TECHNICAL COMMENTARY

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POST-TRAUMATIC STRESS DISORDER LIBRARY

Telemental health

Introduction

There is a growing need to deliver low-cost treatments tailored to individual needs and delivered in a continuous way from any location. Telemental health (or "ehealth") has the potential to meet this need. Telemental health refers to any mental health treatment that is provided electronically, either by telephone or internet (such as online health programs, or video conferencing). This type of intervention involves structured counselling and generally aims to increase medication adherence and prevent relapse. Importantly, it also removes geographic barriers to care. This table includes smart apps for PTSD and all distance-delivered interventions. Please also see the individual therapy tables for additional information.

Method

We have included only systematic reviews (systematic literature search, detailed methodology with inclusion/exclusion criteria) published in full text, in English, from the year 2010 that report results separately for people with PTSD. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. When multiple copies of review topics were found, only the most recent and comprehensive version was included. We prioritised reviews with pooled data for inclusion.

Review reporting assessment was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist that describes a preferred way to present a meta-analysis[1]. Reviews with less than 50% of items checked have been excluded from the library. Note that early reviews may have been guided by less stringent reporting checklists than the PRISMA, and that some reviews may have been limited by journal guidelines.

Evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach where high quality evidence such as that gained from randomised controlled trials (RCTs) may be downgraded to moderate or low if review and study quality is limited, if there is inconsistency in results, indirect comparisons, imprecise or sparse data and high probability of reporting bias. It may also be downgraded if risks associated with the intervention or other matter under review are high. Conversely, low quality evidence such as that gained from observational studies may be upgraded if effect sizes are large or if there is a dose dependent response. We have also taken into account sample size and whether results are consistent, precise and direct with low associated risks (see end of table for an explanation of these terms)[2]. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

Results

We found three systematic reviews that met our inclusion criteria[3-5].

- Moderate quality evidence found medium-sized improvements in PTSD and depression symptoms and functioning pre-post treatment with distance-delivered interventions (mostly CBT), which was maintained for up to 12 months post-treatment. PTSD, depression, and functioning were also improved post-treatment with distance-delivered interventions compared to waitlist controls. Compared to face-to-face interventions (mostly CBT), there were no differences in PTSD symptoms post-treatment, but face-to-face interventions performed better than distance-delivered interventions at 3-6 months follow-up. Depression symptoms improved more with face-to-face interventions immediately post-treatment but not at follow-up.
- Moderate to high quality evidence found a medium-sized improvement in PTSD and

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

depression symptoms with smartphone-based apps pre-post treatment. When compared to waitlist controls, there were no significant differences in PTSD symptoms.

- Moderate quality evidence found the following apps were rated in the top quartile of the Mobile App Rating Scale (>3.73 total score, in descending order of quality rating): PTSD Family Coach, CoachPTBS, Together Strong, PTSD Coach, Mood Coach, STAIR Coach, VetChange, PE Coach2, Trauma Recovery, Reachout My Support Network, DoD Safe Helpline, Elevatr - Therapists & Peers, PTSD Coach Australia, Youper - Anxiety & Depression, Living Well, PTSD Test, T2 Mood Tracker, Quiet Relaxation & Wellness, and CPT Coach.

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

Goreis A, Felnhofer A, Kafka JX, Probst T, Kothgassner OD

Efficacy of Self-Management Smartphone-Based Apps for Post-traumatic Stress Disorder Symptoms: A Systematic Review and Meta-Analysis

Frontiers in Neuroscience 2020; 14

View review abstract online

Comparison	**Efficacy of smartphone-based apps for PTSD symptoms pre-post treatments and vs. waitlist controls.** **Five studies used the PTSD Coach app, one study used multiple apps (LifeArmor, PE Coach, Eventful, Positive Activity Jackpot, Tactical Breather, Daily Yoga, Simple Yoga).**
Summary of evidence	**Moderate to high quality evidence (small samples, consistent, precise, direct) found medium-sized improvements in PTSD and depression symptoms with smartphone-based apps pre-post treatment. When compared to waitlist controls, there were no significant differences in PTSD symptoms.**

PTSD symptoms

Medium-sized effects showed smartphone-based apps improved PTSD and depression symptoms pre-post treatment;

PTSD: 6 studies, N = 209, g = 0.55, 95%CI 0.29 to 0.80, $p < 0.001$, I^2 = 31%

Depression: 5 studies, N = 184, g = 0.45, 95%CI 0.24 to 0.65, $p < 0.001$, I^2 = 1%

There were no significant differences between smartphone-based apps and waitlist controls;

2 studies, N = 169, g = 0.09, 95%CI -0.22 to 0.39, p = 0.574, I^2 = 0%

However, the post-treatment mean effect size in the app group was larger than in the waitlist group g = 0.79 vs. 0.47.

