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# The Efficacy of Synchronous Teletherapy Versus In-Person Therapy: A Meta-Analysis of Randomized Clinical Trials

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Despite the increasing use of teletherapy, it remains unclear if client outcomes differ between remote and in-person settings and, if they do differ, what factors might contribute to these differences. The current study synthesized findings on the comparison between teletherapy and in-person therapy using a meta-analytic approach. All known RCTs comparing teletherapy (telephone and videoconferencing therapy) to in-person therapy were identified via bibliographic database search (*PsycINFO*, Medline, and Cochrane database), manual searches of previously published meta-analyses, and expert contact. We identified 1,393 studies in the initial search, 20 of which satisfied study inclusion criteria. No significant difference was found between teletherapy and in-person therapy in treatment outcomes at posttreatment ($g = -0.043$) or follow-up ($g = -0.045$) or in attrition rates (RR = 1.006). Trainee therapists experienced greater client attrition rates in teletherapy than did licensed therapists. Videoconferencing therapy was at greater risk for client attrition than telephone therapy. Within-group findings showed that teletherapy produced a symptom reduction of a large magnitude at posttreatment ($g = 1.026$) and follow-up ($g = 1.021$). These findings provide empirical support for the practice of teletherapy and that client outcomes in teletherapy do not differ from in-person versions of treatments.

***Public Health Significance Statements***

Teletherapy produces comparable outcome to in-person therapy. Trainee therapists are at greater risk of client dropout in teletherapy than licensed therapists.

*Keywords:* teletherapy, meta-analysis, in-person therapy, attrition, telepsychology

*Supplemental materials:* https://doi.org/10.1037/cps0000056.supp



Teletherapy is defined as the administration of psychotherapy using remote technologies (Telepsychology Task Force, 2013). Teletherapy can be administered asynchronously and synchronously. Asynchronous teletherapy, such as computerized therapy and internet-administered therapy, involves clients accessing intervention materials with varying levels of clinician support (Wootton, 2016). The client-therapist interaction in asynchronous teletherapy is not conducted in real-time (Varker et al., 2019). In contrast, synchronous teletherapy is similar to traditional in-person therapy vis-à-vis treatment intensity (Varker et al., 2019), in which clients and therapists interact in real-time without being in the same room. The most common synchronous teletherapy includes videoconferencing and telephone therapy (Sammons et al., 2020).

Many individuals report barriers to accessing psychological treatments, such as time constraints, cost-related concerns, transportation inconveniences, and perceived stigma (Marques et al., 2010; Mohr et al., 2006). Teletherapy can circumvent these barriers and enable individuals to receive therapy regardless of geographic residence (Brenes et al., 2011; Kafali et al., 2014). In addition to its convenience and accessibility, teletherapy is potentially advantageous for patients with disorders that preclude them from attending in-person treatments, such as social anxiety and panic disorders (Chiauzzi et al., 2020).

The past decades have witnessed increased research on, and the practice of, teletherapy (Brenes et al., 2011; Glueckauf et al., 2018; Pierce et al., 2019; Varker et al., 2019). A nationwide survey across the US on the practice of teletherapy between January 2013 through December 2016 found that 43% of therapists administered at least "some hours" of remote therapy weekly (Glueckauf et al., 2018). In early 2020, due in large part to the COVID-19 pandemic, teletherapy rapidly changed from an adjunct treatment to standard practice (Markowitz et al., 2021; Pierce et al., 2021; Sammons et al., 2020). The proportion of remotely administered clinical services increased to 85.53% in 2020 and will likely

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remain very high after the pandemic (Pierce et al., 2021). The greater practice of teletherapy necessitates an evaluation of the efficacy and suitability of teletherapy compared to in-person therapy and the identification of factors that facilitate or hinder its efficacy.

## The Efficacy of Synchronous Teletherapy

Previous clinical trials have demonstrated the efficacy of synchronous teletherapy for a variety of mental health disorders, including depression (Egede et al., 2015), anxiety (Stubbings et al., 2013), posttraumatic stress disorder (PTSD; Acierno et al., 2016, 2017), panic disorder (Bouchard et al., 2004), and eating disorder (Mitchell et al., 2008). Several reviews of synchronous teletherapy treatments have been published (Bee et al., 2008; Bolton & Dorstyn, 2015; Mohr et al., 2008; Osenbach et al., 2013; Varker et al., 2019; Wootton, 2016). For example, Mohr et al. (2008) synthesized 12 telephone therapy trials and found significant effects of telephone therapy for depression. Osenbach et al. (2013) updated the findings by including 14 studies of videoconferencing and telephone therapy for depression and found similar results. In a meta-analysis of eighteen studies of remote cognitive behavioral therapy (CBT), remote CBT resulted in significant improvements for obsessive-compulsive symptoms (Wootton, 2016). Further, Hilty et al. (2013) reviewed the effectiveness of telemental health and found that telemental health is effective for diagnosis and assessment across different age and ethnic groups and across various settings.

While previous meta-analyses suggest that teletherapy is efficacious, it is unclear if it is equally efficacious as in-person therapy. Previous meta-analyses, however, included studies comparing telepsychology to various types of control groups, including treatment-as-usual (TAU), wait list controls, and in-person therapy using the same or a different treatment manual (Mohr et al., 2008; Osenbach et al., 2013; Wootton, 2016). For example, in Wootton's (2016) meta-analysis, only four of the eighteen included studies compared remote therapy to in-person treatment. To date, no meta-analyses have examined whether teletherapy and in-person therapy produce different outcomes in head-to-head comparisons while controlling for other relevant factors (i.e., with similar samples, clients, therapists, and treatment manuals).

The large number of teletherapy studies published since the most recent meta-analysis, along with the rapid uptake of teletherapy in response to COVID-19, warrant the conduct of a present day meta-analysis (Pierce et al., 2021). Additionally, previous meta-analyses have focused primarily on a single diagnositc category (Wootton, 2016) and on a single telecommunication tool (i.e., telephone-only; Mohr et al., 2008). Potential moderators of the efficacy of teletherapy compared to in-person therapy, such as diagnostic category and teletherapy format, remained unstudied (Chiauzzi et al., 2020). It has yet to be determined for which patients presenting with which conditions teletherapy is most efficacious—perhaps even more efficacious than in-person therapy. For example, Chiauzzi et al. (2020) suggested that teletherapy may be preferable for female clients due to their responsibiltiy of family care. Additionally, older clients may experience more challenges when trying to access and use teconologies and, therefore, might prefer in-person therapy.

