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# Abstract

**Background**

Telehealth services can increase access to care by reducing barriers. Telephone-administered care, in particular, requires few resources and may be preferred by communities in areas that are systemically underserved. Understanding the effectiveness of audio care is important to combat the current mental health crisis and inform discussions related to reimbursement privileges for audio-based services.

**Objectives**

We compared the effectiveness of audio care to usual care for managing mental health and substance use disorders.

**Design**

We used rapid review methods to synthesize available evidence.

**Studies**

We searched for English-language articles from the last 10 years reporting randomized controlled trials (RCTs) of adults diagnosed with mental health or substance use disorders.

**Outcomes**

We abstracted data on clinical outcomes, patient-reported health and quality-of-life, health care access and utilization, care quality and experience, and patient safety.

**Results**

We included 23 RCTs of participants diagnosed with depression, post-traumatic stress disorder (PTSD), insomnia, schizophrenia spectrum disorder, or substance use disorder (SUD). Limited evidence demonstrates promise for replacing in-person care with audio care for depression and SUD and adding audio care to monitor or treat depression, insomnia, and SUD.

Conclusions

Offering remote services for mental health and SUDs is of interest to patients, providers, and payers as it can expand access to care for those who might not be able to access it otherwise. There is promise for managing mental health and substance use with audio care in certain situations. However, more evidence is needed across conditions, but specifically for PTSD, schizophrenia spectrum disorder, and other conditions for which no research was identified.

Keywords

Telehealth, Audio Care, Mental Health, Substance Use, Access to Care

# Introduction

Access to mental health treatment services continues to be challenging, particularly for communities in areas that are systemically underserved.[1](#_ENREF_1), [2](#_ENREF_2) Telehealth services can increase reach by expanding geographic access to mental health professionals and by mitigating patient barriers such as lack of transportation, inflexible work schedules, and lack of childcare. Throughout the COVID-19 public health emergency (PHE), the use of telehealth modalities to deliver care has increased rapidly.[3](#_ENREF_3)

Although video-teleconferencing has shown promise for mental health and substance use problems, this mode of communication may still be challenging for those in areas that are systemically underserved, many of whom are most at risk for disparities.[3-6](#_ENREF_3) When offering patients a choice, older and non-White persons prefer telephone over video consultation.[7](#_ENREF_7) Telehealth advocates emphasize that audio-based options are necessary to increase access to services for patients who continue to face challenges related to accessing in-person or video-teleconferencing options, such as challenges related to distance to providers, access to internet, and digital/technological literacy.[8](#_ENREF_8)

Despite this promise for improving access to care, hesitation to continue reimbursement privileges instated for audio care during the COVID-19 PHE stem from the need to meet the same standard of care as when delivered in-person (i.e., ensuring quality and avoiding overutilization of services).[9](#_ENREF_9) Given the urgency of the mental health crisis in the United States and lack of consensus on the effectiveness of audio-based care, a rapid review was necessary to provide a timely summary of evidence and inform discussions around maintaining access to audio-based services for adults diagnosed with a mental health or substance use disorder (SUD).[10](#_ENREF_10)

# Methods

Our key questions included:

1. What is the impact of audio-only telemedicine visits compared to in-person or video appointments and other usual care for mental health treatment and management in adults?
2. How do the findings vary for patients at risk for health disparities?

A detailed protocol of our process, which follows recommendations from the Cochrane Rapid Reviews Methods Group,[11](#_ENREF_11) was registered on October 6, 2022 on Open Science Framework.[12](#_ENREF_12) In brief, we made the following adjustments to accommodate timely synthesis of the evidence: narrow scope focused on randomized controlled trials (RCTs), omission of gray literature searches, dual screening of excluded abstracts only, focused data extraction, reliance on study-reported statistical significance, and omission of strength of evidence assessment.

## Study Selection

We searched PubMed, Embase, and American Psychological Association PsycInfo for English-language articles reporting RCTs conducted in very high Human Development Index countries from January 2012 through July 2022. Additionally, we manually searched the reference lists of recent relevant systematic reviews. **Table 1** outlines the pre-specified inclusion and exclusion criteria for this review. We included studies testing audio-only interventions or hybrid interventions that combine other synchronous care with audio care.

