TELEMEDICINE AND e-HEALTH
Volume 12, Number 3, 2006
© Mary Ann Liebert, Inc.

Randomized Clinical Trial of Telepsychiatry through Videoconference versus Face-to-Face Conventional Psychiatric Treatment

CARLOS DE LAS CUEVAS, Ph.D., M.D.,[1] M. TERESA ARREDONDO, Ph.D.,[2]
M. FERNANDA CABRERA, Ph.D.,[2] HUBERT SULZENBACHER, Ph.D., M.D.,[3]
and ULRICH MEISE, Ph.D., M.D.[3]

ABSTRACT

Although telepsychiatry in the form of videoconferencing has been well received in terms of increasing access to care and user satisfaction, few data on treatment outcomes and efficacy from telepsychiatry applications are available at the present time. This paper evaluates the efficacy of telepsychiatry through videoconference in the treatment of mental disorders by comparing to face-to-face conventional (F2FC) treatment. We carried out a randomized clinical trial where 140 psychiatric outpatients were randomized to either F2FC treatment or videoconference telepsychiatry (VCTP) treatment. Patients were diagnosed according to International Classification of Diseases, 10th edition (*ICD-10*) criteria using the Composite International Diagnostic Interview. Treatment involves eight consultations lasting 30 minutes over the 24-week study period. Patients received pertinent psychotropic medication plus cognitive–behavioral therapy during sessions. The same psychiatrist diagnosed and treated all the patients that were recruited from the Community Mental Health Centre of San Sebastian de la Gomera, in the Canary Islands. Change in psychiatric test scores served as the primary efficacy criterion. Efficacy was determined by comparing baseline (visit 1) Clinical Global Impressions-Severity of Illness (CGI-S) and -Improvement (CGI-I) scales as well as Global Indexes (GSI, PSDI, and PST) from SCL-90R with scores obtained at the end of the study period (week 24). Response was defined as a CGI-I score of 1 or 2. Reliable Change Indexes were computed in SCL-90R Global Indexes scores. Of 140 patients randomized, 130 completed 24 weeks of treatment. Only 4 patients dropped out prematurely from the study in VCTP and 6 in F2FC. The study involves 534 teleconsultations, 522 F2FC consultations, and more than 500 hours of clinical practice. Significant improvements were found on the CGI and SCL-90-R Global Indexes scores of both treatment groups, showing clear clinical state improvement. No statistically significant differences were observed when the efficacy of VCTP treatment was compared to F2FC psychiatric treatment efficacy. This study demonstrated that telepsychiatry treatment through videoconference has equivalent efficacy to F2FC psychiatric treatment. Telepsychiatry showed to be an effective mean of delivering mental health services to psychiatric outpatients living in remote areas with limited resources.

[1]Department of Psychiatry, University of La Laguna, Canary Islands Health Service, Spain.
[2]Grupo de Bioingeniería y Telemedicina. Universidad Politécnica de Madrid, Spain.
[3]Department of Psychiatry, University of Innsbruck, Austria.

INTRODUCTION

TELEPSYCHIATRY can be conceived as an integrated system of mental healthcare delivery that uses telecommunications and computerized information technology as an alternative to face-to-face conventional (F2FC) modality. Videoconferencing is the central technology currently used in telepsychiatry, because it permits live, two-way interactive, full-color, video, audio, and data communication. Telepsychiatry, in the form of videoconferencing, has been well received in terms of increasing access to care and user satisfaction.[1,2] Questions persist, however, about its effectiveness, because there are few clinical outcome studies and because there may also be a positive reporting bias in the literature.[3]

The Canary Islands are an archipelago of seven islands in the Atlantic Ocean, off the northwestern coast of Africa (Morocco and Western Sahara), approximately 1,350 kilometers from the Spanish mainland. The islands belong to Spain, and form an autonomous community of that country. La Gomera is the second smallest island and is part of the province of Santa Cruz de Tenerife, the capital of the province. The Island of La Gomera can be reached by sea from the port of Los Cristianos, located in the southwest of the island of Tenerife, at 80 kilometers of Santa Cruz de Tenerife. One ferry line and one fast-ferry service connect the port of Los Cristianos with that of San Sebastián de La Gomera several times a day. The trip takes approximately 2 hours by ferry and approximately 45 minutes by the fast-ferry.

In 2003, the Canary Islands Health Service developed a telepsychiatry program to complement the mental healthcare of citizens living in La Gomera Island with the objective of improving access, reducing isolation and improving the quality of mental healthcare in this area. A patient living in La Gomera Island with a mental health problem can choose between seeing the visiting psychiatrist, who travels every Monday from Tenerife Island, or being included in the telepsychiatry program. Telepsychiatry sessions take place every Thursday from 9:00 AM to 2:00 PM. This new system of service delivery is funded by a research grant from the European Union. In order to investigate the efficacy of a routine telepsychiatry service a randomized clinical trial of telepsychiatry through videoconference versus F2FC psychiatric treatment was carried out.

