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Evaluation of an Intensive Intervention Program in Suicidal Behaviour

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Introduction: Suicide is a public health problem. Consumed suicides reach 1 million cases per year worldwide and it is estimated that the number of suicide attempts is 10 to 20 times higher. The aim of this study was to evaluate the effectiveness in reducing repeat suicide attempts in a program for the prevention of suicidal behavior: Intensive Intervention Program (IIP).

Methods: We performed a study that compared a cohort of patients exposed to IIP intervention with another cohort of patients exposed to conventional therapy. The sample was made up of 191 patients, 89 in the treatment group and 102 patients in conventional treatment group, with a 12-month follow-up.

Results: Relapse occurred in 20.6% of patients receiving conventional treatment relapse compared with 10% in the treatment group ($p=0.047$). Patients treated in the program had a 2.88 times lower risk of relapse ($p=0.015$), this being independent of the number of previous attempts, age, gender, need for admission after the index attempt and aggregated diagnosis.

Conclusions: The results show that subjects who are treated in the IIP relapse less, need fewer admissions and the time elapsed between the treatment and the first repeat suicide attempt is greater.

Keywords: Suicide, attempted suicide, Repeat suicide attempts, Prevention, Cognitive behavioral therapy

Actas Esp Psiquiatr 2013;41(5):279-86

Evaluación de un Programa de Intervención Intensiva en Conducta Suicida

Introducción: El suicidio es un problema de salud pública. El suicidio consumado asciende a 1 millón de casos al año en el mundo y se estima que el número de intentos de suicidio es 10 o 20 veces superior. El objetivo del presente trabajo es la evaluación de la efectividad en la reducción de reintentos de suicidio en un Programa de prevención de conducta suicida: el Programa de Intervención Intensiva (PII).

Metodología: Se realiza un estudio en el que se compara una cohorte de pacientes expuestos a la intervención en PII con otra cohorte de pacientes expuestos a terapia convencional. La muestra está formada por un total de 191 pacientes, 89 del grupo de tratamiento en PII y 102 pacientes del grupo de tratamiento convencional. Con un seguimiento de 12 meses.

Resultados: un 20,6% de los pacientes que recibe tratamiento convencional recaen frente al 10% del grupo de tratamiento en PII ($p=0,047$). Los pacientes atendidos en el programa presentaron un riesgo menor 2,88 veces de recaída ($p=0,015$), esto es independiente del número de intentos previos, edad, sexo, necesidad de ingreso tras el intento índice y diagnóstico agregado.

Conclusiones: Los resultados muestran que los sujetos que reciben tratamiento en el PII tiene menos reintentos, necesitan ingresar menos, y el tiempo transcurrido desde el inicio del tratamiento y el primer reintento es mayor.

Palabras clave: Suicidio, Intento de suicidio, Reintento, Prevención, Terapia cognitivo-conductual

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INTRODUCTION

Suicide is a serious complication of many psychiatric disorders and should be considered a public health problem. Approximately 90%^{1,2-4} of persons who commit suicide have a mental disorder, the most frequent diagnosis being that of depression.^{1,5} In 1976, the World Health organization (WHO) defined suicide as *"an act with fatal outcome, deliberately initiated and performed by the subject, with knowledge or expectation of its fatal outcome through which the aim is to obtain changes"* and parasuicide as *"an act without fatal outcome by which, without the help of others, a person inflicts self-injury or takes substances in order to achieve changes through the current or expected consequences on his/her physical state."*⁶

Every year, approximately 1,000,000 persons die by suicide in the world.^{1,7} This represents an annual rate of 14.5 suicides for every 100,000 inhabitants. This tendency is growing, estimating that the rate of suicides consumed in the year 2020 will be 1.53 million.⁷ These figures increase 10 to 20 times when suicide attempts are included.⁸ Different organizations, both international and national, have established prevention of suicide behavior as a priority area of action.⁹⁻¹²

Currently, psychotherapy treatments are increasingly acquiring more importance within the prevention of suicide behavior and its consequences, above all those of cognitive-behavioral intervention.¹³⁻²⁰ According to the evidence of different studies reflected in the Clinical Practice Guidelines on suicide prevention and behavior, these interventions are more effective when oriented towards reducing some specific aspect associated to suicide behavior (suicide ideation, self-injuries, hopelessness, etc.) and when the sessions have, at least in the beginning, a weekly frequency.¹⁴

