Real-Time Telehealth Versus Face-to-Face Management for Patients With PTSD in Primary Care:
A Systematic Review and Meta-Analysis

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ABSTRACT

Objective: We conducted a systematic review and meta-analysis of randomized controlled trials comparing real-time telehealth (video, phone) with face-to-face therapy delivery to individuals with posttraumatic stress disorder (PTSD), by primary or allied health care practitioners.

Data Sources: We searched MEDLINE, Embase, CINAHL, and Cochrane Central (inception to November 18, 2020); conducted a citation analysis on included studies (January 7, 2021) in Web of Science; and searched ClinicalTrials.gov and WHO ICTRP (March 25, 2021). No language or publication date restrictions were used.

Study Selection: From 4,651 individual records screened, 13 trials (27 references) met the inclusion criteria.

Data Extraction: Data on PTSD severity, depression severity, quality of life, therapeutic alliance, and treatment satisfaction outcomes were extracted.

Results: There were no differences between telehealth and face-to-face for PTSD severity (at 6 months: standardized mean difference [SMD] = −0.11; 95% CI, −0.28 to 0.06), depression severity (at 6 months: SMD = −0.02; 95% CI, −0.26 to 0.22; *P* = .87), therapeutic alliance (at 3 months: SMD = 0.04; 95% CI, −0.51 to 0.59; *P* = .90), or treatment satisfaction (at 3 months: mean difference = 3.09; 95% CI, −7.76 to 13.94; *P* = .58). One trial reported similar changes in quality of life in telehealth and face-to-face.

Conclusions: Telehealth appears to be a viable alternative for care provision to patients with PTSD. Trials evaluating therapy provision by telephone, and in populations other than veterans, are warranted.

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The prevalence and severity of posttraumatic stress disorder (PTSD) worldwide vary depending on regional distribution of intensity, diagnostic validity, and completeness of reporting.[1] The general population in the US has an estimated lifetime prevalence of approximately 6%[2;] in Europe, approximately 2%[3]; and in Australia, 7%.[4] For specific subgroup populations, these estimates may be considerably higher, eg, 29% in women who had experienced physical assaults, 39% for men who had experienced combat,[5] and 36% in children and adolescents who had experienced trauma.[6] The burden of PTSD both to the individual and to society is considerable. In Germany, the overall health care costs for people with PTSD are 3 times higher than for controls (42,870 vs 13,942 EUR across a 5-year period).[7] In the US, PTSD- and depression-related costs for veteran care were estimated to be between $4.0 and $6.2 billion USD over a 2-year period (in 2007 dollars).[8]

Clinical practice guidelines recommend several therapies for PTSD, including both pharmacologic and psychotherapies. Among the recommended psychotherapies is cognitive behavioral therapy (CBT), covering cognitive processing therapy (CPT), cognitive therapy, and prolonged exposure therapy. Therapies such as CBT or CPT may be delivered individually or in a group setting. Other therapies (such as brief eclectic psychotherapy, eye movement desensitization and reprocessing, and narrative exposure therapy) are also suggested.[9–11]

Telemedicine has been promoted for over a decade by the World Health Organization (WHO) as a solution to geographic access barriers, and it may be more acceptable to people with privacy and confidentiality concerns about using health services for stigmatized conditions.[12] Given that acceptability appears high,[13] it is important not only to highlight the benefits and challenges of remote service provision[14] but also to assess whether telehealth treatment is as effective as that delivered face-to-face.

In a 2016 review, telehealth-delivered therapies for PTSD were equivalent to face-to-face therapies in terms of PTSD symptom reduction, satisfaction, and absence of patient safety events.[15] Several reviews since then have found evidence to support the equivalence of telehealth-delivered interventions for individuals with mental health conditions,[16,17] and of exposure therapies delivered by telehealth versus face-to-face for PTSD more specifically.[15] A 2016 systematic review by Olthuis and colleagues also evaluated a mix of distance-delivered interventions for PTSD—including those delivered synchronously (eg, telephone and videoconferencing) and those delivered asynchronously (including emailed materials or printed materials with phone support).[18] More recently, a review has investigated the feasibility and acceptability of telehealth for processes such as patient triage, staff training, or clinician supervision.[19]

Clinical Points

- The COVID-19 pandemic has escalated the demand for telehealth services in mental health care.
- The authors conducted a systematic review and meta-analysis of trials comparing telehealth to face-to-face care for individuals with PTSD.
- Telehealth appears to be as effective as face-to-face care for PTSD severity, depression severity, quality of life, therapeutic alliance, and treatment satisfaction.

As the social restrictions associated with the global pandemic have generated a surge in the use of alternative approaches such as telemental health,[20] our systematic review aimed to update and synthesize high-quality evidence from randomized controlled trials, with a focus on primary care, where the demand was addressed by primary or allied health care providers comparing the delivery of therapies to patients with PTSD via synchronous telehealth (video, telephone, or both) and face-to-face.

METHODS

This systematic review is reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement,[21] and the review protocol was developed prospectively. We adopted a modified 2weekSR methodology.[22] Deviations from the protocol are reported in the relevant methods section.

Inclusion and Exclusion Criteria

We included studies of participants of any age or gender who were receiving care for PTSD. We included trials of patient consultations in real time ("live" or "synchronous"), provided via telehealth (video, telephone, or both), provided in primary care settings, on a single or ongoing basis. Care had to be provided by general practitioners/family doctors, primary care/community nurses, or allied health staff such as psychologists, counselors, social workers, or others. The comparison group received consultations in person (face-to-face). The therapy provided to both groups in each trial had to be identical or near identical (eg, the type of therapy provided, as well as its intensity, frequency, and duration).

We excluded trials of care in any setting (eg, hospital-based telepsychiatry), if delivered by medical doctors who had undergone specialty training, those involving self-care, and those involving peer-to-peer care (eg, peer support groups), as those do not represent usual primary care. We excluded trials of telehealth exchanges held exclusively between clinicians (ie, in which the patient was not also present) and trials evaluating interventions involving multiple health care professionals not reflecting usual primary care. Likewise, we excluded trials of mobile apps or internet-based interventions for self-management, trials of interventions relying on patients entering data for real-time or delayed transmission to health care providers, and trials involving novel equipment for remote monitoring (eg, attached to patients, installed in patients' homes, or set up in community centers).

We included randomized controlled trials of any design (eg, parallel, cluster, factorial, and crossover) and excluded all other study designs (ie, observational studies). We excluded trials with sample sizes fewer than 10 as no approximation to normal distribution could be achieved and analysis would lack credibility.

The primary outcome was the severity of PTSD as reported by the included studies. Secondary outcomes included depression severity, quality of life, therapeutic alliance, and satisfaction with treatment.

Search Strategies to Identify Studies

We searched MEDLINE, Embase, CINAHL, and Cochrane Central from inception to November 18, 2020. We designed a search string in MEDLINE, which was translated for use in other databases using the Polyglot Search Translator.[23] (See Supplementary Appendix 1 for the complete search strings.) The searches were deliberately broad, as the present review was conducted as part of a series of systematic reviews on the effectiveness of telehealth compared to face-to-face for health care provision in primary care and allied care.

On January 7, 2021, we conducted a backward (cited) and forward (citing) citation analysis in Web of Science on the included studies identified by the database searches. On March 25, 2021, we searched clinical registries (ClinicalTrials.gov and WHO International Clinical Trials Registry Platform [ICTRP]). Search strings are provided in Supplementary Appendix 1.

No restrictions by language or publication date were imposed. We included only those articles that were published in full. We included clinical registry records with results available. We included publications available as abstract only (eg, conference abstract) only if additional information was available in a clinical registry record or a publication. No attempt to check the gray literature was made, as our focus was high-level evidence from randomized trials.

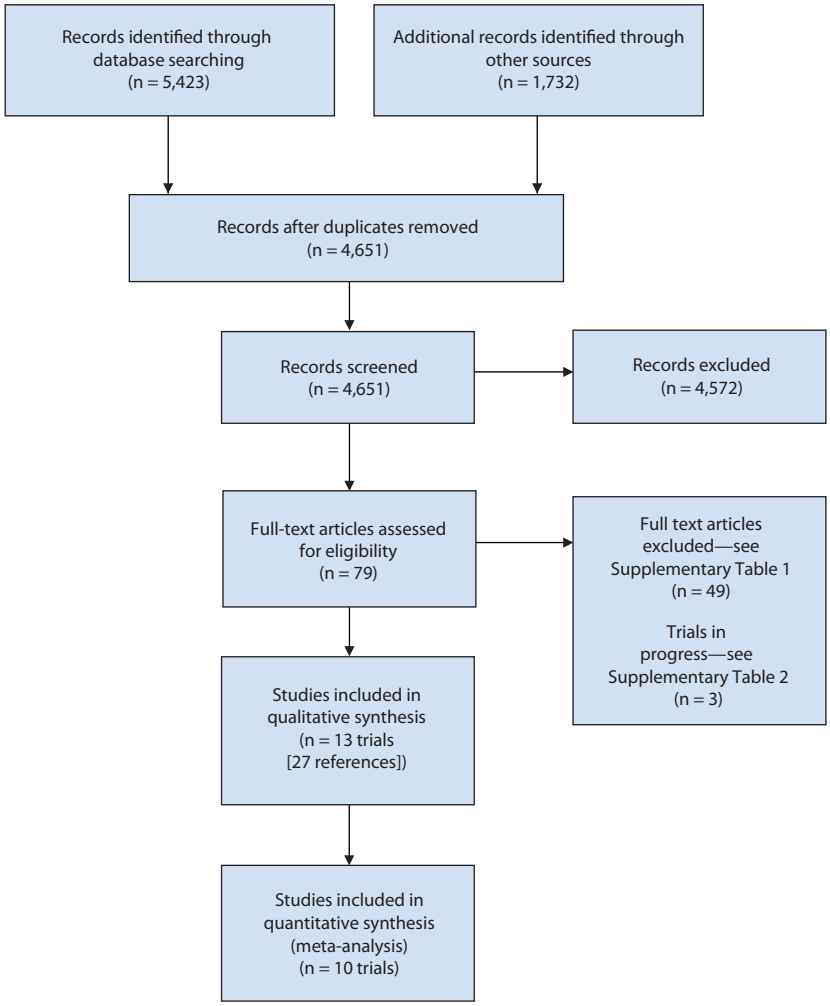
Study Selection and Screening

Pairs of review authors (AMS, HG, MC, JC, NK, RP, PG) independently screened the titles and abstracts against the inclusion criteria. Three review authors (AMS, JC, HG) retrieved full text. Pairs of authors (AMS, HG, MC) then screened the full texts; any disagreements were resolved by discussion or reference to a third author. The selection process was recorded in sufficient detail to complete a PRISMA flow diagram (see Figure 1).

