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COMPARISON OF CLINICAL INDICATORS BETWEEN FACE-TO-FACE AND VIDEOCONFERENCING PSYCHOTHERAPY: SUCCESS, ADHERENCE TO TREATMENT AND EFFICIENCY

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Abstract

Videoconferencing psychotherapy has been a widely used alternative in the aftermath of the COVID-19 pandemic. This study aims to further study the success of this modality and other less studied clinical indicators, such as adherence to treatment and efficiency, compared to the face-to-face modality. Data from 174 participants, 87 of each modality were used. Both treatment modalities were successful, with no differences between them except for the percentage of therapeutic objectives achieved, which was higher in the online modality. No differences were found in adherence to treatment. Efficiency was higher in the face-to-face modality both in the treatment phase and in the therapy as a whole, but not in the assessment phase. We put forward several hypotheses to try to explain these differences, some of them related to the therapeutic relationship. The conclusions of this study open the door to future research lines in the same direction.

KEY WORDS: *videoconferencing psychotherapy, face-to-face therapy, success, adherence to treatment, efficiency, COVID-19.*

Resumen

La terapia psicológica *online* por videoconferencia ha sido una alternativa ampliamente utilizada tras la pandemia por COVID-19. Este estudio tiene los propósitos de seguir estudiando el éxito de esta modalidad además de otros indicadores clínicos menos estudiados, como la eficiencia y la adherencia al tratamiento en comparación con la terapia en modalidad presencial. Se utilizaron los datos de 174 participantes, 87 de cada modalidad. Ambas modalidades de tratamiento resultaron exitosas, sin haber diferencias entre ellas salvo en el porcentaje de objetivos terapéuticos cumplidos, mayor en la modalidad *online*. No se encontraron diferencias en adherencia al tratamiento. La eficiencia fue mayor en la modalidad presencial en la fase de tratamiento y en la terapia en su

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conjunto, no siendo así en la fase de evaluación. Se plantean hipótesis que intentan explicar estas diferencias, entre ellas las referidas a la relación terapéutica, además de abrir la puerta al planteamiento de futuros estudios que continúen en esta línea de investigación.
PALABRAS CLAVE: *terapia online por videoconferencia, terapia presencial, éxito, adherencia al tratamiento, eficiencia, COVID-19.*

Introduction

The emergence of information and communication technologies (ICT) has opened up opportunities for utilizing them in the healthcare sector. e-Health refers to the use of communication technologies and the Internet to deliver healthcare information and services (World Health Organization, WHO, 2006). Various disciplines, such as Medicine, Nursing, Nutrition, and Psychology, among others, fall under the umbrella of this concept. The COVID-19 pandemic has acted as a catalyst in accelerating the use of and scientific interest in e-Health (Doraiswamy et al., 2021), which was already a growing trend in the preceding years (Richardson et al., 2009).

Of particular relevance to this study is telepsychology, which is defined as the "provision of psychological services using ICT" (APA, 2013, p.792). It encompasses a heterogeneous set of interventions that can be grouped into four categories (Barak et al., 2009; Calero & Shih, 2016): (1) online therapy, which involves communication between therapists and clients through videoconferencing, email, phone, chat, etc.; (2) online intervention in web-based environments, which provide clients with structured content (such as psychoeducation, self-guided interventions, or therapist-guided interventions); (3) therapeutic software, which employs technologies like virtual reality or artificial intelligence as therapeutic tools; and (4) other types of online interventions, such as games and applications. We will focus on online therapy, which can be classified based on the simultaneity of communication between therapists and clients as either (1) synchronous, occurring at the same time (videoconferencing, phone, chat, etc.), or (2) asynchronous, taking place at different times (email, viewing pre-recorded videos or audio at different times) (Suler, 2000). Of particular interest is synchronous online therapy conducted via videoconferencing, which has quickly emerged as an alternative for continuing psychological treatments in response to the COVID-19 pandemic (Sammons et al., 2020). This modality also presents potential advantages over face-to-face therapy, such as increased accessibility for people in remote areas or those who prefer this modality due to scheduling or time-saving considerations (Conolly et al., 2020; Field, 1996).