We used DistillerSR (Evidence Partners, Ottawa, Canada) to aid in the literature screening process and tracked results in an EndNote bibliographic database (Clarivate Analytics, Philadelphia, United States). Following a pilot exercise, all abstracts marked for inclusion moved forward for full-text review. After another pilot exercise, full-text articles were screened by 2 reviewers independently. Disagreements were resolved by discussion or by involving another reviewer.

## Data Extraction and Risk-of-Bias Assessment

We used DistillerSR to abstract information about each included study. To assess each study’s potential for bias, we adapted Cochrane’s Risk-of-Bias (RoB) 2.0 tool, which asks signaling questions across 5 domains and results in a low, some concerns, or high RoB judgment. Results judged as high RoB should be interpreted with caution given methodological choices that likely introduced material bias. One reviewer performed the initial data abstraction and RoB assessment, and another verified the data and RoB judgments. Discrepancies were resolved by discussion or by involving another reviewer.

## Data Synthesis and Analysis

We organized data in tables by important study features. Given the range of included conditions, interventions, comparators, and outcomes, we summarized the studies narratively. We developed an evidence map that captures key study characteristics to visually summarize the state of the evidence and identify gaps.

# Results

**Figure 1** depicts a PRISMA diagram summarizing our study identification and screening process. Of 2107 unique records, we included 32 publications representing 23 RCTs.[13-44](#_ENREF_13) Key characteristics of these studies can be found in **Table 2**, with additional detail in **Supplemental Digital Content (****SDC) Table 1**. Only 1 study included non-inferiority analyses.[26](#_ENREF_26) We judged 1 study to have low RoB, 10 to have some concerns, and 9 to have high RoB for all outcomes; 3 had mixed ratings based on outcome (**SDC Table 2**).

The 23 studies evaluated 26 interventions across 30 comparisons of interest. The interventions were largely delivered by mental health providers with advanced degrees such as master’s-level counselors, advanced-degree behavioral health nurses, and PhD-level psychologists (14 studies). Other interventions were delivered by therapists with varying levels of education/credentials (6) or by graduate students supervised by advanced degree clinicians (3). Most of the interventions (20) delivered synchronous care that was audio-only (or nearly audio-only if the only in-person interaction was an intake appointment to establish a call plan, build patient-provider rapport, etc.). Six of these had no other components beyond the audio interactions and 14 included other supports such as educational resources or asynchronous messaging. The remaining 6 interventions delivered synchronous care via a mix of ongoing in-person and audio visits (i.e., hybrid interventions)—3 had no other components and 3 included other supports. The interventions were compared to no care, in-person care, or other supports.

The studies aimed to evaluate interventions for participants diagnosed with depression, post-traumatic stress disorder (PTSD), insomnia, schizophrenia spectrum disorder, or SUD. Participant diagnoses were established in various ways—most studies (15) used medical records, a clinical interview, or noted diagnosis according to *International Classification of Diseases* or *Diagnostic and Statistical Manual of Mental Disorders* criteria, 4 used screening tools with diagnostic validity (e.g., Hamilton Depression Rating Scale or Patient Health Questionnaire-9 [PHQ-9]), and 4 focused on patients receiving care for the diagnosed condition but did not specify a diagnostic method. The following sections and evidence map (**Figure 2**) summarize results by targeted condition. Detailed data can be found in **SDC Tables 3-7**. Within each condition, we summarize results by outcome and the interventions’ primary focus. Eight interventions aimed to facilitate a transition in care (i.e., supporting participants move between settings or levels of care). Ten interventions aimed to monitor a condition (i.e., brief activities to surveille the condition, often including risk assessment or coaching on treatment/medication adherence or behavior change) and 8 aimed to treat the condition (i.e., therapy to remediate the condition).