Data Extraction

From each included study, we extracted study characteristics (methods, participants, interventions, comparators, and outcomes), outcomes (primary and secondary), and data to inform the risk of bias judgements. Data were extracted independently by 2 authors (AMS, MB).

Figure 1. PRISMA Flow Diagram



Discrepancies were resolved by consensus, or by reference to third author if required.

Risk of Bias Assessment

Two review authors (AMS, MB) independently assessed the risk of bias for each included study using the Risk of Bias Tool 1, as outlined in the *Cochrane Handbook*.[24] We used Tool 1 rather than Tool 2, as Tool 1 allows for the assessment of biases arising from study funding and conflict of interest (under domain 7, other bias). All disagreements were resolved by discussion or by referring to a third author. The following domains were assessed:

A. Random sequence generation
B. Allocation concealment
C. Blinding of participants and personnel
D. Blinding of outcome assessment
E. Incomplete outcome data
F. Selective outcome reporting
G. Other bias (focusing on potential biases due to funding or conflict of interest).

Each potential source of bias was graded as low, unclear, or high, and each judgment was supported by a quote from the relevant trial documented on the extraction form.

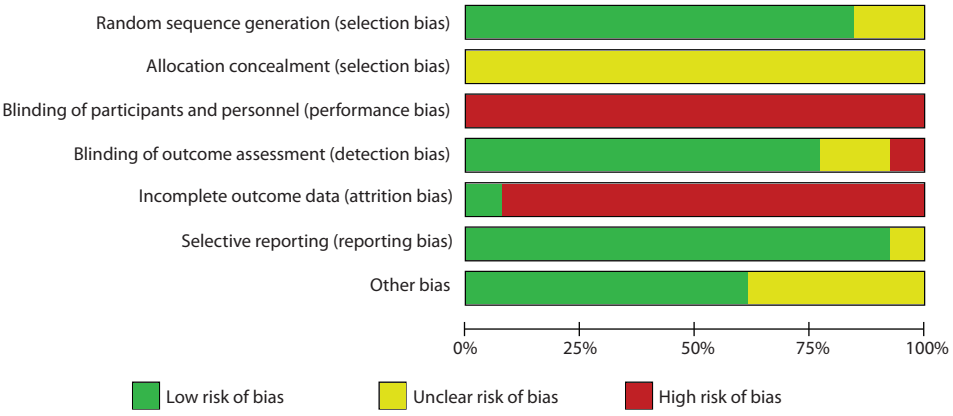
Measurement of Effect and Data Synthesis

Review Manager 5.4 was used to calculate the treatment effect. For continuous outcomes, we used mean difference (MD) or standardized mean difference (SMD), as appropriate. We undertook meta-analyses only when meaningful (when ≥ 2 studies or comparisons reported the same outcome); anticipating considerable heterogeneity, we used a random-effects model.

Analysis

The individual was used as the unit of analysis, where possible. However, where data on the number of individuals with outcomes of interest were not available, we extracted the information as it was presented (eg, mean differences in scores between groups). Meta-analysis was conducted if at least 2 studies had comparable design and the intervention effect was presented in the same/similar outcome measurement units. In cases of high methodological diversity or heterogeneity of outcomes where it was inappropriate to meta-analyze, we have presented results in narrative form. We did not contact investigators or study sponsors to provide missing data due to time constraints.

Figure 2. Review Authors' Judgments About Each Risk of Bias Item Presented as Percentages Across All Included Studies



We had intended to conduct subgroup analyses by diagnoses within a disease category, type of health care provider, and timepoint at which the results are reported. Due to a small number of trials, we were only able to conduct the subgroup analyses by timepoint at which the outcome was reported. We had intended to conduct a sensitivity analysis by including versus excluding studies with 3 or more domains at high risk of bias. Three domains were rated at high risk of bias for one trial.[25] Sensitivity analyses for PTSD severity, therapeutic alliance, and satisfaction with care showed no change in the significance of the difference between telehealth and face-to-face groups when this trial was removed from meta-analyses (data not presented).

Assessment of Heterogeneity and Reporting Biases

We used the I^2 statistic to measure heterogeneity among the included trials. As none of the meta-analyses included 10 or more trials, we did not create a funnel plot.

RESULTS

Results of the Search

The database searches yielded 5,423 records. A backward (cited) and forward (citing) citation analysis, together with the clinical registry searches, yielded an additional 1,732 references, for a total of 4,651 records to screen after deduplication. We excluded 4,572 references on title-abstract screen and assessed 79 references in full text. We excluded 49 full-text references (see Supplementary Table 1) and identified 3 ongoing trials (see Supplementary Table 2). We included 13 trials (27 references) in the systematic review; 10 trials provided meta-analyzable data (Figure 1).

Included Studies

We included 13 trials (27 references) that compared the provision of health care to primary care patients with PTSD via telehealth to face-to-face.[25–50] All of the included RCTs were parallel-arm trials, and all were conducted in the US. The numbers of participants ranged from 17 to 265 (1,497 in aggregate), and follow-up ranged from none (measurement of outcomes immediately postintervention) to 12 months. All trials compared the provision of telehealth via video to face-to-face. Therapies trialed included cognitive behavioral therapy, cognitive processing therapy, behavioral activation, therapeutic exposure, prolonged exposure, anger management, and coping skills intervention. Sessions varied in duration from 50 minutes to 90 minutes and were delivered for up to 14 weeks (Table 1).

Risk of Bias

Overall, the risk of bias for the included trials was low or unclear. Risk of bias was generally low from random sequence generation (Figure 2). All studies were at an unclear risk of bias from allocation concealment (due to nonreporting). All trials were at high risk of bias from blinding of participants and personnel, as the nature of the compared interventions (video vs face-to-face delivery of care) rendered blinding impossible. Nearly all of the trials were at high risk of attrition bias, due to high rate of participant dropout; the risk of reporting bias and other bias (due to funding and conflict of interest) was low or unclear.

Effectiveness of the Intervention

Primary Outcome: PTSD Severity

Twelve trials reported on the effect of treatment on PTSD severity as measured by PTSD Checklists and Clinician-Administered PTSD Scales based on *DSM-5* symptoms onset, duration, and their impact on functioning: 10 were meta-analyzable, providing data immediately posttreatment and at 1–3 month and 6-month follow-up. There were no statistical differences between the telehealth and face-to-face groups immediately posttreatment (SMD = −0.00; 95% CI, −0.18 to 0.17), nor at 1–3 months (SMD = −0.13; 95% CI, −0.36 to 0.10) or 6 months posttreatment (SMD = −0.11; 95% CI, −0.28 to 0.06). Heterogeneity was generally low ($I^2 < 29\%$) (Figure 3).

One trial reported data in both meta-analyzable format (preliminary data, immediately posttreatment, for a subset of the complete study sample)[49] and non–meta-analyzable format (for the complete study population, immediately

Table 1. Characteristics of Included Studies

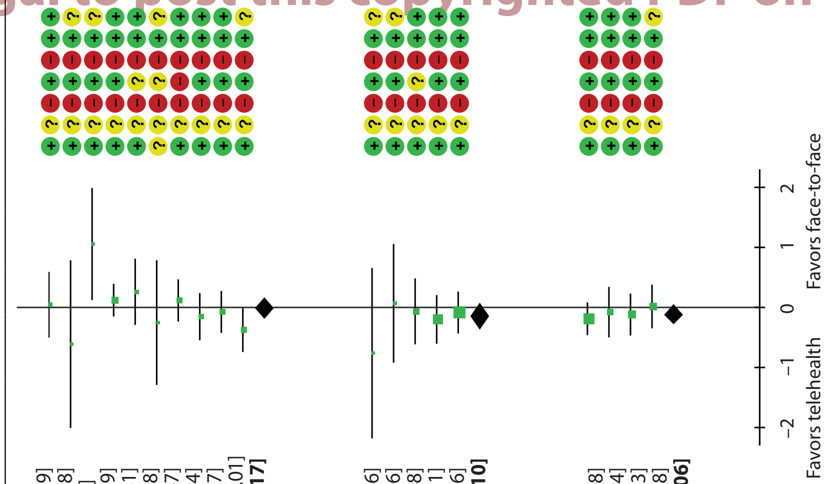
Author and year Location	RCT design	Follow-up	No. participants randomized	Participants	Age, mean (SD), y	Intervention	Telehealth: modality and dose	Comparator: modality and dose
Acierno et al, 2016[26] US	Parallel 2-arm	12 mo	265 (131 TH, 134 F2F)	Veterans with PTSD (full criteria or subthreshold)	46 (15)	Behavioral activation and therapeutic exposure	Video 90 min, 1×/wk, 8 sessions total	F2F 90 min, 1×/wk, 8 sessions total
Acierno et al, 2017[29] US	Parallel 2-arm	6 mo	150 (74 TH, 76 F2F)	Veterans with PTSD	42 (15)	Prolonged exposure	Video 90 min, 10–12 sessions total	F2F 90 min, 10–12 sessions total
Franklin et al, 2017[32] US	Parallel 3-arm[a]	1 mo	25 (10 TH-V, 7 TH-V, 8 F2F)	Rural veterans with PTSD	46 (16)	Prolonged exposure	Video Duration NR, 1×/wk, 12 weeks	F2F Duration NR, 1×/wk, 12 weeks
Frueh et al, 2007[34] US	Parallel 2-arm	3 mo	38 (17 TH, 21 F2F)	Male veterans with PTSD	56 (5)	Cognitive behavioral therapy	Video 90 min, 1×/wk, 14 weeks	F2F 90 min, 1×/wk, 14 weeks
Gilmore et al, 2016[35] US	Parallel 2-arm	6 mo	136 (68 TH, 68 F2F)	Female veterans with military sexual trauma PTSD	43 (12)	Prolonged exposure	Video Duration NR, 1×/wk, 8–12 sessions, 12 weeks	F2F Duration NR, 1×/wk, 8–12 sessions, 12 weeks
Liu et al, 2020[37] US	Parallel 2-arm	6 mo	207 (103 TH, 104 F2F)	Veterans with PTSD	48 (14)	Cognitive processing therapy	Video 60 min, 1×/wk, 12 weeks	F2F 60 min, 1×/wk, 12 weeks
Maieritsch et al, 2016[38] US	Parallel 2-arm	3 mo	90 (45 TH, 45 F2F)	Veterans of the Iraq/ Afghanistan conflict with PTSD	31 (6)	Cognitive processing therapy	Video 50 min, 1–2×/wk, 10+ sessions to be a "completer" and analyzed	F2F 50 min, 1–2×/wk, 10+ sessions to be a "completer" and analyzed
Morland et al, 2004[39] US	Parallel 2-arm	NA[a]	17 (9 TH, 8 F2F)	Male veterans with PTSD	NR (range, 18–60)	Coping skills group intervention	Video 90 min, 1×/wk, 8 weeks	F2F 90 min, 1×/wk, 8 weeks
Morland et al, 2011[25] US	Parallel 2-arm	6 mo	125 (61 TH, 64 F2F)	Male rural veterans with PTSD and anger difficulties	55 (10)	Anger management therapy (CBT)	Video 90 min, 2×/wk, 6 weeks	F2F 90 min, 2×/wk, 6 weeks
Morland et al, 2014[45] US	Parallel 2-arm	6 mo	125 (61 TH, 64 F2F)	Male veterans with PTSD	55 (13)	Cognitive processing therapy—cognitive only	Video 90 min, 2×/wk, 6 weeks	F2F 90 min, 2×/wk, 6 weeks
Morland et al, 2015[47] US	Parallel 2-arm	6 mo	126 (61 TH, 63 F2F)	Female veterans and civilians with PTSD	46 (12)	Cognitive processing therapy	Video 90 min, 1–2×/wk, total of 12 sessions	F2F 90 min, 1–2×/wk, total of 12 sessions
Morland et al, 2020[46] US	Parallel 3-arm[b]	6 mo	175 (58 TH-home, 58 F2F, 59 TH-office[b])	Veterans with PTSD	47 (14)	Prolonged exposure	Video 90 min, 1×/wk, 6–15 sessions (dependent on treatment response)	F2F 90 min, 1×/wk, 6–15 sessions (dependent on treatment response)
Ziemba et al, 2014[50] US	Parallel 2-arm	NA[a]	18 (9 TH, 9 F2F)	Over 18, served in OEF and/or OIF, with existing or suspected PTSD	NR (only 18+ enrolled)	Cognitive behavioral therapy	Video Duration NR, 1×/wk, 10 sessions (15 weeks to complete sessions)	F2F Duration NR, 1×/wk, 10 sessions (15 weeks to complete sessions)

