

Videoconferencing Psychotherapy for Alcohol Use Disorder in Men: Pilot Study of a Randomized Controlled Trial

Psicoterapia por Videoconferência para Transtorno por Uso de Álcool em Homens: Estudo-piloto de um Ensaio Clínico Randomizado

Psicoterapia por videoconferencia para el trastorno por consumo de alcohol en hombres: estudio piloto de un ensayo clínico aleatorizado

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ABSTRACT

Introduction: There is little evidence on the effectiveness of online therapy for several problems, such as alcohol dependence. **Aim:** To adapt a protocol and evaluate the feasibility and initial results of the effectiveness of videoconferencing cognitive-behavioral therapy (CBT) for Alcohol Use Disorder (AUD) in an outpatient setting. **Method:** A pilot study of a randomized clinical trial was conducted. Over two-years, 93 men contacted a university outpatient service, and 47 completed the initial assessment. Eligible participants were allocated to either face-to-face CBT (CBT-F2F - N=12) or videoconferencing CBT (CBT-VC - N=10). The intervention was adapted from Project MATCH, with 12 therapy sessions. Data were collected pre- and post-treatment and at the three-month follow-up. **Results:** Both groups significantly reduced the number of days they drank and the number of doses consumed in the last month between pretreatment, posttreatment, and follow-up. The dropout rate was 50% at each stage between recruitment and completion of therapy, but the adherence of those who entered was high (70% CBT-VC and 50% CBT-F2F). **Conclusion:** Online therapy seems to be a feasible treatment option for the Brazilian population with AUD. In our study, we found similar results to face-to-face therapy.

Keywords: Alcoholism, Online therapy, Telepsychology.

RESUMO

Introdução: Temos pouca evidência sobre a efetividade da psicoterapia on-line para problemas graves, como a dependência de álcool. **Objetivo:** Adaptar um protocolo e avaliar a viabilidade e os dados iniciais da efetividade da terapia cognitivo-comportamental por videoconferência (TCC-VC) para pessoas com transtorno por uso de álcool (TUA) em contexto ambulatorial. **Método:** Um estudo-piloto de ensaio clínico randomizado foi conduzido. Por dois anos, 93 homens contataram um serviço ambulatorial universitário, 47 completaram a avaliação inicial. Os participantes elegíveis foram randomizados para TCC-presencial (TCC-P, n = 12) ou TCC-VC (n = 10). A intervenção foi adaptada do PROJETO MATCH, com 12 sessões de terapia. As avaliações foram feitas na pré e na pós-intervenção e após três meses. **Resultados:** Ambos os grupos reduziram significativamente o número de dias de uso e o número de doses consumidas no último mês entre as avaliações pré, pós e seguimento. A taxa de abandono foi de 50% em cada fase desde o recrutamento até o fim da terapia, mas a adesão de quem entrou foi alta (70% TCC-VC, 50% TCC-P). **Conclusão:** A terapia *on-line* parece ser uma opção de tratamento viável para a população brasileira com TUA. Em nosso estudo, encontramos resultados semelhantes aos da terapia presencial.

Palavras-chave: Alcoolismo, Terapia *on-line*, Telespécologia.

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RESUMEN

Introducción: Hay poca evidencia sobre la eficacia de la psicoterapia online para Trastorno por Consumo de Alcohol (TCA). **Objetivo:** Adaptar un protocolo y evaluar la viabilidad y los datos iniciales sobre la efectividad de la terapia cognitivo-conductual vía videoconferencia (TCC-VC) para personas con TCA en un entorno ambulatorio. **Método:** Se llevó a cabo un estudio piloto, aleatorizado y controlado. Durante dos años, 93 hombres se pusieron en contacto con un servicio ambulatorio y 47 completaron la evaluación inicial. Los participantes elegibles fueron asignados al azar a TCC en persona (TCC-P, n=12) o TCC-VC (n=10). Adaptamos el proyecto MATCH, con 12 sesiones, y las evaluaciones fueron antes, al final y después de tres meses. **Resultados:** Ambos grupos redujeron significativamente el número de días de uso y el número de dosis consumidas en el último mes entre las evaluaciones pre, post y seguimiento. La tasa de abandono fue del 50% en cada fase desde el reclutamiento hasta el final de la terapia, pero la adherencia entre los que ingresaron fue alta (70% TCC-VC, 50% TCC-P). **Conclusión:** La terapia online parece ser una opción de tratamiento viable para la población brasileña con TCA. En nuestro estudio encontramos resultados similares a la terapia presencial.

Palabras clave: Alcoholismo, Intervención basada en la internet, Telepsicología.

Highlights of Clinical Impact

- This study adopted a 12-session CBT protocol, with a robust international empirical basis, to treat people with alcohol dependence in Brazil via videoconference.
- The adaptation involved inserting motivational elements in the assessment sessions, considering the different motivational levels.
- The pilot study showed that participants with alcohol dependence reduced the number of drinking days and the number of alcohol doses, both in videoconference and in-person therapy.
- Preliminary results showed that it is feasible to treat people with serious problems, such as Alcohol Use Disorder, using online CBT in Brazil.

