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Telepsychiatry: Psychiatric Consultation through Videoconference Clinical Results

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Abstract*:* Main Outcome Measures: *Efficacy variables included scores on the 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. Response was defined as a CGI-I score of 1 or 2. Reliable Change Indexes were computed in SCL-90R Global Indexes scores. A multivariate logistic regression analysis was carried out to evaluate the effect of each factor associated with the success of telepsychiatry.*

Results: *With respect to baseline severity of illness, the overall average Clinical Global Impression (CGI-S) score was between 4 (moderately ill) and 5 (markedly ill). Only 4 patients dropped-out prematurely the study. The patients' mean SCL-90-R Global Indexes scores decreased over time, indicating less psychiatric distress. Significant decreases from baseline to week 24 were obtained in psychiatric status. A significant proportion of patients showed clear clinical state improvement. Multivariate logistic regression analysis shows that telepsychiatry was effective independently of gender, age, educational level, ICD-10 diagnosis, initial severity of illness or the presence of antecedents of previous psychiatric disorders and treatments.*

Conclusion: *Telepsychiatry showed to be an effective mean of delivering mental health services to psychiatric outpatients living in remote areas with limited resources.*

INTRODUCTION

Telepsychiatry can be conceived as an integrated system of mental health care delivery that employs telecommunications and computerized information technology as an alternative to face-to-face conventional modality. Videoconferencing is the central technology currently used in telepsychiatry, since it permit live, two-way interactive, full-colour, 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 since there are few clinical outcome studies and because there may also be a positive reporting bias in the literature.[3]

The Canary Islands Health Service developed in 2003 a telepsychiatry programme to complement the mental health-care of the citizens living on La Gomera island with the objectives of improving access, reducing isolation and improving the quality of mental health care in this area. This new system of service delivery was possible thanks to a research grant (EU QLRT-2001-0167 – ISLANDS Project) from the European Union. In order to investigate the effectiveness of a routine telepsychiatry service through videoconferencing a prospective cohort study of a sample of 70 psychiatric outpatients was carried out.

MATERIAL AND METHODS

The telepsychiatry service provides psychiatric consultations to individuals after referral from a general practitioner. A patient living in La Gomera with a mental health problem can choose between joining the waiting list to see the visiting psychiatrist, that travel every Monday from Tenerife island, or being included in the telepsychiatry programme. Telepsychiatry sessions take place every Thursday from 9:00 to 13:00. Emergency access is available from Monday to Friday (8:00 to 15:00). After the teleconsultation, recommendations are provided directly to

Table 1. Sociodemographic and clinical characteristics of the sample studied

Variable	Category	Number of cases	% of sample	% 24 week CGI–Sev ≤ 2	% 24 week CGI– Imp ≤ 2
Age					
	< 25 years	12	17.1	91.7	100
	25-45 years	37	52.9	67.6	78.3
	45-65 years	16	22.9	50	68.7
	> 65 years	5	7.1	60	80
Gender					
	Male	22	31.4	72.7	86.4
	Female	48	68.6	64.6	77.1
Educational level					
	Can read and write	11	15.8	63.6	81.8
	Primary studies	33	47.1	95.6	78.8
	College	13	18.6	46.1	69.2
	University degree	13	18.6	92.3	92.3
ICD-10 Diagnosis *					
	F1	5	7.1	80	80
	F2	5	7.1	80	80
	F3	23	32.9	47.8	69.6
	F4	31	44.3	77.4	83.9
	F6	6	8.6	66.6	100
CGI – Severity of Illness					
	Moderatelly ill	8	11.4	62.5	62.5
	Markedly ill	61	87.1	68.8	83.6
	Severely ill	1	1.4	0	0
Total		70	100	67,2%	80%

*** ICD-10 Diagnoses**
(F1): Mental and behavioural 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 behaviour

% 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.

the patient's GP via email. Telepsychiatry consultations use commercial videoconferencing equipment (Viewstation 512, Polycom®) connected via ISDN lines at up to 512 kbit/s.