[a]Posttreatment measurements (no follow-up occurred).
[b]Compares home-based telehealth, office-based telehealth, and home-based face-to-face arms; for comparability, we retained home-based telehealth and home-based face-to-face arms.
Abbreviations: F2F = face-to-face, OEF = Operation Enduring Freedom, NA = not applicable, OIF = Operation Iraqi freedom, PTSD = posttraumatic stress disorder, NR = not reported, TH = telehealth, TH-V telehealth video.

Figure 3. PTSD Severity

Study or subgroup	Telehealth Mean	Telehealth SD	Telehealth Total	Face-to-face Mean	Face-to-face SD	Face-to-face Total	Weight	Std. mean difference IV, random, 95% CI
Posttreatment								
Acierno 2017[29]/Yuen 2014[49] (PE)	43.41	18.43	23	42.59	18.32	29	8.0%	0.04 [−0.50 to 0.59]
Franklin 2017[32] (PE)	49.3	20.8	3	61.4	16.8	7	1.5%	−0.61 [−2.01 to 0.78]
Frueh 2007[34] (CBT)	68.11	11	9	56.58	10.1	12	3.2%	1.06 [0.12 to 1.99]
Liu 2019[37] (CPT)	51.3	16.3	103	49.3	16.7	104	19.6%	0.12 [−0.15 to 0.39]
Maieritsch 2016[38] (CPT)	47.1	16.2	25	43.2	13.3	26	8.0%	0.26 [−0.29 to 0.81]
Morland 2004[39] (CSG)	62.2	11.9	9	65.5	12.8	6	2.7%	−0.25 [−1.29 to 0.78]
Morland 2010[25] (CBT)	59.2	15	61	57.4	16	64	14.9%	0.12 [−0.24 to 0.47]
Morland 2014[45] (CPT)	55.6	18.8	48	58.7	21	52	13.0%	−0.15 [−0.55 to 0.24]
Morland 2015[47] (CPT)	50.5	42.72	63	53.6	39.28	63	15.0%	−0.08 [−0.42 to 0.27]
Morland 2019[46] (PE)	20.1	21.34	58	27.8	19.3	58	14.1%	−0.38 [−0.74 to −0.01]
Subtotal [95% CI]			**402**			**421**	**100.0%**	**−0.00 [−0.18 to 0.17]**
Heterogeneity: $\tau^2 = 0.02$; $\chi^2_9 = 12.70$ ($P = .18$); $I^2 = 29\%$								
Test for overall effect: $Z = 0.01$ ($P = .99$)								
1–3 Months posttreatment								
Franklin 2017[32] (PE)	43.7	15.4	3	58.3	17.9	7	2.6%	−0.76 [−2.18 to 0.66]
Frueh 2007[34] (CBT)	61.43	14.6	7	60.56	9.8	9	5.4%	0.07 [−0.92 to 1.06]
Maieritsch 2016[38] (CPT)	45.13	12.5	25	45.94	11.73	26	17.3%	−0.07 [−0.62 to 0.48]
Morland 2014[45] (CPT)	53.7	19	46	57.6	19.7	48	31.8%	−0.20 [−0.61 to 0.21]
Morland 2015[41] (CPT)	50.9	43.74	63	54.5	39.89	63	42.9%	−0.09 [−0.43 to 0.26]
Subtotal [95% CI]			**144**			**153**	**100.0%**	**−0.13 [−0.36 to 0.10]**
Heterogeneity: $\tau^2 = 0.00$; $\chi^2_4 = 1.14$ ($P = .89$); $I^2 = 0\%$								
Test for overall effect: $Z = 1.10$ ($P = .27$)								
6 Months posttreatment								
Liu 2019[37] (CPT)	48.3	17	103	51.5	16.7	104	38.5%	−0.19 [−0.46 to 0.08]
Morland 2014[40] (CPT)	56.2	18	44	57.7	19.8	43	16.3%	−0.08 [−0.50 to 0.34]
Morland 2015[30] (CPT)	46.5	45.36	63	52.3	51.43	63	23.5%	−0.12 [−0.47 to 0.23]
Morland 2019[46] (PE)	32.4	20.2	58	32.1	18.32	58	21.7%	0.02 [−0.35 to 0.38]
Subtotal [95% CI]			**268**			**268**	**100.0%**	**−0.11 [−0.28 to 0.06]**
Heterogeneity: $\tau^2 = 0.00$; $\chi^2_3 = 0.80$ ($P = .85$); $I^2 = 0\%$								
Test for overall effect: $Z = 1.28$ ($P = .20$)								
Test for subgroup differences: $\chi^2_2 = 1.05$ ($P = .59$), $I^2 = 0\%$								

Std. mean difference IV, random, 95% CI; Risk of bias[a] A B C D E F G



[a]**Risk of bias legend:**
A. Random sequence generation (selection bias)
B. Allocation concealment (selection bias)
C. Blinding of participants and personnel (performance bias)
D. Blinding of outcome assessment (detection bias)
E. Incomplete outcome data (attrition bias)
F. Selective reporting (reporting bias)
G. Other bias

Abbreviations: CBT = cognitive behavioral therapy, CPT = cognitive processing therapy, CSG = coping skills group, IV = inverse variance, PE = prolonged exposure.

and at 3 and 6 months postintervention).[29] Both sets of data showed no difference between the telehealth and face-to-face groups in PCL scores at any timepoint. The meta-analyzable data were included in Figure 3. One other trial reported nonsignificant differences between telehealth and face-to-face groups in PCL scores immediately postintervention and at 3- and 12-month follow-up.[26,29] One trial reported a similar decrease in CAPS scores pre- to post-therapy in both telehealth and face-to-face groups (−24.4% and −24.2% change, respectively).[50] (For additional detail on measurement scales, see Supplementary Table 3.)

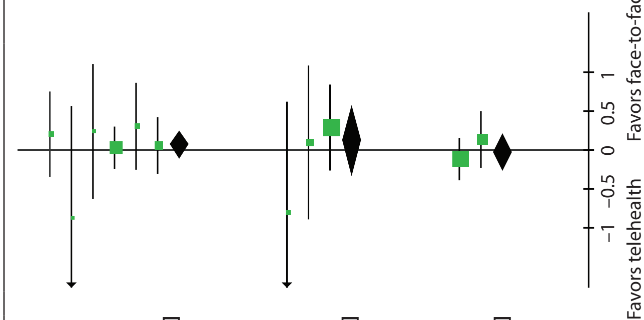
Secondary Outcome: Depression Severity

Seven trials reported on the effect of treatment on self-reported depression severity, measured with Beck Depression Inventory or Patient Health Questionnaire-9, and 6 were meta-analyzed. There were no significant differences between telehealth and face-to-face groups immediately posttreatment (SMD = 0.08; 95% CI = −0.10 to 0.27), nor at 1–3 months posttreatment (SMD = 0.14; 95% CI = −0.32 to 0.59) or 6 months posttreatment (SMD = −0.02; 95% CI, −0.26 to 0.22). Heterogeneity was very low (Figure 4).