Young therapists report greater concerns in delivering teletherapy and poorer common therapeutic skills in teletherapy than older therapists (Lin et al., 2021, in press). This pattern may exist because older therapists have sufficient clinical experience and competency to adapt their skills to remote technologies. Furthermore, videoconferencing therapy may be preferable to audio-only therapy given that it can provides visual cues and is more similar to in-person communications. Treatment length is another potential factor when determineing teletherapy appropriateness because it may more challenging, thus requiring more time for therapists to build alliance with the patients in the absence of interpersonal contact and physical presence. Thus, it may be valuable to examine whether these factors regarding patients, therapists, and treatments may moderate the efficacy of teletherapy.

The present study (a) extends the literature and synthesizes the research on the efficacy of synchronous telepsychology (telephone and videoconferencing therapy) compared to in-person therapy at posttreatment and follow-up, (b) identifies potential predictors of the efficacy of synchronous telepsychology compared to in-person therapy, and (c) examines differences in attrition rates of synchronous telepsychology compared to in-person therapy.

# Method

## Protocol Registration and Search Strategy

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009), this meta-analysis was preregistered with PROSPERO (CRD42020183998) with relevant methods of review specified in advance. We conducted an extensive systematic search of the literature to identify published and unpublished studies from 1964 through May of 2020 for inclusion in the meta-analysis. First, three bibliographical databases (PsycINFO, Medline, and the Cochrane Library) were searched on 07/24/2021, with a focus on titles and abstracts by combining terms indicative of teletherapy, in-person therapy, and randomized clinical trials (RCTs):

> Searched in PsycINFO and MEDLINE (all years): (telephone or phone or audio or tele* or videoconferenc* or video) AND (psychotherapy or counseling or therapy) AND (trial or RCT or randomi*ed) AND (face to face OR face-to-face OR traditional OR onsite)
>
> Search in Cochrane Library (all years): (telephone or phone or audio or tele* or videoconferenc* or video):ti AND (psychotherapy or counseling or therapy):ab AND ("face to face" OR face-to-face OR traditional OR onsite OR in-person OR "in person"):ab

Second, a manual search was conducted of relevant articles by reviewing the cited literature of earlier meta-analyses and systematic reviews on teletherapy. Experts in the field were also contacted for ongoing or recently completed trials that satisfied the inclusion criteria of the meta-analysis (described below). Additionally, a forward-referencing search was performed to identifies articles that cite included articles. Finally, we cross-checked our search results against previous meta-analyses and reviews related to teletherapy.

## Inclusion and Exclusion Criteria

Each included study satisfied the following inclusion criteria: (a) the study was a randomized clinical trial of telephone-administered therapy or videoconferencing therapy compared to in-person

therapy, (b) the intervention included four or more individual therapy sessions, (c) therapy was provided by health professionals, such as licensed therapists, psychologists, counselors, social workers, nurses, psychiatrists, and students who were receiving clinical training, (d) the in-person treatment and teletherapy treatment followed the same treatment manual, (e) the RCT's design included pretreatment and posttreatment evaluations of mental health symptoms using a validated measure, (f) patients were adults (≥ 18 years of age) with mental health symptoms indicated by symptom measures or clinicians' diagnoses, and (g) there were 10 or more patients in each treatment condition.

Studies were excluded if (a) they included patients in inpatient settings; (b) treatment was administered through a telephone hotline, crisis counseling service, or other short-term psychological service; (c) the psychological intervention was adjunct to other treatment (e.g. physical therapy, pharmacotherapy); (d) the treatment was speech therapy, language, or occupational therapy or limited to social support; or (e) the study was duplicated in one or more included studies. Because researchers sometimes publish multiple studies based on the same data, we followed recommendations by Wood (2008) for strategies to detect duplicative studies to avoid the problems of multiplicity. If duplicate studies were identified, the study with most comprehensive data was included and the others were excluded.

## Risk of Bias Assessment and Data Extraction

Each study's risk for bias was assessed using the Cochrane Library risk of bias assessment tool and Cochrane Handbook (Higgins et al., 2020). The following sources of bias in each study were judged as high, low, or unclear risk: sequence generation (whether the study used appropriate methods to generate comparable groups); incomplete outcome data (the completeness of outcome data for each main outcome); selective outcome reporting (the possibility of selective outcome reporting); baseline difference (did baseline differences exist across treatment conditions); treatment compliance (whether patients' compliance to the treatment was acceptable); attrition bias (whether the attrition rate in each treatment condition is acceptable); intent-to-treat bias (whether all patients were included in the analysis regardless of the number of follow-up surveys they completed); and preregistered (whether the study was preregistered).

Characteristics and data of each study were extracted using a predeveloped codebook (see online supplemental materials). The following information was extracted from each study: paper description (study type; year of publication; titles; authors; country), treatment description (format: videoconferencing, telephone; session length; modality; provider characteristics; setting), patient characteristics (age; gender; diagnoses; ethnicity; region: urban or rural), primary outcomes, secondary outcomes, and attrition rates. Means and standard deviations of pretreatment, posttreatment, and follow-up evaluations of main outcome variables were extracted to calculate effect sizes. If these data were not reported, other relevant data were used (e.g., effect sizes of change and confidence intervals, ratio of remission). Study authors were contacted if the data presented in the article were insufficient to calculate effect sizes. The inclusion of studies, assessment of risk, and data extraction were conducted by two trained investigators independently and checked by a third investigator, with an initial agreement of 90.89%, resolved to 100% agreement after discussion.

## Data Analysis

Comprehensive Meta-Analysis (version 3.3070; CMA) was used to calculate pooled between-group effect sizes of a teletherapy group versus an in-person therapy group. A positive effect size indicates that the teletherapy showed greater efficacy than the in-person therapy whereas a negative effect size indicates that the teletherapy showed lesser efficacy. Effect sizes at posttreatment and 3- to 6-month follow-up were calculated. We also calculated the pooled between-group risk ratio (RR) of attrition, which indicated the attrition rate in the teletherapy group divided by the attrition rate in the in-person therapy group. A risk ratio of 1 indicated that the attrition rate in teletherapy was comparable to the attrition rate in in-person therapy. A risk ratio greater than one indicated that the attrition rate in teletherapy was larger than the attrition rate in in-person therapy whereas a risk ratio less than one indicates that the attrition rate in teletherapy was smaller than the attrition rate in in-person therapy. Furthermore, we calculated the within-group effect sizes for teletherapy at posttreatment and follow-up. A random effects pooling model was used in all analyses because heterogeneity is commonly assumed across clinical studies. We also calculated the $Q$ and $I^2$ to test the homogeneity of effect sizes.