There is substantial research evidence supporting the effectiveness of telepsychological interventions using cognitive-behavioral therapies (CBT) for various conditions, as evidenced by systematic reviews and meta-analyses (e.g., Grist & Cavanagh, 2013; Sztein et al., 2018). However, there is relatively little research on the success of synchronous online therapy via videoconferencing, due

to its recent widespread use (Richardson et al., 2009). Several systematic reviews have been published exploring the success of this modality of therapy for treating various conditions, such as depressive disorders (Berryhill, Culmer, et al., 2018) and anxiety disorders (Berryhill, Halli-Tierney, et al., 2018; Rees & Maclaine, 2015), among others. In general, these reviews conclude that videoconferencing therapy is successful and often similar in efficacy to face-to-face therapy, but they highlight the need to improve the methodological quality of the studies. Two recent meta-analyses have specifically investigated the success of videoconferencing therapy: (1) for the treatment of posttraumatic stress disorder and depression in war veterans, finding large effect sizes (d= 1 and d= .86, respectively), and effect sizes that were similar to or slightly smaller than those of face-to-face therapy (d= -.25 and d= 0, respectively) (McClellan et al., 2022); and (2) for the treatment of depressive, anxiety, and somatic disorders, finding a larger effect size compared to control groups (g= -.49) (Matsumoto et al., 2021). The definitions of all methodological abbreviations used in this article are included in Appendix.

Adherence to treatment refers to the degree to which patients complete or engage in treatments (Eysenbach, 2005). Telepsychological treatments have traditionally been criticized for their limited adherence, to the extent that the International Society for Research on Internet Interventions (ISRII) has made it one of the primary objectives of research and professional practice (Ritterband et al., 2006). Research findings have been mixed, with some systematic reviews and meta-analyses indicating the superiority of face-to-face therapy (Fernandez et al., 2015; Richards & Richardson, 2012) and others showing no difference (Ballegooijen et al., 2014; Melville et al., 2010), while others report variability in the results (Banbury et al., 2018; Christensen et al., 2009). With regards to videoconference therapy, only one systematic review has explored adherence to treatment, finding no significant differences with face-to-face therapy in most studies of anxiety and depressive disorders (Thomas et al., 2021). This suggests that research in this area is still limited.

Another clinical indicator of interest is treatment efficiency, which is defined as the ability of treatments to maximize benefits for the clients using the fewest possible resources (Haynes, 1999). This has been a poorly studied indicator in online psychological therapy and has been operationalized in economic terms (cost-benefit), with systematic reviews analyzing this phenomenon in anxiety and depressive disorders, finding that they are generally efficient (Mitchell et al., 2021; Paganini et al., 2018). So far, only one review article has addressed the issue of the efficiency of videoconferencing therapy, indicating that it is potentially capable of reducing economic costs by eliminating the need for clients and therapists to travel, although it acknowledges existing limitations in research (Simpson, 2009). Certain factors, such as greater difficulties in establishing an adequate therapeutic alliance or difficulty in implementing techniques designed for use in face-to-face therapy (Conolly et al., 2020; Norwood et al., 2018), could contribute to the increased duration of videoconferencing treatments. These are questions that are still waiting to be answered.

Given the many unresolved questions about the success, adherence and efficiency of videoconferencing psychotherapy, we propose a study to investigate the clinical differences between face-to-face therapy and videoconferencing therapy. Our interest in this topic stems from our observations at the university clinic of Psychology of the Autonomous University of Madrid (CPA-UAM). This study aims to (1) identify differences in clinical indicators of therapeutic success, treatment adherence, and efficiency between face-to-face and videoconferencing therapy, (2) examine the characteristics of therapy sessions in both modalities at the university clinic, and (3) generate hypotheses about processes that may explain the differences between the two types of therapy, informing future studies. We have generated a series of hypotheses:

1. Therapeutic success: Taking into account pre-post treatment data on different questionnaires (depression, anxiety, general psychopathological symptoms, and quality of life) and the percentage of achieved therapeutic goals, considering the growing evidence of the success of online therapy, we hypothesize that:
    a) There will be no differences in therapeutic success between face-to-face and online therapy via videoconference: we do not expect to find better pre-post treatment changes or differences in the percentage of achieved therapeutic goals in face-to-face therapy compared to online therapy.
    b) Treatments will be successful in both modalities: we expect to find a significant improvement in the questionnaire data after treatment compared to pre-treatment measures in both face-to-face and online therapy.
2. We hypothesize that treatment adherence will be higher in face-to-face therapy than in online therapy via videoconference: we expect to find fewer dropouts, higher compliance with therapy tasks, and greater attendance to therapy sessions in face-to-face therapy, given the concerns expressed in research about adherence in online therapy.
3. Treatment efficiency:
    a) Treatment efficiency will be higher in online therapy via videoconference than in face-to-face therapy in the evaluation sessions: we expect to find fewer evaluation sessions in online therapy, based on research results that indicate that less time may be spent in establishing a therapeutic alliance.
    b) Treatment efficiency will be higher in face-to-face therapy than in online therapy via videoconference in the treatment sessions and overall therapy: we expect to find fewer sessions in both the treatment phase and overall therapy in face-to-face therapy, based on research results that suggest that the difficulty of implementing techniques and a poorer therapeutic alliance in online therapy may slow down the process of treatment.