According to the World Health Organization (WHO, 2022), alcohol use is a serious public health problem. Its harmful use is linked to more than 200 health conditions. In 2016, three million deaths (5.3%) around the globe were attributed to alcohol consumption, and 5.1% of all disability-adjusted life years were the result of harmful alcohol consumption. The 3rd National Survey on Drug Use by the Brazilian Population, conducted by Fiocruz, indicated a 1.5% prevalence of alcohol dependence in the last 12 months, representing 2.3 million people between 12 and 65 years old. Dependence was 3.4 times more prevalent in men than among women (Bastos *et al.*, 2017). In Latin America, public services for the treatment of substance users are available, although they do not always have sufficient coverage. The disparity between supply and demand for health care is a reality in developing countries, such as Brazil (Harris *et al.*, 2019). This limitation calls for alternative treatments, like eHealth interventions.

eHealth is a safe and cost-effective use of information and communication technologies in support of health. It encompasses health services, health surveillance, health literature and education, health knowledge and research (WHO, 2024). Since 1997, the WHO has recognized the impact and use of the internet for health-related issues. In last years,

WHO (2021) developing the Global strategy on digital health authenticating the potential of eHealth to improve the quality, safety, and access to health services and encouraged member states to incorporate it into their health systems. The role of internet use in eHealth is seen as a possibility to increase the accessibility and quality of health services, especially in low- or middle-income countries, as is the case in Brazil. Additionally, in this direction, Muñoz (2022) debates on the importance of the association between psychology and technology to help reduce human suffering beyond the local context, permitted only using face-to-face interventions, and contribute to making healthcare a universal human right. The author has been before highlighted the importance of interventions made available by computer or internet as resources to assist inhabitants of hard-to-reach places, people on waiting lists, patients who avoid the stigma of seeking a mental health service, and extending health care to prevention activities, especially in developing countries. Some authors point out that web-based interventions are more effective when provided in regular clinical settings to better serve groups that have less access to mental health services and people in countries where mental health services may be less developed. In fact, there is great interest in some countries in evaluating

interventions carried out over the internet for different mental disorders (Andersson *et al.*, 2019; Matsunomo *et al.*, 2021).

To promote better access to health, the stepped-care model (Roddy *et al.*, 2023) proposes interventions with low to high intensities tailored to each patient's demand. Low-intensity interventions are generally self- or minimally guided, asynchronous and preventive. High-intensity interventions provide people with a more complex diagnosis, are highly personalized and are usually delivered face-to-face or, when online, using synchronous tools (i.e., audio or videoconferences).

In the case of alcohol use, there is evidence showing that individuals with mild alcohol use can benefit from treatments or brief interventions, both face-to-face and online treatments self-guided or asynchronous modalities (Kruse *et al.*, 2020; Lin *et al.*, 2019). Severe cases of addiction do not have good results with low-intensity treatments and require more intensive treatments, such as psychotherapy and motivational or pharmacological interventions. In this sense, one of the most extensive clinical trials to evaluate different treatments for alcohol dependence - the Project MATCH - proposed hypothesis that patients with severe dependence would have better results with a treatment based on the twelve steps than on cognitive-behavioral therapy (CBT) and motivational interviewing. This hypothesis was not supported among patients undergoing outpatient treatment, since the results were similar between the three modalities. In the group that received intervention after hospitalization, called CBT aftercare, patients with less severe dependence had better results with CBT (Cooney *et al.*, 2001). Therefore, the CBT protocol used in the study may be a promising treatment for alcohol-dependent individuals, but it has not yet been evaluated for use in videoconferencing psychotherapy.

Studies have been carried out to test the effectiveness of computerized, internet or videoconference psychotherapy interventions for users of alcohol and other drugs. Kiluk *et al.* (2019) performed a meta-analysis in which 15 trials were identified, primarily involving individuals categorized as at-risk or heavy drinkers. The structure and content of CBT Tech programs varied from 4 to 62 sessions or modules (media 9); 47% incorporated elements of motivational interviewing; 60% aimed at moderating alcohol use (no abstinence). Among several findings, the researchers indicated the efficacy of technology-delivered, CBT-based interventions either as standalone therapy for heavy drinking or as an adjunct to usual care within specialized substance use settings. Most studies were about computerized interventions and whether or not therapists guided them. This review found only two studies that compared internet-based CBT with in-person CBT, and both found no difference in outcomes.

Therapy using the internet to help people reduce their drinking behavior is already supported by evidence. Gumier (2019) found three studies (six papers) on internet therapy with the participation of a therapist for alcohol users (Blankers *et al.*, 2011; Kay-Lambkin *et al.*, 2009, 2011; Postel *et al.*, 2015). Four

studies were randomized clinical trials, one was a pilot study with a pre, post-test design, and one study used secondary data from an already published study. The results showed a reduction in alcohol consumption at posttreatment and at the follow-up evaluation. The results also showed good results in measures of related problems and reasonable satisfaction with the treatment received. On the other hand, none of the treatments were directed toward diagnosed alcohol-dependent individuals. Additionally, the treatments evaluated in this meta-analysis used messages, emails, or chats instead of videoconferencing.

More recently, studies have shown promising results on the effectiveness of online interventions with therapist contact for reducing alcohol use (Kruse *et al.*, 2020; Johansson *et al.*, 2021; Lin *et al.*, 2019; Sundstrom *et al.*, 2017). The systematic review by Lin *et al.* (2019) included 13 studies on psychotherapy and prescribing medication by videoconference for alcohol, tobacco, and opioids. Interventions for alcohol dependence included Motivational Interviewing, Relapse Prevention, CBT, and Family Therapy. There was a small dropout rate in treatments and a significant reduction in alcohol consumption, except for patients undergoing treatment due to criminal justice issues. However, the authors pointed out many methodological flaws and the need for further studies. In the review by Sundstrom *et al.* (2017), the gap in knowledge about the effect of therapist participation and its association with treatment duration on treatment outcomes was highlighted.