Figure 4. Depression Severity

Study or subgroup	Telehealth Mean	Telehealth SD	Telehealth Total	Face-to-face Mean	Face-to-face SD	Face-to-face Total	Weight	Std. mean difference IV, random, 95% CI	Risk of bias[a] A	B	C	D	E	F	G
Post-intervention															
Acierno 2017[29]/Yuen 2014[49] (PE)	19.38	15.87	23	16.43	12.97	29	11.3%	0.20 [−0.35 to 0.75]	+	?	−	+	−	+	+
Franklin 2017[32] (PE)	22	16.8	3	33.3	9.4	7	1.6%	−0.87 [−2.31 to 0.57]	+	?	−	+	−	+	?
Frueh 2007[34] (CBT)	27.56	11.9	9	25.17	7.6	12	4.5%	0.24 [−0.63 to 1.11]	+	?	−	+	−	+	?
Liu 2019[37] (CPT)	12.9	7.2	103	12.7	6.7	104	45.9%	0.03 [−0.24 to 0.30]	+	?	−	+	−	+	+
Maieritsch 2016[38] (CPT)	19.2	13.2	24	15.5	10.6	26	10.9%	0.31 [−0.25 to 0.86]	+	?	−	?	−	+	+
Morland 2020[46] (PE)	17.2	14.87	58	16.4	12.34	58	25.7%	0.06 [−0.31 to 0.42]	+	?	−	+	−	+	?
Subtotal [95% CI]			**220**			**236**	**100.0%**	**0.08 [−0.10 to 0.27]**							
Heterogeneity: $\tau^2 = 0.00$; $\chi^2_5 = 2.78$ ($P = .73$); $I^2 = 0\%$															
Test for overall effect: $Z = 0.86$ ($P = .39$)															
1–3 Months															
Franklin 2017[32] (PE)	19.3	13.3	3	30.3	12	7	10.2%	−0.81 [−2.23 to 0.62]	+	?	−	+	−	+	?
Frueh 2007[34] (CBT)	28.71	12.7	7	27.67		9	21.3%	0.10 [−0.89 to 1.09]	+	?	−	+	−	+	?
Maieritsch 2016[38] (CPT)	20.99	13.5	25	17.29	11.7	26	68.4%	0.29 [−0.26 to 0.84]	+	?	−	?	−	+	+
Subtotal (95% CI)			**35**			**42**	**100.0%**	**0.14 [−0.32 to 0.59]**							
Heterogeneity: $\tau^2 = 0.00$; $\chi^2_2 = 1.97$ ($P = .37$); $I^2 = 0\%$															
Test for overall effect: $Z = 0.58$ ($P = .56$)															
6 Months															
Liu 2019[37] (CPT)	12.5	6.8	103	13.3	6.9	104	62.0%	−0.12 [−0.39 to 0.16]	+	?	−	+	−	+	+
Morland 2020[46] (PE)	18.9	14.37	58	17.1	11.84	58	38.0%	0.14 [−0.23 to 0.50]	+	?	−	+	−	+	?
Subtotal [95% CI]			**161**			**162**	**100.0%**	**−0.02 [−0.26 to 0.22]**							
Heterogeneity: $\tau^2 = 0.00$; $\chi^2_1 = 1.18$ ($P = .28$); $I^2 = 15\%$															
Test for overall effect: $Z = 0.17$ ($P = .87$)															

Test for subgroup differences: $\chi^2_2 = 1.05$ ($P = .59$), $I^2 = 0\%$



[a]**Risk of bias legend:**
A. Random sequence generation (selection bias)
B. Allocation concealment (selection bias)
C. Blinding of participants and personnel (performance bias)
D. Blinding of outcome assessment (detection bias)
E. Incomplete outcome data (attrition bias)
F. Selective reporting (reporting bias)
G. Other bias

Abbreviations: CBT = cognitive behavioral therapy, CPT = cognitive processing therapy, CSG = coping skills group, IV = inverse variance, PE = prolonged exposure.

One trial reported data in both meta-analyzable format (preliminary data, immediately posttreatment, for a subset of the complete study sample)[49] and non–meta-analyzable format (for the complete study population, immediately and 3 and 6 months postintervention).[29] Both showed no difference between the telehealth and face-to-face groups in depression severity scores at any timepoint. The meta-analyzable data were included in Figure 4. One other trial provided data that could not be pooled, reporting nonsignificant differences between groups in BDI scores at postintervention and at 3-month and 12-month follow-up.[26,29]

Secondary Outcome: Quality of Life

Only 1 trial reported on quality of life (SF-36 scores). For the SF-36-Physical score, there were comparable improvements in the two groups: a 4.4% increase from pre- to postintervention in the telehealth group and 4.5% increase in the face-to-face group. For the SF-36-Mental health scores, there was a 45.8% increase in the telemedicine group and 37.9% increase in the face-to-face group.[50]

Secondary Outcome: Therapeutic Alliance

Four trials reported on therapeutic alliance (participant scores). Immediately postintervention, there was no

difference between groups in scores (SMD = −0.04; 95% CI, −0.30 to 0.21); there was also no difference at 3 months postintervention (SMD = 0.04; 95% CI, −0.51 to 0.59) (Supplementary Figure 1).

One trial also reported on therapeutic alliance scores for the therapists. There were no significant differences in Working Alliance Inventory scores between the telehealth and face-to-face groups at session 2 ($P = .75$), session 6 ($P = .61$), or session 12 ($P = .84$) of a trial evaluating the delivery of 12 sessions of cognitive processing therapy.[47]

Secondary Outcome: Satisfaction With Treatment

Seven trials reported on satisfaction with treatment; 4 were meta-analyzable. Immediately posttreatment, there was no difference between telehealth and face-to-face groups in satisfaction (MD = 0.32; 95% CI, −3.33 to 3.97). There was also no difference at 1 month posttreatment (MD = −6.00; 95% CI, −13.65 to 1.65) or at 3 months posttreatment (MD = 3.09; 95% CI, −7.76 to 13.94) (Supplementary Figure 2).

One trial found no differences between telehealth and face-to-face groups on any of the subscores of the Charleston Psychiatric Outpatient Satisfaction Scale, including respectful care, appearance of facility, recommendation, or convenience of facility.[29] One trial reported no significant differences in median scores in overall satisfaction at the end of an 8-week treatment (4.0 in telehealth and 3.5 in face-to-face, where 0 corresponds to "very dissatisfied" and 4 to "very satisfied").[39] One trial reported overall satisfaction score of 98.1% out of 100% in the telehealth group and 92.1% in the face-to-face group, although it is not clear if the difference was statistically significant.[50]

DISCUSSION

We found 13 randomized clinical trials (1,497 participants in aggregate) that compared the delivery of care to patients with PTSD via telehealth to face-to-face. All trials were conducted in the US, and all compared the delivery of care via video-telehealth to its delivery in person. The trials were generally at low or unclear risk of bias; blinding of participants was rated at high risk of bias for all trials, as the nature of the compared interventions precluded blinding, and nearly all trials were at high risk of attrition bias, due to considerable dropout. There were no differences between the telehealth and face-to-face groups for PTSD severity, depression, quality of life, therapeutic alliance, or satisfaction with treatment at any timepoint reported (from posttreatment up to 6 months).

We identified several evidence gaps. First, no trials evaluated the delivery of care by telephone. This gap has previously been noted by other reviews evaluating the provision of telehealth to patients with mental health disorders.[16,18,51] Because telephone-delivered interventions may be as effective as face-to-face interventions,[16] this gap is worth investigating—particularly as patients living in remote communities may face barriers to adequate internet access (required for video telehealth).

Second, the evidence about the quality of life and therapeutic alliance outcomes is limited, consisting of 1 trial and 4 trials, respectively. A previous systematic review found mixed results for the therapeutic alliance outcome in studies comparing telehealth to face-to-face delivery of interventions to veterans with PTSD, with most reporting no difference in individual therapy settings, but favoring face-to-face delivery in group therapy settings.[51] Other reviews have similarly found a lack of evidence for the quality-of-life outcome for PTSD treatments for the general population[18] or in children and adolescents.[6] Paucity of quality-of-life evidence has also been identified in a review of pharmacologic interventions for preventing PTSD.[52] As PTSD considerably impacts the individual's quality of life,[53] collecting the evidence on this outcome should be prioritized in subsequent trials.

Finally, while the trials included a mix of genders and PTSD thresholds, it is noteworthy that all were conducted in the US and included only veteran populations. This is not surprising, as individuals serving in the armed forces are at higher risk of developing PTSD.[15] However, this does preclude the generalizability of the findings to other population groups and settings. Additional trials are warranted in health care settings other than the US, in lower- and middle-income countries, in civilian populations, and in children and youth, as they may respond differently to PTSD therapies or have different therapeutic needs.[6]

This systematic review fills in a gap identified for the synchronously delivered care. Olthuis and colleagues[18] identified 8 trials (with 721 participants) comparing synchronously delivered video or telephone care to face-to-face care. Seven trials were meta-analyzable, showing no difference in PTSD outcomes for video-telehealth compared to face-to-face care immediately postintervention; however, meta-analysis of 5 trials identified inferior outcomes for telehealth at 3–6 months.[18] In the present review, we were able to meta-analyze 5 additional studies (total of 13 studies), with 776 additional patients (total of 1,497 patients). These studies were conducted subsequently to Olthuis and colleagues' review and enabled the extension of the analyses to 6 months. Our analyses further support their finding of no difference between telehealth and face-to-face groups immediately postintervention, and additionally show no difference between groups at 3 months and at 6 months posttreatment for severity of PTSD and severity of depression. However, trials with a longer duration of follow-up are required, as only half of individuals diagnosed with PTSD recover within 2 years, and one-third continue to meet the diagnostic criteria for PTSD 6 years later.[54]

The strengths of this review include comprehensive searches and rigorous methodology. The included trials evaluated a broad range of psychotherapies and participants with both diagnosed and subthreshold or suspected PTSD, which increases the generalizability of the findings. There was sufficient evidence to conduct meta-analyses for the severity of PTSD and severity of depression outcomes at up to 6 months, and therapeutic alliance and satisfaction with

treatment outcomes at up to 3 months posttreatment. We found no differences between telehealth and face-to-face groups for those outcomes and timepoints.

In these unprecedented times of intermittent lockdowns and restricted availability of face-to-face services, telehealth care has the potential to increase access to evidence-based care for individuals[55] living not only in remote areas but also in urban settings, those facing barriers to transportation, and those in areas with provider shortages.[17] It also has the benefit of reducing travel time, inconvenience, and stigma[49] and may also increase compliance with repeat appointments.[34,56] Given the findings of no difference between telehealth and face-to-face delivery of care to patients PTSD for key outcomes, telehealth may be a viable care delivery model for addressing the needs of patients with PTSD both during the global crisis and into the "new normal."