Method

Participants

We had a sample of 174 cases from the university clinic of Psychology of CPA-UAM, whose treatments took place between 2019 and 2022. The sample consisted of adult participants aged between 18 and 62, with a mean age of 24.94 years (*SD*= 8.933), who belonged to the face-to-face modality (*n*= 87, *M*= 25.51, *SD*= 9.612) and the online modality (*n*= 87, *M*= 24.37, *SD*= 8.214). There were no significant differences between the two groups in this variable, $t(172) = -.839$, $p = .402$, which helps to ensure comparability between them. No significant differences were found between the online and face-to-face therapy groups in any of the sociodemographic variables, helping to ensure that both groups are comparable. Table 1 presents some sociodemographic data of the participants.

Table 1
Sociodemographic data of the participants

Sociodemographic variable	Online therapy		Face-to-face therapy		Sig. of the differences
	n	%	*n*	%	
Gender					
Woman	59	67.82	59	67.82	$X^2(1)= 0$, $p= 1$
Man	28	32.18	28	32.18	
Nationality					
Spanish	82	94.25	81	93.10	$X^2(1)= .097$, $p= .755$
Other	5	5.75	6	6.90	
Marital status					
Single	44	50.57	49	56.32	$X^2(1)= .577$, $p= .447$
Couple or married	43	49.43	38	43.68	
Educational level					
Primary or secondary	7	8.04	7	8.04	$X^2(3)= .713$, $p= .870$
Baccalaureate	56	64.37	51	58.62	
University	16	18.39	19	21.84	
Postgraduate/PhD	8	9.20	10	11.50	
Occupation					
Student	75	87.21	66	75.86	$X^2(1)= 3.029$, $p= .082$
Working	12	12.79	21	24.14	

25 therapists participated, 21 women and four men, who work from a cognitive-behavioral orientation. During this stage, the center carried out a four-year residency program for the training of therapists who graduated from the Master's Degree in General Health Psychology (MPGS), in which four to six therapists entered the first year of residency (R1) and two of them continued as residents in the second (R2), third (R3) and fourth (R4) year. Expert therapists (associate professors and the director of the clinic) were also part of the team, who in addition to their roles as therapists, were responsible for training and

supervising less experienced therapists. R1 therapists received eight hours of weekly supervision coordinated by the R2 therapists, with the participation of university professors and more experienced therapists. R2, R3 and R4 therapists received less frequent supervisions from the director of the clinic. The diagnoses treated at the center were varied. Once again, no significant differences were found between the therapy modalities in these variables, providing a guarantee that the groups are comparable. Table 2 provides descriptive data on the diagnoses of the cases and the experience of the therapists who treated them.

Table 2
Diagnoses and therapists' experience descriptive data

Variable	Online therapy		Face-to-face therapy		Sig. of the differences
	n	%	*n*	%	
Diagnosis (DSM-5)					
Anxiety	33	37.93	33	37.93	$\chi^2(3)= .733$, $p= .865$
Depression	18	20.69	22	25.29	
Trauma related	10	11.49	10	11.49	
Other	26	29.89	22	25.29	
Experience of the therapists					
Inexperienced	69	79.31	74	85.06	$\chi^2(1)= .981$, $p= .322$
Experienced	18	20.69	13	14.94	

Each participant received treatment from a single therapist in individual therapy. The cases included in the sample were completed at the time of data collection and corresponded to three therapy modalities: (1) face-to-face therapy, in which over 75% of sessions were conducted in person; (2) online therapy, in which over 75% of sessions were conducted online ($n= 43$, mean percentage of online sessions= 81.22); and (3) combined therapy, in which there were between 25% and 75% of face-to-face and online sessions ($n= 40$, mean percentage of online sessions= 60.67). Online treatments began at the center in March 2020 due to the pandemic. For this reason, only face-to-face and online therapy cases that received treatment from the academic year 2019-2020 onwards were considered, to equalize the groups and eliminate the potential confounding variable of receiving treatment during the pandemic. As we had a significantly larger number of face-to-face treatment data compared to the other two therapy types, we randomly selected cases from this first modality to make the sample sizes similar.