There was no moderating effect of treatment duration.

Consistency in results‡	Consistent
Precision in results§	Precise
Directness of results‖	Direct

Olthuis JV, Wozney L, Asmundson GJ, Cramm H, Lingley-Pottie P, McGrath PJ

Distance-delivered interventions for PTSD: A systematic review and meta-

analysis

Journal of Anxiety Disorders 2016; 44: 9-26

View review abstract online

Comparison	**Distance-delivered interventions (telephone, internet, videoconferencing, mail) pre-post treatment and vs. waitlist/no treatment and face-face treatments.**
Summary of evidence	**Moderate quality evidence (medium-large samples, some inconsistency, mostly precise, indirect) found medium-sized improvements in PTSD and depression symptoms and functioning pre-post treatment with distance-delivered interventions (mostly CBT), which was maintained for up to 12 months post-treatment. PTSD, depression, and functioning were also improved post-treatment with distance-delivered interventions compared to waitlist controls. Compared to face-to-face interventions (mostly CBT), there were no differences in PTSD symptoms post-treatment, but face-to-face interventions performed better than distance-delivered interventions at 3-6 months follow-up. Depression symptoms improved more with face-to-face interventions immediately post-treatment but not at follow-up.**

PTSD symptoms

Medium-sized effects showed improved PTSD and depression symptoms and functioning pre-post treatment with distance-delivered interventions (mostly CBT);

PTSD post-treatment: 18 studies, N = 1,440, *g* = 0.81, 95%CI 0.65 to 0.97, *p* < 0.001, I^2 = 63%

PTSD 3-6 months follow-up: 11 studies, N = 1,145, *g* = 0.78, 95%CI 0.59 to 0.97, I^2 = 62%

PTSD 7-12 months follow-up: 3 studies, N = 141, *g* = 0.75, 95%CI 0.25 to 1.26, I^2 = 84%

Depression post-treatment: 15 studies, N = 1,189, *g* = 0.66, 95%CI 0.56 to 0.77, Q*p* = 0.40

Depression 3-6 months follow-up: 9 studies, N = 894, *g* = 0.58, 95%CI 0.40 to 0.77, I^2 = 55%

Depression 7-12 months follow-up: 3 studies, N = 141, *g* = 0.49, 95%CI 0.17 to 0.82, Q*p* = 0.05

Functioning post-treatment: 5 studies, N = 401, *g* = 0.52, 95%CI 0.33 to 0.71, Q*p* = 0.23

Functioning 3-6 months follow-up: 3 studies, N = 283, *g* = 0.49, 95%CI 0.34 to 0.63, Q*p* = 0.46

Medium-sized effects showed improved PTSD and depression symptoms and functioning post treatment with distance-delivered interventions (mostly CBT) compared to waitlist controls;

PTSD post-treatment: 6 studies, N = 460, *g* = 0.68, 95%CI 0.51 to 0.86, I^2 = 61%

Depression post-treatment: 6 studies, N = 460, *g* = 0.62, 95%CI 0.36 to 0.88, I^2 = 83%

Functioning post-treatment: 4 studies, N = 321, *g* = 0.42, 95%CI 0.01 to 0.84, I^2 = 91%

There were no differences in PTSD symptoms post-treatment between distance-delivered and face-

to-face interventions (mostly CBT), although face-to-face interventions were better than distance-delivered interventions at follow-up; PTSD post-treatment: 7 studies, N = 703, *g* = -0.05, 95%CI -0.31 to 0.20, I^2 = 79% PTSD 3-6 months follow-up: 5 studies, N = 611, *g* = -0.25, 95%CI -0.44 to -0.07, Q*p* = 0.94 *Depression symptoms showed greater improvement with face-to-face interventions (mostly CBT), post-treatment but not at follow-up;* Depression post-treatment: 5 studies, N = 452, *g* = -0.22, 95%CI -0.31 to -0.14, Q*p* = 0.67 Depression 3-6 months follow-up: *g* = 0.27, 95%CI -0.82 to 1.37, I^2 = 98%