MATERIAL AND METHODS

Telepsychiatry service provides psychiatric consultations to individuals after referral from a general practitioner. After the teleconsultation, recommendations are provided directly to the patient's general practitioner via e-mail. Telepsychiatry consultations use commercial videoconferencing equipment (Viewstation 512, Polycom®; Slough, Berks, United Kingdom) providing high-quality enhanced video at 30 frames per second (fps) at 384 to 768 kilobits per second (Kbps) and full-duplex digital audio with noise suppression and echo cancellation.

Patients

The sample comprised 140 consecutive psychiatric outpatients recruited from the Community Mental Health Centre of San Sebastian de la Gomera, in the Canary Islands, that were randomly assigned to the treatment groups (70 to the videoconference telepsychiatry [VCTP] group and 70 to the F2FC treatment group) being followed up through 24 weeks. The Composite International Diagnostic Interview (CIDI)[4] was administered to all patients being patients diagnosed according to *International Classification of Diseases, 10th edition* (*ICD-10*) criteria. In order to balance potential risk factors between the telepsychiatry and F2FC treatments and to remove potential psychiatrist biases the same psychiatrist diagnosed and treated all the patients. The sociodemographic and clinical characteristics of the sample studied are shown in Table 1.

Treatment

The telepsychiatry treatment was conducted by videoconference between the University Hospital de la Candelaria in Santa Cruz de Tenerife (psychiatrist's location) and the Mental Healthcare Centre of San Sebastian de la

TABLE 1. SOCIODEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF THE SAMPLES STUDIED

Variable	*Category*	*Number of cases*		*% of sample*		*% 24 week CGI–Sev ≤2*		*% 24 week CGI–Imp ≤2*	
Age		VCTP	F2FC	VCTP	F2FC	VCTP	F2FC	VCTP	F2FC
	<25 years	12	13	17.1	18.6	83.3	86.9	100	86.1
	25–45 years	37	33	52.9	47.1	67.6	57.5	78.3	75.7
	45–65 years	16	21	22.9	30	50	61.9	68.7	71.4
	>65 years	5	3	7.1	4.3	60	33.3	80	66.6
Gender		VCTP	F2FC	VCTP	F2FC	VCTP	F2FC	VCTP	F2FC
	Male	22	25	31.4	35.7	72.7	60	86.4	80
	Female	48	45	68.6	64.3	64.6	64.4	77.1	733
Educational level		VCTP	F2FC	VCTP	F2FC	VCTP	F2FC	VCTP	F2FC
	Can read and write	11	5	15.8	7.1	63.6	40	81.8	60
	Primary studies	33	40	47.1	57.1	95.6	65	78.8	70
	College	13	14	18.6	20	46.1	64.3	69.2	85.7
	University degree	13	11	18.6	15.8	92.3	63.6	92.3	90.9
ICD-10 Diagnosis[a]		VCTP	F2FC	VCTP	F2FC	VCTP	F2FC	VCTP	F2FC
	F1	5	6	7.1	8.5	80	66.6	80	83.3
	F2	5	6	7.1	8.5	80	66.6	80	83.3
	F3	23	25	32.9	35.7	47.8	56	69.6	72
	F4	31	25	44.3	35.7	77.4	72	83.9	76
	F6	6	8	8.6	11.4	66.6	50	100	62.5
CGI—Severity of Illness		VCTP	F2FC	VCTP	F2FC	VCTP	F2FC	VCTP	F2FC
	Moderatelly ill	8	5	11.4	7.1	62.5	66.6	62.5	80
	Markedly ill	61	65	87.1	92.9	68.8	63.1	83.6	75.3
	Severely ill	1	0	1.4	0	0	0	0	0
Total		70	70	100	100	67.2	62.5	80	75.7

[a]*ICD-10* Diagnoses
(F1): Mental and behavioral disorders due to psychoactive substance abuse;
(F2): Schizophrenia, schizotypal, and delusional disorders;
(F3): Mood (affective) disorders;
(F4): Neurotic, stress-related and somatoform disorders;
(F6): Disorders of the adult personality and behavior.
% 24 week CGI—Sev ≤2: Proportion of patients with CGI Severity of Illness score ≤2 (1 = normal, not at all ill; 2 = borderline, mentally ill) at week 24.
% 24 week CGI—Imp ≤2: Proportion of patients with CGI Global Improvement score ≤2 (1 = very much improved; 2 = much improved) at week 24.
VCTP, videoconference telepsychiatry group; F2FC, Face-to-face conventional group.