Instruments

MEASURING THERAPEUTIC SUCCESS

a) *Beck Depression Inventory - Second Edition* (BDI-II; Beck et al., 1996) adapted to Spanish (Sanz et al., 2005), as a measure of depression. This instrument consists of 21 items that assess depression based on the criteria of the diagnostic manual DSM-IV, including somatic, cognitive, and emotional

components. The adapted Spanish version of the instrument showed good reliability scores (Cronbach's alpha between .87 and .91).

b) *State-Trait Anxiety Inventory* (STAI; Spielberger et al., 1970) in its Spanish version (Buela-Casal et al., 2011), as a measure of anxiety. This instrument consists of two scales, each with 20 items, assessing state anxiety (at the time the person completes the instrument) and trait anxiety (in general), respectively. The Spanish adaptation of this instrument obtained good reliability indices (Cronbach's alpha between .82 and .95).

c) *Symptom Checklist 90 Revised* (SCL-90-R; Derogatis et al., 1976) in its Spanish version (González de Rivera et al., 1989) as a measure of general psychopathological symptoms. This instrument consists of 90 items divided into nine primary scales of psychological symptoms (Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism) and three global indices of psychological distress (Global Severity Index, Positive Symptom Distress Index, and Total Psychopathology). The reliability indices obtained for the nine primary scales were adequate (Cronbach's alpha between .69 and .85).

d) *World Health Organization's Quality of Life Assessment - Abbreviated Version* (WHOQoL-BREF; WHO, 1998) to assess quality of life. This instrument consists of 26 items divided into four scales: Physical Health, Psychological Health, Social Relationships, and Environment. The Spanish version obtained adequate reliability indices for all four scales (Cronbach's alpha between .72 and .79).

ADHERENCE TO TREATMENT

e) *Compliance with therapy tasks*: throughout the treatment, clients not only work in therapy sessions, but also need to implement the acquired learning in their daily lives to achieve generalization. The therapists at the clinic indicate in the database to what extent each client has committed to completing the tasks: (1) did not do any tasks; (2) attempted some tasks; (3) did some of the tasks; (4) did all the tasks; (5) did more tasks than requested. Task compliance has been used in previous studies as a measure of treatment adherence (Christensen et al., 2009; Marchena-Giráldez et al., 2023).

f) *Dropouts*: this is a variable already studied in the literature as a measure of adherence to treatment (Eysenbach, 2005; Thomas et al., 2021). At the end of the therapy, the therapists indicate the reason for its termination: (1) discharge, if the therapist considers that the goals have been reasonably met and decides that the client does not need to continue attending therapy; (2) dropout, if the client decides to end the treatment despite not having reasonably met the goals; (3) referral, when the client abandons the clinic without having reasonably met the goals and continues treatment in another center.

g) *Attendance to therapy sessions*: a variable operationalized as a percentage of the total therapy sessions that each client attends. A percentage is calculated

taking into account the total treatment sessions and the sessions the client misses without prior notice (by protocol, clients are required to give a minimum of 24 hours notice if they are not going to attend therapy).

TREATMENT EFFICIENCY

Treatment efficiency was operationalized as the number of sessions required for the evaluation, treatment, and completion of therapy as a whole. We did not consider operationalizing this variable in economic terms, as is done in the literature, because the clinic's fees vary from client to client, and this could lead to confusing results. The separation of evaluation sessions from treatment sessions responds to research indicating that differences in efficiency may exist between therapy modalities due to the characteristics of each modality, such as the establishment of a therapeutic alliance and the difficulty of implementing techniques (Conolly et al., 2020; Norwood et al., 2018).

Procedure

CHARACTERISTICS OF THE TREATMENTS

Treatments at the CPA-UAM consist of weekly 50-minute sessions. Clients first attend a pre-evaluation session, during which clinic coordinators (R2) conduct a 20-minute interview to obtain a brief description of their issues and assign them a therapist who is more suitable to their characteristics. Treatments typically begin with an evaluation phase, during which the therapist collects all the necessary information to understand the client's issues and develop a functional analysis. The therapist then explains the functional analysis to the client and seeks agreement on a set of goals to be achieved through therapy. At this point, the treatment phase begins, during which a set of techniques are implemented to approach the agreed-upon goals. Once the therapist determines that the therapy goals have been reasonably achieved, the follow-up phase begins, in which sessions are no longer weekly and are spaced further apart. The aim of this final phase is to ensure that the behavioral changes achieved with therapy are maintained.

SAMPLE COLLECTION

The BDI-II, STAI, SCL-90-R, and WHOQoL-BREF, which assess various aspects related to individuals' psychological health, such as depression, anxiety, general psychopathological symptoms, and quality of life, are filled out by clients at the beginning and end of therapy. The questionnaires are provided by clinic coordinators (R2) during the pre-evaluation session for clients to complete and return to their assigned therapists in the first therapy session. When therapists anticipate the end of therapy, they arrange for clients to fill out the same questionnaires again and return them in the last therapy session. Regarding the

recording of achieved objectives at the end of therapy, therapists, after returning the functional analysis, enter in the database the total number of objectives agreed upon with the client. Later, at the end of therapy, therapists enter in the database the final number of achieved objectives.