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Role of the sponsor: The funder was not involved in the conduct, analysis, or interpretation of the systematic review or in the decision to submit the manuscript for publication.

Supplementary material: Available at PSYCHIATRIST.COM.

REFERENCES

1. Ng LC, Stevenson A, Kalapurakkel SS, et al. National and regional prevalence of posttraumatic stress disorder in sub-Saharan Africa: a systematic review and meta-analysis. *PLoS Med*. 2020;17(5):e1003090.
2. Goldstein RB, Smith SM, Chou SP, et al. The epidemiology of DSM-5 posttraumatic stress disorder in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. *Soc Psychiatry Psychiatr Epidemiol*. 2016;51(8):1137–1148.
3. Alonso J, Angermeyer MC, Bernert S, et al; ESEMeD/MHEDEA 2000 Investigators, European Study of the Epidemiology of Mental Disorders (ESEMeD) Project. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand suppl*. 2004;(420):21–27.
4. McEvoy PM, Grove R, Slade T. Epidemiology of anxiety disorders in the Australian general population: findings of the 2007 Australian National Survey of Mental Health and Wellbeing. *Aust N Z J Psychiatry*. 2011;45(11):957–967.
5. Bisson JI, Roberts NP, Andrew M, et al. Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database Syst Rev*. 2013;2013(12):CD003388.
6. Gillies D, Taylor F, Gray C, et al. Psychological therapies for the treatment of post-traumatic stress disorder in children and adolescents. *Cochrane Database Syst Rev*. 2012;12:CD006726.
7. Bothe T, Jacob J, Kröger C, et al. How expensive are post-traumatic stress disorders? Estimating incremental health care and economic costs on anonymised claims data. *Eur J Health Econ*. 2020;21(6):917–930.
8. Tanielian T, Jaycox LH. *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery*. RAND Corporation; 2008.
9. American Psychiatric Association (APA). *Clinical Practice Guideline for the Treatment of PTSD*. 2017.
10. Hamblen JL, Norman SB, Sonis JH, et al. A guide to guidelines for the treatment of posttraumatic stress disorder in adults: an update. *Psychotherapy (Chic)*. 2019;56(3):359–373.
11. Lethbridge R. Australian Guidelines for the Prevention and Treatment of Acute Stress Disorder, Posttraumatic Stress Disorder, and Complex Posttraumatic Stress Disorder (version 5.6). NHMRC. Magicapp website. https://files.magicapp.org/guideline/357a1e08-05d4-44b1-89dd-e15a971b3bbf/published_guideline_4672-5_6.pdf. Published 2020. Accessed October 8, 2021.
12. World Health Organization. *Telemedicine: Opportunities and Developments in Member States: Report on the Second Global Survey on eHealth 2009*. World Health Organization; 2010.
13. Martinez KA, Rood M, Jhangiani N, et al. Patterns of use and correlates of patient satisfaction with a large nationwide direct to consumer telemedicine service. *J Gen Intern Med*. 2018;33(10):1768–1773.
14. Centers for Disease Control and Prevention. Using Telehealth to Expand Access to Essential Health Services during the COVID-19 Pandemic. CDC website. https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html. Published 2020. Updated June 10, 2020. Accessed 8 October 2021.
15. Olden M, Shingleton R, Finkelstein-Fox L, et al. Telemedicine exposure therapy and assessment for PTSD: a systematic clinical practice narrative review. *J Technol Behav Sci*. 2016;1(1–4):22–31.
16. Varker T, Brand RM, Ward J, et al. Efficacy of synchronous telepsychology interventions for people with anxiety, depression, posttraumatic stress disorder, and adjustment disorder: a rapid evidence assessment. *Psychol Serv*. 2019;16(4):621–635.
17. Shigekawa E, Fix M, Corbett G, et al. The Current State Of Telehealth Evidence: a Rapid Review. *Health Aff (Millwood)*. 2018;37(12):1975–1982.
18. Olthuis JV, Wozney L, Asmundson GJ, et al. Distance-delivered interventions for PTSD: a systematic review and meta-analysis. *J Anxiety Disord*. 2016;44:9–26.
19. Monaghesh E, Hajizadeh A. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health*. 2020;20(1):1193.
20. Hazarika M, Math SB. Tele-mental health during the coronavirus disease 2019 (COVID-19) pandemic. *Open J Psychiatry Allied Sci*. 2020;11(2):77–79.
21. Moher D, Liberati A, Tetzlaff J, et al; PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6(7):e1000097.
22. Clark J, Glasziou P, Del Mar C, et al. A full systematic review was completed in 2 weeks using automation tools: a case study. *J Clin Epidemiol*. 2020;121:81–90.
23. Clark JM, Sanders S, Carter M, et al. Improving the translation of search strategies using the Polyglot Search Translator: a randomized controlled trial. *J Med Libr Assoc*. 2020;108(2):195-207.
24. Higgins J, Thomas J, Chandler J, et al. *Cochrane Handbook for Systematic Reviews of Interventions (version 6.0)*. The Cochrane Collaboration; 2019. https://onlinelibrary.wiley.com/doi/book/10.1002/9781119536604
25. Morland LA, Greene CJ, Rosen CS, et al. Telemedicine for anger management therapy in a rural population of combat veterans with posttraumatic stress disorder: a randomized noninferiority trial. *J Clin Psychiatry*. 2010;71(7):855–863.
26. Acierno R, Gros DF, Ruggiero KJ, et al. Behavioural activation and therapeutic exposure for posttraumatic stress disorder: a noninferiority trial of treatment delivered in person versus home-based telehealth. *Depress Anxiety*. 2016;33(5):415–423.
27. Strachan M, Gros DF, Ruggiero KJ, et al. An integrated approach to delivering exposure-based treatment for symptoms of PTSD and depression in OIF/OEF veterans: preliminary findings. *Behav Ther*. 2012;43(3):560–569.
28. Strachan M, Gros DF, Yuen E, et al. Home-based telehealth to deliver evidence-based psychotherapy in veterans with PTSD. *Contemp Clin Trials*. 2012;33(2):402–409.
29. Acierno R, Knapp R, Tuerk P, et al. A non-inferiority trial of prolonged exposure for posttraumatic stress disorder: in person versus home-based telehealth. *Behav Res Ther*. 2017;89:57–65.
30. Gros DF, Allan NP, Lancaster CL, et al. Predictors of treatment discontinuation during prolonged exposure for PTSD. *Behav Cogn Psychother*. 2018;46(1):35–49.
31. Gros DF, Lancaster CL, López CM, et al. Treatment satisfaction of home-based telehealth versus in-person delivery of prolonged exposure for combat-related PTSD in veterans. *J Telemed Telecare*. 2018;24(1):51–55.
32. Franklin CL, Cuccurullo LA, Walton JL, et al. Face to face but not in the same place: a pilot study of prolonged exposure therapy. *J Trauma Dissociation*. 2017;18(1):116–130.
33. Frueh BC, Monnier J, Grubaugh AL, et al. Therapist adherence and competence with manualized cognitive-behavioral therapy for PTSD delivered via videoconferencing technology. *Behav Modif*. 2007;31(6):856–866.
34. Frueh BC, Monnier J, Yim E, et al. A randomized trial of telepsychiatry for post-traumatic stress disorder. *J Telemed Telecare*. 2007;13(3):142–147.
35. Gilmore AK, Davis MT, Grubaugh A, et al. "Do you expect me to receive PTSD care in a setting where most of the other patients remind me of the perpetrator?" home-based telemedicine to address barriers to care unique to military sexual trauma and veterans affairs hospitals. *Contemp Clin Trials*.

2016;48:59–64.
36. Gilmore AK, Lopez C, Muzzy W, et al. Emotion dysregulation predicts dropout from prolonged exposure treatment among women veterans with military sexual trauma-related posttraumatic stress disorder. *Womens Health Issues*. 2020;30(6):462–469.
37. Liu L, Thorp SR, Moreno L, et al. Videoconferencing psychotherapy for veterans with PTSD: results from a randomized controlled non-inferiority trial. *J Telemed Telecare*. 2020;26(9):507–519.
38. Maieritsch KP, Smith TL, Hessinger JD, et al. Randomized controlled equivalence trial comparing videoconference and in person delivery of cognitive processing therapy for PTSD. *J Telemed Telecare*. 2016;22(4):238–243.
39. Morland LA, Pierce K, Wong MY. Telemedicine and coping skills groups for Pacific Island veterans with post-traumatic stress disorder: a pilot study. *J Telemed Telecare*. 2004;10(5):286–289.
40. Greene CJ, Morland LA, Macdonald A, et al. How does tele-mental health affect group therapy process? secondary analysis of a noninferiority trial. *J Consult Clin Psychol*. 2010;78(5):746–750.
41. Mackintosh MA, Morland LA, Kloezeman K, et al. Predictors of anger treatment outcomes. *J Clin Psychol*. 2014;70(10):905–913.
42. Morland LA, Greene CJ, Grubbs K, et al. Therapist adherence to manualized cognitive-behavioral therapy for anger management delivered to veterans with PTSD via videoconferencing. *J Clin Psychol*. 2011;67(6):629–638.
43. Morland LA, Hynes AK, Mackintosh MA, et al. Group cognitive processing therapy delivered to veterans via telehealth: a pilot cohort. *J Trauma Stress*. 2011;24(4):465–469.
44. Morland LA, Raab M, Mackintosh MA, et al. Telemedicine: a cost-reducing means of delivering psychotherapy to rural combat veterans with PTSD. *Telemed J E Health*. 2013;19(10):754–759.
45. Morland LA, Mackintosh MA, Greene CJ, et al. Cognitive processing therapy for posttraumatic stress disorder delivered to rural veterans via telemental health: a randomized noninferiority clinical trial. *J Clin Psychiatry*. 2014;75(5):470–476.
46. Morland LA, Mackintosh MA, Glassman LH, et al. Home-based delivery of variable length prolonged exposure therapy: a comparison of clinical efficacy between service modalities. *Depress Anxiety*. 2020;37(4):346–355.
47. Morland LA, Mackintosh MA, Rosen CS, et al. Telemedicine versus in-person delivery of cognitive processing therapy for women with posttraumatic stress disorder: a randomized noninferiority trial. *Depress Anxiety*. 2015;32(11):811–820.
48. Morland LA, Wells SY, Glassman LH, et al. What do veterans want? understanding veterans' preferences for PTSD treatment delivery. *Mil Med*. 2019;184(11-12):686–692.
49. Yuen EK, Gros DF, Price M, et al. Randomized controlled trial of home-based telehealth versus in-person prolonged exposure for combat-related PTSD in veterans: preliminary results. *J Clin Psychol*. 2015;71(6):500–512.
50. Ziemba SJ, Bradley NS, Landry LA, et al. Posttraumatic stress disorder treatment for Operation Enduring Freedom/Operation Iraqi Freedom combat veterans through a civilian community-based telemedicine network. *Telemed J E Health*. 2014;20(5):446–450.
51. Turgoose D, Ashwick R, Murphy D. Systematic review of lessons learned from delivering tele-therapy to veterans with post-traumatic stress disorder. *J Telemed Telecare*. 2018;24(9):575–585.
52. Amos T, Stein DJ, Ipser JC. Pharmacological interventions for preventing post-traumatic stress disorder (PTSD). *Cochrane Database Syst Rev*. 2014;(7):CD006239.
53. Danielsson FB, Schultz Larsen M, Nørgaard B, et al. Quality of life and level of post-traumatic stress disorder among trauma patients: a comparative study between a regional and a university hospital. *Scand J Trauma Resusc Emerg Med*. 2018;26(1):44.
54. Lewis C, Roberts NP, Bethell A, et al. Internet-based cognitive and behavioural therapies for post-traumatic stress disorder (PTSD) in adults. *Cochrane Database Syst Rev*. 2018;12(12):CD011710.
55. Blandford A, Wesson J, Amalberti R, et al. Opportunities and challenges for telehealth within, and beyond, a pandemic. *Lancet Glob Health*. 2020;8(11):e1364–e1365.
56. Hernandez-Tejada MA, Zoller JS, Ruggiero KJ, et al. Early treatment withdrawal from evidence-based psychotherapy for PTSD: telemedicine and in-person parameters. *Int J Psychiatry Med*. 2014;48(1):33–55.