Studies evaluating the implementation of videoconference treatments for alcohol dependence in developing countries are lacking. Additionally, we are not aware of studies that control many conditions in the delivery of videoconferencing. Thus, we adapted a protocol and conducted a pilot study of a randomized clinical trial (RCT) to evaluate the feasibility and effectiveness of videoconference therapy for alcohol dependence in an outpatient setting in Brazil. The intervention delivered by videoconferences is expected to be equivalent to the intervention delivered in person, showing the method to be a possibility for increasing access to specialized treatment for alcohol dependence.

MATERIALS AND METHODS

DESIGN

This is the pilot study of a quantitative randomized clinical trial comparing face-to-face treatment to videoconferencing. The study was registered at the Brazilian Registry of Clinical Trials RBR-74jtvn.

PARTICIPANTS

We included 22 participants in the pilot study. Inclusion criteria were (1) being male, (2) between 18 and 65 years old, and (3) meeting the criteria for alcohol dependence based on the Mini International Neuropsychiatric Interview (MINI; Amorim, 2000). Individuals with (1) abusive or dependent

use of other drugs (with the exception of tobacco), (2) who participated in specialized treatment for problems with alcohol and other drugs in the last three months (weekly psychotherapy and/or hospitalization in a specialized clinic or therapeutic communities), and (3) who were abstinent for more than 30 days or who met criteria for severe mental disorders were excluded. Subjects who met the criteria for depression, generalized anxiety disorder and low risk of suicide, and were on medication or attended mutual aid groups, were included in the study or (4) who met the criteria for severe mental disorders. We included participants who scored as low suicide risk on the MINI but who, clinically, responded that thoughts of dying occurred in the past or did not clearly refer to suicidal ideation.

MEASURES

Measures applied only in the initial assessment:

1. Sociodemographic data: questions about age, sex, education, religion, and socioeconomic level.
2. Internet use assessment: It is composed of two items (1. Do you use computers? If yes, how often do you use the internet?; 2. Regarding your difficulty using a computer, how do you rate yourself?) elaborated by the researchers to assess the frequency of internet use and the familiarity with computer usage among participants. The answers to both questions are given on an ordinal scale. The first one is evaluated from “no usage” to “almost every day/daily”. The second one is evaluated from “It is hard for me to use the computer” to “I do not have issues using a computer”
3. Question about the therapy’s goal: a single question asking the patients’ goal on the treatment, to reduce or quit the consumption.
4. Mini-Mental State Examination (MMSE; Mendonça et al., 2020): a brief screening to assess the cognitive function, such as spatial orientation, memory, arithmetic and language skills.
5. Personal Expectations and Beliefs About Alcohol Inventory (IECPA; Oliveira & Werlang, 1993): composed of affirmations about the personal expectations and beliefs related to alcohol effects. It is a Likert-scale with 61 items distributed in five factors: global positive effects and facilitators of social interactions; decreased and/or avoidance of negative emotions; sexual activation and pleasure; positive effects on activity and mood; and positive effects on self-assessment. It could be self-administered.
6. University of Rhode Island Change Assessment Scale — Brazilian version (URICA; Szupczynski & Oliveira, 2008): it is composed of 32 items aiming to investigate the motivation stage for change of behavioral of drink, including pre-contemplation (no motivated), contemplation (ambivalence), action (motivated to action), and maintenance (post abstinence).
7. Mini International Neuropsychiatric Interview version 5.0. - Brazilian version (MINI; Amorim, 2000): a brief standardized diagnostic interview based on the Diagnostic and Statistical Manual of Mental Disorders - IV(DSM-IV). It is a semi-structured interview to assess psychiatry disorders, including substance use disorder.

Measure not applied to participants:

10. Adherence to treatment: it was measured by the prevalence of patients who attended at least eight sessions (Ballegooijen et al., 2014), by the prevalence of patients who finished the therapy, and by the number of sessions they participated.

4. Procedures and randomization

The *Álcool e Saúde* Program was implemented in 2015 at the Applied Psychology Center (CPA) of *Federal University of Juiz de Fora*. CPA is a psychological aid service that provides ambulatory care for patients facing a variety of psychological problems. This service is not specialized for aiding substance users.

The study was approved by Research Ethics Committee of the *Federal University of Juiz de Fora* (Nº 278.167), and followed Resolution 011/2018 of the Federal Psychology Council (Resolução n. 11, de 2018). After approval of the ethics Committee, the study participants were recruited during short lectures in local health services, flyers, events for prevention and information about alcohol use, dissemination in local media and in social media.

Patient registration was performed through telephone contact with the CPA. After registration, the candidates were

Measures applied in the initial, final and follow-up assessment:

5. Questions about alcohol consumption: two questions elaborated by the research team, used as primary outcomes, including the consumption frequency (based on the number of days) and the number of doses consumed per occasion, both in the last 30 days. They are based on Project MATCH (Kadden et al., 1995).
6. Addiction Severity Index 6 – Alcohol Area (ASI6; Kessler et al., 2012): it is a semi-structured interview composed of 24 questions about alcohol treatment history, symptoms related to the addiction diagnosis, and the individual’s alcohol use pattern.

contacted and assessed in person (pretest) with standardized questionnaires by one of the project psychologists. A week after the evaluation, a session was carried out, in which the patients received feedback on the instruments they completed and were informed about the modality of care they were randomized to, whether it was going to be in person or online. In this session they also signed the consent form.

Eligible participants were randomly assigned to the modalities of care - face-to-face Cognitive-Behavioral Therapy (CBT - F2F) or Cognitive-Behavioral Therapy via Videoconference (CBT - VC) - following a randomization list performed by pairs by the R blockrand package (Snow, 2020). To reduce therapist style bias, the psychologists were allocated so that they all received the same number of patients in each treatment modality. Ineligible patients were referred to other treatment services, including the CPA internship program and local health care services.