Regarding adherence to treatment, at the end of therapy, therapists evaluate the completion of tasks as described in the previous section and determine whether the case has ended up in discharge or dropout, based on the achievement of therapeutic objectives or, where applicable, referral. With respect to attendance, therapists enter in the database the total number of therapy sessions and the number of sessions in which clients did not attend without prior notice. The number of treatment sessions, a measure of treatment efficiency, is also recorded by therapists at the end of treatments, noting the number of sessions for each phase of therapy (evaluation, treatment, and follow-up) and the total number of sessions.

All the above information is recorded by therapists in the clinic's database. Each therapist fills out their own database with their cases and sends it to the database manager, who checks that what has been filled out is correct and integrates it along with the data from the other therapists.

All participants signed informed consents authorizing the use of their data for research and teaching purposes, in compliance with European Regulation 2016/679 of 27 April 2016 (GDPR), and Spanish Organic Law 3/2018 of 5 December (LOPDGDD). This research in particular has the approval of the research ethics committee of the Faculty of Psychology at the Autonomous University of Madrid.

Data analysis

The differences between the scores before and after treatment were considered for depression, anxiety, and general psychopathological symptoms, while the differences between after and before treatment were considered for quality of life. This was done because it is expected that the treatment will lead to decreases in psychopathological symptoms and increases in quality-of-life scores. Additionally, the percentage of therapeutic goals achieved at the end of treatment compared to the goals agreed upon between the client and therapist after the functional analysis delivery was used as a measure of therapeutic success. The percentage of goals achieved was calculated by dividing the number of goals achieved in therapy by the total number of agreed-upon goals. The remaining measures of adherence and efficiency were reported by each of the therapists.

Non-manipulative cross-sectional designs are proposed since the data was already collected in the absence of experimental control, and statistical tests are applied for its description (Botella & Caperos, 2019). IBM SPSS Statistics 23.0 was used for data analysis. For the therapeutic success contrasts, the two-way repeated measures ANOVA test was used for pre-post questionnaire data, which are quantitative variables separated into two therapy modalities and two temporal

moments. The independent samples T-test was used for the percentage of goals achieved in therapy, which is a quantitative variable separated into two therapy groups. For treatment adherence contrasts, the Chi-Square test for independence was used for task compliance and dropouts since both are categorical variables separated into two therapy groups. The independent samples T-test was used for therapy attendance, which is a quantitative variable separated into two therapy groups. The independent samples T-test was again used for efficiency contrasts, which again involved quantitative variables separated into two therapy modalities.

Results

In all contrasts, we decided to group cases that received online and combined therapy into a single group (called online). This decision was made to facilitate comparisons with face-to-face therapy, as there were more cases in this modality compared to the other two modalities.

Therapeutic success

For the contrast of data from questionnaires, we had 76 participants: 38 in face-to-face therapy and 38 in online therapy via videoconference. We did not have the complete sample (174 participants) due to the clinic's characteristics: being a university clinic, there is a rotation of therapists; clients often decide to continue treatment with their therapists outside the clinic, so some post-treatment questionnaire data are lost. The 38 participants in face-to-face therapy were randomly selected for the contrast, as there were more cases in this modality and to facilitate comparison with the online group. Table 3 provides descriptive statistics for all contrasts, as well as verification that there are no differences between modalities in pre-treatment values.

Given the large number of contrasts performed (20), the significance level was calculated using Bonferroni correction to avoid Type I errors (Botella & Caperos, 2019). The significance level was set at alpha= 0.0025. In all contrasts (depression, anxiety, general psychopathological symptoms, and quality of life), significant differences were found in the main effect of time (before and after treatment), with effect sizes, in all cases, being large (Cohen, 1988). This indicates that, on average, scores on the questionnaires in both modalities (face-to-face and online) were more therapeutically desirable (higher scores on quality of life scales and lower scores on the other scales) after treatment than before, according to the hypothesis. No significant differences were found in the main effects of therapy modality (face-to-face or online), indicating that, on average, there are no differences between modalities in scores before and after treatment. In turn, no significant interaction effects were found between scores on the scales before and after treatment and therapy modality. This indicates that receiving therapy in one of the two modalities is not associated with greater improvements in therapeutic success indicators compared to the other treatment modality. These results are

Table 3
Descriptive statistics from the success contrasts and pre-treatment differences contrasts