Consistency in results	Some inconsistency
Precision in results	Mostly precise
Directness of results	Indirect; mixed treatment conditions

Sander LB, Schorndanner J, Terhorst Y, Spanhel K, Pryss R, Baumeister H, Messner E

'Help for trauma from the app stores?' a systematic review and standardised rating of apps for Post-Traumatic Stress Disorder (PTSD)

European Journal of Psychotraumatology 2020; 11: 1701788

View review abstract online

Comparison	**Quality rating of apps for PTSD.** **Half of the apps (50.7%) were based on CBT and offered a wide range of content, including processing of trauma-related emotions and beliefs, relaxation exercises, and psychoeducation.**
Summary of evidence	**Moderate quality evidence (direct) found the following apps were rated in the top quartile of the Mobile App Rating Scale (in descending order of quality): PTSD Family Coach, CoachPTBS, Together Strong, PTSD Coach, Mood Coach, STAIR Coach, VetChange, PE Coach2, Trauma Recovery, Reachout My Support Network, DoD Safe Helpline, Elevatr - Therapists & Peers, PTSD Coach Australia, Youper - Anxiety & Depression, Living Well, PTSD Test, T2 Mood Tracker, Quiet Relaxation & Wellness, and CPT Coach.**
Quality of apps	

The following apps were assessed with the Mobile App Rating Scale (MARS-G), which is based on a 5-point scale (1-inadequate, 2-poor, 3-acceptable, 4-good, and 5-excellent). It includes 19 items that are divided into four subscales: 1. engagement (5 items: fun, interest, individual adaptability, interactivity, target group), 2. functionality (4 items: performance, usability, navigation, gestural design), 3. aesthetics (3 items: layout, graphics, visual appeal), and 4. information quality (7 items: accuracy of app description, goals, quality of information, quantity of information, quality of visual information, credibility, evidence base).

The total scores are presented below in descending order;

PTSD Family Coach: reviewed on iTunes and Google Play, MARS-G = 4.70

CoachPTBS: reviewed on Google Play, MARS-G = 4.63

Together Strong: reviewed on iTunes, MARS-G = 4.61

PTSD Coach: reviewed on iTunes and Google Play, MARS-G = 4.33

Mood Coach: reviewed on iTunes, MARS-G = 4.25

STAIR Coach: reviewed on iTunes, MARS-G = 4.25

VetChange: reviewed on iTunes, MARS-G = 4.20

PE Coach2: reviewed on iTunes and Google Play, MARS-G = 4.15

Trauma Recovery: reviewed on iTunes, MARS-G = 4.13

Reachout My Support Network: reviewed on iTunes, MARS-G = 4.09

DoD Safe Helpline: reviewed on iTunes, MARS-G = 4.05

Elevatr – Therapists & Peers: reviewed on iTunes, MARS-G = 4.04

PTSD Coach Australia: reviewed on iTunes and Google Play, MARS-G = 4.03

Youper – Anxiety & Depression: reviewed on Google Play, MARS-G = 3.99

Living Well: reviewed on iTunes, MARS-G = 3.91

PTSD Test: reviewed on iTunes and Google Play, MARS-G = 3.80

T2 Mood Tracker: reviewed on iTunes, MARS-G = 3.76

Quiet Relaxation & Wellness: reviewed on iTunes, MARS-G = 3.75

CPT Coach: reviewed on iTunes and Google Play, MARS-G = 3.73

CBT-i Coach: reviewed on iTunes, MARS-G = 3.72

Backup Buddy [SSP]: reviewed on Google Play, MARS-G = 3.72

PTSD Coach Canada: reviewed on iTunes, MARS-G = 3.70

Mental Health Tests: reviewed on Google Play, MARS-G = 3.67

PSYTREC Breathing Trainer (fee required): reviewed on iTunes, MARS-G = 3.65

Calmster: reviewed on iTunes, MARS-G = 3.64

Self Help: reviewed on Google Play, MARS-G = 3.63

The App For Trauma Therapy-Morpheus (fee required): reviewed on Google Play, MARS-G = 3.59

KidTrauma: reviewed on Google Play, MARS-G = 3.59

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

Anxiety Coaches Podcasts & Workshops by Gina Ryan: reviewed on iTunes, MARS-G = 3.56

