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Patient and provider experiences with CBT-I administered in-person or via telemedicine: A randomized non-inferiority trial

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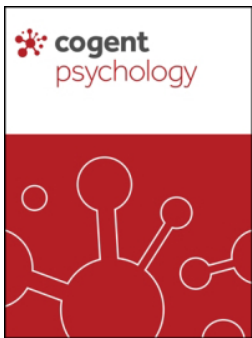
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CLINICAL PSYCHOLOGY | RESEARCH ARTICLE

Patient and provider experiences with CBT-I administered in-person or via telemedicine: A randomized non-inferiority trial

Rachel E. Granberg¹, Arianna Heyer², Philip R. Gehrman², Paul W. Gunter², Nathan A. Hoff², Amanda Guth², Matthew S. Kayser², Samuel Kuna² and Rosemary Frasso^{2*}

Abstract: Cognitive behavioral therapy for insomnia (CBT-I) is an effective treatment in adults. However, access to care is limited. One potential solution is telemedicine. Though synchronous video-based telemedicine CBT-I has been shown to be non-inferior to in-person treatment, there is no study to date that evaluates patient and provider experiences with video-based treatment. Our study team evaluated patient and provider perceptions of CBT-I delivered via telemedicine versus an in-person format. As part of a larger randomized control trial, we interviewed patients and providers in both arms of the study (in-person and via telemedicine). 20 minute interviews were conducted over the phone and were transcribed and coded to identify themes. While patients shared initial concerns about telemedicine CBT-I, including privacy and technological issues, they were satisfied with the approach and had similar experiences as the patients receiving in-person treatment. Providers shared concerns about challenges establishing a strong therapeutic alliance, patient engagement, and accountability in CBT-I, but felt these did not interfere with their overall ability to deliver care. Patients and providers were satisfied with CBT-I treatment delivered via telemedicine when compared to those being treated in-person. Patients in both arms noted that virtual care could increase access and provide convenience.

Subjects: Public Health Policy and Practice; Psychiatry; Sleep Medicine

Keywords: cognitive behavioral therapy; insomnia; telemedicine

ABOUT THE AUTHOR

Dr. Rosemary Frasso is a qualitative and mixed methods researcher. She collaborates with clinicians and other researchers to integrate qualitative approaches into their work. The goal is always to amplify the voices of patients, providers, and communities through systematic data collection and analysis. Dr. Frasso worked closely with a team of MD-MPH students and Dr. Gehrman, the study PI on this project. Dr. Gehrman's work focuses on understanding the underlying mechanisms of insomnia and insomnia treatment modalities. This project is part of a portfolio of work focused on improving access to treatment for insomnia and other mental health conditions.

PUBLIC INTEREST STATEMENT

This work is for individuals interested in learning more about increasing access to mental health services, like CBT-I, via telemedicine. This paper highlights ways telemedicine can help to break down time and geographical barriers for patients seeking treatment for sleep medicine disorders.

1. Introduction

Insomnia disorder negatively impacts multiple domains, with research demonstrating decreased quality of life for the individual and between \$1 to 3 billion in societal costs within the U.S (Benza, 2001; Bolge et al., 2009; Fullerton, 2006; Roth, 2007). Population-based studies indicate that approximately 30% of the general population has some complaint of sleep disruption, with 10% having daytime functional impairment consistent with a diagnosis of insomnia (National Institutes of Health, 2005). Furthermore, the prevalence of insomnia, as well as the severity of insomnia symptoms, has increased significantly during the COVID-19 outbreak (Li et al., 2020).

Several meta-analyses and systematic reviews have demonstrated the efficacy of cognitive behavioral therapy for insomnia (CBT-I) for the treatment of insomnia in adults (Irwin et al., 2006; Mitchell et al., 2012; Montgomery & Dennis, 2003; Morin et al., 2006). Due to its efficacy and favorable risk profile compared with pharmacological interventions, CBT-I is considered first-line standard of care for insomnia disorder treatment (Qaseem et al., 2016).