Variable (instrument)	*M* (*SD*) pre-treatment		*M* (*SD*) post-treatment		Pre-treatment statistical differences
	Face-to-face	Online	Face-to-face	Online	
Depression (BDI-II)	21.47 (10.72)	21.45 (9.37)	5.61 (6.05)	6.16 (6.02)	$t(74)= -.011$, $p= .991$
Trait anxiety (STAI-T)	32.79 (11.00)	35.74 (8.44)	17.37 (10.38)	18.87 (11.35)	$t(74)= 1.310$, $p= .194$
State anxiety (STAI-S)	29.55 (12.14)	33.11 (9.80)	13.37 (9.41)	15.53 (10.28)	$t(74)= 1.403$, $p= .165$
Psychopathological symptomatology (SCL-90-R)					
Somatization	.90 (.81)	1.09 (.83)	.43 (.60)	.52 (.63)	$t(74)= .985$, $p= .328$
Obsessive-Compulsive	1.48 (.85)	1.77 (.78)	.61 (.56)	.89 (.72)	$t(74)= 1.555$, $p= .124$
Interpersonal Sensitivity	1.21 (.77)	1.40 (.75)	.49 (.56)	.67 (.63)	$t(74)= 1.080$, $p= .284$
Depression	1.52 (.84)	1.80 (.78)	.57 (.60)	.78 (.68)	$t(74)= 1.508$, $p= .136$
Anxiety	.96 (.75)	1.28 (.70)	.39 (.51)	.55 (.61)	$t(74)= 1.893$, $p= .062$
Hostility	.62 (.57)	.87 (.74)	.22 (.25)	.30 (.27)	$t(74)= 1.677$, $p= .098$
Phobic Anxiety	.44 (.53)	.52 (.55)	.21 (.35)	.26 (.40)	$t(74)= .643$, $p= .522$
Paranoid Ideation	.86 (.51)	.87 (.76)	.43 (.52)	.41 (.45)	$t(74)= .064$, $p= .949$
Psychoticism	.73 (.58)	.82 (.55)	.23 (.28)	.28 (.30)	$t(74)= .672$, $p= .504$
Global Severity Index	1.03 (.57)	1.23 (.52)	.43 (.43)	.56 (.46)	$t(74)= 1.643$, $p= .105$
Positive Symptom Distress	45.60 (17.12)	51.47 (15.76)	24.92 (18.54)	30.34 (19.80)	$t(74)= 1.555$, $p= .124$
Positive Symptom Total	1.92 (.46)	2.06 (.46)	1.34 (.37)	1.44 (.40)	$t(74)= 1.297$, $p= .199$
Quality of Life (WHOQoL-BREF)					
Physical	98.53 (17.85)	94.11 (17.95)	113.26 (15.28)	111.45 (18.10)	$t(74)= -1.076$, $p= .285$
Psychological	68.63 (17.61)	64.53 (13.70)	89.16 (18.01)	83.79 (18.10)	$t(74)= -1.134$, $p= .260$
Social Relationships	38.10 (10.12)	38.10 (9.65)	46.32 (9.60)	45.58 (10.42)	$t(74)= 0$, $p= 1$
Environmental	113.16 (18.94)	110.42 (18.21)	124.84 (20.31)	125.76 (19.27)	$t(74)= -0.642$, $p= .523$
Global	79,60 (10.57)	76.79 (11,81)	93.47 (12.91)	91.10 (14.82)	$t(74)= -1.013$, $p= .314$

consistent with the hypothesis. Table 4 shows the data from the main effects and interaction effect contrasts on all scales.

Regarding the percentage of fulfilled objectives, using this time the sample as a whole, we found a greater percentage of fulfilled objectives at the end of therapy in the online modality (*M*= 72.52%) compared to the face-to-face modality (*M*= 61.25%), *t*(172)= 2.106, *p*= .04, *d*= 0.32, with a small effect size as it was between .20 and .50 (Cohen, 1988). This was contrary to what was hypothesized.

Adherence to treatment

The task compliance categories were grouped into (1) compliance (completed more tasks than requested, completed all tasks) and (2) noncompliance (completed some tasks, attempted some tasks, did not do any tasks), in order to meet the assumptions of the statistical test used. No significant differences were found in task compliance between therapy modalities, $\chi^2(1)= 2.506$, *p*= .113, φ= .120. In the contrast regarding therapy attendance between therapy modalities, again no significant differences were found between therapy modalities, *t*(172)= .908, *p*= .365, *d*= 0.138. For the contrast of the proportion of dropouts between therapy modalities, only cases that were not referrals were selected because the latter did not provide information on adherence to treatment. Therefore, only those cases that ended in discharge or dropout were considered, resulting in a final sample of 132 participants, 66 in each therapy modality. No significant differences were found in the proportion of dropouts between therapy modalities, $\chi^2(1)= 2.060$, *p*= .151, φ= .125. These results do not correspond to the hypotheses proposed, as it was expected to find worse adherence to treatment results in online therapy.