## Depression

Eleven RCTs (13 comparisons, 1770 participants) investigated audio interventions to facilitate a transition in care, monitor, or treat depression.[13](#_ENREF_13), [14](#_ENREF_14), [16-20](#_ENREF_16), [21](#_ENREF_21) , [24](#_ENREF_24), [25](#_ENREF_25), [26](#_ENREF_26)  All 11 studies reported clinical outcomes (for 12 comparisons) with 5 reporting clinically meaningful change (CMC) defined as achieving remission or a level of improvement in symptom severity that is deemed clinically relevant, and the other 6 reporting severity scores only.

One study evaluated an audio-only intervention to support participants’ transition out of inpatient care and found no benefit over usual care for reducing symptom severity.[13](#_ENREF_13) Two of 3 audio-only interventions used to monitor participants reported favorable clinical outcomes. In the first, more participants with multiple sclerosis receiving telephone-based physical activity promotion no longer met diagnostic criteria for depression at post-treatment than those on the waitlist (P=0.0029).[14](#_ENREF_14) The second study reported a greater reduction in symptom severity when supplementing self-paced cognitive behavioral therapy (CBT) modules with brief audio calls over supplementing with asynchronous messaging (P=0.049, high RoB).[16](#_ENREF_16) However, there was no reported benefit for symptom severity or clinical response (achieving ≤10 on the Beck Depression Inventory) of another brief audio intervention to support self-paced CBT modules similarly compared to self-paced modules with email support.[17](#_ENREF_17)

Audio interventions delivering psychotherapy-based treatment tended to report favorable clinical outcomes when compared to participants not receiving mental health care and similar outcomes when compared to those receiving treatment in-person. Three studies reported greater reductions in symptom severity with either telephone-based therapy over seeking care as needed (Ps<0.05, 1 high RoB)[18](#_ENREF_18), [21](#_ENREF_21), [22](#_ENREF_22) or supplementing integrated primary care with treatment-focused calls (P=0.003).[20](#_ENREF_20) A fourth study reported more participants achieving a clinical response (50% reduction in PHQ-9 score or score <10) with telephone-based coaching over educational material (Ps=0.01).[19](#_ENREF_19) Three of 4 studies replacing in-person CBT with audio-only CBT reported similar clinical response, remission, or severity scores between arms at post-treatment or later follow-up.[21](#_ENREF_21), [22](#_ENREF_22), [24](#_ENREF_24), [25](#_ENREF_25) The fourth study found that while both arms showed significant improvements in depression and no difference in clinical response or remission at post-treatment, participants receiving in-person therapy had favorable clinical outcomes at 6-month follow‑up.[26](#_ENREF_26), [27](#_ENREF_27)

Three studies assessed patient-reported health or quality-of-life across 4 eligible comparisons and reported no statistically significant differences between arms at post-treatment or follow-up, regardless of whether the audio-only intervention was facilitating a transition out of inpatient care,[13](#_ENREF_13) monitoring self-paced CBT,[17](#_ENREF_17) or delivering CBT.[21](#_ENREF_21) Four studies reported health care access and utilization outcomes. When replacing face-to-face therapy with telephone-based therapy, 1 study reported no statistically significant difference in number of sessions attended (high RoB),[25](#_ENREF_25) while another favored the audio-only intervention for more sessions attended and fewer participants discontinuing (Ps<0.02).[26](#_ENREF_26), [29](#_ENREF_29) Supplementing self-paced CBT with calls was also favored for treatment completion (P=0.02, high RoB).[16](#_ENREF_16) For medication adherence, telephone-based therapy was favored over in-person therapy at post-treatment (P=0.04, high RoB).[25](#_ENREF_25) Although supplementing integrated primary care with treatment-focused calls intended to increase health care utilization, there was no statistically significant difference in non-study mental health visits.[20](#_ENREF_20)

Regarding care experience, 1 study reported no statistically significant difference in satisfaction with treatment between telephone-based and face-to-face therapy.[25](#_ENREF_25) Five studies reported on patient safety, all reporting no adverse events or discontinuation due to adverse events.[16](#_ENREF_16), [18](#_ENREF_18), [24-26](#_ENREF_24)