Additionally, subgroup analyses were performed for the following characteristics of the study: treatment format (videoconferencing vs. telephone) and provider license status (licensed vs. trainee) to examine whether any were associated the pooled effect sizes. Sensitivity analyses were also conducted to assess risk of bias to compare the pooled effect size of studies with low risk of bias (low or unclear risk on all bias items) to studies with high risk on at least one of the eight bias items. Furthermore, the "one-study removed" method was used to examine whether systematically removing each study impacted the overall effect size. Finally, for continuous variables, metaregression analyses were conducted to examine whether patients' average age, gender, and treatment length were associated with the pooled effect sizes at posttreatment and follow-up as well as attrition.

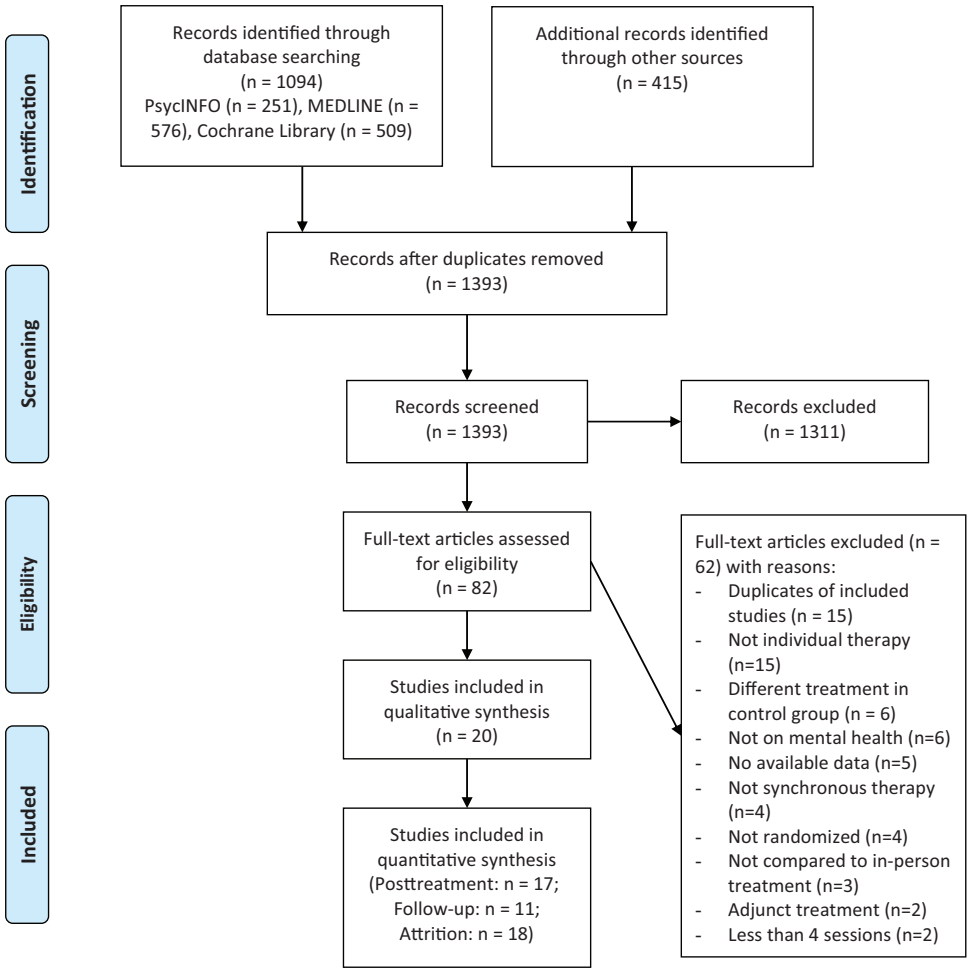
# Results

## Study Selection

A total of 1,751 studies (1,393 after removal of duplicates) were identified via the procedures described above. After abstract screening, 82 full-text articles were assessed for eligibility (see Figure 1). Twenty studies that directly compared teletherapy and in-person therapy and satisfied all inclusion criteria were included in the meta-analysis. The PRISMA flowchart described the inclusion process and reasons for exclusion (see Figure 1).

Of the 20 studies, 3 did not provide sufficient data to calculate effect sizes and 2 did not report attrition rates. Therefore, 17 studies with 18 comparisons were included in the meta-analysis of effect sizes (including 35 unique samples and 2,004 participants), and 18 studies with 19 comparisons were included in the meta-analysis of attrition rate (including 37 unique samples and 2,159 participants). Additionally, 11 studies that included follow-up at 3

**Figure 1**
*Selection and Exclusion of Studies*




*Note*. See the online article for the color version of this figure.

and 6 months were included to calculate the longer-term effect of synchronous teletherapy compared to in-person therapy.

## Characteristics of Included Studies

The characteristics of the 20 included studies are outlined in Table 1. Of the 20 studies, 6 compared in-person therapy to telephone therapy and 13 compared in-person therapy to videoconferencing therapy; one study compared both videoconferencing and telephone therapy to in-person therapy. The 20 studies were conducted in the United States (n = 11), Canada (n = 3), the United Kingdom (n = 2), New Zealand (n = 1), Spain (n = 1), China (n = 1), and Australia (n = 1). The majority of studies tested CBT (n = 12); other specified treatment modalities included cognitive processing therapy (CPT; n = 2), behavioral activation (BA; n = 2), exposure therapy (n = 1), and problem-solving therapy (n = 1). In terms of diagnostic category, the included studies have primarily focused on PTSD (n = 5), depression (n = 4), generalized anxiety disorder (n = 1), eating disorder (n = 1), panic disorder with agoraphobia (n = 1), gambling (n = 1), and dementia (n = 1). The others (n = 5) did not focus on any specific diagnosis of mental disorder. Treatment lengths varied from 5 to 20 session, and each session ranged from 30 minutes to 90 minutes.