Those studies that include suicide attempts as a variable obtained more significant results in treatment efficacy. In adults, cognitive-behavioral therapy in individual format or combined with group therapy obtains better results. In the adolescents group, therapy is the most effective.^{13,21} In patients diagnosed of borderline personality disorder who have a history of chronic suicide behavior, dialectic-behavioral therapy has been shown to be more effective than other therapies.²²⁻²⁶ Interpersonal therapy in patients over 60 years with major depression and suicidal ideation reduces the latter.^{27,28} Sufficient evidence is not available on the efficacy of familial therapy in the reduction of suicidal behavior.¹⁴ In the treatments that include telephone follow-up, the reduction of suicidal behavior is more significant.^{16,30}

Those who attempt suicide as well as those who have suicidal ideation frequently have a deficit in problem-solving skills and/or self-perception of being incapable to do so. Increasing and/or acquiring said skills and training in the generalization of them are effective in the reduction of

suicidal behavior.²⁹⁻³² It has also been observed that management of impulsivity, regulation of emotions and behavior activation oriented towards an objective play an important role in the reduction of suicidal behavior.^{5,33,34}

Until 2009, there was no specific intervention for patients with suicidal behavior in the Galician Health Care Service, and these patients were referred to their reference Mental Health Care Unit. The Intensive Intervention Program (IIP) in suicidal behaviors was designed in response to the needs of this group of patients. This is a health care and preventive program of suicidal behavior whose objective is to intervene in persons with expressed or non-expressed suicidal ideation, detected in primary care consultations and in those who have attempted suicide and are seen in the primary care site or general hospital emergency service. The program activity began in November 2008 providing training in detection and evaluation of patients with suicidal risk in the Primary Care sites of the reference area to specialist in family medicine and the nursing staff. The care team consists of one psychiatrist, one clinical psychologist and one nurse specialized in mental health. Care to patients began in April 2009 and has continued up to the present. The objectives of the program are: a) to increase detection of patients at risk and candidates to receive specific care: patients with suicidal ideas at risk and patients who have attempted suicide; b) to improve care by offering the best treatment available based on scientific evidence, also guaranteeing that the patients will be attended in the least possible time; c) to prevent suicide attempts or repeat attempts in patients with risk ideas or recent suicide attempts, respectively.

This study has aimed to evaluate effectiveness in reduction of new suicide attempts after an index attempt in patients under follow-up in the Intensive Intervention Program in suicidal behavior.

METHODOLOGY

A study that compared a cohort of patients exposed to IIP intervention with another nonexposed cohort of patients subjected to conventional therapy was carried out.

The subjects who formed a part of the study were those patients seen in the emergency service of the Complejo Hospitalario Universitario of Orense (CHUO) after a suicide attempt who did or did not require hospital admission and who were subsequently referred for outpatient treatment and who at least came to the first visit. The sample was made up of a cohort of 89 patients being treated in the IIP between April 2009 and June 2010 and another cohort of 102 patients who received conventional treatment from January 2007 to December 2007.

The definition of suicide attempt of Silverman^{35,36} for suicide attempt was used. All of those cases that adapted to

the following types were collected: with or without intentionality, with or without injuries, but without fatal outcome. Subjects with self-injuries, undetermined suicidal behavior and suicide attempts entered into the study.

The group of patients with conventional treatment were recruited from patients who were attended in general emergency services after a suicide attempt and evaluated by the on-duty psychiatrist, as stated in the psychiatric service emergency registry. The data for this group were collected retrospectively. Their clinical history was reviewed at an interval of one year after the suicide attempt that led to their referral for treatment to the reference Mental Health Care Unit. In the patients from the IIP treatment group who were also seen in the general emergency service after a suicide attempts, the information was collected prospectively during the 6-month treatment period and in the follow-up visit at one year of having initiated treatment. When this information could not be obtained because the patient did not come to the annual appointment, the patient's clinical history was reviewed. It was considered that there had been a repeat suicide attempt if there had been an emergency visit for this reason.

In conventional therapy, the patient is initially seen by the nursing staff with a welcoming interview and then by a psychiatrist and/or clinical psychologist. Treatment time does not have a defined time limit and there is no established frequency for the follow-up visits. Treatment is decided on a case by case basis. Referral for IIP treatment is through the emergency psychiatrist with the program. The appointment for the first consultation does not exceed 15 days of the emergency visit. The patient is seen by the nurse and psychiatrist on their first visit within the program. The nurse carries out a nursing evaluation and establishes the individualized care plan. The psychiatrist makes the evaluation, diagnosis and initiation and/or follow-up of psychopharmacological treatment. The following week, the patient is given an appointment to initiate psychotherapy treatment, with a mean of 10 sessions. This consists in a specific intervention for patients with cognitive-behavioral type suicide attempts in accordance with the treatment model that has been used by the Berk, Henriques et al. group at the University of Pennsylvania.^{19,37,38} The treatment is distributed into three phases:

- First phase (sessions 1 to 3): in which cognitive conceptualization of the case was made (identifying beliefs, automatic thoughts, emotions and behaviors that arise prior to the suicide attempt). A crisis plan is created (a list of coping strategies is made that incorporate new strategies as the therapy advances, including telephone numbers where the patient can call and the sites they can go when they have a crisis and cannot manage it alone).
- Second phase (sessions 4 to 7): Its target is suicidal behavioral, to help the patient develop both cognitive and behavioral strategies for better management of malaise, and thus to improve their level of functioning and coping regarding stressful situations and to modify their dysfunctional beliefs and thinking about the world, others and one's self. To do so, we apply cognitive techniques and coping behavior strategies that help the patient to manage the suicidal ideation in a crisis situation and in this way be able to prevent a suicide attempt. The "hope kit" is developed in this phase. This consists in choosing a significant object for the patient so that the patient can be connected with life by observing it in a moment of crisis.
- Third phase (session 8-10): This is the relapse prevention phase. We evaluated the coping mechanisms learned in therapy by discussing them in three different situations: index attempt, hypothetical situation similar to index attempt and a third situation - what would be the worst that could happen to you and how would you cope with it, how would you handle the suicide ideas that could appear?

There are two types of consultations, face-to-face consultations with the psychiatrist, clinical psychologist and nurse, and telephone consultations made by the nursing staff between sessions in order to supervise the guidelines given in the face-to-face consultation. Frequency, number of total consultations and their distribution among the three professionals can be observed in Table 1. Moreover, assertive follow-up is provided by a telephone call to the patients when they do not come to the consultation. Treatment has a duration of 6 months, with a follow-up visit at one year of treatment initiation. The program has telephone support for the primary care professionals and emergency services for evaluation of the risk of suicide and its initial management. The patient has a direct telephone to call during the morning from Monday to Friday in case of emergency. Outside of this period, the patients can go to the emergency services of the CHUO.

A data base to collect information in which the following study variables were recorded was created:

- Sociodemographic variables (age at index attempt, gender).
- Type of treatment received (conventional / IIP).
- ICD-10 Diagnosis.
- Number of previous attempts at time of inclusion in the study.
- Number of suicide attempts in the year following initiation of treatment.
- Need for admission with each new attempt.
- Suicide consumed during follow-up.

Table 1	Type and frequency of consultations																		
	Week																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	20	24	52
Psychiatrist	+		+					+										X	A
Psychologist		+	+	+		+		+		+			+			+	+	X	A
Nurse	+	+		+	*	+	*		*	+		*	+		*		+	X	A

+ Face to face consultation, *Telephone consultation, X Discharge consultation and A Annual consultation

- Suicide method used.

This study has the authorization of the Ethics Committee (EC), with dossier number 2010/473.

STATISTICAL ANALYSIS

A descriptive analysis of the sample was carried out for the data processing. The qualitative variables were described as frequencies and percentages and the continuous variables as mean and standard deviation. The Chi-square test was used to compare the categoric variables of both cohorts. The Kolmogorov-Smirnov Normality test was performed to determine normality of the continuous variables. The Student's T test for Gaussian variables was used in the comparison of the continuous variables in relation to exposed and non-exposed and the Mann-Whitney non-parametric U test was used for non-Gaussian variables.

The Kaplan-Meier survival curve and Cox Regression model were used for the analysis of recurrence of the suicide attempt.

Values of $p < 0.005$ were considered statistically significant. The statistical analyses were performed using the SPSS 15.0 program for Windows.

An analysis was made by intention to treat. This analysis included the data from the clinical records of those patients who abandoned treatment in both groups and all the suicide attempts that appeared in the emergency consultations by these patients.

RESULTS

A total of 191 patients (89 from the IIP group and 102 from the conventional treatment group) were recorded. Mean global age of the patients was $39.63 (\pm 16.21)$ years. Most were women, 143 (74.9%), and had not had a hospital admission in the index attempt - 150 (78.5%). The suicide method used most was drug poisoning in 146 patients (76.4%).

When both groups were compared (Table 2), it was observed that there were no significant differences regarding gender, age at index attempt, method used and need for admission. There were significant differences in the diagnosis ($p < 0.001$) and in the number of previous attempts. In the conventional treatment group, the mean of previous attempts was $0.69 (\pm 1.34)$ and in the IIP treatment group, it was $1.07 (\pm 1.4)$ ($p = 0.013$). In the latter group, 62.9 % of the patients were diagnosed of adaptive disorder.