## Post-Traumatic Stress Disorder

Three RCTs (1466 participants) evaluated audio care for facilitating a transition in care among veterans with PTSD and reported symptom severity.[31-33](#_ENREF_31) Two of the studies reported no benefit of supplementing usual care with telephone support.[31](#_ENREF_31), [32](#_ENREF_32) The third study investigated the effect of a brief CBT transition intervention by gender and only reported group differences for the small sample of female veterans (21 intervention, 14 control), finding lower PTSD severity among those on the waitlist at 6 months.[33](#_ENREF_33)

In addition, the 2 studies investigating the addition of telephone support to usual care reported quality-of-life and health care access and utilization outcomes. Audio care was associated with similar quality-of-life and, as anticipated, more non-study mental health visits at post-treatment (Ps<0.01, high RoB).[31](#_ENREF_31), [32](#_ENREF_32)[31](#_ENREF_31), [32](#_ENREF_32) The same studies also reported on patient safety, with one reporting no unintended effects or harms across arms[31](#_ENREF_31) and the other reporting 13 non–study related adverse events.[32](#_ENREF_32)

## Insomnia

Two RCTs (3 comparisons, 249 participants) reported CMC and patient-reported health or quality-of-life for brief audio-only interventions to monitor self-paced treatment modules for insomnia (cognitive and behavioral therapies)[34](#_ENREF_34) or to deliver CBT treatment.[35](#_ENREF_35) Post-treatment results favored the interventions for clinical response (achieving a change of ≥8 on the Insomnia Severity Index) in all 3 comparisons (Ps<0.02, 1 high RoB) and for remission when comparing the monitoring interventions to waitlist control (Ps<0.001).[34](#_ENREF_34), [35](#_ENREF_35) Although the comparison between telephone-delivered CBT and informational pamphlet found no statistically significant difference in remission at post-treatment (8 weeks), the audio-only treatment was favored at 12-week follow-up (P<0.01, high RoB).[35](#_ENREF_35) Audio-only care was associated with greater improvement in or similar quality-of-life compared to no active care for the monitoring[34](#_ENREF_34) and treatment interventions,[35](#_ENREF_35) respectively. Patient-reported functional impairment scores at post-treatment favored the monitoring intervention over waitlist (Ps<0.001).[34](#_ENREF_34)

## Schizophrenia Spectrum Disorder

One RCT (105 participants) compared audio-only to in-person follow-up for monitoring schizophrenia spectrum disorder, and only reported health care access and utilization outcomes. [36](#_ENREF_36) There was no statistically significant difference in psychiatric and non-psychiatric medication adherence based on pill counts; however, serum analysis specifically for antipsychotic medication found that a greater proportion of those receiving telephone follow-up had medication levels within therapeutic range than those receiving in-person follow-up (P=0.023, high RoB).

## Substance Use Disorders

Six RCTs (10 comparisons, 2417 participants) evaluated audio-only[37-40](#_ENREF_37) or hybrid[41](#_ENREF_41), [42](#_ENREF_42) care to facilitate a transition out of intensive care or monitor substance use over 1 to 2 years and reported clinical outcomes. Three of 4 studies assessing audio-only interventions to support participants transition out of inpatient or intensive outpatient care reported favorable outcomes (i.e., fewer alcohol or drug use days, lower odds of heavy drinking),[38-40](#_ENREF_38) while the fourth reported no statistically significant difference.[37](#_ENREF_37)

Two studies assessed hybrid interventions (supplementing intensive outpatient care with brief calls) to monitor alcohol or cocaine use disorder for 1 to 2 years. Adding telephone monitoring (with or without other supports) was favored for fewer heavy drinking days compared to in-person services alone (Ps<0.018, high RoB) for people with alcohol use disorder[41](#_ENREF_41) but did not result in statistically significant differences in drug-positive urine screens or abstinence from use of cocaine, other drugs, or heavy alcohol use overall for those with cocaine use disorder.[42](#_ENREF_42) However, the intervention did show benefit without financial incentive for the abstinence composite for subgroups of participants with cocaine or alcohol use at baseline (Ps < 0.05).[42](#_ENREF_42)