Widespread implementation of CBT-I is limited by the lack of clinicians who are trained in this treatment and their geographic distribution. There is a need for strategies to increase access, particularly for patients in more rural locations where providers and financial or social support may be scarce (Scogin et al., 2018). One potential solution is telemedicine, a healthcare delivery modality that has been increasingly utilized during the COVID-19 pandemic. There are two types of telemedicine: synchronous and asynchronous. In synchronous telemedicine, patients and providers are separated geographically but telecommunicate in real time using audiovisual technology. In asynchronous telemedicine, patients and providers are separated both by distance and time so communication is not occurring “live” (Hsieh et al., 2020; Singh et al., 2015). Furthermore, there are app and web-based CBT-I programs that can be fully independent of provider interaction or partially involving the provider via asynchronous interactions (Hsieh et al., 2020). There has been a growing body of research investigating the efficacy of app and web-based CBT-I programs with multiple meta-analyses finding significant improvements in sleep outcomes similar to in-person therapy (Seyffert et al., 2016; Ye et al., 2015).

Despite asynchronous CBT-I programs demonstrating efficacy, there is still a paucity of studies investigating synchronous telemedicine delivery of CBT-I. To our knowledge, there are only four studies demonstrating the clinical efficacy of synchronous video-based telemedicine CBT-I, and only one study where preliminary results demonstrate telemedicine-delivered CBT-I is non-inferior to face-to-face delivery in terms of the therapeutic alliance between provider and patient (Arnedt et al., 2019; Conroy et al., 2019; Gehrman et al., 2021, 2016; Holmqvist et al., 2014).

While this preliminary research provides evidence that synchronous video-based telemedicine CBT-I is non-inferior to in-person treatment, there is no study to date that evaluates the patient and provider perceived barriers or benefits to the video-based treatment, or patient and provider satisfaction with this delivery modality. Our study team conducted a randomized control trial comparing the two approaches which included a qualitative component to evaluate the process outcomes (satisfaction, alliance, and adherence) in patients receiving synchronous telemedicine CBT-I compared to patients receiving in-person care.

2. Methods

2.1. Study overview

We conducted a randomized non-inferiority trial (NCT 03328585) to compare in-person CBT-I to the same treatment delivered by synchronous video teleconferencing (to be referred to as telemedicine going forward; Gehrman et al., 2021). We utilized a parallel mixed methods design, that

is data were collected in two strands: one quantitative and one qualitative (Creswell & Plano 2011; Teddlie & Tashakkori, 2009). The quantitative strand, which was designed to examine actigraphic sleep efficiency by modality of delivery (in-person versus telemedicine), has been presented in a separate article (Gehrman et al., 2021). The qualitative strand is the focus of this report. It involved examining provider and patient-level perspectives, attitudes, and preferences regarding CBT-I delivered via telemedicine versus in-person delivery, as well as barriers and facilitators to delivery or receipt of care in each approach. The Institutional Review Board at the University of Pennsylvania approved this study and the team followed COREQ (Consolidated Criteria for Reporting Qualitative Studies) guidelines in the development of this manuscript (Tong et al., 2007).

2.2. Data collection

We conducted qualitative semi-structured interviews with patients ($n = 36$) in each arm of the study: those who received CBT-I in-person, including those in the waitlist control group who then went on to receive CBT-I ($n = 23$), those who received CBT-I via telemedicine ($n = 13$), as well as providers ($n = 7$) regarding their experiences being treated, or administering CBT-I either in person or via telemedicine. All interviews with patients were conducted 3 months post-completion of CBT-I, and all but 3 of the interviews were conducted prior to care interruptions related to the COVID-19 pandemic (March, 2019). All provider interviews were conducted in June and July, 2020. An interview guide (Appendix B) of open-ended questions was designed to elicit a range of responses rather than quantifiable data. The interview guide was developed using a modified grounded theory approach and, as described by Creswell and Proth, was iteratively revised in order to reflect the teams' evolving understanding of participant perspectives (Creswell & Poth, 2018). The interviews lasted an average of 20 minutes and were conducted over the phone. Interviews were audio recorded, transcribed verbatim and de-identified by an independent third-party. The transcripts were then uploaded to NVivo12 Plus (QSR International, Doncaster, Australia), a qualitative software program used to facilitate data coding and analysis.