Efficiency

In the contrast of the number of evaluation sessions between therapy modalities, no significant differences were found, *t*(172)= -.258, *p*= .797, *d*= -0.043. In the contrast of the number of sessions in the treatment phase, a significantly lower number of sessions were found in the face-to-face modality, *t*(172)= -2.607, *p*= .01, *d*= 0.396, as predicted by the hypothesis, with a small effect size. On average, there were 14.51 sessions in the face-to-face modality compared to 19.00 in the online modality. For the contrast of the total number of therapy sessions, significant differences were again found in the direction predicted by the hypothesis, *t*(172)= 2.417, *p*= .017, *d*= 0.367. Again, the number of sessions on average was higher in the online modality (23.75) than in the face-to-face modality (19.08), with a small effect size. These results will be discussed in the next section.

Table 4

Results from the success contrasts: Main effects of time (pre-post treatment), modality (face-to-face and online) and interaction

Variable (instrument)	*df*	Main effect: Time		Main effect: Modality		Interaction effect	
		F	η^2_p	*F*	η^2_p	*F*	η^2_p
Depression (BDI-II)	1, 75	216.244*	.745	.028	<.001	.075	.001
Trait anxiety (STAI-T)	1, 75	186.940*	.716	1.164	.015	.376	.005
State anxiety (STAI-S)		138.517*	.652	2.202	.029	.236	.003
Psychopathological symptomatology (SCL-90-R)							
Somatization (SOM)	1, 75	50.679*	.406	.851	.011	.417	.006
Obsessive-Compulsive (OBS)		117.414*	.613	3.656	.047	.008	<.001
Interpersonal Sensitivity (IS)		87.929*	.543	1.867	.025	.001	<.001
Depression (DEP)		141.171*	.656	2.855	.037	.160	.002
Anxiety (ANS)		67.858*	.478	3.541	.045	1.001	.013
Hostility (HOS)		49.177*	.399	3.155	.041	1.699	.022
Phobic Anxiety (PHO)		16.829*	.185	.524	.007	.069	.001
Paranoid Ideation (PAR)		38.684*	.343	.006	<.001	.066	.001
Psychoticism (PSYC)		97.669*	.569	.278	.005	.121	.002
Global Severity Index (GSI)		150.694*	.671	2.749	.036	.519	.007
Positive Symptom Distress (PSDI)		130.711*	.639	2.367	.031	.015	<.001
Positive Symptom Total (PST)		161.411*	.687	1.947	.026	.135	.002
Quality of Life (WHOQoL-BREF)							
Physical (PHY)	1, 75	84.533*	.533	.761	.010	.558	.007
Psychological (PSY)		112.463*	.623	1.886	.025	.123	.002
Social Relationships (SSRR)		59.024*	.444	.032	<.001	.130	.002
Environmental (ENV)		45.919*	.383	.053	.002	.841	.001
Global		116.381*	.611	.928	.012	.029	<.001

Note: *p< .001

Discussion

In this study, we found that both face-to-face and online therapy via videoconferencing can achieve successful treatment outcomes. Overall, there is no evidence that the modality of therapy is associated with treatment success or adherence. However, it was found that face-to-face therapy is more efficient in the treatment phase and in overall therapy, a result that was not replicated in the evaluation phase. The above results will be discussed in detail below.

The hypotheses about therapeutic success predicted that no differences would be found in the desirable therapeutic direction (increased quality of life, decreased depression, anxiety, and general psychopathological symptoms) in the pre-post treatment change between therapy modalities, and that no differences would be found in the percentage of therapeutic goals achieved. Based on the results of the questionnaire analysis, no such differences were found on any scale, so there is no evidence that face-to-face therapy is associated with greater therapeutic success. Additionally, the main effect of time factor (differences before and after therapy) was significant in all cases with large effect sizes, so taking both therapy modalities together, they do seem to be associated with therapeutic improvement.

On the other hand, contrary to our hypothesis, the percentage of achieved goals was higher in the online modality than in the face-to-face modality. This result, along with the previous ones, is in line with the scientific literature, indicating that online therapy via videoconferencing is successful, at least to the level of face-to-face therapy, and sometimes even producing superior results (Berryhill, Culmer, et al., 2018; Berryhill, Halli-Tierney, et al., 2018; Matsumoto et al., 2021; McClellan et al., 2022; Rees & Maclaine, 2015).