Two studies reported on quality-of-life, one supplementing in-person intensive outpatient care with telephone monitoring and one replacing in-person continuing care for transitioning out of intensive outpatient care with telephone calls, and did not find statistically significant differences between arms.[39](#_ENREF_39), [41](#_ENREF_41) Regarding experience, a similar degree of satisfaction was reported for the audio-only intervention and in-person continuing care.[39](#_ENREF_39) Only 1 study presented data on patient safety, reporting no serious events across arms.[40](#_ENREF_40)

## Populations at Risk for Disparities

Sixteen of the 23 studies included at least a quarter of participants representing populations at risk for disparities (**Table 2**). Veterans comprised the entire sample for 8 studies and at least half of participants in 1 study. Participants who were Black, Indigenous, and people of color made up at least half of 4 studies’ samples. Participants in rural areas comprised the entire sample for 1 study and low-income individuals and immigrants each made up at least half of another study’s sample. Findings from these studies are representative of the broader evidence base, given they make up most of the available evidence (**Figure 2**).

## Gaps in the Current Evidence

The evidence map (**Figure 2**) summarizes included studies and reported outcomes, listing only conditions for which eligible studies were identified. Most of the included studies (17) evaluated audio care for participants diagnosed with depression or SUD, revealing no studies for various mental health conditions (e.g., anxiety and bipolar disorders). Further, within condition, we did not identify audio-based interventions that represent the full continuum of care. Of interventions focused on delivering treatment, all but 1 targeted depression with psychosocial therapies—no treatment interventions were identified for PTSD, schizophrenia spectrum disorder, or SUD. Interventions targeting other conditions focused on facilitating a transition in care or monitoring the condition.

All but 2 studies provided evidence on clinical outcomes and included significance testing to determine whether differences between the intervention and comparator were meaningful. White gaps in the evidence map indicate no significance testing was conducted or data were not available (for either arm or only reported for the intervention). There is little evidence on health care access and utilization outside of studies targeting depression, and little evidence across conditions on care quality and experience as well as patient safety. Among studies reporting on care quality and experience, fidelity to the standard of care was only reported for the audio intervention and was not compared to similar interventions delivered in-person. Regarding experience, only the patient perspective (and not the provider perspective) was reported. Further, available evidence is not always free of potential bias. We judged nearly half (25 of 52) of the identified outcome comparisons as high RoB.

# Discussion

Offering audio care for mental health and substance use disorders is of great interest to patients, providers, and payers as it has the potential to expand access to care, particularly for communities systemically underserved and at risk for disparities. The limited evidence available demonstrates that (1) similar outcomes may be achieved when replacing in-person care for depression or SUD with audio care and (2) clinical outcomes may be improved when adding audio care to monitor or treat depression, insomnia, and SUD. Our findings update and align with those from prior reviews on audio care for depression and psychotic disorder.[45-47](#_ENREF_45" \o "Coughtrey, 2018 #2302)

We synthesized findings separately for interventions that sought to facilitate a transition in care, monitor a condition, or treat a condition. Of 8 interventions focused on supporting transitions in care, 3 reported statistically significant improvements in clinical outcomes over the comparator (for SUD[37](#_ENREF_37), [39](#_ENREF_39), [40](#_ENREF_40)), while the others reported no benefit of adding audio interactions (for depression,[13](#_ENREF_13) PTSD,[31-33](#_ENREF_31) and SUD[38](#_ENREF_38)). When interventions focused on monitoring, 4 of 5 that added audio care to oversee participant progress on self-paced activities for depression[14](#_ENREF_14), [16](#_ENREF_16), [17](#_ENREF_17) or insomnia[34](#_ENREF_34) reported favorable outcomes. For SUD, adding audio care to intensive outpatient care demonstrated better or similar outcomes compared to intensive outpatient care alone, depending on whether other supports were leveraged.[41](#_ENREF_41), [44](#_ENREF_44) Across audio-based psychotherapy interventions for treating depression[18](#_ENREF_18), [20-23](#_ENREF_20) and insomnia,[35](#_ENREF_35) the intervention was favored for improving clinical outcomes when compared to patients not receiving active care from a mental health provider. Treatments for depression delivered via audio to replace in-person treatment largely demonstrated similar outcomes across arms.[21-30](#_ENREF_21)