2.3. Data analysis and coding

We deployed a directed content analysis approach to identify and explore patient and provider perspectives via interviews that were conducted by a trained research assistant and coauthor (PG). That is interview transcripts were the unit of analysis and they were coded to explore content. Codes were developed in two ways: a priori (informed by the literature and interview guide) and through line-by-line reading of a subsample of interview transcripts (Assarroudi et al, 2018; Hsieh & Shannon, 2005). This iterative and inductive approach allowed the research team to identify, organize, analyze and describe patterns or thematic categories in these data (Braun & Clark, 2006; Nowell et al., 2017). In this case, the study team developed two code books to guide the data analysis, one addressing the interviews of participating providers and the second tailored to the patients (Appendix C). Each code was given an explicit definition to ensure coding accuracy and improve intercoder reliability (Glaser & Strauss, 1967). Two trained research assistants (MN and WE) independently coded all transcripts. The coders met periodically during the coding process to identify and resolve discrepancies as they arose. Intercoder reliability was calculated throughout the coding process and at its completion in NVivo12 by using the κ coefficient. Complete agreement in coding correlates with a mean κ value of 1, near perfect agreement with a mean κ value of 0.81 to 0.99, substantial agreement with a mean κ value of 0.61 to 0.80, and moderate agreement with a mean κ value of 0.41 to 0.60. When coding was complete and intercoder reliability deemed acceptable, the research team met, assessed saturation in each group of interviews (that is coding of latter interviews did not generate new codes), synthesized the coding output and identified the key themes described below (Saunders et al., 2018).

Study design, data collection, coding and team analysis was supervised by a qualitative research scientist with over 15 years' experience (RF). As is appropriate in qualitative work, our analysis was focused on identifying an array of perspectives across interviewees, rather than deriving quantifiable results. While we compare and contrast perspectives, our results do not report the number of times a particular opinion, barrier, or perspective was mentioned, but aim to amplify the voices of patients and providers who participated in the parent randomized control trial (Assarroudi et al,

2018; Crabtree & Miller, 1992; Creswell & Poth, 2018; Hsieh & Shannon, 2005; Nowell et al., 2017; Braun & Clark, 2006; Glaser & Strauss, 1967; Frasso et al., 2018; Elo & Kyngäs, 2008).

3. Results

A total of 60 participants were randomized to in-person CBT-I ($n = 20$), telemedicine CBT-I ($n = 21$) or waitlist control ($N = 19$) shown in Appendix A. Demographic characteristics of the groups are provided in Table 1. Fifteen, (75.0%) of the participants randomized to the in-person CBT-I treatment group, and 16 (76.2%) of the participants randomized to the telemedicine group completed at least 6 treatment sessions. There was not a significant difference in drop out or lost-to-follow-up between the two treatment groups. In the waitlist control, 2 (10.5%) dropped out of the study before their post-wait list treatment. A total of 36 participating patients all of whom completed the CBT-I treatment, consented and participated in the follow-up interview. Additionally, the team of providers ($n = 7$) who delivered CBT-I in person and via the telemedicine video platform also completed interviews. Analysis of intercoder reliability for this study revealed near perfect agreement between coders (mean $\kappa = 0.8$). This result was supported by a percentage of agreement analysis, which yielded a mean of 97 % agreement between coders for all codes.

The results of the data analysis are organized into three thematic categories described below and supported by participant quotations. First, we explore the patients' experience in treatment (in person and telemedicine). Second, we explore the provider's experience, attitudes toward, and concerns about in-person care and telemedicine as delivery modalities, as felt prior to study initiation. Third, we investigated providers' reflections on the trial generally and specifically in the context of the recent pandemic, as provider interviews were conducted June-July 2020 and providers did comment on their experience with that reality in mind. Noting that while patient participation in the study ended before the recent COVID-19 pandemic restrictions on in-person care were initiated, a minority of patient interviews (3 of 36) were completed after the pandemic onset.

(1) *Patients' experience and reflections telemedicine and in-person CBT-I*

Overall, participants assigned to the telemedicine intervention group were satisfied with their assignment because they felt attending therapy sessions online would be more convenient than in person. Of note, patient satisfaction with CBT-I treatment outcome did not appear to vary based on the participants' intervention assignment in either the telemedicine or in-person groups. Other benefits participants experienced from the telemedicine modality were expanded access for patients and greater flexibility in scheduling. Some participants expressed concern over possible technical issues—including having enough privacy during sessions or felt they may have a more difficult time opening up to a therapist via video conference.