Gomera. (patient's location). F2FC treatment takes place at the Mental Healthcare Centre of San Sebastian de la Gomera, in the same telepsychiatry room. Treatment was the same in both alternatives and involves at least eight sessions lasting 30 minutes over the 24-week study period. Additional treatment sessions take place if clinically indicated. The treatment consists of pertinent psychotropic medication plus cognitive–behavioral treatment and psychological evaluation concerning the disease, medications, and side effects. The mean number of psychoactive drugs prescribed was very similar in groups (1.76 ± 0.84 in VCTP and 1.9 ± 1 in F2FC, range 0–4). Antidepressants were the most prescribed drugs (74.3%), followed by benzodiazepine tranquillizers (72.9%) and antipsychotics (14.3%). Venlafaxine was the more frequent antidepressant used, while clorazepate was the benzodiazepine more used, and risperidone the more frecuent antipsychotic.

Instruments

The CIDI is a comprehensive, fully standardized interview that was used to assess mental disorders according to the definitions and criteria of *ICD-10*. The interview is modular and covers somatoform disorders, anxiety disorders, depressive disorders, mania, schizophrenia, eating disorders, cognitive impair-

ment, and substance use disorders. The reliability of the CIDI has been demonstrated in a major international field trial of the instrument[5,6] and in other studies.[7] The validity of the CIDI has also been established.[8] The efficacy of treatments received was measured by changes in the Symptom Checklist-90 Revised (SCL-90R)[9] global distress indexes and Clinical Global Impression (CGI)[10] ratings at weeks 0, 2, 4, 8, 12, 16, 20, and 24.

The SCL-90R is a standardized multidimensional 90-item self-report symptom inventory covering various dimensions of psychological distress. Each item is rated on a five-point scale of distress, ranging from not at all (0) to extremely (4). It uses three global distress indexes: Global Severity Index (GSI), Positive Symptom Distress Index (PSDI) and Positive Symptom Total (PST). The GSI combines the number of symptoms reported and intensity of reported distress to yield the single best descriptor of current mental health. The PSDI represents the average level of distress reported for symptoms endorsed and the PST reflects the total number of symptoms reported regardless of symptom intensity. Normative data for Canary Islands citizens and psychiatric outpatients were available and were used to calculate reliable changes indexes.[11]

CGI is a three-item scale used to assess treatment response in all categories of psychiatric patients. It was administered by the patient's psychiatrist and 2 minutes are enough to complete. The items are: Severity of Illness; Global Improvement and Efficacy Index. Item 1 is rated on a seven-point scale (1 = normal to 7 = extremely ill); item 2 on a seven-point scale (1 = very much improved to 7 = very much worse); and item 3 on a four-point scale (from "none" to "outweighs therapeutic effect").

Procedure

The evaluation methods included two levels of statistical analysis: the level of the group in comparison with the VCTP treatment group as a whole with the F2FC comparison group, and the level of the individual participants.

The nonparametric Kruskal-Wallis test was used to assess significant treatment effects for scale efficacy data. Within-patient treatment efficacy was assessed using the Wilcoxon signed rank statistic. Treatment effects were tested at the $\alpha = 0.05$ level of significance. Categorical efficacy data were analyzed using the χ^2 tests with appropriate degrees of freedom

In the same way that Jacobson and Truax,[12] we defined "reliable change" in terms of the reliability of the measurement instruments used. We considered that the error variance in a set of scores that is due to the unreliability of the scale is the standard error of measurement. Scales that are highly reliable will have a small standard error of measurement. If we know the reliability of the scale (typically measured as Cronbach α) and the standard deviation of the raw scores on that scale we can find the expected standard deviation of the variability of the error scores. The formula for the standard error measurement is:

$$SE_{meas} = \sigma_{meas} = SD * \sqrt{1 - r_{11}}$$

Where SD = the standard deviation of the measure, and r_{11} = the reliability (typically coefficient alpha) of the measure.

A Reliable Change Index (RCI) is computed by dividing the difference between the pretreatment and posttreatment scores by the standard error of the difference between the two scores. If the RCI is greater than 1.96, then the difference is reliable, a change of that magnitude would not be expected due to the unreliability of the measurement. Conversely, if the RCI score is 1.96 or less, then the change is not considered to be reliable, it could have occurred just due to the unreliability of the measure.

$$RCI = (posttest - pretest)/SE_{mea}$$

RESULTS

Of 140 randomized patients, 130 completed 24 weeks of treatment. Only 4 patients dropped out prematurely from the VCTP group and 6 from the F2FC treatment group. Clinical changes in CGI Severity and Improvement scores after treatment via telepsychiatry and conventional treatment are provided in Table 1. This shows that telepsychiatry was effective