The audio interventions largely achieved similar patient-reported health and quality-of-life as comparators, which is promising when replacing in-person interactions with audio-based interactions.[21-23](#_ENREF_21), [39](#_ENREF_39) Additionally, when reported, health care access and utilization outcomes were frequently favorable for those receiving audio care.[16](#_ENREF_16), [20](#_ENREF_20), [25-32](#_ENREF_25), [36](#_ENREF_36) Studies that reported call completion, fidelity, or patient satisfaction for the audio interventions only generally reported positive outcomes,[13-15](#_ENREF_13), [19](#_ENREF_19), [20](#_ENREF_20), [31](#_ENREF_31), [34](#_ENREF_34), [35](#_ENREF_35), [38](#_ENREF_38), [42](#_ENREF_42) although call completion for interventions targeting SUD (~50% to 66%) could be improved.[37](#_ENREF_37), [38](#_ENREF_38), [41-44](#_ENREF_41)

Our review offers a comprehensive synthesis to progress understanding of audio care. We identified 20 studies and 28 articles that were not included in prior reviews on audio care.[45-47](#_ENREF_45) For clinical and patient-reported outcomes, only validated measures were eligible—the measures we encountered are widely used in practice, increasing the applicability of our findings. We prioritized clinical outcomes reflecting meaningful change over symptom severity scores to avoid over reliance on group-averaged differences between arms over time.[48](#_ENREF_48) Acknowledging both the potential of audio-based services to improve access to care and concerns about compromising quality, this review expands beyond clinical and patient-reported outcomes to synthesize available evidence on health care access and utilization, care quality, and patient and provider experience. All outcomes were interpreted with nuance for whether audio interactions supplement or replace other synchronous interactions between patients and providers. This is important for understanding whether similar outcomes between arms ultimately favors the intervention or comparator. Additionally, we looked for evidence specific to different populations at risk for disparities. Prior reviews on audio care do not offer an in-depth look at vulnerable populations.[45-47](#_ENREF_45)

The contributions of this review should be considered with some limitations. First, we excluded studies that did not require participants have a mental health or substance use disorder diagnosis, except for depression studies that used screening tools and score thresholds with diagnostic validity. Our findings may not be generalizable to populations with subthreshold symptoms. Eight studies focused solely on veterans and 5 on populations with co-morbid physical chronic conditions, potentially limiting their generalizability further. Because this review is limited to RCTs, we may have overlooked additional information from observational studies in areas we identified as gaps (e.g., patient/provider experience and patient safety).[11](#_ENREF_11) Additionally, some studies that included other components did not assess the components individually, so we could not always isolate the effectiveness of the audio component. Another limitation is the volume of evidence judged as high RoB. We omitted strength of evidence assessment to ensure timely synthesis per established rapid review guidance.[11](#_ENREF_11) Finally, we did not identify evidence collected since the COVID-19 PHE began, as all included studies had concluded by March 2020.

The PHE necessitated a rapid shift in health care delivery that included leveraging audio care. Consequently, a synthesis of available evidence was necessary to inform discussions regarding appropriateness of audio modalities for routine mental health care beyond the COVID-19 PHE as well as future research directions. Existing research suggests audio care has promise for managing depression, insomnia, and SUD. However, more high-quality evidence on audio-based interventions for transitioning, monitoring, and treating patients across the full continuum of care is needed for all conditions but specifically for PTSD, schizophrenia spectrum disorder, and other conditions for which no research was identified. Future studies should at minimum compare fidelity, clinically meaningful change, and patient safety between the intervention and comparator. Additionally, more information is needed about patient and provider experience and the impacts of audio care on health care access and utilization. Findings from this review and ongoing research can inform discussions about appropriate circumstances for adopting audio-based services to maximize reach and benefit for patients in need.

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# Figure Legend

Figure 1. PRISMA Diagram

Figure 2. Evidence Map

# List of SDC

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