I felt great [about being assigned to telemedicine]. I felt as though it was very convenient. I liked the idea of utilizing technology in a way that's efficient. So I thought okay, great. I have a laptop and finally it would be good for me to do this and be able to see if there are benefits. And I know some people who'd go it's not the same but I'd definitely would have gone on board with being able to do the digital conference as opposed to in-person.
(Participant in the telemedicine group)

I have done therapy in-person but I've never done therapy remotely and I guess I do have a little bit of skepticism about whether or not it would be as effective because of – I think I just feel more connected to – it's easier to feel connected to someone when you're in-person for me. (Participant in the telemedicine group)

Patients assigned to the in-person or waitlist control group were asked their opinion about telemedicine. They shared common concerns about privacy and technology. However, they also

noted that the convenience of telemedicine made it appealing, especially in the winter, and they reported being open to it had they been assigned to that group.

I imagine depending on a person's lifestyle or even for me if I was sitting in my office trying to receive therapy over my computer screen, you know my daughter could have burst into the room or my cat could have jumped on my head or something like that then could have potentially been a serious distraction from the focus required just talking to another person. (Participant in the in-person group)

No, I mean I think it's probably just a bit easier. I think it's definitely easier to just kind of converse with somebody in-person versus online just again because you don't have all the glitches and sound quality and it's just like the awkwardness that comes with like - there's a delay and you start talking over each other, all these little things that just kind of add up to make it - it's a bit more of a barrier to just having like a smooth flowing conversation that you're doing it online. I mean it's not huge but it's enough. (Participant in the in-person group)

So again I wonder if there are practical and logistic down sides to that. But would they have been as bad as I really thought about the benefits to not having to come in here, during the winter time, not having to get on my bike. I'm really loving the idea of being able to. It's less time of a time commitment honestly because it doesn't include the travel time that I really see that as being a pretty huge benefit. (Participant in the in-person group)

Some participants were initially disappointed that they were not assigned to the telemedicine group because of the perceived inconvenience of having to attend sessions, including carving out time for transportation and finding parking. While others reported feeling relieved as they believed in-person therapy would be more effective than telemedicine and they wondered if it might have been harder to invest in treatment or feel accountable to their therapist, if care was delivered on-line.

You know I just wonder. I don't think that personally that I would necessarily take it less seriously. I feel like certainly because of how frustrated and upset I was about my insomnia I think I would have really really tried to give it my all and be committed and connected and present. (Participant in the in-person group)

Leading up to it, I thought that I would have preferred doing it in-person. But, then, when I got it, my immediate reaction was, 'Oh, but that's going to require me to, once a week, get myself over there.' And it was a big commitment. And I had a window of time in my professional life where I could make that work . . . but now I would not be able to do it. And so, I thought, 'Oh, that's really cool that this study is about the option of providing [therapy] through telemedicine because that would make it much more accessible to a lot of people.' (Participant in the in-person group)

The act of having to be where I was, to go somewhere else made receiving treatment a little bit more of an event I guess, which made me more likely to commit to the homework given, because I would have to go out of my way to check in the next week. So, I wanted to make sure that there was progress to report on. (Participant in the in-person group)

(1) *Provider perceptions of telemedicine and in-person delivery modalities of CBT-I prior to trial*

Prior to study initiation, most providers had little to no experience administering care via telemedicine, however they were optimistic about the potential benefits, including increased access to care for patients who lived far from a provider's office or for those who could not easily travel. Providers shared that prior to the study they had speculated that telemedicine could improve continuity of care, may decrease cancellations and missed appointments for patients, and that it may be more convenient for providers as well.

I was really looking forward to [using telemedicine]. I thought this could be the future of therapy, especially in terms of reaching out to people who are more in distant areas or older adults who have more difficulty coming into the hospital.

