

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

**Appendix D18 Glossary**

**Glossary of relevant terms in this review** (in part based on the glossary of the Cochrane Community; Cochrane Community, 2020)

**Acceptance and Commitment Therapy:** form of psychotherapy (third wave of cognitive behavior therapy) that uses acceptance and mindfulness strategies (e.g., being in contact with present moment) and commitment and behavior-change skills (e.g., values, committed action) in order to increase psychological flexibility

**Active control (in this review):** alternative treatment (no standard care; for example, treatment developed specifically for the treatment study) that does not control for the amount of time and attention in the intervention group, and is not attention control in a narrow sense

**Adverse event:** an adverse outcome that occurs during or after the use of an intervention but is not necessarily caused by it

**Allied healthcare professionals:** healthcare staff working in allied health professions distinct from medical care (e.g., psychologists, social workers, counsellors, physical therapists, occupational therapists, speech therapists, medical assistants, medical technicians)

**Arm (e.g., intervention arm, control arm):** group of participants allocated to the intervention or control group

**Attention and Interpretation Therapy:** mindfulness-based approach to reduce stress and increase resilience that teaches to delay judgements and to focus the attention on the novelty of the world as well as higher-order principles (e.g., acceptance, gratitude)

**Attention control:** alternative treatment in the control group that mimics the amount of time and attention received (e.g., by the trainer) in the intervention group

**Attrition:** loss of participants during the course of a study (also referred to as loss to follow-up)

**Attrition bias:** systematic differences between comparison groups in withdrawals or exclusions of participants from the results of a study (e.g., number or reasons, or both)

**Available-case analysis:** analysis in which data are analyzed for every participant for whom the outcome was obtained; subset may be defined after considering exposure to treatment, availability of measurements

**Baseline characteristics:** values of demographic, clinical, and other variables collected for each participant at the beginning of a study, before the intervention is administered

**Baseline comparability:** data on the potential (statistical) differences between the study groups in baseline characteristics

**Bias:** a systematic error or deviation in results or inferences from the truth

**Bibliotherapy:** resilience intervention is delivered via a self-help book/self-help materials

**Blinding:** process of preventing those involved in a trial from knowing to which comparison group a particular participant belongs. The risk of bias is minimized when as few people as possible know who is receiving the experimental intervention and who the control intervention. Participants, outcome assessors, and analysts are all candidates for being blinded

**Cluster-randomized trial:** a trial in which clusters of individuals (e.g., clinics, geographical areas), rather than individuals themselves, are randomized to different arms

**Coaching:** resilience intervention uses a coaching approach (e.g., executive coaching, life coaching); individual problems of one or several clients are discussed with a coach; coaching approaches often include goal setting

**Cochrane Handbook for Systematic Reviews of Interventions (formerly Cochrane Reviewers' Handbook):** document containing guidance and advice on how to prepare and maintain Cochrane reviews

**Cognitive-Behavioral Therapy/training (CBT):** form of psychotherapy that is based on the assumption that mental health problems (e.g., depression) result from dysfunctional thinking and therefore aims to modify cognitive processes (e.g., identify and challenge dysfunctional thoughts in order to find functional ones)

**Combined setting:** resilience interventions delivered as combination of group and individual setting

**Combined theoretical foundation/combination:** resilience interventions that are based on two or more explicit theoretical foundations, such as CBT and ACT or CBT and mindfulness

**Comorbidity:** presence of one or more diseases or conditions other than those of primary interest

**Concealment of allocation:** process used to ensure that the person deciding to enter a participant into a randomized controlled trial does not know the comparison group into which that individual will be allocated. This is distinct from blinding, and is aimed at preventing selection bias. Some attempts at concealing allocation are more prone to manipulation than others, and the method of allocation concealment is used as an assessment of the quality of a trial

**Conference abstract:** short summary of presentations at conferences, which may be published

**Confidence interval:** a measure of the uncertainty around the main finding of a statistical analysis. Estimates of an effect, such as the standardized mean difference comparing an experimental intervention with a control, are usually presented as a point estimate and a 95% confidence interval. This means that if someone were to keep repeating a study in other samples from the same population, 95% of the confidence intervals from those studies would contain the true value of the unknown quantity. Wider intervals indicate lower precision; narrow intervals, greater precision

**Conflict of interest:** personal, financial, or other interests that could have influenced a person's contributions to a study