5. *Treatment:* The 12 therapy sessions started in the week after the feedback. The interventions performed in both groups followed a protocol from the US National Institute on Alcohol Abuse and Alcoholism - the Cognitive-Behavioral Coping Skills Therapy Manual, from the Project MATCH (Kadden *et al.*, 1995). This model was translated and adapted by Gumier (2015) into a protocol based on CBT, on relapse prevention and on principles of motivational interviewing. Although the original model of the Project MATCH, from which this project was derived, is exclusively based on CBT, in this study Motivational Interview (MI) strategies were included, especially in the feedback session of the evaluation and in the initial therapy sessions, to favor behavioral change and minimize the proportion of treatment dropout (Hettema *et al.*, 2005).

The first session's goal was to welcome the patient, establish rapport, perform psychoeducation on CBT and alcohol, provide motivation strategies, set goals to be achieved and establish a therapeutic contract. The second session focused on managing the craving, identifying risk factors and establishing strategies to avoid them. In the third session, permissive thoughts about alcohol were addressed, and a list of pros and cons regarding alcohol consumption was made. The main theme of the fourth session was problem solving. The fifth session was techniques and strategies for turning down drinking proposals. The sixth session was prevention and management of relapse. The seventh session discussed seemingly irrelevant decisions.

By the end of the seventh session, the patient and the therapist collaboratively chose topics for the next four sessions, the so-called elective sessions, according to the patient's specific needs. Theme options included Initial Conversations, Non-Verbal Communications, Introduction to Assertiveness,

Receiving Criticism, Anger Awareness, Anger Management, Negative Thought Awareness, Managing Negative Thinking, Increasing Pleasant Activities, Managing Negative Moods and Depression, Enhancing Social Support Networks, Job-Seeking Skills, and Couples/Family Involvement.

Sessions occurred weekly and lasted 60 minutes each. Both interventions were conducted at the CPA. In the CBT-VC, the patient and the therapist stayed in distant rooms without any personal contact and used Skype or Google Hangouts for communication. The computer was previously prepared for therapy, and the printed material necessary to conduct the therapy was made available previously at the patient's desk. If any participant had difficulty using the computer, a team member provided guidance.

Posttreatment assessment was conducted one week after the end of treatment. A three-month follow-up assessment was performed. All assessments were carried out in person. Patients who did not complete treatment were also contacted for the completion of posttreatment assessment and for the follow-up assessment while maintaining the expected date for the end of the treatment. The sessions and evaluations were carried out by postgraduate therapists who were trained and specialized in the area of alcohol and other drugs and who received weekly supervision from a therapist with experience in the area.

6. Statistical Analysis

For feasibility analysis we calculated frequencies and percentages. For the initial results of effectiveness using primary outcomes, the intention to treat (ITT) method was used. All the randomized patient's data were analyzed, regardless of the group to which they were randomized and regardless of their adherence to the protocol and completion of treatment (Fisher *et al.*, 1990). For missing data, from participants who did not attend the assessments, we considered the participant's last response to the primary outcomes. For those who did not attend the final assessment, data from the initial assessment were used. For those who did not attend the follow-up assessment, data from the final assessment were used. Outcomes were compared on measurements performed at pretreatment, posttreatment and after three months follow-up. As they are continuous data, using Poisson regression, the adjusted incidence rate ratio (incidence rate ratio - IRR) of the number of doses and number of days that the subject drank in the last 30 days was calculated for one group compared to the other in each phase of the evaluation and from the same group among themselves and their respective confidence intervals (95% CI).

For continuous variables, the adjusted mean, standard error or standard deviation, and confidence intervals were calculated. Student's t test was used for inferential analysis of these same variables. For categorical variables, frequency and percentage were used.