Table 1. Baseline demographic and clinical characteristics of the study sample

	In Person (N = 20)	Telehealth (N = 21)	Waitlist Control (N = 19)	Overall (N = 60)
Age (yr)	33.70 ± 10.58	33.14 ± 10.00	31.21 ± 8.70	32.72 ± 9.70
Race n (%)				
Asian	3 (15)	3 (14)	1 (5)	7 (12)
Black or African American	5 (25)	5 (24)	1 (5)	11 (18)
White	11 (55)	13 (62)	16 (84)	40 (67)
Preferred not to answer	1 (5)	0 (0)	1 (5)	2 (3)
Non-Hispanic n (%)	18 (90)	21 (100)	19 (100)	58 (97)
Female n (%)	13 (65)	13 (62)	13 (68)	39 (65)
Marital Status n (%)				
Single—never married	13 (65)	17 (81)	15 (79)	45 (75)
Married	6 (30)	3 (14)	4 (21)	13 (22)
Divorced	1 (5)	0 (0)	0 (0)	1 (2)
Widowed	0 (0)	1 (5)	0 (0)	1 (2)
Employment n (%)				
Working, full-time	10 (50)	13 (62)	10 (53)	33 (55)
Working, part-time	5 (25)	2 (10)	3 (16)	10 (17)
Not currently employed	4 (20)	1 (5)	4 (21)	9 (15)
Student	1 (5)	5 (24)	2 (11)	8 (13)
Education n (%)				
Completed high school/GED	1 (5)	1 (5)	1 (5)	3 (5)
1–3 years of college	7 (35)	2 (10)	0 (0)	9 (15)
Completed college	5 (25)	11 (52)	10 (53)	26 (43)
Post-graduate college	7 (35)	7 (33)	8 (42)	22 (37)
Insomnia Severity Index	16.2 ± 2.7	17.9 ± 3.9	17.1 ± 4.3	17.0 ± 3.7
PHQ-9 ^a	8.1 ± 3.7	8.5 ± 4.2	9.1 ± 3.2	8.5 ± 3.7
GAD-7 ^b	6.9 ± 4.1	5.3 ± 4.1	7.3 ± 3.8	6.5 ± 4.0
Multidimensional Fatigue Inventory	53.2 ± 13.0	55.7 ± 14.6	55.1 ± 11.9	54.7 ± 13.1
Work Social Adjustment Scale	15.8 ± 7.7	18.2 ± 8.4	14.3 ± 7.7	16.2 ± 8.0
EuroQOL Index ^c	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
SF-12 Physical ^d	51.3 ± 5.0	51.1 ± 5.8	51.6 ± 4.6	51.3 ± 5.1
SF-12 Mental ^e	28.7 ± 8.5	30.7 ± 10.9	31.1 ± 8.5	30.2 ± 9.3

^aPHQ-9: Patient Health Questionnaire-9

^bGAD-7: General Anxiety Disorder-7

^cEuroQOL Index: European Quality of Life Index

^dSF-12 Physical: Short Form-12 Physical

^eSF-12 Mental: Short Form-12 Mental

I was a little skeptical about the way that it would feel to do therapy via telehealth in terms of establishing rapport with patients and ... just making sure that you could connect with them in the same way that you could in-person. So, I was a little worried that it might not be

as easy to establish rapport. But I was certainly excited by the possibility of using it because I think it can help us reach more people, which is really important.

Providers note that, before the study began they were concerned that it might be hard to establish a solid connection, build rapport, or a strong therapeutic alliance with patients via telemedicine. Some providers felt that the patient commitment required to complete in-person treatment, including devoting time and energy to get to a physical meeting place on a regular basis, helped to ensure patient motivation and accountability over time, something that may be lacking in telemedicine treatment modalities. Providers were also concerned that they or their patients may experience connectivity or technical problems during sessions or that there would be other distractions or privacy issues when engaging with patients in their homes.

I was very interested in [telemedicine] in theory, but I think one of my concerns was, as we get increasingly less personal and not sharing space with patients and kind of robotizing and automatizing everything that it might be detrimental to the therapeutic alliance and the therapeutic benefits.

I think just being in the room with somebody allows you to pick up on – or I thought, at least, being in the room would allow you to pick up on more than it would via a telehealth. And so, I would be concerned that there may be pieces of their behavior that I just wasn't getting as well because it was via the video chat rather than in-person.

Although I fully support telemedicine, I just felt that [accountability] was always kind of an issue, keeping patients and clients motivated to actually sit down somewhere privately and sit in front of their computer and have an appointment.

(1) *Providers' reflections on the trial*

The vast majority of providers interviewed reported having a generally positive experience using telemedicine with their patients. Treating patients remotely allowed for convenience and flexibility for both providers and patients, expanded access to care, and better session attendance rates.