**Control group/control:** comparison group that receives no intervention, identical training after waiting period or an alternative intervention

**Degrees of freedom:** concept that refers to the number of independent contributions to a sampling distribution (such as Chi2 distribution)

**Detection bias:** systematic difference between comparison groups in how outcomes are ascertained, diagnosed, or verified

**Dichotomous data:** data that can take one of two possible values, such as depressive/non-depressive (depending on cut-off for clinically relevant mental disorder)

**Effect size (ES):** 1. generic term for the estimate of effect of treatment for a study; 2. dimensionless measure of effect used for continuous data when different scales (e.g., for measuring resilience) are used to measure an outcome

**Estimate of effect:** observed relationship between an intervention and an outcome expressed as standardized mean difference in this review

**Face-to-face:** resilience intervention delivered via face-to-face contact between trainer and one or several participants

**F test:** statistical hypothesis test derived from the F distribution; typically used to compare continuous data between more than two groups

**False positive:** a falsely drawn positive conclusion

**Fixed-effect model (in meta-analysis):** model that calculates a pooled effect estimate using the assumption that all observed variation between studies is caused by the play of chance; studies assumed to be measuring the same overall effect

**Follow-up:** observation over a period of time of study/trial participants to measure outcomes under investigation; in this review: short-term:  $\leq 3$  months; medium-term:  $> 3$  to  $\leq 6$  months; and long-term follow-up:  $> 6$  months

**Forest plot:** graphical representation of the individual results of each study included in a meta-analysis together with the combined meta-analysis result; plot also allows readers to see the heterogeneity among the results of the studies. The results of individual studies are shown as squares centered on each study's point estimate. A horizontal line runs through each square to show each study's confidence interval (in this review: 95% confidence interval). The overall estimate from the meta-analysis and its confidence interval are shown at the bottom, represented as a diamond. The center of the diamond represents the pooled point estimate, and its horizontal tips represent the confidence interval.

**Funnel plot:** graphical display of some measure of study precision plotted against effect size that can be used to investigate whether there is a link between study size and treatment effect; one possible cause of an observed association is reporting bias

**Grey literature:** kind of material that is not published in easily accessible journals or databases (e.g., conference proceedings that include the abstracts of the research presented at conferences, unpublished theses, etc.)

**Group setting:** resilience intervention delivered in group of several participants

**Hardiness:** a (modifiable) personality characteristic ('a hardy person') that consists of three elements (challenge, commitment, and control); partly used as synonym of resilience; in this review, hardiness is viewed as one of several resilience factors which partially determines resilience as outcome

**Healthcare professionals:** healthcare staff delivering direct medical care (e.g., nurses, physicians, hospital personnel)

**Heterogeneity:** 1. used in a general sense to describe the variation in, or diversity of, participants, interventions, and measurement of outcomes across a set of studies; 2. used specifically, as statistical heterogeneity, to describe the degree of variation in the effect estimates from a set of studies

**Heterogeneous:** used to describe a set of studies or participants with sizeable heterogeneity

**Homogeneous:** 1. used in a general sense to mean that the participants, interventions, and measurement of outcomes are similar across a set of studies; 2. used specifically to describe the effect estimates from a set of studies where they do not vary more than would be expected by chance

**Individual setting:** resilience interventions delivered in one-on-one setting

**Intention-to-treat analysis:** a strategy for analyzing data from a randomized controlled trial; all participants are included in the arm to which they were allocated, whether or not they received (or completed) the intervention given to that arm. Intention-to-treat analysis prevents bias caused by the loss of participants, which may disrupt the baseline equivalence established by randomization and which may reflect non-adherence to the protocol

**Inter-rater reliability:** degree of stability exhibited when a measurement is repeated under identical conditions by different raters; reliability refers to the degree to which the results obtained by a measurement procedure can be replicated. Lack of inter-rater reliability may arise from divergences between observers or instability of the attribute being measured

**Interaction:** situation in which the effect of one independent variable on the outcome is affected by the value of a second independent variable

**Intervention:** the process of intervening on people in an experimental study (in this review: by resilience-training programs)

**Intervention group:** a group of participants in a study receiving a particular intervention (in this review: resilience intervention)

**Laboratory delivery:** resilience intervention is provided in the laboratory (under standardized conditions)

**Mean:** an average value, calculated by adding all the observations and dividing by the number of observations

**Mean difference:** difference between two estimated means (e.g., used in this review to present the results for single studies that could not be combined in meta-analysis together with other studies)

**MeSH headings (Medical Subject Headings):** terms used by the United States National Library of Medicine to index articles in Index

**Medicus and MEDLINE.** The MeSH system has a tree structure in which broad subject terms branch into a series of progressively narrower subject terms.