## Risk of Bias Assessment

Among the 20 studies, eighteen studies were determined to have adequate sequence generation, while two studies had high risk for inadequate sequence generation. Fifteen studies had acceptable attrition rates (<30% for treatments with less than 8 session; <35% for treatment with 8 or more sessions) whereas three studies had higher attrition rates; two study did not report attrition. Eleven studies conducted intent-to-treat analyses while seven did not. Ten studies had been preregistered whereas ten had not. Seventeen studies were determined to be at low risk for significant baseline differences between groups while three had higher risk of baseline differences between groups. Fourteen studies had lower risk for poor treatment adherence or patient compliance; 6 did not provide any information on treatment adherence. In terms of selective outcome reporting, 17 were at low risk. Sixteen studies had low risk for incomplete outcome data. Overall, fourteen studies were at risk for some biases and

**Table 1**
*Characteristics of the Included Studies*

| Study | Country | Format | Modality | Therapist Expertise | Contain in-person contact | Diagnoses/problems | *M* age (*SD*) | % female | Control Group | *n* | # of session | Follow-up |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acierno et al. (2016) | USA | VC | BA | Master's level counselors | No | PTSD | 45.6 (14.9) | 5.60% | F2F | VC: 111F2F: 121 | 8 | Pre- and posttreatment, 3 m and 12 m |
| Acierno et al. (2017) | USA | VC | Exposure therapy | Licensed master's level counselors | No | PTSD | 41.8 (14.5) | 3.80% | F2F | VC: 65F2F: 68 | 10 | Pre- and posttreatment, 3 m and 6 m |
| Alegría et al. (2014) | USA | TP | CBT | Psychologists, licensed social workers, and counselor | No | Depression | 44.9 | 81.71% | F2F; TAU | TP: 87F2F: 84TAU: 86 | 9 | Pre- and posttreatment, 2 m and 4 m |
| Arnedt et al. (2021) | USA | VC | CBT | Psychologist | No | Insomnia | 47.2 (16.3) | 70.80% | F2F | VC: 31F2F: 31 | 6 | Pre- and posttreatment, 3 m |
| Bouchard et al. (2004) | Canada | VC | CBT | Psychologists, PhD candidates, and psychoeducators | No | Panic disorder with agoraphobia | 37.99 | 71.40% | F2F | VC: 11F2F: 10 | 12 | Intake, pre- and posttreatment, 6 m |
| Burgess et al. (2012) | UK | TP | CBT | Trained nurse therapists | Yes | Chronic fatigue syndrome | 37.4 (10.1) | 78.75% | F2F | TP: 45F2F: 35 | 14 | Pre- and posttreatment, 3 m, 6 m, and 12 m |
| Choi et al. (2014) | USA | VC | PST | Master's level social workers | No | Depression | 64.8 (9.18) | 78.48% | F2F; CC | VC: 40F2F: 45CC: 31 | 6 | pretreatment, 12 w, 24 w, and 36 w |
| Cuevas et al. (2006) | Spain | VC | CBT | Psychiatrists | No | NS | 40.21 | 66.43% | F2F | VC: 70F2F: 70 | 8 | Pre- and posttreatment |
| Day and Schneider (2002) | USA | VC & TP | CBT | Doctoral students | No | NS | 39.35 (15.88) | 65.00% | F2F | F2F: 27VC: 26TP: 27 | 5 | Pre- and posttreatment |
| Egede et al. (2015) | USA | VC | BA | Licensed master's level counselors | No | MDD | 63.9 (5.1) | 2.48% | F2F | VC: 120F2F: 121 | 8 | pretreatment, 4 w, 8 w, 3 m and 12 m |
| Germain et al. (2009) | Canada | VC | CBT | Psychologists | No | PTSD | 42.33 | 60.40% | F2F | VC: 16F2F: 32 | 20 | Pre- and posttreatment |
| Maieritsch et al. (2016) | USA | VC | CPT | PhD-level psychologists and social worker | Yes | PTSD | 30.9 (6.05) | 6.70% | F2F | VC: 25F2F: 26 | 10 | Pre- and posttreatment |
| Mitchell et al. (2008) | USA | TP | CBT | Psychologists | No | BN or unspecified eating disorder | 29.02 | 98.44% | F2F | TP: 62F2F: 66 | 14 | Pre- and posttreatment, 3 m and 12 m |
| Mohr et al. (2012) | USA | TP | CBT | PhD-level psychologists | No | MDD | 47.7(13.0) | 77.54% | F2F | TP: 163F2F: 162 | 18 | Pre- and posttreatment, 3 m and 6 m |
| Morland et al. (2015) | USA | VC | CPT | NS | No | PTSD | 46.4 (11.9) | 100% | F2F | VC: 63F2F: 63 | 12 | pre- and posttreatment, 3 m and 6 m |
| Poon et al. (2005) | China | VC | Cognitive treatment | Social worker | No | Cognitive impairments | Unclear | Unclear | F2F | VC: 11F2F: 11 | 12 | Pre- and posttreatment |
| Robillard et al. (2017) | Canada | VC | CBT | Doctoral students | No | GAD | 41.15 | 82.05% | F2F | VC: 52F2F: 65 | 15 | Pre- and posttreatment, 6 m and 12 m |
| Stubbings et al. (2013) | Australia | VC | CBT | Doctoral students | Yes | NS | 30 (11) | 57.69% | F2F | VC: 14F2F: 12 | 12 | Pre- and posttreatment, 6 w |
| Tse et al. (2013) | New Zealand | TP | CPT | Social workers and counselors | No | Pathological gambling | 44.6 (12.3) | 67.39% | F2F | TP: 46F2F: 46 | 6 | Pre- and posttreatment |
| Watson et al. (2017) | UK | TP | CBT | NS | No | NS | 50.42 | 72.03% | F2F | F2F: 58TP: 60 | 4 | Pre- and posttreatment |

*Note.* BA = Behavioral activation; BN = Bulimia nervosa; CBT = Cognitive-behavioral therapy; CC = Care call; CPT = Cognitive processing therapy; F2F = Face-to-face therapy; GAD = Generalized anxiety disorder; MDD = Major depressive disorder; NS = nonspecified; PST = Problem-solving Therapy; PTSD = Posttraumatic stress disorder; TAU = Treatment as usual; TP = Telephone therapy; VC = Videoconferencing therapy

six showed low risk for all biases (see Supplemental Figure 1 for details of individual study).

## Between-Group Analyses

### *Posttreatment Effects of Teletherapy Compared to In-Person Therapy*

Table 2 shows the pooled effect sizes of teletherapy compared to in-person therapy. The pooled between-group effect size of synchronous teletherapy versus in-person therapy at posttreatment was hedges' $g = -0.043$ (k = 18; 95% CI [−0.137, 0.051]; $p = .367$), with zero heterogeneity ($I^2 = 0$; Q = 12.634, $p = .760$). The pooled between-group effect sizes at posttreatment ranged from −0.066 to −0.026 after removing each study, indicating no change to the effect size. Specifically, compared to in-person therapy at posttreatment, the pooled between-group effect sizes for video-conferenced therapy was $g = -0.077$ (k = 12; 95% CI [−0.201, 0.046], $p = .219$) and $g = 0.004$ (k = 6; 95% CI [−0.141, 0.148]; $p = .960$) for telephone-administered therapy.