PATIENTS

The sample comprised 70 psychiatric outpatients patients, with 66.3% female and 33.7% male, which were followed up through 24 weeks. The mean age was 39.8±15 years (range 15–80). Women registered a higher mean age than men (42.9±15 vs. 33.2±12). Patients were diagnosed according to ICD-10 criteria. Anxiety disorders were the more prevalent diagnosis. Most of the patients (87.1%) included were markedly ill at the beginning and the majority of them (67.1%) have antecedents of previous psychiatric treatments in face-to-face alternative. Of 70 patients included in the study, only 4 dropped-out prematurely. Other socio-demographic 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 location) and the Mental Health Care Health Centre of San Sebastian de la Gomera. (Patients location). Treatment involves at least 6 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-behavioural treatment and psychological evaluation concerning the disease, medications, and side effects. The mean number of psychoactive drugs prescribed was 1.76±0.84 (range 0-4). Antidepressants were the most prescribed drugs (74.3%), followed by benzodiazepine tranquillisers (72.9%) and antipsychotics (14.3%).

INSTRUMENTS

The efficacy of treatments received was measured by changes in the Symptom Checklist-90 Revised (SCL-90R)[4] global distress indices and Clinical Global Impression (CGI) (NIMH, 1970) ratings at weeks 0, 4, 8, 12, 16, 20 and 24.

The Symptom Checklist-90 Revised is a standardized multidimensional 90-item self-report symptom inventory covering various dimensions of psychological distress. Each item is rated on a 5-point scale of distress, ranging from not at all (0) to extremely (4). It utilizes 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 were available and were used to calculate reliable changes indexes.

Clinical Global Impression is a three-item scale used to assess treatment response in all categories of psychiatric patients. It was administered by 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

In the same way that Jacobson and Truax,[5] 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's alpha) 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 measure. 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.

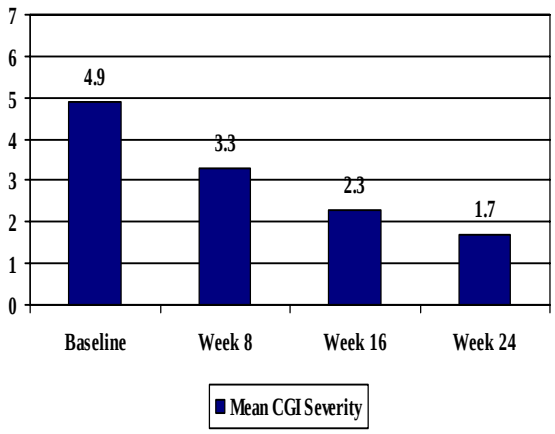
$$RCI = (posttest - pretest) / SE_{meas}$$

In order to evaluate the effect of each factor associated with the success of telepsychiatry, a multivariate logistic regression analysis was carried out.

RESULTS

Clinical changes in CGI Severity and Improvement scores after treatment via telepsychiatry are provided in Table 1. This shows that telepsychiatry was effective 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. In the same way, 80% of the patients included in the study were "much" or "very much" improved on the clinical global impression scale. Figure 1 shows the mean CGI Severity of Illness scores at baseline, week 8, week 16 and week 24.

Figure 1. Mean CGI Severity of Illness scores at baseline, week 8, week 16 and week 24



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 2. Only 3% of patients that finished the 24 weeks follow up reported a reliable deterioration in their mental health status according GSI, while 22.7% reported uncertain changes at the end of the videoconferencing treatment period. 74.3% of patients reported a reliable improvement in their CGI scores, being 45.5% recovered. Concerning the level of distress informed, 68.1% of the patients reported reliable improvements, being 62.1% recovered. Considering the total number of symptoms reported, 52.1% informed reliable improvement, being only 39.6% recovered. It is

Table 2. Reliable Change Index Summary Statistics of SCL-90R Global Indexes

(*n* = 66)	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***	**%**
SCL-90R GSI	2	3	15	22,7	19	28,8	30	45,5	35 of 66	53
SCL-90R PSDI	2	3	19	28,8	4	6	41	62,1	54 of 66	82
SCL-90R PST	1	1,5	30	45,4	11	13,5	24	39,6	30 of 66	45,5

Variable	Statistic value of Wald	Degrees of Freedom	P value of Wald
Gender	2,454	1	,117
Age	2,296	1	,130
Educational Level	3,741	5	,587
ICD-10 Diagnoses	,428	4	,980
Antecedents	,041	1	,839
Severity of Illness	,299	2	,861