**Meta-analysis:** use of statistical techniques in a systematic review to integrate the results of included studies

**Mindfulness-based training:** intervention that aims to foster mindfulness (i.e., non-judging awareness of the present moment and its accompanying mental phenomena, like body sensations, thoughts, and emotions), by teaching formal and informal mindfulness practices (e.g., body scan, breathing awareness) (e.g., mindfulness-based stress reduction, MBSR)

**Mixed samples:** studies with samples including healthcare professionals and participants from the non-healthcare sector (e.g., ambulance personnel and firefighters)

**Multimodal delivery:** intervention is delivered by a combination of different formats (e.g., face-to-face and online)

**No intervention control:** control group that received no intervention

**Online- or mobile-based delivery:** resilience intervention is delivered online/internet-based or via smartphones (e.g., smartphone application)

**Outcome:** a component of a participant's clinical and functional status after an intervention has been applied, which is used to assess the effectiveness of an intervention

**p value:** the probability (ranging from zero to one) that the results observed in a study (or results more extreme) could have occurred by chance if in reality the null hypothesis was true. In a meta-analysis, the P value for the overall effect assesses the overall statistical significance of the difference between the intervention groups, whilst the P value for the heterogeneity statistic assesses the statistical significance of differences between the effects observed in each study.

**Parallel group trial:** a trial that compares two groups of people concurrently, one of which receives the intervention of interest and one of which is a control group; some parallel trials have more than two comparison groups

**Participant:** an individual who is studied in a trial

**Per-protocol analysis:** an analysis of the subset of participants from a randomized controlled trial who completed the trial or complied with the protocol sufficiently (e.g., specific dose of treatment) to ensure that their data would be likely to exhibit the effect of treatment; this subset may be defined after considering exposure to treatment and absence of major protocol violations. The per-protocol analysis strategy may be subject to bias as the reasons for non-compliance may be related to treatment.

**Performance bias:** systematic differences between intervention groups in care provided apart from the intervention being evaluated; for example, if participants know they are in the control group, they might act differently, and if intervention providers are aware of the group a particular participant is in, they might act differently. Blinding of study participants (both the recipients and providers of intervention) is used to protect against performance bias.

**Positive psychology:** scientific study of character strengths and positive aspects of human life (e.g., happiness) that allow individuals to thrive; interventions based on positive psychology aim to foster these factors

**Posttraumatic growth (also stress-related growth):** often used synonymously with resilience; however, in contrast to resilience (i.e., maintaining or restoring mental health after a stressor), posttraumatic or stress-related growth refers to increasing the level of functioning compared to that prior to the stressor

**Posttest/postintervention:** the assessment immediately after the end of treatment (in this review: within one week after the end of training)

**Precision:** a measure of the likelihood of random errors in the results of the meta-analysis; the greater the precision, the less random error. Confidence intervals around the estimate of effect from each study are one way of expressing precision, with a narrower confidence interval meaning more precision.

**Primary outcome:** the outcome of greatest importance

**Primary study:** 'original research' in which data are collected

**Problem-solving training:** closely related to CBT; training based on problem-solving theory (e.g., to foster a positive problem orientation and to teach structured problem-solving)

**Random allocation:** method that uses the play of chance to assign participants to comparison groups in a trial, e.g., by using a random numbers table or a computer-generated random sequence. Random allocation implies that each individual or unit being entered into a trial has the same chance of receiving each of the possible interventions. It also implies that the probability that an individual will receive a particular intervention is independent of the probability that any other individual will receive the same intervention.

**Random-effects model (in meta-analysis):** a statistical model in which both within-study sampling error (variance) and between-studies variation are included in the assessment of the uncertainty (confidence interval) of the results of a meta-analysis; when there is heterogeneity among the results of the included studies beyond chance, random-effects models will give wider confidence intervals than fixed-effect models

**Randomization:** the process of randomly allocating participants into one of the arms of a controlled trial. There are two components to randomization: the generation of a random sequence; and its implementation, ideally in a way so that those entering participants into a study are not aware of the sequence (concealment of allocation).