TABLE 2. SUMMARY OF EFFICACY CHANGES FROM BASELINE

	Baseline			*End point*			p-*Values*	
Variable	*Mean*	*Median*	*SD*	*Mean*	*Median*	*SD*	*Within Group*[a]	*Overall*[b]
VCTP-CGI	4.9	5	0.3	1.6	1	1	<0.001	0.751
F2FC-CGI	4.8	5	9.3	1.5	1	1	<0.001	
VCTP-GSI	1.81	1.78	0.7	0.99	0.87	0.71	<0.001	0.959
F2FC-GSI	1.79	1.80	0.6	0.99	0.95	0.73	<0.001	
VCTP-PSDI	2.56	2.59	0.6	1.73	1.8	0.65	<0.001	0.499
F2FC-PSDI	2.60	2.55	0.6	1.65	1.5	0.63	<0.001	
VCTP-PST	63.4	64	15.4	44.2	44	21.1	<0.001	0.680
F2FC-PST	64.8	65	13.9	43.7	44	19.9	<0.001	

[a]The significance of a location shift from zero of the change from baseline within a treatment group is tested by the Wilcoxon signed rank procedure.
[b]Kruskal-Wallis.
VCTP, videoconference telepsychiatry; CGI, Clinical Global Impressions; F2FC, face-to-face conventional; GSI, Global Severity Index; PSDI, Positive Symptom Distress Index; PST, Positive Symptom Total; SD, standard deviation.

in significantly reducing clinical measures of severity as determined by a CGI change score of 2 or less (normal, not at all ill or borderline, mentally ill) in 67.2% of the sample at week 24, while F2FC treatment was in 62.5%. In the same way, 80% of the patients under telepsychiatry treatment were "much" or "very much" improved on the clinical global impression scale at week 24, while this figure was 75.7% in conventional treatment.

There was a statistically significant ($p < 0.001$) improvement in CGI Improvement (Table 2) and SCL-90R Global Indexes scores (Table 2), measured from baseline to endpoint in the VCTP and F2FC treatment groups, showing clear clinical state improvement.

There was no statistically significant difference in the mean change in CGI-Improvement and SCL-90R Global Indexes scores between VCTP-treated patients and F2FC-treated patients (Table 2).

The patients' mean SCL-90-R Global Indexes scores decreased over time, indicating less psychiatric distress. Statistical summaries of the data, including reliable change index data, are displayed in Table 3. Only 3% of patients who finished the 24-week follow up reported a reliable deterioration of their mental health status according GSI, while 22.7% reported uncertain changes at the end of the videoconferencing treatment period. A total of 74.3% of patients reported a reliable improvement in their CGI scores, being 45.5% recovered. Concerning the level of distress reported, 68.1% of the patients

TABLE 3. RELIABLE CHANGE INDEX SUMMARY STATISTICS OF SCL-90R GLOBAL INDEXES

VCTP n = 66 *F2FC* n = 64	*Reliable deterioration*		*Uncertain change*		*Reliable improvement—not recovered*		*Reliable improvement—recovered*		*% Moved from above cutoff score at pretest to below cutoff score at follow-up*	
Measure	n	%	n	%	n	%	n	%	n	%
VCTP-GSI	2	3	15	22,7	19	28,8	30	45,5	35 of 66	53
F2FC-GSI	2	3,1	14	21,9	17	26,6	31	48,4	30 of 64	46,9
VCTP-PSDI	2	3	19	28,8	4	6	41	62,1	54 of 66	82
F2FC-PSDI	1	1,6	15	23,4	5	7,8	43	67,2	52 of 64	81,2
VCTP-PST	1	1,5	30	45,4	11	13,5	24	39,6	30 of 66	45,5
F2FC-PST	0	0	32	50	10	15,6	22	34,4	31 of 64	48,4

VCTP, videoconference telepsychiatry; CGI, Clinical Global Impressions; F2FC, face-to-face conventional; GSI; Global Severity Index; PSDI, Positive Symptom Distress Index; PST, Positive Symptom Total; SD, standard deviation.