Table 3. Multivariate logistic regression analysis results. Variables in the equation

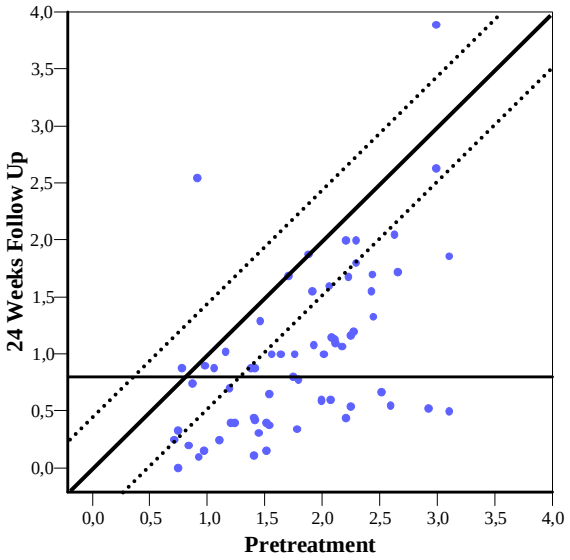


Figure 2. Graphic Representation of Reliable Change Index in Global Severity Index

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.

necessary to consider that almost all patients received drug treatments that involve adverse effects that bias this figures.

None of the variables included in the study influenced in a significant way the success of the treatment (Table 3). Neither the gender, nor the age or the educational level of the patients showed statistically significant differences in the rate of telepsychiatry success. In the same way, neither the diagnosis of the patient, nor the existence of antecedents of previous psychiatric disorders treated, or the severity of the illness the beginning of treatment influenced the success of the telepsychiatry treatment.

As conclusion of the exposed results, telepsychiatry showed to be an effective mean of delivering mental health services to psychiatric outpatients living in remote areas with limited resources. Its clinical efficacy was not conditioned by any of the analysed variables.

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Figure 3. Graphic Representation of Reliable Change Index in Positive Symptom Distress Index

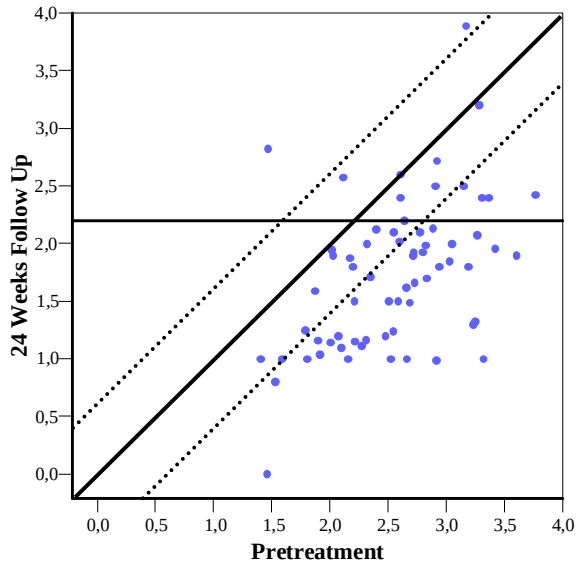
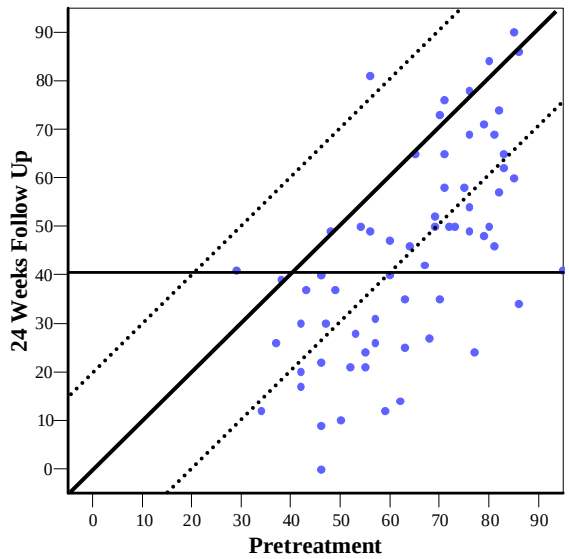


Figure 4. Graphic Representation of Reliable Change Index in Positive Symptom Total



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