RESULTS

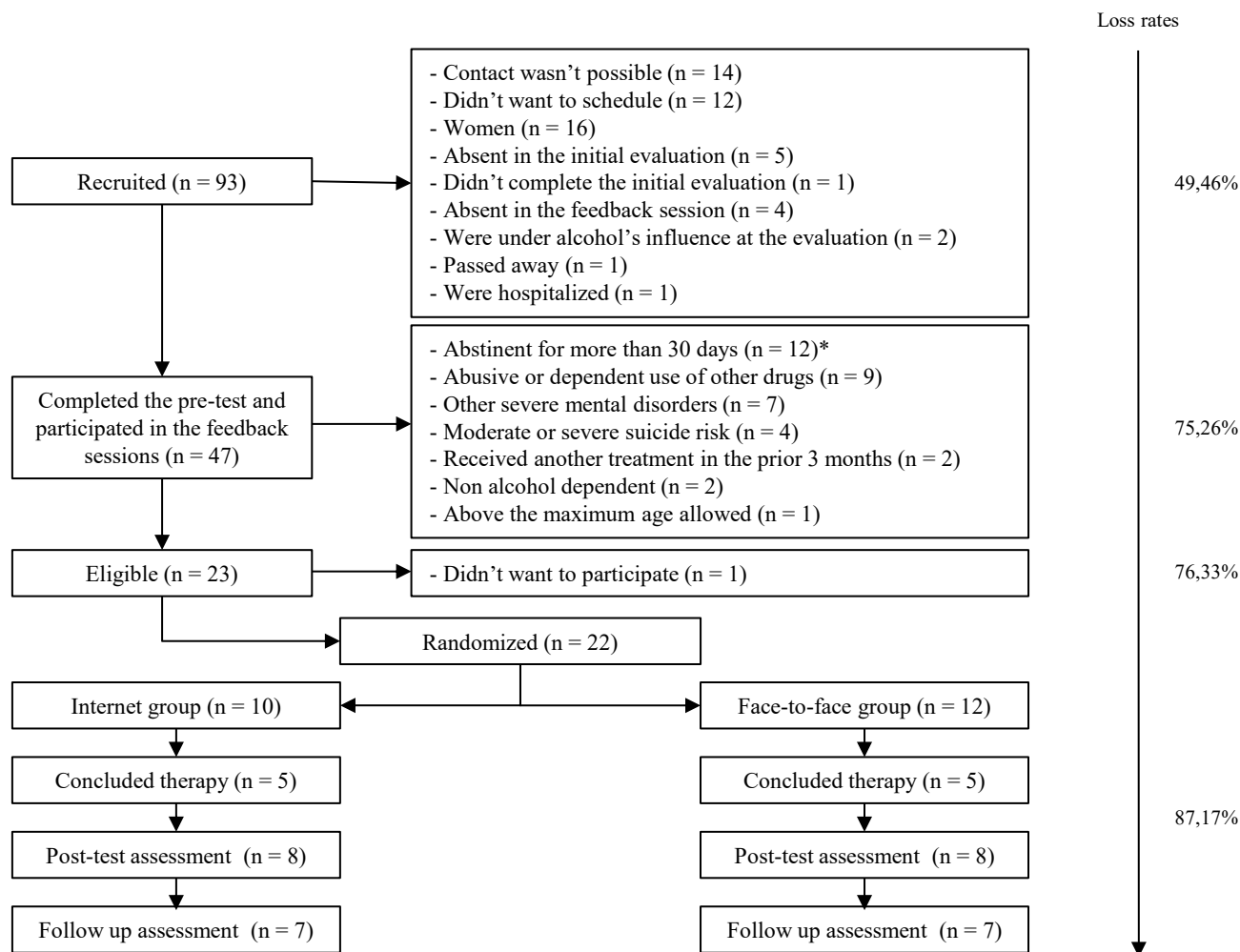
FEASIBILITY

Figure 1 presents the flowchart of the frequencies and rates of patient loss that occurred during the pilot study. Over a period of two years, 93 patients contacted the CPA for registration, and from those, 47 patients attended the initial assessment and feedback session. Between contact with the institution and the initial assessment, there was a loss of approximately 49.5% of the participants. Among the evaluated patients, 23 met the inclusion criteria, 12 were randomized to the CBT-F2F group and 10 to the CBT-VC group. The rate of loss of contact with the clinic until randomization was 76.33%. Eleven participants reached the end of therapy: five from the CBT-F2F group and six from the CBT-VC group. The reasons

for dropping out are described in Figure 1. Most participants came from referral by friends and family (45.7%), followed by the referral made by the Primary Health Care Units (26.1%), by CAPS-AD (13%), by CAPS (8.7%) and by the media (6.5%).

SAMPLE CHARACTERISTICS

Sample characteristics were collected in the initial assessment. The average age of the CBT-VC group was 49.8 (± 6.3) years, most of them from socioeconomic class C (N=7, 77.8%). Six (60%) participants were in the contemplation of change stage, two (20%) in precontemplation and two (20%) in action. Four (40%) had a diagnosis of current depression, and nine (90%) had abstinence as a goal of therapy. The CBT-F2F group was formed by people with a mean age of 46.5 years (± 9.5), most of whom were from socioeconomic class C (N=8, 56.7%). Nine (75%) participants were in contemplation, two



*Some participants fit in more than one reason for exclusion.

Figure 1. Pilot study's flow diagram.

(16.7%) in action and one (8.3%) in precontemplation. Three (25%) had a diagnosis of current depression, three (25%) had a low risk of suicide, and eight (66.7%) desired to abstain from alcohol. One participant from each group participated of mutual aid groups in the last six months. The groups did not differ in any sociodemographic characteristics.

Regarding the difficulty of using the computer, four participants in the CBT-VC said they had a lot or some difficulty and four had not used a computer before. Only two had no difficulty using the computer.

RESULTS OF PILOT STUDY

Using Intention to Treat methods, we analyzed data from 12 participants in the CBT-F2F group and 10 in the CBT-VC group across the three assessments. Figure 2 shows the averages of the number of days in which the subject drank in the last 30 days and the average of the number of doses consumed, on those occasions, in the last 30 days for patients in the CBT-F2F and CBT-VC groups in the pretreatment, posttreatment and follow-up evaluation.

In the CBT-F2F group (N=12), 33.3% of subjects were abstinent at the end of treatment, as were 25% of participants in the CBT-VC (N=10). At the follow-up assessment, there was little participation, and 20.0% of the CBT-F2F group and 28.6% of the CBT-VC group were abstinent.

Table 1 presents the incidence rate ratio that compares the CBT-VC group (N=10) in relation to the CBT-F2F (N=12) and the posttreatment and follow-up evaluations in relation to the pretreatment evaluation. The table shows that at the beginning of the treatment, the participants of the group that received the intervention via videoconference drank 11% more days than the participants of the group that received the face-to-face intervention. This difference was not significant (CBT-F2F: M=15.83, CBT-VC: M=17.5; $p=0.34$).

When comparing the averages of the number of days in which the subject drank in the last 30 days of the posttreatment with those of the pretest, both the CBT-VC group (pre: M=17.5, 95% CI: 14.9-20.1; post: M=3.01; 95% CI: 1.8-4.2%) and the CBT-F2F group (pre: M=15.83, 95% CI: 13.6-18.1; post: M=5.79, 95% CI: 4.2-7.3) significantly reduced alcohol consumption. However, participants in the CBT-VC group drank 53% fewer days than the CBT-F2F group in the posttreatment ($p=0.01$).