In the conventional treatment group, 21 patients (20.6%) relapsed at least once. Six of them required admission while in the IIP treatment cohort, only 9 (10%) relapsed and although one was a consumed attempt, none required admission. Statistically significant differences were found between the percentage of relapses ($p = 0.047$). (Table 2)

By estimation of the Kaplan-Meier survival curve (Figure 1), significant differences were observed between both

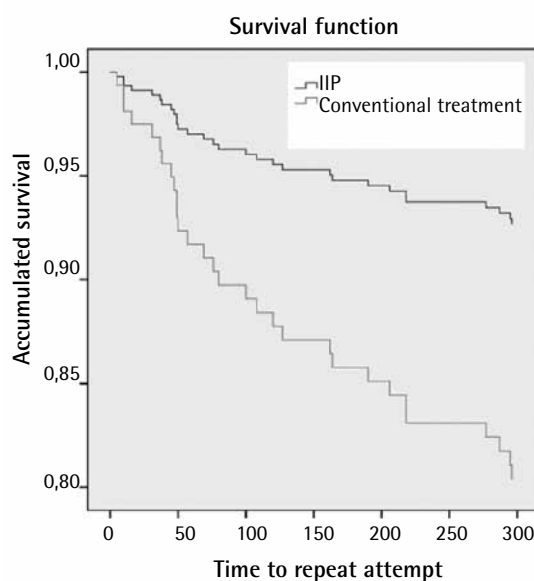


Figure 1 | Curves of repetition time after a first attempt

Table 2 Comparison between both groups in the study variables: demographic data (age and gender), admission for index attempt, method used, ICD-10 diagnosis, previous attempts and relapses after initiation of treatment

	IIP Treatment (n=89)	Conventional Treatment (n=102)	Total (n=191)	p
Gender (%)				0.260
Women	70 (78.7%)	73 (71.6%)	143 (74%)	
Men	19 (21.3%)	29 (28.4%)	48 (25.1%)	
Admission	17 (19.1%)	24 (23.5%)	41 (21.5%)	0.457
Age mean (SD)	39.66 (14.71)	39.62 (17.50)	39.63 (16.21)	0.987
Method (%)				0.124
Drug	64 (71.9%)	82 (80.4%)	146 (76.4%)	
Chemical agent	1 (1.1%)	1 (1.0%)	2 (1.0%)	
Bladed weapon	8 (9.0%)	12 (11.8%)	20 (10.5%)	
Firearm	0 (0.0) %	1 (1.0%)	2 (0.5%)	
Hanging	5 (5.6%)	4 (3.9%)	9 (4.7%)	
Jumping from heights	9 (10.1%)	1 (1.0%)	10 (5.2%)	
Others	2 (2.2%)	1 (1.0%)	3 (1.6%)	
Diagnosis (%)		19 (25.0%)		<0.001
Affective D.	16 (18.0%)	24 (31.6%)	35 (21.2%)	
Personality D.	12 (13.5%)	17 (22.4%)	36 (21.8%)	
Adaptive D.	56 (62.9%)	16 (15.8%)	73 (44.2%)	
Others	5 (5.6%)		21 (10.9%)	
Mean previous attempts (SD)	1.07 (1.4)	0.69 (1.3)	0.87(1.4)	0.013
Relapse (%)	9 (10.1%)	21 (20. %6)	30 (15%)	0.047

groups ($\chi^2=3.99$; $p=0.046$). Mean time to relapses in the first repeat attempt of the IIP group was greater -340.30 (± 8.32) days versus those receiving conventional treatment -312.89 (± 10.99) days ($p<0.001$). Furthermore, it was observed that 50% of the patients from the IIP group who relapsed did so before 90 days versus the 54 days for the conventional treatment group.

After, a multivariate Cox regression model was made (Table 3) to determine the effectiveness of the treatment adjusted by number of previous attempts, age, gender, need for admission after index attempt and aggregated diagnosis. It was observed that the only predictive variable of relapse was type of treatment received: the patients who had been attended in the program had 2.88 times less risk of relapse ($p=0.015$).