This in itself was very easy to use, and it was nice that you can share files. That helps a lot because you have to look at things together, and so it helped that you can do that ahead of time. And then, have the person have the information they needed for the session. So, that was really easy to use. I think it was nice.

There were a couple of people I saw who went on vacation or had things go on in their life during the course of therapy. And so, my guess is that it helped us actually retain our ... therapeutic alliance because we didn't have to skip sessions as often as you might with in-person.

Alternatively, some providers argued that CBT-I was a challenging intervention to deliver via telemedicine because of the demanding nature of the treatment itself. These providers felt that communicating about the requirements of CBT-I was easier in person so they could more clearly explain the rationale for the treatment structure.

I feel like my overall experience was that it was harder to connect with the patient in telehealth and that there's something – it was like – in CBT-I, we're asking people to do something very challenging. We're asking people to do something that on its face sounds pretty draconian.

In this society, people would really have to try and be very motivated to make it to weekly sessions. But in-person, style could definitely give you the depth of the human interaction being more efficient in delivering empathy over an in-person interaction ... delivering educational materials.

When asked specifically to compare and contrast administering treatment in-person versus via telemedicine, most providers were enthusiastic about continuing to see patients remotely, but expressed a general preference to in-person sessions.

I think many of my worries about the barriers in telehealth did not bear out ... I felt like I was able to connect with people during that first session when you get a lot of background information from them, both in-person and via telehealth. I didn't notice much difference in the amount of information I was receiving, or even really the amount of time that I got from people depending on [delivery] modality.

However, some providers noted that telemedicine had an unexpected benefit, in that it provided a unique window into the patient's life.

Like I said, I had not done it before. So, I had concern that it would feel more awkward. But I actually don't think it did really at all. And in some ways, it provides a different insight into the patient because we were able to see a little bit more of their life ... in that way.

Patient access to reliable internet did not prove to be a huge issue, however when sessions were interrupted by poor connectivity, providers noted it was certainly disruptive. The patient's dedication to the intervention was seen as a major facilitator to their overall success with CBT-I via telemedicine. Providers did note however, that the intervention was less effective via telemedicine when patients did not deliberately carve out a private time and space for their video conference meetings.

While the trial was completed prior to care disruptions related to the COVID-19 pandemic, several interviews were completed after that time and telemedicine was top of mind for some providers. The need to shift to more remote treatment modalities during the pandemic emerged for some participants as an important reason to support the expansion of telemedicine options for patients throughout the healthcare industry, including therapy. Providers argued that not only would expanded access to telemedicine be beneficial during periods requiring physical isolation or distance from patients, it would increase access to health services for those outside urban hubs or for those without access to specialists in their area.

I think overall, just that my impression of this has been that largely the telehealth format is really, really cool. And especially in the time of COVID-19, this has proven to be a really, really sustainable solution, and it's something that's easily accessible. I feel very positively about the telehealth arm.

4. Discussion

To our knowledge, our study is the first randomized non-inferiority trial with a qualitative component to evaluate patient and provider perspectives, attitudes, and preferences regarding CBT-I delivery via telemedicine versus in person care, as well as the facilitators and barriers to receipt and delivery of each care delivery modality. The findings are uniquely relevant in light of the recent impact of the pandemic on healthcare delivery.

Both groups of patients assigned to telemedicine and in-person CBT-I were generally satisfied with their treatment. Both groups who were assigned to telemedicine, and those who were assigned to in-person treatment, recognized the benefits associated with telemedicine, including the decreased time commitment due to travel, and convenience afforded. Additionally, both groups expressed similar concerns regarding CBT-I delivered via telemedicine including privacy and technology issues, as well as decreased clinical effectiveness due to less personal accountability or provider rapport. While we found no qualitative studies that previously evaluated the patient experience of CBT-I, interestingly, many of these patient perceptions regarding the benefits of and barriers to telemedicine treatment are not unique to CBT-I, but have also been reported by patients in primary care and paediatrics (Powell et al., 2017; Tully et al., 2021).