### *Longer-Term Effects of Teletherapy Compared to In-Person Therapy*

At 3- to 6-month follow-up, the pooled effect size of synchronous teletherapy versus in-person therapy was $g = -0.045$ (k = 11; 95% CI [−0.151, 0.082]; $p = .411$), with zero heterogeneity ($I^2 = 0$; Q = 6.579; $p = .765$; see Table 2). Specifically, compared to in-person therapy at follow-up, the pooled effect size of videoconferencing therapy versus was $g = -0.02$ (k = 7; 95% CI [−0.160, 0.121]; $p = .785$) and the pooled effect size of telephone-administered therapy was $g = -0.055$ (k = 4; 95% CI [−0.263, 0.154]; $p = .607$). The pooled effect sizes at follow-up ranged from −0.065 to 0.005 after removing each study, indicating no change to the effect size.

### *Attrition Rate in Teletherapy Compared to In-Person Therapy*

Table 3 presents the risk ratio of attrition in teletherapy versus in-person therapy. The pooled risk ratio of attrition in synchronous teletherapy versus in-person therapy was 1.006 (k = 19; 95% CI [0.850, 1.191]; $p = .797$), with no heterogeneity ($I^2 = 0$; Q = 16.149, $p = .582$). Specifically, the pooled risk ratio of attrition in videoconferencing therapy versus in-person therapy was 1.249 (k = 12; 95% CI [0.971, 1.607]; $p = .084$). The pooled odds ratio of attrition in telephone therapy versus in-person therapy was 0.852 (k = 7; 95% CI [0.669, 1.085]; $p = .193$). The pooled risk ratio ranged from 0.970 to 1.092 after removing each study, indicating no changes to the effect size.

### *Subgroup Analyses and Metaregressions*

Table 4 shows differences in posttreatment and longer-term effects and attrition rates of teletherapy compared to in-person therapy when studies were grouped by treatment format, overall risk of bias, and therapist license status. None of these factors significantly moderated the effect sizes at posttreatment and follow-up of teletherapy versus in-person therapy. Of note, the risk ratio of attrition in teletherapy compared to in-person therapy varied by treatment format ($p = .032$) and therapist license status ($p = .045$). Compared to in-person therapy, videoconferencing therapy had greater risk for client attrition compared to telephone therapy. Compared to licensed therapists, trainee therapists experienced greater client attrition when administering teletherapy.

**Table 2**

*Between-Group Effect Sizes Comparing Telepsychology to In-Person Therapy at Postttreatment and Follow-Up*

| Study | Treatment format | Pretreatment to posttreatment | | Weight of included study | Pretreatment to follow-up | | Weight of included study |
|---|---|---|---|---|---|---|---|
| | | g | 95% CI | | g | 95% CI | |
| Alegría et al. (2014) | TP | 0.169 | [−0.130, 0.468] | 23.363 | 0.092 | [−0.207, 0.390] | 12.724 |
| Burgess et al. (2012) | TP | 0.210 | [−0.303, 0.723] | 7.946 | 0.239 | [−0.306, 0.785] | 3.819 |
| Day and Schneider (2002) | TP | 0.053 | [−0.474, 0.580] | 7.529 | −0.105 | [−0.563, 0.352] | 5.417 |
| Mitchell et al. (2008) | TP | −0.187 | [−0.622, 0.248] | 11.033 | — | — | — |
| Mohr et al. (2012) | TP | −0.064 | [−0.294, 0.166] | 39.440 | −0.236 | [−0.470, −0.001] | 20.608 |
| Watson et al. (2017) | TP | −0.098 | [−0.540, 0.344] | 10.689 | — | — | — |
| TP | | 0.004 | [−0.141, 0.148] | | −0.055 | [−0.263, 0.154] | |
| Acierno et al. (2016) | VC | −0.035 | [−0.311, 0.240] | 20.027 | 0.006 | [−0.269, 0.282] | 14.932 |
| Acierno et al. (2017) | VC | −0.174 | [−0.514, 0.166] | 13.151 | −0.162 | [−0.502, 0.178] | 9.821 |
| Arnedt et al. (2021) | VC | −0.094 | [−0.575, 0.387] | 6.579 | −0.047 | [−0.528, 0.433] | 4.915 |
| Bouchard et al. (2004) | VC | 0.473 | [−0.370, 1.316] | 2.139 | 0.200 | [−0.636, 1.037] | 1.623 |
| Choi et al. (2014) | VC | — | — | — | 0.052 | [−0.332, 0.435] | 7.701 |
| Cuevas et al. (2006) | VC | −0.067 | [−0.409, 0.275] | 12.993 | — | — | — |
| Egede et al. (2015) | VC | −0.242 | [−0.576, 0.092] | 13.612 | −0.126 | [−0.481, 0.228] | 9.036 |
| Day and Schneider (2002) | VC | 0.030 | [−0.501, 0.561] | 5.387 | — | — | — |
| Germain et al. (2009) | VC | −0.706 | [−1.350, −0.063] | 3.672 | — | — | — |
| Maieritsch et al. (2016) | VC | −0.090 | [−0.633, 0.454] | 5.148 | — | — | — |
| Morland et al. (2015) | VC | 0.095 | [−0.253, 0.442] | 12.606 | 0.109 | [−0.238, 0.457] | 9.405 |
| Poon et al. (2005) | VC | −0.041 | [−0.846, 0.764] | 2.346 | — | — | — |
| Stubbings et al. (2013) | VC | 0.348 | [−0.458, 1.154] | 2.340 | — | — | — |
| VC | | −0.077 | [−0.201, 0.046] | | −0.020 | [−0.160, 0.121] | |
| Overall | | −0.043 | [−0.137, 0.051] | | −0.045 | [−0.151, 0.062] | |