**Randomized controlled trial:** study in which two or more conditions, possibly including a control intervention or no intervention, are compared by being randomly allocated to participants

**Reporting bias:** bias caused by only a subset of all the relevant data being available. The publication of research can depend on the nature and direction of the study results. Studies in which an intervention is not found to be effective are sometimes not published. In addition, a published report might present a biased set of results (e.g., only outcomes or subgroups where a statistically significant difference was found).

**Resilience:** maintenance or fast recovery of mental health during or after substantial adversities; different definitions exist, however, there is a consensus about two essentials: 1. exposure to substantial stressors or adversities; 2. successful coping with these adversities

**Resilience factor:** psychological or social factors associated to resilience, e.g., optimism

**Search strategy:** 1. the methods used to identify trials within the review's scope (including searching electronic databases, trial registers, personal contact with researchers/study authors, and checking reference lists); 2. the combination of terms used to identify studies in an electronic database such as MEDLINE

**Secondary outcome:** an outcome used to evaluate additional effects of the intervention deemed a priori as being less important than the primary outcomes

**Selection bias:** systematic differences between comparison groups in prognosis or responsiveness to treatment; random allocation with adequate concealment of allocation protects against selection bias. Other means of selecting who receives the intervention are more prone to bias because decisions may be related to prognosis or responsiveness to treatment

**Sensitivity analysis:** analysis used to determine how sensitive the results of the systematic review are to changes in how it was done; sensitivity analyses are used to assess how robust the results are to uncertain decisions or assumptions about the data and the methods that were used.

**Single blind:** single masked

**Standard deviation:** measure of the spread or dispersion of a set of observations, calculated as the average difference from the mean value in the sample

**Standard error:** standard deviation of the sampling distribution of a statistic; measurements taken from a sample of the population will vary from sample to sample. The standard error is a measure of the variation in the sample statistic over all possible samples of the same size. The standard error decreases as the sample size increases.

**Standardized mean difference:** difference between two estimated means divided by an estimate of the standard deviation; used to combine results from studies using different ways of measuring the same concept, e.g., resilience or mental health. By expressing the effects as a standardized value, the results can be combined since they have no units.

**Stress inoculation:** form of CBT; psychotherapeutic method to prepare participants to deal with stressors successfully and to achieve coping strategies by exposing them to milder forms of stress

**Subgroup analysis:** an analysis in which the intervention effect is evaluated in a defined subset of the participants/interventions in a trial, or in complementary subsets, such as by intervention setting or delivery format

**Telephone delivery:** resilience intervention that are provided via the telephone (e.g., calls between trainer and participant)

**Training intensity:** intensity of intervention as indicated by the number of sessions or the number of hours (i.e., duration); in this review: low intensity: total duration of  $\leq 5$  hours or  $\leq$  three sessions; moderate intensity:  $> 5$  hours to  $\leq 12$  hours or  $> 3$  to  $\leq 12$  sessions; high intensity:  $> 12$  hours or  $> 12$  sessions

**Treatment as usual (TAU):** the control group receives an (established) standard treatment (synonyms: standard care, usual care)

**t test:** a statistical hypothesis test derived from the t distribution; used to compare continuous data in two groups

**Trialist:** refers to a person conducting or publishing a controlled trial

**Type I error (also false positive):** conclusion that a treatment works, when it actually does not work; the risk of a Type I error is often called alpha. In a statistical test, it describes the chance of rejecting the null hypothesis when it is in fact true.

**Unspecific theoretical foundation/unspecific training programs:** resilience interventions fostering one or several resilience factors but without specifying any explicit theoretical foundation or where the underlying framework cannot be assigned to a certain theoretical approach

**Unspecified/not specified setting, delivery, training intensity, or comparator:** no information on the respective intervention characteristic or the comparator are available and could not be received by the study authors

**Variable:** a factor that differs among and between groups of people, e.g., patient characteristics such as age, sex, and smoking, or measurements such as blood pressure or depression score; there can also be treatment or condition variables (e.g., length of treatment dose) and outcome variables

**Wait-list control:** control group receiving the training after a waiting period



## References

Cochrane Community. (2020). *Glossary*. Retrieved July 26, 2020, from  
<https://community.cochrane.org/glossary>