Regarding adherence to treatment, the scientific literature has traditionally pointed to it as a limitation of online therapy in all its forms, not exclusively through videoconferencing (Ritterband et al., 2006). However, despite having a small number of studies at present, online therapy via videoconferencing does not seem to differ in adherence to treatment compared to face-to-face therapy (Thomas et al., 2021). In this study, no significant differences were found between therapy modalities in adherence to treatment, operationalized as dropouts, task completion, and attendance to therapy sessions. These results are consistent with the limited literature available at the moment on adherence to treatment in online therapy via videoconferencing. In this study, we hypothesized that we could find higher adherence to treatment in face-to-face therapy due to the traditional limitation of online therapy in general and the low volume of studies on therapy via videoconferencing currently available. These results can serve as a driving force to continue research on treatment adherence in online therapy via videoconferencing.

As for treatment efficiency, the scientific literature has not studied this phenomenon operationalized as treatment duration, only having found studies that do so in terms of economic cost-benefit (Mitchell et al., 2021; Paganini et al.,

2017; Simpson, 2009). Due to some concerns that arise in the scientific literature about the implementation of an adequate therapeutic alliance and the difficulties of implementing treatments in online therapy, we hypothesized that during the evaluation phase, efficiency would be higher in the online modality since therapists could spend less time establishing an adequate therapeutic alliance. The results of this study support that there is greater efficiency, both in the treatment phase and in the therapy as a whole, in the face-to-face modality, not finding differences between modalities in the evaluation phase, but the reason for this cannot be analyzed. In future studies, already planned by our research team, the therapeutic relationship will be studied by analyzing the verbal interactions between therapists and clients, trying to determine if the greater efficiency in the face-to-face modality may be due to not having established an adequate therapeutic relationship. Another reason this may be happening is that intervention techniques are more adapted to the face-to-face modality. It will be necessary to continue analyzing this phenomenon in future approaches to offer the necessary adaptations to treatments to make them work more optimally in both therapy modalities.

This work has some limitations. First, it should be noted that there was no random assignment of participants to online and face-to-face therapy groups. Additionally, the small sample size for certain contrasts must be mentioned, largely due to the reduced number of cases in online or combined therapy. Related to this limitation is the fact that participants from these two modalities had to be unified into one group to facilitate comparison with face-to-face therapy. Receiving therapy in these two different modalities (online and combined) could have repercussions, such as on the formation of an adequate therapeutic alliance (Calero & Shih, 2016), which could alter the results of the clinical indicators studied. These effects may have been masked in this study. In future approaches, it will be necessary to gather a larger sample of participants receiving therapy in online and combined modalities, so that they can be separately compared to the face-to-face modality. Another limitation of the study relates to the characteristics of the university clinic at CPA-UAM, which trains recently graduated psychologists from the MPGS who leave the center after completing their training (and sometimes take their clients with them). Therefore, some cases may not have completed their treatment upon leaving the clinic, and we may not have their complete data. This is why different sample sizes had to be used for certain analyses, and in some cases, their small size may be a limitation. Another limitation of this study is the formulation of hypotheses with the expectation of not finding significant differences. The appropriate procedure would have been to conduct equivalence tests that would allow us to affirm that the groups being compared (face-to-face and online modalities) are equivalent in clinical indicators. These tests require extremely large samples, which are sometimes difficult to gather with clinical data (Botella & Caperos, 2019), so it was not possible to conduct them in this study.

Future research, already planned in our research team, will focus on analyzing verbal interactions between therapists and clients to shed light on the change mechanisms that may be behind the differences or similarities in the clinical indicators found in this study. In this regard, observational methodology will be used to analyze the therapeutic relationship, a phenomenon that we hypothesize could be behind the differences in the clinical indicators studied. On the other hand, our research team is also exploring an innovative clinical indicator: the pace of therapeutic change. This study will allow us to clarify the assertion that "change in therapy is not linear", and knowing when clients change more quickly and more slowly during therapy, both face-to-face and online, will enable us to introduce improvements that optimize interventions.

In conclusion, this study has deepened our knowledge of clinical indicators in face-to-face and online videoconference therapy. It has continued to provide evidence for phenomena that have already been widely studied, such as therapeutic success, as well as for indicators that are still poorly studied, such as adherence to treatment and efficiency. Online videoconferencing therapy appears to be another useful alternative for psychological intervention, although the processes that could make a difference with face-to-face therapy are still unknown. The results and hypotheses launched in this study will be useful for posing new research questions in future studies.

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Appendix

Methodological abbreviations guide

Abbreviation	Definition
M	Weighted mean
SD	Standard deviation
F	Contrast statistic *F*
t	Contrast statistic t
χ^2	Contrast statistic chi-squared
df	Degrees of freedom
p	*p*-value or critical value
n	Sample size
d	Cohen's *d* statistic. Effect size indicator
g	Hedge's *g* statistic. Effect size indicator
η^2_p	Partial eta-squared statistic. Effect size indicator
φ	Phi statistic. Effect size indicator