See supplementary material for this article at PSYCHIATRIST.COM.

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Supplementary Material

Article Title: Real-Time Telehealth Versus Face-to-Face Management for Patients With PTSD in Primary Care: A Systematic Review and Meta-Analysis

Authors: Anna Mae Scott, PhD; Mina Bakhit, PhD; Hannah Greenwood, BSc(Hons); Magnolia Cardona, PhD; Justin Clark, BA; Natalia Krzyzaniak, PhD; Ruwani Peiris, MD; and Paul Glasziou, PhD

DOI Number: 10.4088/JCP.21r14143

List of Supplementary Material for the article

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This Supplementary Material has been provided by the author(s) as an enhancement to the published article. It has been approved by peer review; however, it has undergone neither editing nor formatting by in-house editorial staff. The material is presented in the manner supplied by the author.

Supplementary Appendix 1: Searches

Database searches

PubMed Search run 18/11/2020
("Telemedicine"[Mesh] OR "Videoconferencing"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR Videoconferencing[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])
AND
("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Ïrritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])
AND
((Face-to-face[tiab]) OR “Usual care”[tiab] OR Visits[tiab] OR Visit[tiab] OR In-person[tiab] OR “In person”[tiab] OR ((Clinic[tiab] OR Centre[tiab] OR Home[tiab]) AND (Based[tiab] OR Contact[tiab])) OR Conventional[tiab] OR “Practice-based”[tiab] OR “Practice based”[tiab] OR Traditional[tiab] OR “Standard care”[tiab] OR Homecare[tiab] OR ((Routine[tiab] OR Home[tiab]) AND (Care[tiab])))
AND
("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])
AND
("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab])
AND
(Randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR randomised[tiab] OR placebo[tiab] OR "drug therapy"[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab]) NOT
(Animals[Mesh] not (Animals[Mesh] and Humans[Mesh]))
NOT
(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR Meta-Analysis[pt] OR “Observational Study”[pt] OR “Systematic Review”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR Meta-Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CENTRAL via the Cochrane Library run 18/11/2020
([mh Telemedicine] OR [mh Videoconferencing] OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face-to-face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)
AND
([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR

Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face-to-face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR

Conventional:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

Embase search run 18/11/2020

('Telemedicine'/exp OR 'Videoconferencing'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)

AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face-to-face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR In-person:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR Practice-based:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

AND

(random* OR factorial OR crossover OR placebo OR blind OR blinded OR assign OR assigned OR allocate OR allocated OR 'crossover procedure'/exp OR 'double-blind procedure'/exp OR 'randomized controlled trial'/exp OR 'single-blind procedure'/exp NOT ('animal'/exp NOT ('animal'/exp AND 'human'/exp)))

AND [embase]/lim

Clinical registry searches

Searches run 25/03/2021

Clinicaltrials.gov

Intervention field: (Telemedicine OR Videoconferencing OR Telephone OR Telehealth) AND (“Usual care” OR “Standard care” OR Face-to-face OR Face to face”)

Condition or disease field: “Post traumatic stress” OR PTSD

WHO ICTRP

Telemedicine AND “Post traumatic stress” OR Telehealth AND “Post traumatic stress” OR Videoconferencing AND “Post traumatic stress” OR Telemedicine AND PTSD OR Telehealth AND PTSD OR Videoconferencing AND PTSD

Supplementary Table 1 – Table of Excluded Studies

No.	Reference	Reason for exclusion
1	Acierno R, Rheingold A, Amstadter A, Kurent J, Amella E, Resnick H, et al. Behavioral activation and therapeutic exposure for bereavement in older adults. Am J Hosp Palliat Care. 2012;29(1):13-25.	population
2	Applebaum AJ, DuHamel KN, Winkel G, Rini C, Greene PB, Mosher CE, et al. Therapeutic alliance in telephone-administered cognitive-behavioral therapy for hematopoietic stem cell transplant survivors. J Consult Clin Psychol. 2012;80(5):811-6.	comparison
3	Backhaus A, Agha Z, Maglione ML, Repp A, Ross B, Zuest D, et al. Videoconferencing psychotherapy: a systematic review. Psychol Serv. 2012;9(2):111-31.	study type
4	Badour CL, Gros DF, Szafranski DD, Acierno R. Problems in sexual functioning among male OEF/OIF veterans seeking treatment for posttraumatic stress. Compr Psychiatry. 2015;58:74-81.	study type
5	Fortney JC, Pyne JM, Kimbrell TA, Hudson TJ, Robinson DE, Schneider R, et al. Telemedicine-based collaborative care for posttraumatic stress disorder: A randomized clinical trial. JAMA Psychiatry. 2015;72(1):58-67.	comparison
6	Fortney JC, Pyne JM, Mouden SB, Mittal D, Hudson TJ, Schroeder GW, et al. Practice-based versus telemedicine-based collaborative care for depression in rural federally qualified health centers: A pragmatic randomized comparative effectiveness trial. American Journal of Psychiatry. 2013;170(4):414-25.	comparison
7	Gehrman P, Bellamy S, Medvedeva E, Barilla H, Brownlow J, Prigge J, et al. Telehealth delivery of group CBT-I is noninferior to in-person treatment in veterans with PTSD. Sleep. 2018;41:A141-A2.	study type
8	Germain V, Marchand A, Bouchard S, Drouin M-S, Guay S. Effectiveness of Cognitive Behavioural Therapy Administered by Videoconference for Posttraumatic Stress Disorder. Cognitive Behaviour Therapy. 2009;38(1):42-53.	study type
9	Glassman LH, Mackintosh MA, Talkovsky A, Wells SY, Walter KH, Wickramasinghe I, et al. Quality of life following treatment for PTSD: Comparison of videoconferencing and in-person modalities. Journal of Telemedicine and Telecare. 2019;25(2):123-7.	study type
10	Glassman LH, Mackintosh MA, Wells SY, Wickramasinghe I, Walter KH, Morland LA. Predictors of Quality of Life Following Cognitive Processing Therapy Among Women and Men With Post-Traumatic Stress Disorder. Mil Med. 2020;185(5-6):e579-e85.	study type
11	Greene CJ, Morland LA, Durkalski VL, Frueh BC. Noninferiority and equivalence designs: issues and implications for mental health research. J Trauma Stress. 2008;21(5):433-9.	study type
12	Gros DF, Gros KS, Acierno R, Frueh BC, Morland LA. Relation Between Treatment Satisfaction and Treatment Outcome in Veterans with Posttraumatic Stress Disorder. Journal of Psychopathology and Behavioral Assessment. 2013;35(4):522-30.	study type
13	Gros DF, Morland LA, Greene CJ, Acierno R, Strachan M, Egede LE, et al. Delivery of Evidence-Based Psychotherapy via Video Telehealth. Journal of Psychopathology and Behavioral Assessment. 2013;35(4):506-21.	study type
14	Gros DF, Price M, Strachan M, Yuen EK, Milanak ME, Acierno R. Behavioral activation and therapeutic exposure: an investigation of relative symptom changes in PTSD and depression during the course of integrated behavioral activation, situational exposure, and imaginal exposure techniques. Behav Modif. 2012;36(4):580-99.	study type
15	Gros DF, Price M, Yuen EK, Acierno R. Predictors of completion of exposure therapy in OEF/OIF veterans with posttraumatic stress disorder. Depress Anxiety. 2013;30(11):1107-13.	outcomes
16	Gros DF, Strachan M, Ruggiero KJ, Knapp RG, Frueh BC, Egede LE, et al. Innovative service delivery for secondary prevention of PTSD in at-risk OIF-OEF service men and women. Contemp Clin Trials. 2011;32(1):122-8.	study type