The observed increase in the number of days of use between the posttreatment and the follow-up assessment in the CBT-VC group was significant (M=7.6, 95% CI: 5.6-9.7), which did not occur in the CBT-F2F group (M=7.4, 95% CI: 5.1-9.8). However, compared to the pretreatment assessment, the reduction remained significant in both groups. The groups did not differ significantly in the follow-up assessment, both reporting approximately seven days of use on average ($p=0.75$).

Regarding the consumption of doses per occasion, when we calculated the incidence rate we found that at the beginning of the treatment, individuals in the CBT-VC group consumed

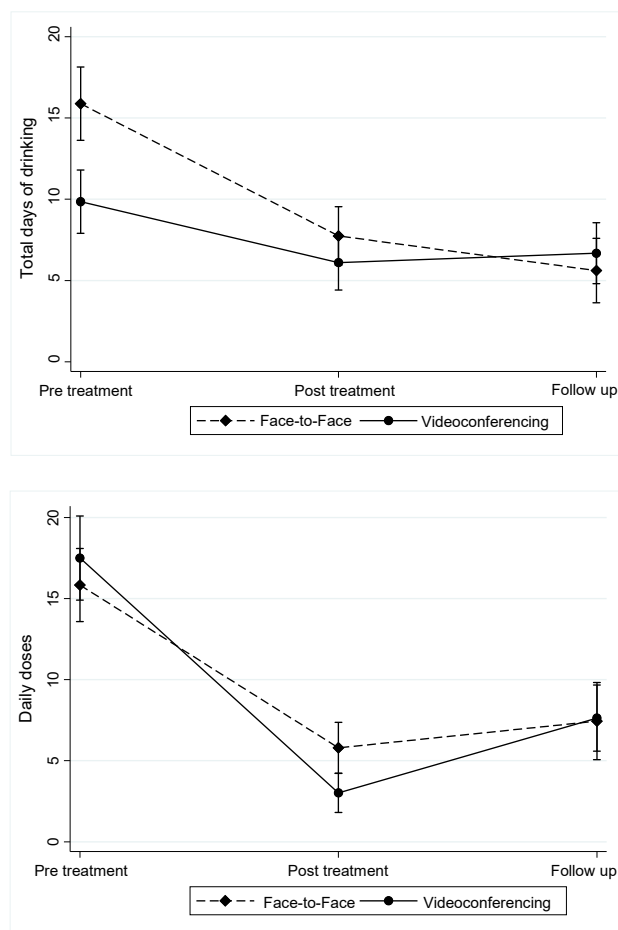


Figure 2. Average number of days of consumption in the prior 30 days and average number of doses per occasion of consumption of patients from the CBT-Videoconferencing (N=10) and CBT-Face-to-Face (N=12) in the pre, post and follow-up assessment.

38% fewer doses per occasion than individuals in the CBT-F2F group. This initial difference between the groups was significant (CBT-F2F: M=15.9, 95% CI: 13.6-18.1; CBT-VC: M=9.9, 95% CI: 7.9-11.8; $p=0.01$). When comparing the posttreatment to the pretreatment assessment, this reduction in alcohol consumption was significant in both groups (CBT-F2F: M=7.7, 95% CI: 5.9-9.5; CBT-VC: M=6, 1, 95% CI: 4.4-7.8), as shown by the nonoverlapping confidence intervals ($p=0.01$). However, the graph shows a more pronounced reduction behavior in the CBT-F2F group. The CBT-VC group drank 29% less than the CBT-F2F group, although it was not significant ($p=0.26$). In the corresponding period between the posttreatment and follow-up assessments, the CBT-F2F group continued to reduce its consumption per occasion (M=5.6, 95% CI: 3.6-7.6); however, this reduction was not significant. The CBT-VC group, on the other hand, showed a nonsignificant increase in consumption between the posttreatment and follow-up assessments (M=6.7, 95% CI: 4.8-8.6). The difference in dose consumption between the groups at follow-up did not differ significantly ($p=0.75$).

Table 1. Incidence Rate Ratio (IRR) of number of days the subject drank in the past 30 days and number of doses drank in the days that they drank between subjects from the CBT-Videoconferencing (N=10) and CBT-Face-to-Face (N=12) groups.

	IRR	p value	CI 95%
N° of days of consumption			
Face-to-face	1.00		
Videoconferencing	1.11	p = 0.34	0.90 – 1.36
Face-to-face			
	Pre-treatment	1.00	
	Post-treatment	0.36	p = 0.01
	Follow-up	0.47	p = 0.01
Interaction			
	Videoconferencing Post-treatment	0.47	p = 0.01
	Videoconferencing Follow-up	0.93	p = 0.75
			0.28 – 0.79
			0.58 – 1.48
N° of doses			
Face-to-face	1.00		
Videoconferencing	0.62	p = 0.01	0.49 – 0.79
Face-to-face			
	Pre-treatment	1.00	
	Post-treatment	0.49	p = 0.01
	Follow-up	0.25	p = 0.01
Interaction			
	Videoconferencing Post-treatment	1.29	p = 0.26
	Videoconferencing Follow-up	2.76	p = 0.75
			0.83 – 1.99
			1.55 – 4.91

Table 2 presents the results of secondary outcomes collected in the pretreatment, posttreatment and follow-up assessments. The IECPA indicated a reduction in the proportion of participants who still remained within the score range indicative of dependence in both groups in the post-treatment and follow-up assessment. URICA also pointed to a lower proportion of participants who were still in the contemplation stage for change in the final stages. The ASI6 and the MMSE did not identify any difference.