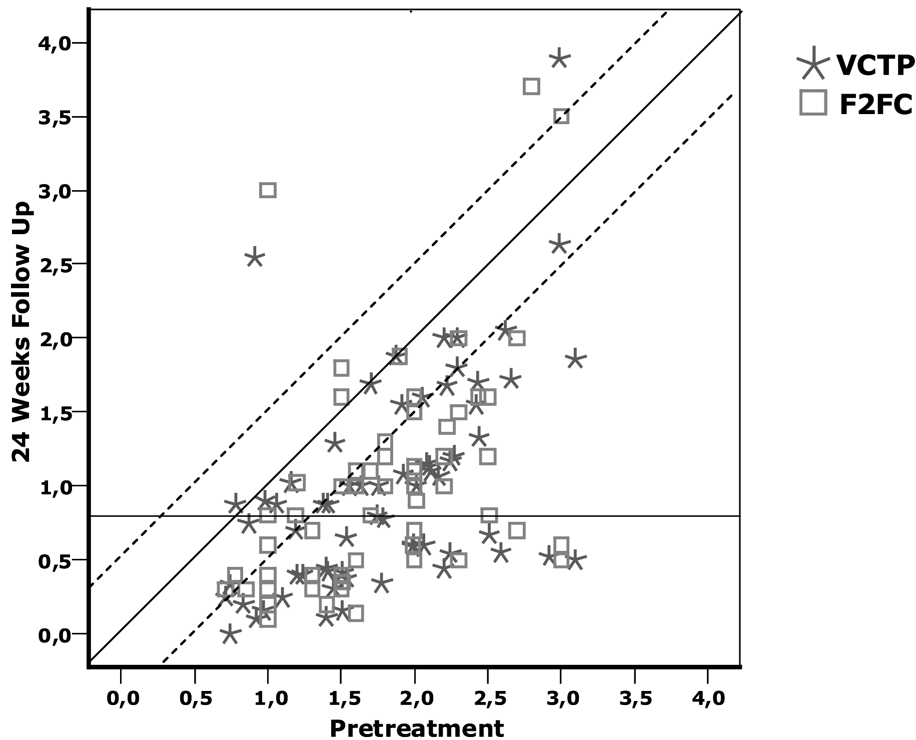

FIG. 1. Graphic representation of reliable change index in SCL-90R global severity index. Reliable deterioration are those cases in the upper right triangle, outside of the band of no reliable change. Uncertain change are those participants within the band of no reliable change. Reliable improvement not recovered are individuals to the right of the band of no reliable change and above the 1 SD cutoff score. Reliable improvement recovered are individuals to the right of the band of no reliable change and below the 1 SD cutoff score.

reported reliable improvements, being 62.1% recovered. Considering the total number of symptoms reported, 52.1% reported reliable improvement, being only 39.6% recovered. It is necessary to consider that almost all patients received drug treatments that involve adverse effects that bias these figures.

In order to make a graphic representation of the reliable change index in SCL-90R Global Index scores, we setup 95% confidence bounds around a change score of zero and display the results graphically. The reliable change index data shown in Figures 1, 2, and 3 represents individual data for the SCL-90R Global Indexes. They show whether there were significant changes at the individual level. The horizontal axes show pretreatment scores, the vertical axes show the 24-week follow-up scores. The horizontal line represents the +1 SD normative-group cutoff score. Scores below the cutoff score are considered to be within the normal range of scores. The diagonal line from the lower left to the upper right is the line of no change. Data points that fall on the diagonal line are the same at both pretest and at the 24-week follow-up. Data points in the upper left triangle are higher at follow-up than at pretest, that is, have deteriorated from pretest to follow-up. Data points in the lower right triangle are lower at follow-up than at pretest, that is, they have improved from pretest to follow-up. The dotted lines to the left and right of the diagonal line represent the reliable change index band, set at an RCI score of ±1.96 standard errors of measurement around the line of no change. Individual scores within the RCI band have not shown reliable change while scores outside of the RCI band have shown reliable change.

DISCUSSION

When interactive television was introduced in psychiatry in the 1950s, one could have anticipated a great breakthrough of this new form of technology.[13] However, slow development of telepsychiatric videoconferencing services occurred place. Although many different proj-