17	Gros DF, Szafranski DD, Acierno R. Symptoms of Post-Traumatic Stress Disorder and Major Depressive Disorder in Veterans of Operations Enduring Freedom/Iraqi Freedom in Comparison With Those Veterans of Other Conflicts. Military Behavioral Health. 2016;4(4):383-9.	study type
18	Gros DF, Veronee K, Strachan M, Ruggiero KJ, Acierno R. Managing suicidality in home-based telehealth. J Telemed Telecare. 2011;17(6):332-5.	study type
19	Gros DF, Yoder M, Tuerk PW, Lozano BE, Acierno R. Exposure Therapy for PTSD Delivered to Veterans via Telehealth: Predictors of Treatment Completion and Outcome and Comparison to Treatment Delivered in Person. Behavior Therapy. 2011;42(2):276-83.	study type
20	Gros DF, Yoder M, Tuerk PW, Lozano BE, Acierno R. Exposure Therapy for PTSD Delivered to Veterans via Telehealth: Predictors of Treatment Completion and Outcome and Comparison to Treatment Delivered in Person. Behavior Therapy. 2011;42(2):276-83.	duplicate
21	Haghnia Y, Samad-Soltani T, Yousefi M, Sadr H, Rezaei-Hachesu P. Telepsychiatry- based care for the treatment follow-up of iranian war veterans with post- traumatic stress disorder: A randomized controlled trial. Iranian Journal of Medical Sciences. 2019;44(4):291-8.	provider (specialist)
22	Hernandez-Tejada MA, Zoller JS, Ruggiero KJ, Kazley AS, Acierno R. Early treatment withdrawal from evidence-based psychotherapy for PTSD: telemedicine and in-person parameters. Int J Psychiatry Med. 2014;48(1):33-55.	study type
23	Hershenberg R, Paulson D, Gros DF, Acierno R. Does Amount and Type of Activity Matter in Behavioral Activation? A Preliminary Investigation of the Relationship between Pleasant, Functional, and Social Activities and Outcome. Behav Cogn Psychother. 2015;43(4):396-411.	study type
24	Keller SM, Tuerk PW. Evidence-based psychotherapy (EBP) non-initiation among veterans offered an EBP for posttraumatic stress disorder. Psychol Serv. 2016;13(1):42-8.	study type
25	Korte KJ, Allan NP, Gros DF, Acierno R. Differential treatment response trajectories in individuals with subclinical and clinical PTSD. J Anxiety Disord. 2016;38:95-101.	intervention
26	Lejuez CW, Hopko DR, Acierno R, Daughters SB, Pagoto SL. Ten year revision of the brief behavioral activation treatment for depression: revised treatment manual. Behav Modif. 2011;35(2):111-61.	study type
27	Lleras M, Casellas-Grau A, Sumalla E, Ortega AR, Andrés JMB, Ochoa C. Randomized Control Trial (RCT) of Online vs Presential Positive Group Psychotherpay. Psycho-Oncology. 2017;26:44-5.	population
28	Macdonald A, Greene C, Torres J, Frueh B, Morland L. Concordance Between Clinician-Assessed and Self-Reported Symptoms of Posttraumatic Stress Disorder Across Three Ethnoracial Groups. Psychological Trauma: Theory, Research, Practice, and Policy. 2013;5:401.	intervention
29	Marchand A, Beaulieu-Prévost D, Guay S, Bouchard S, Drouin MS, Germain V. Relative efficacy of cognitive-behavioral therapy administered by videoconference for posttraumatic stress disorder: A six-month follow-up. Journal of Aggression, Maltreatment and Trauma. 2011;20(3):304-21.	study type
30	Morland LA, Greene CJ, Rosen C, Mauldin PD, Frueh BC. Issues in the design of a randomized noninferiority clinical trial of telemental health psychotherapy for rural combat veterans with PTSD. Contemp Clin Trials. 2009;30(6):513-22.	study type
31	Morland LA, Mackintosh M-A, Greene CJ, Rosen CS, Chard KM, Resick P, et al. Cognitive Processing Therapy for Posttraumatic Stress Disorder Delivered to Rural Veterans via Telemental Health: A Randomized Noninferiority Clinical Trial. Journal of Clinical Psychiatry. 2014;75(5):470-6.	duplicate of an included study
32	Morland LA, Mackintosh MA, Glassman LH, Wells SY, Thorp SR, Rauch SAM, et al. Home-based delivery of variable length prolonged exposure therapy: a comparison of clinical efficacy between service modalities. Depression and anxiety. 2019.	comparison
33	Morland LA, Mackintosh MA, Glassman LH, Wells SY, Thorp SR, Rauch SAM, et al. Home-based delivery of variable length prolonged exposure therapy: A comparison of clinical efficacy between service modalities. Depress Anxiety. 2020;37(4):346-55.	duplicate

34	Paul LA, Gros DF, Strachan M, Worsham G, Foa EB, Acierno R. Prolonged Exposure for Guilt and Shame in a Veteran of Operation Iraqi Freedom. Am J Psychother. 2014;68(3):277-86.	study type
35	Pelton D, Wangelin B, Tuerk P. Utilizing Telehealth to Support Treatment of Acute Stress Disorder in a Theater of War: Prolonged Exposure via Clinical Videoconferencing. Telemed J E Health. 2015;21(5):382-7.	study type
36	Poon P, Hui E, Dai D, Kwok T, Woo J. Cognitive intervention for community-dwelling older persons with memory problems: telemedicine versus face-to-face treatment. International Journal of Geriatric Psychiatry. 2005;20(3):285-6.	population
37	Price M, Gros DF, Strachan M, Ruggiero KJ, Acierno R. The Role of Social Support in Exposure Therapy for Operation Iraqi Freedom/Operation Enduring Freedom Veterans: A Preliminary Investigation. Psychol Trauma. 2013;5(1):93-100.	intervention
38	Price M, Gros DF, Strachan M, Ruggiero KJ, Acierno R. Combat experiences, pre-deployment training, and outcome of exposure therapy for post-traumatic stress disorder in Operation Enduring Freedom/Operation Iraqi Freedom veterans. Clin Psychol Psychother. 2013;20(4):277-85.	study type
39	Price M, Kuhn E, Hoffman JE, Ruzek J, Acierno R. Comparison of the PTSD Checklist (PCL) Administered via a Mobile Device Relative to a Paper Form. J Trauma Stress. 2015;28(5):480-3.	comparison
40	Raab PA, Mackintosh MA, Gros DF, Morland LA. Impact of comorbid depression on quality of life in male combat Veterans with posttraumatic stress disorder. J Rehabil Res Dev. 2015;52(5):563-76.	study type
41	Raab PA, Mackintosh MA, Gros DF, Morland LA. Examination of the Content Specificity of Posttraumatic Cognitions in Combat Veterans With Posttraumatic Stress Disorder. Psychiatry. 2015;78(4):328-40.	study type
42	Ruskin PE, Silver-Aylaian M, Kling MA, Reed SA, Bradham DD, Hebel JR, et al. Treatment outcomes in depression: Comparison of remote treatment through telepsychiatry to in-person treatment. American Journal of Psychiatry. 2004;161(8):1471-6.	provider (specialist)
43	Soltis K, Acierno R, Gros DF, Yoder M, Tuerk PW. Post-traumatic stress disorder: ethical and legal relevance to the criminal justice system. J Law Med Ethics. 2014;42(2):147-54.	study type
44	Thorp SR, Fidler J, Moreno L, Floto E, Agha Z. Lessons learned from studies of psychotherapy for posttraumatic stress disorder via video teleconferencing. Psychol Serv. 2012;9(2):197-9.	study type
45	Tuerk PW. Starting from something: augmenting exposure therapy and methods of inquiry. Am J Psychiatry. 2014;171(10):1034-7.	study type
46	Tuerk PW, Wangelin B, Rauch SA, Dismuke CE, Yoder M, Myrick H, et al. Health service utilization before and after evidence-based treatment for PTSD. Psychol Serv. 2013;10(4):401-9.	study type
47	Wells SY, Glassman LH, Talkovsky AM, Chatfield MA, Sohn MJ, Morland LA, et al. Examining Changes in Sexual Functioning after Cognitive Processing Therapy in a Sample of Women Trauma Survivors. Women's health issues. 2018;(no pagination).	duplicate of an included study
48	Yuen EK, Gros DF, Price M, Zeigler S, Tuerk PW, Foa EB, et al. Randomized Controlled Trial of Home-Based Telehealth Versus In-Person Prolonged Exposure for Combat-Related PTSD in Veterans: Preliminary Results. J Clin Psychol. 2015;71(6):500-12.	duplicate of an included study
49	Zhang J, Sheerin C, Mandel H, Banducci AN, Myrick H, Acierno R, et al. Variation in SLC1A1 is related to combat-related posttraumatic stress disorder. J Anxiety Disord. 2014;28(8):902-7.	study type

Supplementary Table 2 – Ongoing trials

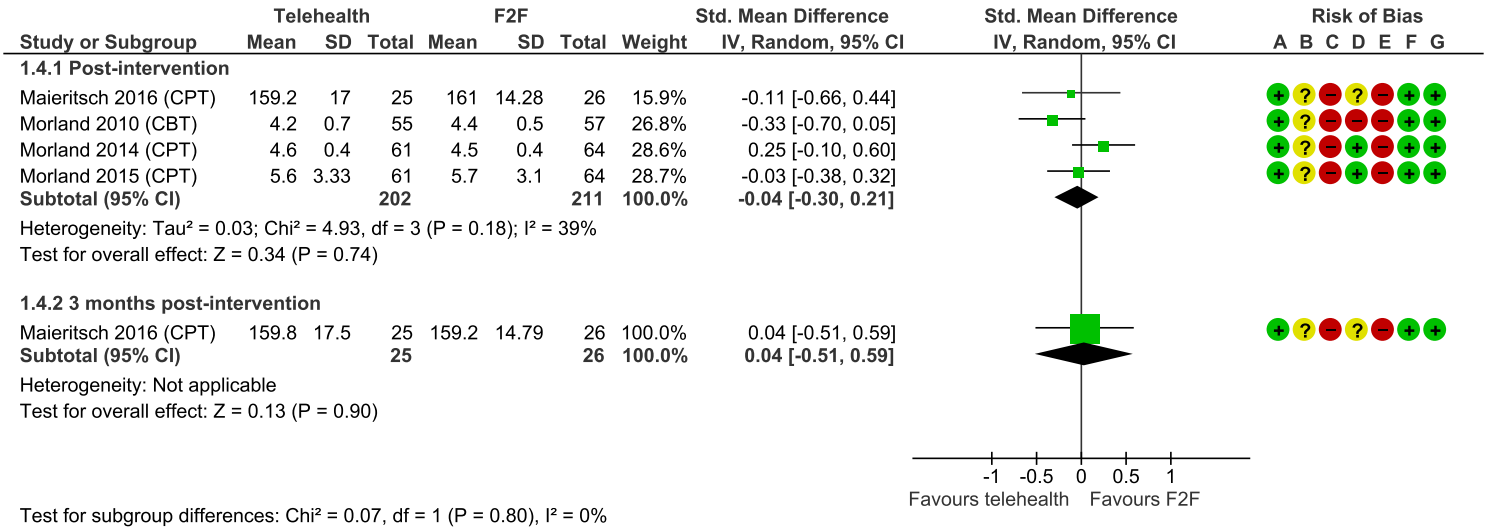
Trial registry number	Title	PICO
NCT01158001	Telemedicine for Improved Delivery of Psychosocial Treatments for Post Traumatic Stress Disorder	P = Primary diagnosis of chronic PTSD due to combat, over 18 years old I = Prolonged exposure therapy via telehealth (video) C = Prolonged exposure therapy face-to-face O = PTSD severity (CAPS scale)
NCT00333710	Evaluating a Telehealth Treatment for Veterans With Hepatitis C and PTSD	P = clinical diagnosis of hepatitis C, clinical diagnosis of PTSD I = Individual telephone psychotherapy C1 = Individual face-to-face psychotherapy C2 = Control condition/treatment as usual O = Hepatitis C knowledge questionnaire; quality of life, adverse events
NCT02290847	Clinical Effectiveness Trial of In-Home Cognitive Processing Therapy for Combat-Related PTSD	P = active duty military and veterans, with PTSD I = Telehealth (video) cognitive processing therapy (CPT) C1: in-office face-to-face CPT C2: at home face-to-face CPT O = PTSD symptoms (PCL-5 scale)