*Note*. TP = Telephone therapy; VC = Videoconferencing therapy

**Table 3**
*Between-Group Risk Ratio Comparing Attrition Rate of Telepsychology to In-Person Therapy*

| Study | Treatment format | Attrition rates of telepsychology versus in-person therapy | | Weight of included study | Attrition rates of telepsychology | | Weight of included study |
|---|---|---|---|---|---|---|---|
| | | *RR* | 95% CI | | AR | 95% CI | |
| Alegría et al. (2014) | TP | 0.841 | [0.502, 1.409] | 19.207 | 0.310 | [0.193, 0.427] | 15.995 |
| Burgess et al. (2012) | TP | 1.667 | [0.680, 4.088] | 6.929 | 0.333 | [0.165, 0.502] | 12.082 |
| Day and Schneider (2002) | TP | 2.266 | [0.440, 11.678] | 2.141 | 0.156 | [0.019, 0.293] | 14.398 |
| Mitchell et al. (2008) | TP | 0.828 | [0.468, 1.464] | 16.085 | 0.339 | [0.194, 0.484] | 13.790 |
| Mohr et al. (2012) | TP | 0.638 | [0.414, 0.981] | 26.150 | 0.209 | [0.138, 0.279] | 19.819 |
| Tse et al. (2013) | TP | 1.071 | [0.640, 1.793] | 19.267 | 0.652 | [0.419, 0.886] | 8.442 |
| Watson et al. (2017) | TP | 0.642 | [0.309, 1.334] | 10.220 | 0.218 | [0.095, 0.342] | 15.474 |
| TP | | 0.852 | [0.669, 1.085] | | 0.289 | [0.204, 0.375] | |
| Acierno et al. (2016) | VC | 1.452 | [0.705, 2.992] | 12.156 | 0.057 | [0.001, 0.113] | 12.231 |
| Acierno et al. (2017) | VC | 1.770 | [0.892, 3.514] | 13.505 | 0.229 | [0.117, 0.341] | 8.720 |
| Arnedt et al. (2021) | VC | 1.939 | [0.176, 21.388] | 1.102 | 0.246 | [0.121, 0.370] | 8.002 |
| Choi et al. (2014) | VC | 0.875 | [0.326, 2.349] | 6.508 | 0.333 | [0.165, 0.502] | 5.871 |
| Cuevas et al (2006) | VC | 0.667 | [0.188, 2.362] | 3.967 | 0.333 | [0.102, 0.564] | 3.884 |
| Day and Schneider (2002) | VC | 1.933 | [0.354, 10.555] | 2.204 | 0.338 | [0.197, 0.480] | 7.104 |
| Egede et al. (2015) | VC | 1.186 | [0.621, 2.265] | 15.188 | 0.061 | [−0.023, 0.145] | 10.474 |
| Germain et al. (2009) | VC | 1.222 | [0.500, 2.990] | 7.933 | 0.125 | [0.032, 0.218] | 9.922 |
| Maieritsch et al. (2016) | VC | 0.882 | [0.441, 1.767] | 13.171 | 0.133 | [0.003, 0.264] | 7.662 |
| Morland et al. (2015) | VC | 1.192 | [0.567, 2.504] | 11.510 | 0.157 | [0.086, 0.228] | 11.334 |
| Robillard, et al. (2017) | VC | 1.621 | [0.752, 3.492] | 10.774 | 0.167 | [0.094, 0.240] | 11.179 |
| Stubbings et al. (2013) | VC | 1.286 | [0.215, 7.695] | 1.983 | 0.214 | [−0.028, 0.457] | 3.617 |
| VC | | 1.249 | [0.971, 1.607] | | 0.176 | [0.123, 0.230] | |
| Overall | | 1.006 | [0.850, 1.191] | | 0.219 | [0.169, 0.269] | |

*Note*. AR = attrition rate; RR = risk ratio; TP = Telephone therapy; VC = Videoconferencing therapy

Table 5 presents the results from metaregressions of the effects of teletherapy and attrition rates in teletherapy compared to in-person therapy. Patients' age and gender, and treatment length did not moderate the effects at posttreatment and follow-up or attrition rates in teletherapy compared to in-person therapy.

## Within-Group Analyses

Table 6 shows the pooled within-group effect sizes of teletherapy of studies included in the meta-analysis. The pooled within-group effect sizes of teletherapy were large (k = 16; g = 1.026; 95% CI [0.795, 1.256]; $p < .001$) from pretreatment to posttreatment, with a high level of heterogeneity ($I^2$ = 82.002; Q = 83.343, $p < .001$). More specifically, the pooled within-group effect sizes from pretreatment to posttreatment were g = 0.833 (k = 6; 95% CI [0.537, 1.130]; $p < .001$) for telephone therapy and g = 1.196 (k = 10; 95% CI [0.830, 1.561]; $p < .001$) for videoconferencing therapy.

The pooled within-group effect sizes of synchronous teletherapy were maintained (k = 9; g = 1.021; 95% CI [0.773, 1.269]; $p < .001$) from posttreatment to follow-up, with a high level of heterogeneity ($I^2$ = 80.108; Q = 40.217, $p < .001$). More specifically, the pooled within-group effect sizes from posttreatment to follow-up were g = 0.946 (k = 4; 95% CI [0.689, 1.203]; $p < .001$) for telephone therapy and g = 1.118 (k = 5; 95% CI [0.658, 1.579]; $p < .001$) for videoconferencing therapy.

The pooled attrition rates in teletherapy were 0.219 (k = 19; 95% CI [0.169, 0.269]; see Table 3), with a high level of heterogeneity ($I^2$ = 74.066; Q = 69.407, $p < .001$). Attrition rates ranged from 0.057 to 0.652.

## Discussion

To the best of our knowledge, the present study was the first meta-analysis to compare teletherapy to in-person therapy in terms of posttreatment effects, longer-term effects, and attrition rates. Overall, synchronous teletherapy demonstrated comparable effects to in-person therapy at posttreatment ($g = -0.043$) and follow-up ($g = -0.045$). Within-group analyses found that teletherapy produced large pooled effect sizes at posttreatment (g = 1.026) and that these effects were maintained at 3- to 6-month follow-up (g = 1.021). Given the potential for lower associated costs and easier access of teletherapy (Crow et al., 2009; Egede et al., 2018; Kafali et al., 2014), the remote delivery of psychotherapy appears to be particularly promising and equally effective as in-person therapy.