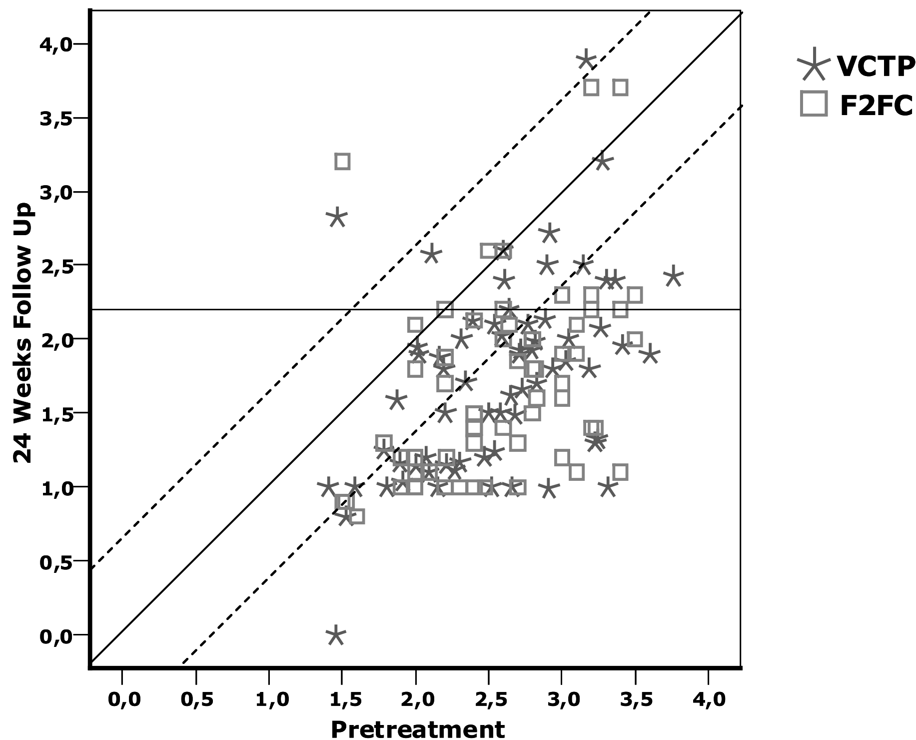

FIG. 2. Graphic representation of reliable change index in SCL-90R positive symptom distress index. Reliable deterioration are those cases in the upper right triangle, outside of the band of no reliable change. Uncertain change are those participants within the band of no reliable change. Reliable improvement not recovered are individuals to the right of the band of no reliable change and above the 1 SD cutoff score. Reliable improvement recovered are individuals to the right of the band of no reliable change and below the 1 SD cutoff score.

ects were initiated, only a few projects succeeded, mostly in Australia, Canada, Finland, and the United States. In other words, in countries with vast remote areas, and high economic, medical, and technological standards.

Although refusals to use the system by patients[14] and resistance of health professionals[15–18] were reported, most studies showed a high satisfaction of patients and professionals involved in videoconferencing services.[19–26] Patients reported some improvement from therapy; many commented that videoconferencing enhanced the therapeutic relationship and that it was less intrusive than F2FC communication.[26] Also professionals can profit from videoconferencing: The increase of knowledge and skills, decreased isolation, and strengthened relationship of mental health clinicians with colleagues are certainly advantages for health professionals.[27,28]

Although there are advantages for using videoconferencing, service providers have issues in its application. Teleconsultations require more preparation and training[15,18] and there are some uncertainties concerning accountability, liability, and confidentiality,[24] difficulties regarding personal contact between providers and consumers were also described.[17,28]

Our results are similar to those obtain by Ruskin et al. (2004). Their work showed that remote treatment by means of telepsychiatry and in-person treatment have comparable outcomes.[29] However, at the present, telepsychiatry research is in need of more efficacy studies. The outcome of which will benefit future effectiveness studies.[30]

Our study constitutes the first randomized clinical trial that compares telepsychiatry through videoconference with F2FC psychiatric treatment in psychiatric outpatients that control aspects of doctor–patient communication. Because the psychiatrist was the same one in both treatment modalities, it was possible to control aspects concerning information giving, positive affect, social conversation, psychosocial talk, partnership building, and patient-oriented behaviours through the study. The liter-

