsen et al., 2015; Schroeder et al., 2016; Sood et al., 2011; Strijk et al., 2011; Tierney &amp; Lavelle, 1997; Varker &amp; Devilly, 2012; West et al., 2014; West et al., 2015; Wild, 2016)</li> <li>• Multimodal delivery: 10 studies (e.g., web-based intervention and daily diary; Chesak et al., 2015; Cieslak et al., 2016; Duchemin et al., 2015; ISRCTN69644721; Khoshnazary et al., 2016; Lin et al., 2019; Mealer et al., 2014; Mistretta et al., 2018; Smith et al., 2019; Sood et al., 2014)</li> <li>• Online or mobile-based: three studies (NCT02603133; NCT03645798; Villani et al., 2013)</li> <li>• Laboratory setting and unlikely with face-to-face contact: one study (Stetz et al., 2007)</li> <li>• Unclear delivery format: one study (Medisaukaite &amp; Kamau, 2019)</li> </ul>
Intervention - training intensity	<ul style="list-style-type: none"> <li>• High intensity (i.e., &gt; 12 hours or &gt; 12 sessions): 18 studies (Berger &amp; Gelkopf, 2011; Bernburg et al., 2016; Bernburg et al., 2019; Calder Calisi, 2017; Gelkopf et al., 2008; Lebares et al., 2019; 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; NCT03645798; Schroeder et al., 2016; Smith et al., 2019; Strijk et al., 2011; West et al., 2014; Wild, 2016)</li> <li>• Moderate intensity (i.e., &gt; 5 to ≤ 12 hours or &gt; three to ≤ 12 sessions): 15 studies (Cheung, 2014; Cieslak et al., 2016; Clemow et al., 2018; Duchemin et al., 2015; Fei, 2019; Hosseinnejad et al., 2018; Ireland et al., 2017; ISRCTN69644721; Klatt et al., 2015; Loiselle, 2018; Luthar et al., 2017; Mistretta et al., 2018; Poulsen et al., 2015; Tierney &amp; Lavelle, 1997; West et al., 2015)</li> <li>• Low intensity (i.e., ≤ 5 hours or ≤ three sessions in total): seven studies (Chesak et al., 2015; NCT02603133; Sood et al., 2011; Sood et al., 2014; Stetz et al., 2007; Varker &amp; Devilly, 2012; Villani et al., 2013)</li> <li>• Unclear training intensity: four studies (Alexander et al., 2015; Khoshnazary et al., 2016; Medisaukaite &amp; Kamau, 2019; Mirzaeirad et al., 2019)</li> </ul>
Intervention - theoretical foundation	Interventions categorized into eight groups, based on their content and the descriptions provided by the study authors;

Key characteristics of included studies	Number of included studies with respective references
	see Digital Appendix D11
Comparator	<ul style="list-style-type: none"> <li>• No intervention control: 14 studies (Bernburg et al., 2016; Fei, 2019; Luthar et al., 2017; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mealer et al., 2009; Medisauskaite &amp; Kamau, 2019; Mistretta et al., 2018; Smith et al., 2019; Stetz et al., 2007; Tierney &amp; Lavelle, 1997; West et al., 2014)</li> <li>• Wait-list control: 13 studies (Berger &amp; Gelkopf, 2011; Bernburg et al., 2019; Calder Calisi, 2017; Cheung, 2014; Duchemin et al., 2015; ISRCTN69644721; Klatt et al., 2015; Lin et al., 2019; Loiselle, 2018; Schroeder et al., 2016; Sood et al., 2011; Sood et al., 2014; West et al., 2015)</li> <li>• Active control: six studies (Chesak et al., 2015; Gelkopf et al., 2008; Ireland et al., 2017; Poulsen et al., 2015; Strijk et al., 2011; Wild, 2016)</li> <li>• Attention control: four studies (Cieslak et al., 2016; Lebares et al., 2019; Varker &amp; Devilly, 2012; Villani et al., 2013)</li> <li>• TAU: four studies (Alexander et al., 2015; Clemow et al., 2018; Hosseinnejad et al., 2018; NCT03645798)</li> <li>• Control group not further specified: two studies (Khoshnazary et al., 2016; Mirzaeirad et al., 2019)</li> <li>• For NCT02603133 : number of control groups and whether the study only included a wait-list control or also an active control (see lecture on safety culture) unclear</li> </ul>
Funding sources	<ul style="list-style-type: none"> <li>• Different hospitals or hospital grants (e.g., Mayo Clinic): five studies (Calder Calisi, 2017; Poulsen et al., 2015; Smith et al., 2019; Sood et al., 2011; West et al., 2014)</li> <li>• Universities (e.g., certain faculties) and university research funds: five studies (Alexander et al., 2015; Hosseinnejad et al., 2018; Klatt et al., 2015; Medisauskaite &amp; Kamau, 2019; NCT03645798)</li> <li>• National Institutes of Health (NIH): two studies (Clemow et al., 2018; Mealer et al., 2014)</li> <li>• Ministries: two studies (Berger &amp; Gelkopf, 2011; Cieslak et al., 2016)</li> <li>• Different foundations: two studies (Gelkopf et al., 2008; Strijk et al., 2011)</li> <li>• State/regional and city initiatives for healthcare: two studies (Lin et al., 2019; Schroeder et al., 2016)</li> <li>• US army: one study (Stetz et al., 2007)</li> <li>• Research grants (e.g., for student research): one study (Cheung, 2014)</li> <li>• Research programs (e.g., specifically for resilience): one study (Duchemin et al., 2015)</li> <li>• Combination of funding sources (e.g., university and national institute, hospital grant and gift, university and charity, hospital funds and EU grant Horizon 2020, NIH and foundations, hospital and university): seven studies (ISRCTN69644721; Lebares et al., 2019; Luthar et al., 2017; Mistretta et al., 2018; NCT02603133; Sood et al., 2014; Wild, 2016)</li> <li>• Funding sources not specified: 15 studies (Bernburg et al., 2019; Chesak et al., 2015; Fei, 2019; Ireland et al., 2017; Khoshnazary et al., 2016; Loiselle, 2018; Mache et al., 2017; Mache et al., 2016; Mache, Danzer, et al., 2015; Mache, Vitzthum, et al., 2015; Mirzaeirad et al., 2019; Tierney &amp; Lavelle, 1997; Varker &amp; Devilly, 2012; Villani et al., 2013) or could not be retrieved from the available information (e.g., conference abstract; West et al., 2015)</li> <li>• No funding support: one study (Bernburg et al., 2016)</li> </ul>

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