EMDR 101 (fee required): reviewed on iTunes, MARS-G = 3.56

Breathe Easy: reviewed on Google Play, MARS-G = 3.54

Self Help for Trauma: reviewed on iTunes and Google Play, MARS-G = 3.53

Life Armour: reviewed on iTunes, MARS-G = 3.51

Exhale – Anxiety Assistant: reviewed on iTunes, MARS-G = 3.48

Calmster Pro (fee required): reviewed on iTunes, MARS-G = 3.43

Better me: reviewed on iTunes, MARS-G = 3.41

eReading: Sam, the Boy with PTSD (fee required): reviewed on iTunes, MARS-G = 3.37

End Anxiety Hypnosis Stress, Panic Attack Help: reviewed on Google Play, MARS-G = 3.31

Exposure – Face Your Fears: reviewed on iTunes, MARS-G = 3.28

PHIT for Duty: reviewed on iTunes, MARS-G = 3.24

EyeMove X EMDR Traumatherapie: reviewed on iTunes and Google Play, MARS-G = 3.21

EyeMoveX.as – EMDR Sessions (fee required): reviewed on iTunes, MARS-G = 3.20

Deep Relaxation with Andrew Johnson HD (fee required): reviewed on iTunes, MARS-G = 3.17

Veterans Mental Health: reviewed on iTunes, MARS-G = 3.06

Virtual EMDR: reviewed on iTunes, MARS-G = 3.05

PTSD Support on the Go: reviewed on iTunes and Google Play, MARS-G = 3.03

WhatsMyM3 (fee required): reviewed on iTunes, MARS-G = 3.01

Post-Traumatic Stress Disorder: reviewed on Google Play, MARS-G = 3.00

Qigong Meditation with Dr. Yang, Jwing-Ming (YMAA): reviewed on iTunes, MARS-G = 2.99

iChill: reviewed on iTunes, MARS-G = 2.99

Tap Into a Better You (fee required): reviewed on Google Play, MARS-G = 2.96

MHU: Mental Health and You: reviewed on iTunes, MARS-G = 2.90

Serve And Protect: reviewed on iTunes, MARS-G = 2.87

PTSD STOPS HERE: iTunes, reviewed on Google Play, MARS-G = 2.78

Anxiety and Panic Attacks: reviewed on Google Play, MARS-G = 2.73

PTSD Aid: reviewed on Google Play, MARS-G = 2.72

Post Traumatic Stress (fee required): GP, MARS-G = 2.72

Hypnosis PTSD Free: reviewed on Google Play, MARS-G = 2.72

Bust PTSD (fee required): reviewed on iTunes, MARS-G = 2.69

Trauma Aid: reviewed on Google Play, MARS-G = 2.61

Psychologist – Anywhere-Anytime: reviewed on Google Play, MARS-G = 2.59

EMDR Therapy (fee required): reviewed on iTunes, MARS-G = 2.59

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

PTSD Hub: iTunes, reviewed on Google Play, MARS-G = 2.55 Erase Stress & Fear With PSTEC: reviewed on Google Play, MARS-G = 2.45 Vital Tones Psychological: reviewed on iTunes, MARS-G = 2.30 Free Hypnosis (fee required): reviewed on Google Play, MARS-G = 2.20 Deprelibero: reviewed on Google Play, MARS-G = 2.06 EMDR+ (fee required): reviewed on iTunes, MARS-G = 2.01 Assistenzhund Bullet Ptbs/Ptsd Bullet: reviewed on iTunes, MARS-G = 1.95	
Consistency in results	Not applicable
Precision in results	No Cis are reported
Directness of results	Direct

Explanation of acronyms

CI = confidence interval, *g* = hedges standardised mean difference, I^2 = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), N = number of participants, NS = not significant, *p* = statistical probability of obtaining that result, Q = test for heterogeneity, RCT = randomised controlled trial, vs. = versus

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small[6].

† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Weighted mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) that allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect[6].

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if RR > 2 or < 0.5 and a large effect if RR > 5 or < 0.2[7]. lnOR stands for logarithmic OR where a lnOR of 0 shows no difference between groups. Hazard ratios measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg, r) indicate the strength of association or relationship

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between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (*b*) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. I^2 is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula[6];

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed[8].

‖ Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

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Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au