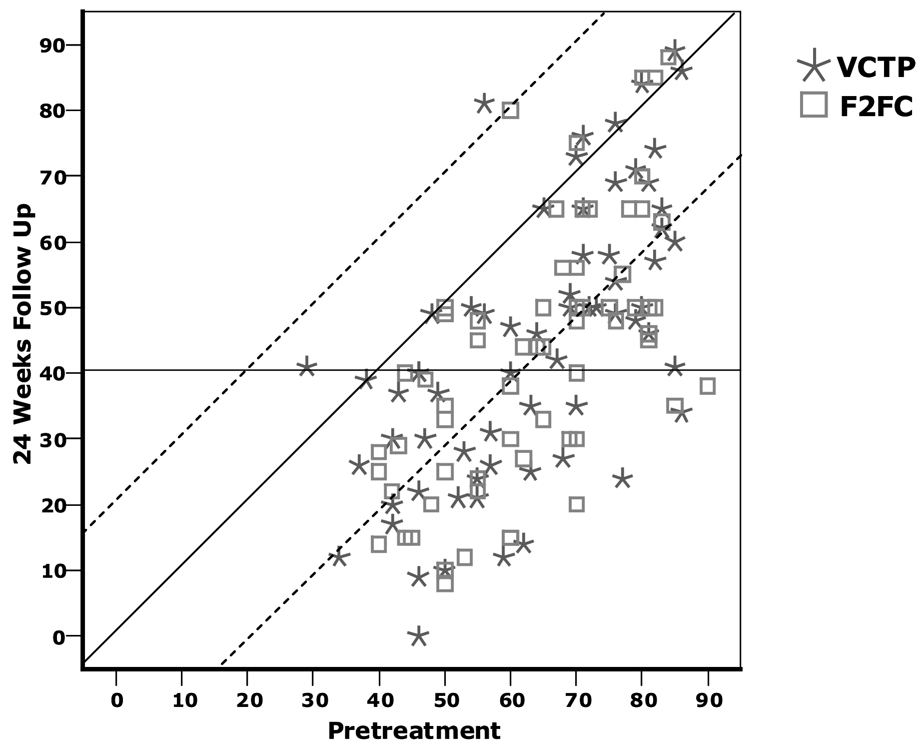

FIG. 3. Graphic representation of reliable change index in SCL-90R positive symptom total index. Reliable deterioration are those cases in the upper right triangle, outside of the band of no reliable change. Uncertain change are those participants within the band of no reliable change. Reliable improvement not recovered are individuals to the right of the band of no reliable change and above the 1 SD cutoff score. Reliable improvement recovered are individuals to the right of the band of no reliable change and below the 1 SD cutoff score.

ature on doctor–patient communication shows that patient, provider, and contextual characteristics all influence behavior in medical encounters, which in turn is an important determinant of health outcomes.[31] However, using the same psychiatrist can introduce bias in terms psychiatrist's bias favoring one method over the other that changes the way he/she interacts with patients. This is not possible to determine. The fact that the same psychiatrist make all the assessments and provided all the treatments constitutes a novel strength, and at the same time, a weakness of the present study. Most of the existing research in this field does not cover this aspect in their methodology. Conversely, given the present design, what we really learn is that for this psychiatrist there is no difference in telepsychiatry and in-person psychiatry in that good treatment was provided in both cases.

The question persists about to what extent the present results can be generalized. The literature shows that some psychiatrists considered telepsychiatry via videoconference to be impersonal and expressed a reluctance to use it, as well as their concern about confidentiality It is clear that videoconferencing, like all tools, can be used poorly or well, and requires that the user learn a set of basic rules and an etiquette to maximize the equipment's capabilities. Nevertheless, it is probably necessary to accomplish future studies to analyze what styles are the more adequate to use this type of technology.

In telepsychiatry, the evaluation of the videoconferencing encounter context has focused on its ability to simulate real-time experience in terms of image and interaction.[3] Our room-based videoconference system provided instantaneous signal transmission and has splendid audio and visual-image quality without technical problems. The videoconference room in La Gomera is also the consultation office for F2FC encounters and was outfitted in order to obtain the best lighting and acoustic conditions, establishing a relaxed environment. Videocon-

ference rooms were designed as one half of a pair; each room is an extension of the other in order to help all participants feel that they are in the same room, removing the natural sense of distance and promoting a sense of closeness and privacy, two important factors if the room is to be considered a viable alternative to in-person meetings. The control of this type of variables probably improves the efficacy of telepsychiatry doing it in a similar way to the conventional F2FC alternative.

Telepsychiatry through videoconference was shown to be an effective mean of delivering mental health services to psychiatric outpatients living in remote areas with limited resources. Its clinical efficacy was indistinguishable of the corresponding one to F2FC psychiatric treatment.

ACKNOWLEDGMENT

This study is part of the ISLANDS Research Project (Integrated System for Long distance psychiatric Assistance and Non-conventional Distributed health Services) funded by the European Union (Quality of Life and Management of Living Resources, Contract Number: QLRT-2001-01637).