These findings are consistent with previous comparisons of teletherapy to in-person therapy. In a meta-analysis of synchronous teletherapy for depression (Osenbach et al., 2013), the pooled effect size of six studies comparing remote therapy with in-person therapy was -0.11 (i.e., a nonsignificant difference). Additionally, Wootton (2016) synthesized four studies that compared remote CBT to in-person CBT and found that the effect size differences were not clinically meaningful but marginally statistically significant at posttreatment (g = −0.21; 95% CI [−0.43, 0.02]) and follow-up (g = −0.28; 95% CI [−0.58, 0.00]). This may be because two of the four studies utilized asynchronous teletherapy treatment, which produce smaller effects (Wootton, 2016). Compared to previous findings, this studied identified a larger number of studies and found smaller between-group effect sizes between two treatment formats. Notably, the effect sizes differences in this and previous studies, though not at traditionally significant levels, do

**Table 4**
*Subgroup Analysis on Effects at Posttreatment and Follow-Up and Attrition of Telepsychology Versus In-Person Therapy*

| Moderator (k) | Hedges' g | *RR* | 95% CI | *Q* value | *p* value |
|---|---|---|---|---|---|
| Effect at posttreatment | | | | | |
| Format | | | | 0.700 | .403 |
| Videoconferencing (12) | −0.077 | | [−0.201, 0.046] | | |
| Telephone (6) | 0.004 | | [−0.141, 0.148] | | |
| Therapist License | | | | 1.080 | .299 |
| Licensed (11) | −0.081 | | [−0.195, 0.033] | | |
| Trainee (5) | 0.044 | | [−0.163, 0.252] | | |
| Overall risk of bias | | | | 0.789 | .374 |
| High (13) | −0.005 | | [−0.131, 0.120] | | |
| Low (5) | −0.091 | | [−0.232, 0.050] | | |
| Effect at follow-up | | | | | |
| Format | | | | 0.075 | .784 |
| Videoconferencing (7) | −0.020 | | [−0.160, 0.121] | | |
| Telephone (4) | −0.055 | | [−0.263, 0.151] | | |
| Therapist License | | | | 0.508 | .476 |
| Licensed (8) | −0.080 | | [−0.204, 0.044] | | |
| Trainee (2) | 0.025 | | [−0.236, 0.287] | | |
| Overall risk of bias | | | | 2.251 | .134 |
| High (5) | 0.063 | | [−0.113, 0.239] | | |
| Low (6) | −0.107 | | [−0.240, 0.027] | | |
| Attrition | | | | | |
| Format | | | | 4.611 | .032* |
| Videoconferencing (12) | | 1.249 | [0.971, 1.607] | | |
| Telephone (7) | | 0.852 | [0.669, 1.085] | | |
| Therapist License | | | | 4.035 | .045* |
| Licensed (12) | | 0.948 | [0.782, 1.150] | | |
| Trainee (5) | | 1.587 | [0.998, 2.525] | | |
| Overall risk of bias | | | | 0.076 | .783 |
| High (13) | | 1.063 | [0.857, 1.318] | | |
| Low (6) | | 0.999 | [0.682, 1.464] | | |

*Note*. RR = risk ratio; TP = Telephone therapy; VC = Videoconferencing therapy.
* $p < .05$

slightly favor of in-person therapy, suggesting that more studies examining the effects of teletherapy are needed.

Treatment format and patient demographic variables did not significantly moderate the between-group pooled effects sizes in teletherapy versus in-person therapy. In particular, telephone therapy showed equivalent efficacy to videoconferencing therapy, suggesting that key therapeutic ingredients can be conveyed by therapists and perceived by clients despite the lack of visual cues. It should be noted, however, the included studies have merely focused on cognitive and/or behavioral treatments and limited kinds of psychiatric disorders. Many potential

**Table 5**
*Metaregression on Effects at Posttreatment and Follow-Up and Attrition of Telepsychology Versusi In-Person Therapy*

| Moderator | Coefficient | 95% CI | Z value | *p* value |
|---|---|---|---|---|
| Effects at posttreatment | | | | |
| Intercept | 0.114 | [−0.568, 0.795] | 0.33 | .744 |
| Age | −0.003 | [−0.016, 0.010] | −0.46 | .643 |
| Gender: % of female | 0.212 | [−0.090, 0.509] | 1.40 | .162 |
| Treatment length | −0.013 | [−0.036, 0.009] | −1.16 | .247 |
| Effect at follow-up | | | | |
| Intercept | 0.361 | [−0.443, 1.165] | 0.88 | .378 |
| Age | −0.004 | [−0.017, 0.009] | −0.63 | .526 |
| Gender: % of female | 0.187 | [−0.122, 0.497] | 1.19 | .236 |
| Treatment length | −0.028 | [−0.057, 0.001] | −1.87 | .062 |
| Attrition | | | | |
| Intercept | 0.732 | [−0.407, 1.872] | 1.26 | .208 |
| Age | −0.008 | [−0.030, 0.012] | −0.76 | .448 |
| Gender: % of female | −0.399 | [−0.934, 0.136] | −1.46 | .144 |
| Treatment length | −0.012 | [−0.052, 0.027] | −0.60 | .546 |

*Note*. TP = Telephone therapy; VC = Videoconferencing therapy.
* $p < .05$

**Table 6**
*With-Group Effect Sizes of Telepsychology at Posttreatment and Follow-Up*

| Study | Treatment format | Pretreatment to posttreatment | | Weight of included study | Pretreatment to follow-up | | Weight of included study |
|---|---|---|---|---|---|---|---|
| | | g | 95% CI | | g | 95% CI | |
| Alegría et al. (2014) | TP | 0.731 | [0.489, 0.973] | 18.878 | 0.852 | [0.599, 1.105] | 29.011 |
| Burgess et al. (2012) | TP | 0.879 | [0.455, 1.302] | 14.985 | 0.885 | [0.429, 1.342] | 17.765 |
| Day and Schneider (2002) | TP | 0.548 | [0.153, 0.942] | 15.619 | — | — | — |
| Mitchell et al. (2008) | TP | 0.715 | [0.376, 1.054] | 16.837 | 0.713 | [0.357, 1.070] | 22.725 |
| Mohr et al. (2012) | TP | 1.378 | [1.156, 1.601] | 19.244 | 1.244 | [1.014, 1.474] | 30.499 |
| Watson et al. (2017) | TP | 0.641 | [0.192, 1.090] | 14.436 | — | — | — |
| TP | | 0.833 | [0.537, 1.130] | | 0.946 | [0.689, 1.203] | |
| Acierno et al. (2017) | VC | 1.225 | [0.970, 1.480] | 12.243 | 1.304 | [1.043, 1.565] | 22.542 |
| Arnedt et al. (2021) | VC | 1.789 | [1.244, 2.334] | 10.099 | 1.861 | [1.302, 2.420] | 17.894 |
| Bouchard et al. (2004) | VC | 1.231 | [0.473, 1.989] | 8.350 | 1.036 | [0.323, 1.749] | 15.362 |
| Choi et al. (2014) | VC | — | — | — | 1.062 | [0.732, 1.392] | 21.603 |
| Cuevas et al. (2006) | VC | 1.783 | [1.354, 2.212] | 11.040 | | | |
| Day and Schneider (2002) | VC | 0.619 | [0.209, 1.029 | 11.190 | — | — | — |
| Germain et al. (2009) | VC | 3.094 | [1.921, 4.268] | 5.568 | — | — | — |
| Maieritsch et al. (2016) | VC | 0.967 | [0.498, 1.437] | 10.718 | | | — |
| Morland et al. (2015) | VC | 0.454 | [0.197, 0.710] | 12.236 | 0.454 | [0.198, 0.711] | 22.598 |
| Poon et al. (2005) | VC | 0.893 | [0.223, 1.563] | 9.063 | | | |
| Stubbings et al. (2013) | VC | 0.879 | [0.261, 1.497] | 9.492 | — | — | — |
| VC | | 1.196 | [0.830, 1.561] | | 1.118 | [0.658, 1.579] | |
| Overall | | 1.026 | [0.795, 1.256] | | 1.021 | [0.773, 1.269] | |