ADHERENCE TO TREATMENT

Regarding the treatment adherence data, the average number of participants in the CBT-VC group sessions was 7.7 ± 4.3 sessions and that of the CBT-F2F group was 6.7 ± 4.5 sessions (Min=1, Max=12) ($p=0.59$). Considering adherence as participating in more than eight sessions, seven participants (70%) in the CBT-VC group and six participants (50%) in the CBT-F2F group adhered to the treatment. This difference is not significant ($p=0.34$). Regarding the completion of therapy, approximately 50% of participants in both groups reached the end of the intervention.

DISCUSSION

In this study we adapted a clinical protocol and evaluated the feasibility and initial results of effectiveness of CBT delivered via videoconferences in comparison to face-to-face CBT for Alcohol Use Disorders. The study is pioneering in the sense that, to our knowledge, it is the first evaluation of the feasibility

Table 2. Secondary outcomes presented by the participants in the pre, post, and follow-up assessments

Measurements	Pre	Post	Follow-up
IECPA (stage > 136): F(%)			
Face-to-face	10 (83)	4 (57.1)	2 (50)
Videoconferencing	8 (80)	2 (25)	4 (57.1)
Urca (Contemplation): F(%)			
Face-to-face	9 (75)	2 (33.3)	3 (75)
Videoconferencing	6 (60)	6 (75)	4 (57.1)
ASI6 (Alcohol): MD ± IIQ			
Face-to-face	4 ± 1	4 ± 2.5	3 ± 2
Videoconferencing	4 ± 0.3	4 ± 2.8	4 ± 2
Mini Mental: MD ± IIQ			
Face-to-face	27.5 ± 2.6	27.0 ± 2.3	27.8 ± 3.9
Videoconferencing	26.4 ± 2.9	27.6 ± 3.2	28.6 ± 1.6

Note: Post: Face-to-Face (n = 7); Videoconferencing (n = 8). Follow-up: Face-to-Face (n = 4); Videoconferencing (n = 7)

Inventory of expectations and beliefs about alcohol (IECPA) > 136 – indicates alcohol dependence.

Addiction Severity Index (ASI) – 0 to 4 in which 3 means considerable problems and 4, extreme problems.

of the effectiveness of videoconference-based CBT for AUD in developing countries, such as Brazil. Although this was a pilot study, which limits the conclusions based on the results, a reduction in alcohol consumption was observed throughout the intervention. Both groups at posttreatment and follow-up

significantly reduced the number of days they drank and the number of doses consumed per occasion measured.

Regarding drinking days in the last month (abstinence), the CBT-VC group reduced drinking days by more than half when compared to the CBT-F2F group at posttreatment. However, at the follow-up assessment, the CBT-VC group increased the number of days they drank slightly more. The proportion of totally abstinent individuals was approximately a quarter of the sample and is in line with the results found by Project MATCH (19% of individuals in all three treatment modalities remained totally abstinent throughout follow-up, while 46% had a three-day relapse at the end of the 15-month follow-up). Although consistent with the literature, these results show a relatively low proportion of abstinence, which can be explained by the severity of dependence of our patients. Even though most of them had abstinence as their primary goal, they achieved a reduction in their drinking pattern. These results did not differ between one group and the other.

Regarding the number of doses per occasion, the reduction in the CBT-F2F group was 8.1 doses from pre- to posttreatment, and in the CBT-VC group, it was 3.7 doses in this same period. Data from Project MATCH show that patients who completed the 12 therapy sessions had a reduction in alcohol consumption per drinking occasion of 12.5 doses at posttreatment (Cutler & Fishbain, 2005). One possible explanation for the smaller reduction in the number of doses compared to Project MATCH is the severity of addiction among the participants. The sample in our study, especially in the TCC-VC group, had a less severe profile, with an initial consumption of 9 doses.

Although subjects were randomized, the CBT-VC and CBT-F2F groups differed significantly at the beginning of the intervention regarding the number of doses consumed per occasion. This difference may have been the result of sampling error because the sample size of the pilot study was small. However, in the posttreatment test and follow-up assessments, a reduction in alcohol consumption was observed in both groups, and the difference between them was not significant. These results corroborate what is found in the literature, in which a reduction in alcohol consumption is observed in online interventions with the presence of a therapist in the period between the baseline assessment and the three-month assessment (Blankers *et al.*, 2011; Kay-Lambkin *et al.*, 2009, 2011; Postel *et al.*, 2015). The increase in consumption observed between the posttreatment and follow-up assessments in the CBT-VC group, although not significant, was also found in other studies (Kay-Lambkin *et al.* 2009; Postel *et al.*, 2015).

Although not a significant reduction from a statistical point of view, the result can be substantial from a clinical point of view since more significant damage to health is associated with greater consumption of alcohol per occasion. The reduction in consumption can be considered a very interesting result when evaluating the harm related to harmful consumption of

this substance and the pattern of “greater harm per liter” that is found for many different effects caused by alcohol use, as pointed out by the Global status report on alcohol and health (WHO, 2022). As part of the WHO work agenda to achieve the “Sustainable Development Goals (SDGs),” which aim to provide a fairer and more sustainable future for all people by 2030, health targets are proposed for substance abuse and the treatment of noncommunicable diseases (United Nations Development Program, 2022).

Secondary data analyses were limited due to the small sample size. It was possible to note, however, a change in the stage of dependence assessed by the IECPA and a reduction of participants in contemplation with regard to the stage of motivation for change. This result has clinical relevance and shows us that CBT in both groups led to a reduction in positive beliefs and expectations about alcohol use, as assessed by the IECPA, and in the pattern of motivation to stop or reduce alcohol consumption.