REFERENCES

1. Mair F, Whitten P. Systematic review of studies of patient satisfaction with telemedicine. *BMJ* **2000;**320:1517–1520.
2. De las Cuevas C, Artiles J, De la Fuente J, Serrano P: Telepsychiatry in the Canary Islands: user acceptance and satisfaction. *J Telemed Telecare* **2003;**9:221–224.
3. Hilty DM, Liu W, Marks S, Callahan EJ. The effectiveness of telepsychiatry: A review. *CPA Bull de l'APC* October **2003:**10–17.
4. World Health Organization. *CIDI core: Composite international diagnostic interview core version 1.0, researchers Copy*. Geneva; WHO, 1990.
5. Wittchen HU, Robins LN, Cottler LB, Sartorius N, Burke JD, Regier D. Cross-cultural feasibility, reliability and sources of variance of the Composite International Diagnostic Interview (CIDI). *Br J Psychiatry* **1991;**159:645–653.
6. Cottler LB, Robins LN, Grant BF, Towle LH, Wittchen, HU, Sartorius N. The CIDI-Core substance abuse and dependence questions: Cross-cultural and nosological issues. *Br J Psychiatry* **1991;**159:653–658.
7. Wittchen HU. Reliability and validity studies of the WHO Composite International Diagnostic Interview (CIDI): A critical review. *J Psychiatric Res* **1994;**28:57–84.
8. Peters J. Procedural validity of the computerized version of the Composite International Diagnostic Interview (CIDI-Auto) in the anxiety disorders, Psychol Med **1993;**25:1269–1280.
9. Derogatis LR. SCL-90-R: *Administration, scoring and procedures manual—II*. Baltimore: Clinical Psychometric Research, **1992.**
10. National Institute of Mental Health. CGI: Clinical Global Impressions. In: Guy W, Bonato RR, eds. *Manual for the ECDEU assessment battery, 2. Rev ed*. Chevy Chase, MD: National Institute of Mental Health, **1970:**12-1–12-6.
11. González de Rivera JL, De las Cuevas C, Gracia-Marco R, Henry M, Rguez.-Pulido F, Monterrey AL. Age, sex, and marital status differences in minor psychiatric morbidity. *Eur J Psychiatry* **1991;**5:166–176.
12. Jacobson NS, Truax P. Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *J Consult Clin Psychol* **1991;**59:12–19.
13. Wittson C, Dutton R. A new tool in psychiatric education. *Ment Hosp.* **1956;**7:11–14.
14. Haslam R, McLaren P. Interactive television for an urban adult mental health service: The Guy's Psychiatric Intensive Care Unit Telepsychiatry Project. *J Telemed Telecare* **2000;**6(Suppl 1):50–52.
15. Buist A, Coman G, Silvas A, Burrows G. An evaluation of the telepsychiatry programme in Victoria, Australia. *J Telemed Telecare* **2000;**6:216–221.
16. Elford R, White H, Bowering R, Ghandi A, Maddiggan B, St John K, House M, Harnett J, West R, Battcock A. A randomized, controlled trial of child psychiatric Assessments conducted using videoconferencing. *J Telemed Telecare* **2000;**6:73–82.
17. Montani C, Billaud N, Tyrrell J, Fluchaire I, Malterre C, Lauvernay N, Couturier P, Franco A. Psychological impact of a remote psychometric consultation with hospitalized elderly people. *J Telemed Telecare* **1997;**3:140–145.
18. Navein J. Physician resistance to telemedicine. *J Telemed Telecare* **1998;**2(Suppl 1):103–104.
19. Bishop JE, O'Reilly RL, Maddox K, Hutchinson LJ. Client satisfaction in a feasibility study comparing face-to-face interviews with telepsychiatry. *J Telemed Telecare* **2002;**8:217–221.
20. Clarke PH. A referrer and patient evaluation of a telepsychiatry consultation-liaison service in South Australia. *J Telemed Telecare* **1997;**3(Suppl 1):12–14.
21. Gammon D, Bergvik S, Bergmo T, Pedersen S. Videoconferencing in psychiatry: A survey of use In northern Norway. *J Telemed Telecare* **1996;**2:192–198.
22. Kopel H, Nunn K, Dossetor D. Evaluating satisfaction with a child and adolescent psychological telemedicine outreach service. *J Telemed Telecare* **2001;**7(Suppl 2):35–40.
23. Mekhjian H, Turner JW, Gailiun M, McCain TA. Patient satisfaction with telemedicine in a prison environment. *J Telemed Telecare* **1999;**5:55–61

24. Nesbitt TS, Hilty DM, Kuenneth CA, Siefkin A. Development of a telemedicine program: A review of 1,000 videoconferencing consultations. *West J Med* **2000;**173:169–174.
25. Simpson J, Doze S, Urness D, Hailey D, Jacobs P. Evaluation of a routine telepsychiatry service. *J Telemed Telecare* **2001;**7:90–98.
26. Simpson S. The provision of a telepsychology service to Shetland: Client and therapist satisfaction and the ability to develop a therapeutic alliance. *J Telemed Telecare* **2001;**7(Suppl 1):34–36.
27. Aas IHM. Learning in organizations working with telemedicine. *J Telemed Telecare* **2002;**8:107–111.
28. Gelber H. The experience in Victoria with telepsychiatry for the child and adolescent mental health service. *J Telemed Telecare* **2001;**7(Suppl 2):32–34.
29. Ruskin PE, Silver-Aylaian M, Kling MA, Reed SA, Bradham DD, Hebel JR, Barrett D, Knowles F, 3rd, Hauser P. Treatment outcomes in depression: Comparison of remote treatment through telepsychiatry to in-person treatment. *Am J Psychiatry* **2004;**161:1471–1476.
30. Frueh BC, Monnier J, Elhai JD, Grubaugh AL, Knapp RG: Telepsychiatry treatment outcome research methodology: Efficacy versus effectiveness. *Telemed J E Health* **2004;**10:455–458.
31. Miller E. Telemedicine and doctor–patient communication: A theoretical framework for evaluation. *J Telemed Telecare* **2002;**8:311–318.

Address reprint requests to:
Prof. Carlos De las Cuevas, Ph.D., M.D.
Urbanización Las Cañas, 33
38208 La Laguna, Tenerife
Canary Islands
Spain

E-mail: ccuevas@ull.es