*Note*. TP = Telephone therapy; VC = Videoconferencing therapy.



moderators (e.g., clinical setting) for determining which venues and factors are most amenable to teletherapy remained unknown.

It is premature to conclude that teletherapy is as efficacious as in-person therapy across all conditions, symptoms, and patient populations. Patients with severe psychiatric problems may require more therapist engagement and therefore may show better outcome in in-person therapy (Koblauch et al., 2018). For example, Mohr et al. (2011) found no significant benefits for a 16-session telephone-delivered CBT over TAU and attributed the null results to the unique nature of the sample (veterans), who might have been more refractory to treatment in general than other populations. In another RCT with specific treatment characteristics (patients with bulimia nervosa), Mitchell et al. (2008) found that in-person CBT produced showed significantly greater reductions in certain symptoms compared to telephone CBT. Researchers and practitioners may not provide teletherapy to patients who, in their opinion, are unlikely to benefit from or not suitable for teletherapy, which may have resulted in selection bias. Therefore, more research is needed to examine potential moderators of efficacy in teletherapy.

Teletherapy did not significantly differ from in-person therapy in terms of attrition rates. Attrition rates did, however, vary as a function of treatment format and therapist experience. Videoconferencing therapy evidenced higher attrition rates than in-person therapy whereas telephone therapy showed lower attrition rates than in-person therapy. Perhaps telephone therapy is easier to access and operate technically than videoconferencing therapy. Videoconferencing has more disparities among patient use of technology than telephone uses, including disparities in quality of personal device equipment, internet access, clients' attitudes toward technology (e.g., Schuster et al., 2020). For example, clients can attend telephone session from venues without networks and equipment requisite for video calls.

In addition, whereas licensed therapists had comparable attrition rates in teletherapy to in-person therapy, trainee therapists had higher attrition rates during teletherapy than during in-person therapy. A recent survey study evidenced that, compared to older therapists, young therapists' skills in building alliance and repairing ruptured alliance were more affected by telecommunication (Lin et al., in press). Whereas experienced therapists may be competent in building a strong alliance remotely and leverage advantages afforded by teletherapy, trainee therapists may find it challenging to build a strong alliance and sufficiently engage in teletherapy, which was further associated with client dropout (Sharf et al., 2010). It may be necessary to provide relevant and more real-world training for less experienced therapists to enhance their teletherapy skills.

It is worth noting that, in spite of the documented successes of teletherapy, many psychological professionals continue to doubt its efficacy and reported preferences for, and greater competency in, in-person therapy (Perle et al., 2014; Perry et al., 2020). There may be several explanations for this phenomenon. First, therapists' preferences for in-person therapy may be based more on what is traditional and convenient and based less on empirical evidence. For example, therapists may be unwilling to use teletherapy due to potential technical inconveniences and teletherapy-specific policies (e.g., obtaining telepsychology consent). Second, teletherapy may be inferior to in-person therapy in some aspects of therapy (e.g., expressing emotions), even though these issues may not be necessary for positive client outcomes. Additionally, whereas therapists in RCTs typically receive trainings and follow intervention manuals, these same supports may not be available in community practice.

## Limitations and Future Directions

Several limitations of this meta-analysis should be noted. First, several potential moderators of teletherapy were not examined. For example, we were unable to examine race/ethnicity as a moderator because some studies did not report race/ethnicity and some studies were conducted in other countries with different racial/ethnic distribution. Likewise, the included studies only

covered limited types of psychiatric disorders and clinical settings. The comparability of teletherapy to in-person therapy for other disorders and in other settings should be further investigated. Because most studies included in this meta-analysis used cognitive and behavioral approaches, more research is needed to examine the efficacy of noncognitive and nonbehavioral therapy modalities delivered remotely. Second, this study focused on individual therapy for adults. Future research should examine whether teletherapy can achieve equivalent effects for children and adolescents and when delivered in group format.

Third, although this meta-analysis synthesized efficacy of teletherapy at 3- to 6-month follow-up, we were unable to examine longer-term effects because only a limited number of included studies included long-term follow-up measurements. Furthermore, this study synthesized findings from RCTs. Given the potential challenges in delivering remote treatment in community practice, future meta-analyses may also include findings from naturalistic settings. Finally, the current meta-analysis only included a limited number of studies that were conducted prior to the pandemic. The results of subgroup analyses and metaregressions should be interpreted with caution. Future meta-analyses may update the current findings by included more teletherapy studies in the postpandemic era.

## Implication and Conclusion

This study found that teletherapy was comparable to in-person therapy vis-à-vis symptom improvement and may achieve equally large effects at posttreatment and follow-up. Telephone therapy may be a reliable, alternative treatment for patients with limited access to the internet or equipment required for videoconferencing communication. Furthermore, the study examined moderators of the effects and attrition rates of teletherapy versus in-person therapy to determine which situations may be most optimal for teletherapy. Trainee therapists may be at greater risk for client dropout in teletherapy compared to in-person therapy. These findings may inform the optimal approach for delivering teletherapy services. For example, considering their comparable efficacy, telephone therapy be a good alternative treatment to videoconferencing therapy when required technology is unavailable. Also, clients receiving telephone therapy may be more likely to stay in treatment to experience the full "dose effect." Our meta-analysis underscores the comparability of teletherapy and in-person therapy. Teletherapy has the potential to improve psychological health and reach patients who might otherwise not be reached. Finally, this meta-analysis may provide a roadmap for further research on teletherapy for various disorders and in different settings.

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