Supplementary Table 3 – Measurement scales for primary and secondary outcomes

Outcome	Abbreviated name	Full Name	Use of scale	Quality	Items	Delivery	Scoring
PTSD Severity	PCL-M	PTSD Checklist - Military	Assesses DSM-IV PTSD symptom severity amongst military personnel; asks about symptoms in response to "stressful military experiences."	reliable and valid	17	Self report	5-point Likert scale. A total symptom severity score (range = 17-85) can be obtained by summing the scores from each of the 17 items that have response options ranging from 1 “Not at all” to 5 “Extremely”. High score = higher symptom severity.
	PCL-C	PTSD Checklist - Civilian	Assesses DSM-IV PTSD symptom severity, in relation to generic “stressful experiences” and can be used with any population	reliable and valid	17	Self report	5-point Likert scale. A total symptom severity score (range = 17-85) can be obtained by summing the scores from each of the 17 items that have response options ranging from 1 “Not at all” to 5 “Extremely”. High score = higher symptom severity.
	CAPS/ CAPS-5	Clinician-Administered PTSD Scale	Assesses the 20 DSM-5 PTSD symptoms; targets the onset and duration of symptoms, subjective distress, impact of symptoms on functioning, improvement in symptoms since a previous CAPS, overall response validity, overall PTSD severity, and specifications for the dissociative subtype	reliable and valid	30	Clinician administered	CAPS total score and criterion scores were used (higher scores indicative of more symptomatology). CAPS-5 total symptom severity score is calculated by summing severity scores for the 20 DSM-5 PTSD symptoms. CAPS-5 symptom cluster severity scores are calculated by summing the individual item severity scores for symptoms corresponding to a given DSM-5 cluster
Depression Severity	PHQ-9	Patient Health Questionnaire	Used in screening for probable depression and monitoring treatment progress	reliable and valid	9	Self report	Total score of 27, higher score indicates more severe depression
	BDI/BDI-II	Beck Depression Inventory	Evaluates the severity of depression in normal and psychiatric populations	reliable and valid	21	Self report	Sum scores are calculated with a possible range of 0 to 63, with higher scores indicating higher levels of depression symptom severity
Quality of Life	SF-36	Short Form Survey	Measures health status and functioning over the past 4 weeks	Reliable and valid	36	self report	Final scores range from 0-100, with the highest level of functioning being 100. Physical health score only
Therapeutic working alliance	WAI-T	Working Alliance Inventory Short Form - Therapist version	Refined measure of the therapeutic alliance that assesses three key aspects of the therapeutic alliance	Reliable and valid	12	Self report	Higher scores reflect more positive working alliance, scored on a scale of 1-7

	WAI-C	Working Alliance Inventory Short Form - Client version	Refined measure of the therapeutic alliance that assesses three key aspects of the therapeutic alliance	Reliable and valid	12	Self report	Higher scores reflect more positive working alliance, scored on a scale of 1-7
	GTAS	Group therapy alliance scale	Assesses therapeutic alliance and group cohesion	Version used not validated	30	Self report	Scoring unclear, seems to be on 1-5 Likert scale where higher scores indicate more agreement/satisfaction. High score 150.
Satisfaction	CPOSS	Charleston Psychiatrics Outpatient Satisfaction Scale	Measures satisfaction in psychiatric outpatients	Reliable and valid	16	Self report	The overall score results from summing responses to individual questions for a possible range of 13 to 65 with higher scores indicating higher satisfaction
	CPOSS-VA	Charleston Psychiatrics Outpatient Satisfaction Scale - Veterans	Evaluates satisfaction with care among combat veterans treated within VA PTSD clinics	Reliable and valid	16	Self report	5-point Likert scale response format, high score of 80 where higher score = high satisfaction
	Service Delivery Perceptions Questionnaire	Service Delivery Perceptions Questionnaire	Assesses the level of satisfaction with their modality of treatment received	Unclear	8	Self report	5-point Likert scale, high scores = higher satisfaction
	N/A	Overall patient satisfaction questionnaire	Measures patient satisfaction with treatment	unclear	unclear	Self report	Unclear

Supplementary Figure 1: Telehealth vs. face-to-face for PTSD: therapeutic alliance (the evaluated therapy is indicated in brackets after each reference)

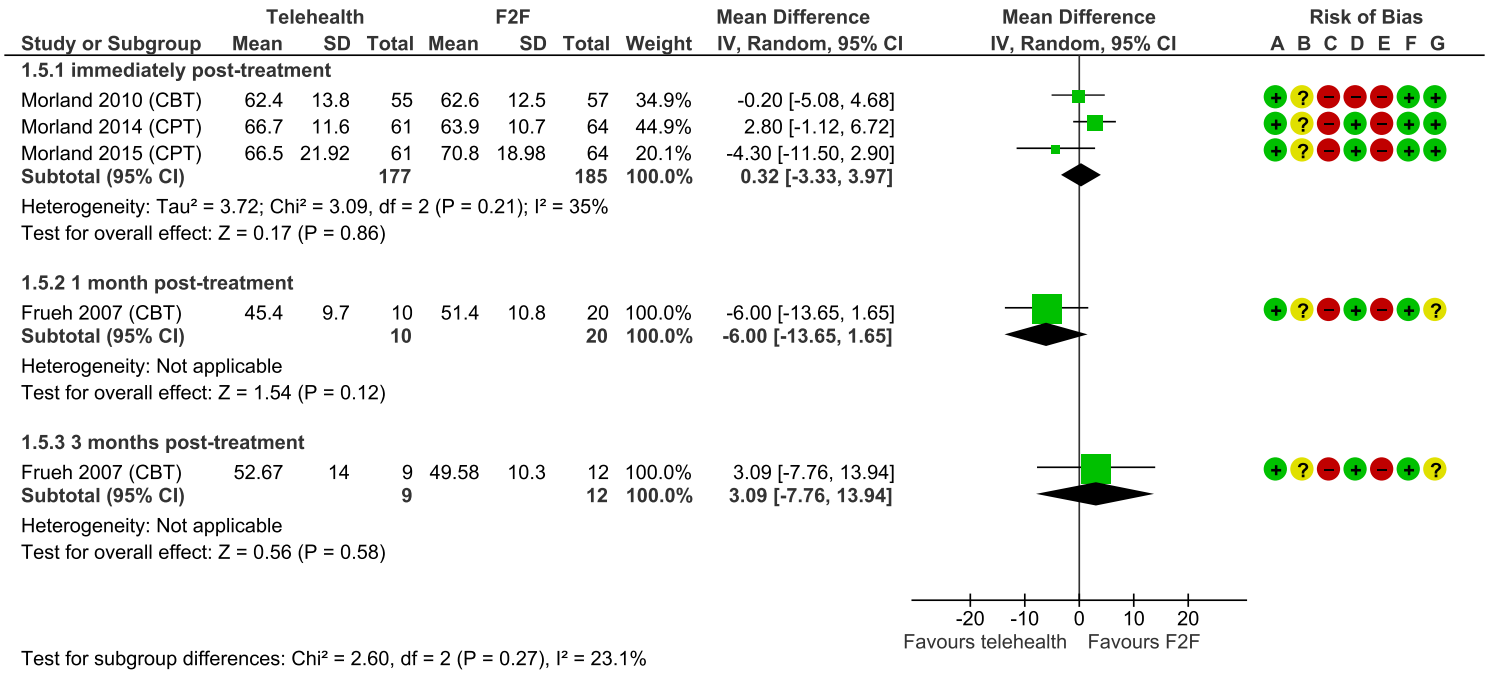


Test for subgroup differences: Chi² = 0.07, df = 1 (P = 0.80), I² = 0%

Risk of bias legend

(**A**) Random sequence generation (selection bias)
(**B**) Allocation concealment (selection bias)
(**C**) Blinding of participants and personnel (performance bias)
(**D**) Blinding of outcome assessment (detection bias)
(**E**) Incomplete outcome data (attrition bias)
(**F**) Selective reporting (reporting bias)
(**G**) Other bias

Supplementary Figure 2: Telehealth vs. face-to-face for PTSD: satisfaction with treatment (the evaluated therapy is indicated in brackets after each reference)



Test for subgroup differences: Chi² = 2.60, df = 2 (P = 0.27), I² = 23.1%

Risk of bias legend

(**A**) Random sequence generation (selection bias)
(**B**) Allocation concealment (selection bias)
(**C**) Blinding of participants and personnel (performance bias)
(**D**) Blinding of outcome assessment (detection bias)
(**E**) Incomplete outcome data (attrition bias)
(**F**) Selective reporting (reporting bias)
(**G**) Other bias