Regarding the feasibility data, we observed a dropout rate of more than 75% between the first contact with the clinic and the randomization phase. At each stage, approximately half of the participants dropped out. Studies of WHO show that treatment dropout rates for substance use disorders and other severe problems are higher in low-, middle- and high-income countries (Fernández *et al.*, 2021). Moreover, studies on internet-based treatment show dropout rates in pretreatment of 10% to 15% higher than in face-to-face individual and group treatment modalities (Fernandez *et al.*, 2015). The data obtained from the literature review show that not all dropouts that occur throughout the intervention are due to treatment failure.

Similar results have been observed in other studies involving online treatments. In the follow-up evaluation of an e-therapy program with the active involvement of a therapist for problematic alcohol users, adherence was observed at 54% (Postel *et al.*, 2015). A review of Kiluk *et al.* (2019) founded adherence between 45% to 100%. On the other hand, response rates to assessments were high, considering that some patients who did not complete therapy responded to both posttreatment and follow-up assessments. However, they were lower than the response rates obtained in the Project MATCH, in which in the 15-month follow-up 92.5% of the participants were interviewed (Zweben *et al.*, 1998).

The reasons for dropping out of therapy were not investigated in the present study, which may be considered a limitation and should be addressed in future studies. Despite the large dropout rate, 70% of the eligible patients in the CBT-VC group and 50% of the patients in the CBT-F2F group attended more than eight sessions of the intervention and therefore adhered to treatment. The mean number of sessions was similar between the two groups and was approximately seven sessions, since those who did not finish the treatment (intention to treat) were also considered for the calculation. Data from Project MATCH (Carroll, 1997) indicates that participants in

the outpatient arm who received the proposed intervention in the CBT group attended an average of 8.28 sessions (± 4.18) of treatment. Regarding completion of therapy, approximately 50% of participants in both groups reached the end of the intervention, which corroborates the data already consolidated in the literature that one of the few universal problems in health care delivery is treatment adherence. A meta-analysis (Lappan *et al.*, 2020) showed that in the case of alcohol and other drug abuse and dependence, the dropout rates ranged from 25,1% to 53,5% depending of type of drug, race, time of treatment.

Overall, the results from our pilot study indicate that although it seems feasible to conduct an effectiveness study with a larger sample size, strategies are needed to (1) intensify contact with participants and their inclusion in evaluation and treatment, (2) expand the dissemination of the project, and/or (3) conduct it through a multicenter study. We previously calculated a sample size for conducting a noninferiority clinical trial of 64 individuals in the CBT-F2F group and 64 individuals in the CBT-VC group (with a significance level of 5% and power of 80%). The sample size calculation was carried out expecting a reduction from an average of 15 doses at baseline to three in the follow-up evaluation and considering a loss of 50% in the evaluation (Project MATCH Research Group, 1997). The results of this pilot study show that it is worth replicating these procedures with a larger sample to better understand the differences between the two formats.

Different from what is found in most studies on internet interventions, we chose to carry out both interventions in the outpatient clinic. One of the reasons for this was the possibility of access to more vulnerable populations whose households do not have internet access. The prevalence of households in Brazil with internet access increased from 71% to 82% between 2019 and 2021; however, there are still 35.5 million households without internet access. An increase was observed in class A, while there was a reduction in lower classes. Therefore, this part of the population may need access to specialized interventions in health services (Núcleo de Informação e Coordenação do Ponto BR, 2022). In addition, the choice for this methodological design can be considered a strength of the study, since it was possible to control the commuting to the service factor, which is normally not observed in studies that compare online interventions with face-to-face interventions. Participants in both outpatient setting. This and other strategies used in this study to control sample characteristics were an effort to balance the internal and external validity of the study. Therefore, the differences can be attributed to the videoconference or face-to-face format itself.

The inclusion of people with anxiety disorders and depression is a strength of our study and was done considering that it is unusual to find, among the alcohol-using population, individuals who do not have other psychiatric comorbidities. In addition, considering that most patients need drug monitoring, especially at the beginning of the treatment, we opted for the inclusion of individuals receiving treatment as usual, including participants

who were in mutual aid groups. Even when making the participant selection as close as possible to the reality observed in the field of alcohol dependence, approximately half of the participants who took the initial assessment did not meet the inclusion criteria. Furthermore, future studies may evaluate online psychotherapy for alcohol-dependent individuals with severe comorbidities that are commonly encountered, such as bipolar disorder.

Women were not included in the study. Although the absolute number of women drinkers has increased worldwide, women still drink less frequently than men, and when they do, they drink fewer doses (WHO, 2022). Therefore, the decision to include only men was made to homogenize the sample and control possible biases. However, the decision restricts the possibility of generalizations of the results presented. In any case, the results obtained need to be investigated in a larger sample. Future studies that include women are recommended to evaluate the generalizability of the present results for this public or even describe the possible specificities.

Investing in effectiveness studies of interventions for alcohol use in this population and evaluating their results on long-term substance use is in line with the health agenda of the WHO and other countries. The randomized clinical trial is the main methodology for evaluating the effectiveness and efficacy of interventions for specific phenomena. Studies such as this one are not common in developing countries such as Brazil, a fact that makes it difficult to compare its results with the literature due to the absence of data from countries that share the Brazilian reality. This study suggests that it is feasible to perform CBT by videoconferencing in an outpatient setting. The data presented demonstrate the possibility of providing care to individuals who have some difficulty with the use of technology and low socioeconomic level, which is a reality commonly found in developing countries. The initial evidence of effectiveness shows equivalence between the videoconference and face-to-face modalities. Therefore, this model of care is a promising response to the disparity between the supply and demand for care for alcohol dependence in Brazil, pointing to paths for the formulation of public policies in this area in developing countries. Future studies can be realized including a waiting list group or one that only received support material could bring greater clarity to the results.

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