Providers reported that prior to the study they had similar perceptions of the benefits of telemedicine as their patients, including convenience, access to care, and continuity care. They also shared similar concerns, including establishing a strong therapeutic alliance, patient engagement and accountability in CBT-I, and technological problems that could hinder effective care. Following this trial, most providers reflected on a positive experience and were enthusiastic about telemedicine for CBT-I, noting benefits in provider and patient convenience, expanded access for patients, and improved continuity of care. While not specific to CBT-I, qualitative studies with psychiatrists and mental health professionals have demonstrated recognition of similar benefits and barriers to telemedicine success in treatment in both the outpatient and inpatient setting (Sander et al., 2021; Uscher-Pines et al., 2020). Furthermore, many of the provider perceptions of benefits, limitations, and acceptability of telemedicine have also been found across other disciplines in medicine, including pediatrics, oncology, and for opioid use disorder treatment (Heyer et al., 2021; Tully et al., 2021; Uscher-Pines et al., 2020).

Providers were interviewed during the COVID-19 pandemic and raised the necessity of expanding telemedicine options for patients during this acute period. Several providers extended this beyond acute pandemic needs to the benefits of expanding access more generally. Telemedicine's role in expanding access to care was discussed by both patients and providers, and spanned from improving individual access via increased scheduling flexibility to a broader geographic expansion of care.

Given that our study focused on synchronous technology, we found that our findings were consistent with existing literature on patient and provider perspectives regarding this digital modality in other fields of medicine, such as primary care (Donelan et al., 2019; Hays et al., 2022; Thiyagarajan et al., 2020). Though we did not compare synchronous to asynchronous technology, we found that telemedicine offered synchronously has important utility in treating sleep disorders—such as insomnia—as evidenced by other research and work by this team and others (Gehrman et al., 2021; Shamim-Uzzaman et al., 2021). Additionally, our findings add to the growing body of evidence that patients and providers are comfortable with receipt and delivery of mental health treatment via synchronous telemedicine (Gieselmann & Pietrowsky, 2019; Lichstein et al., 2013). However, further research is needed to test the differences between utilizing asynchronous versus synchronous digital modalities in the fields of sleep medicine and psychiatry.

The study design of a randomized non-inferiority trial, rather than a convenience sample of patients who selected telemedicine treatment, reduces bias associated with participant selection. However, our study has a couple of limitations. First, the eligibility criteria included only English-speaking patients. This may have positively influenced the perceptions of participants regarding telemedicine CBT-I delivery as non-English speaking patients may have substantial communication challenges exacerbated by telemedicine, where translator services are limited. Both patients, who were interviewed 3 months after trial completion, and providers, who were interviewed after the COVID-19 pandemic onset, may have experienced recall bias in reflecting on trial experiences, and pre-trial attitudes towards telemedicine and in-person CBT-I delivery. In addition, the study population was limited to a metropolitan area with large, academic health systems. These perspectives may not be representative of patients from rural areas, who have less exposure to telemedicine visits and interaction with health systems in which telemedicine adoption is substantially decreased when compared to metropolitan areas (Chen et al., 2021). Furthermore, 55 percent of the patient sample was not in full employment, limiting our ability to transfer our findings about the benefits of telemedicine to the working population.

While our paper did include provider perceptions regarding CBT-I delivered via telemedicine in this new pandemic era, the majority of our interviews with patients occurred prior to the onset of the COVID-19 pandemic. During this pandemic, there has been increased exposure and engagement in telemedicine practices for both patients and providers. Thus, patient perceptions regarding the barriers, benefits, and acceptability of telemedicine delivered CBT-I may have evolved. It is crucial that future studies investigate patient perceptions of telemedicine for this use.

Abbreviations

CBT-I – Cognitive Behavioral Therapy for Insomnia
COREQ – Consolidated Criteria for Reporting Qualitative Studies
COVID-19 – Coronavirus
EuroQOL Index – European Quality of Life Index
GAD-7 – General Anxiety Disorder-7
ISI – Insomnia Severity Index
PHQ-9 – Patient Health Questionnaire-9
SF-12 Mental – Short Form-12 Mental
SF-12 Physical – Short Form-12 Physical
TM – Telemedicine

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Clinical trial information

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Data Availability Statement

All data used for this project are available on request from the corresponding authors. The data are not publicly available due to the sensitive information contained in the interviews. Selected sections can be requested in order to not compromise the privacy of the research participants.

Supplementary material

Supplemental data for this article can be accessed [here](#).

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