CONCLUSIONS

The results show that subjects who were treated within the Intensive Intervention Program (IIP) have fewer relapses, need fewer admissions, and the time from onset of treatment and first repeat attempt - if it occurs, is greater. These results are consistent with those found in other studies that have

evaluated effectiveness of the same brief cognitive therapy¹⁶ in prevention of suicidal behavior. The patients who had received said therapy had 50% less likelihood of relapse during the follow-up period versus those who had received conventional treatment. The Suicide Behavior Prevention Program (treatment with psychiatrist, clinical psychologist and nursing), a program based on health care education, has been carried out in the district of Detra de l'Eixample in Barcelona, Spain for some years. A total of 219 patients, 67% of whom completed the follow-up at one year, were compared with a group of patients from another district who received conventional treatment. Their results were along the same line as ours. The patients in the program had fewer suicide attempts, and time from initiation of treatment and first repeat attempt was greater. Fewer hospitalizations were also required.³⁹

The intervention efficacy in terms of proportion of patients who relapse is independent of gender, age, admission after index attempt, number of previous attempts and diagnosis (even though there are significant differences between both groups in the last two variables). Thus, receiving specific treatment in IIP becomes the only predictor factor of survival. This contrast with the previously mentioned study¹⁶ in which no differences were found

Table 3 Cox's Multivariate Analysis to determine predictive factors of suicide attempt

	B	Sig.	Exp(B)	95.0% CI for Exp(B)	
				Inferior	Superior
Cohort (PII)	-1.058	0.015	0.347	0.148	0.814
Gender (Man)	0.366	0.437	1.443	0.572	3.636
Age (years)	-0.002	0.869	0.998	0.972	1.024
No. previous attempts	0.134	0.221	1.143	0.922	1.417
Admission	-0.413	0.363	0.661	0.272	1.611
Diagnosis		0.344			
Personality	-0.028	0.957	0.972	0.347	2.723
Adaptive	-0.501	0.367	0.606	0.204	1.799
Others	-1.238	0.124	0.290	0.060	1.402

Cohort (IIP): Patients treated in the intensive intervention program (Untreated reference variable with IIP program); Gender (Man): Patient gender (Reference variable Woman); Age: Age in years at onset of treatment; Admission: Patients who need admission after index attempt (reference variable patients without admission); Psychiatric diagnosis according to ICD-10 of patient at onset of treatment (reference variable affective diagnosis).

when, age and gender are controlled when applying the Cox regression model.

This study has a series of limitations that should be mentioned. On the one hand, as it is a retrospective study for the conventional treatment group and a prospective one for the IIP treatment group, differences and biases could be expected when collecting information. However, in this case, this favors the conventional treatment patients since a tendency to collect fewer relapses is expected as the collection of information in the follow-up at one year is retrospective and therefore it could seem that there is a better evolution. In spite of this, the data favor the program group.

The diagnoses had to be classified into four groups because of their diversity and the small sample size to allow for a minimum level of analysis (table 2). The differences by diagnosis found could lead to the suspicion that both samples were not homogeneous. However, we have included all the patients attended in both groups and that met the inclusion criteria and therefore we believe that this is not a problem of bias in the sampling. Analyzing the information collection process, it was seen that the differences could be due to the different moments that the diagnoses were collected, this being in the emergency services for the conventional treatment group and in the first medical visit for the program group. Thus, it cannot be concluded that the samples were not homogeneous regarding the diagnosis. Unfortunately, this difference has prevented us from obtaining reliable conclusions regarding the diagnosis.

Another limitation of the study due to its retrospective character in those who receive conventional treatment is that there are no data on abandonment due to the difficulty of identifying patients who have left the treatment in this

group. Thus, data on abandonment is only available in the treatment group. Although this does not harm the efficacy data, it limits the information regarding the acceptability and capacity of patient treatment adherence. The efficacy data are not affected when an analysis is made by intention to treat, including all the patients recruited. It has the advantage that the principal variable is also known in all the patients, whether they have completed the treatment or not. This difference is once again a bias that favors the evolution of the treatment group and leads to the consideration that the differences in efficacy could be even greater than those found.

Previous suicide attempt is identified consistently in the literature as one of the most important risk factors of suicide.^{1,3,40-43} We see that the IIP treatment group in begins with a greater burden in backgrounds of suicide behavior and therefore can be considered as a more severe sample. In spite of this disadvantage, the program was demonstrated as efficient, so that greater effectiveness in patients with equal risk can be expected.

So we can state that a specific, simple, and economic intervention, as it does not require great technologies, oriented at risk groups, prevents recurrence in suicidal behavior.^{13,14,17-19,44-46} The suicide death rate is an important and required variable in this type of study. However, its lack of frequency requires the use of much larger samples, something that is out of our reach.

We consider that the development of multicenter studies that make it possible to evaluate the efficacy of similar interventions in consumed suicide and that more accurately predict which factors have an influence in the prevention of the suicide to be of vital important.

ACKNOWLEDGEMENTS

General subdirection of the Socio-Health Care and Mental Health Care Management, Research Unit of the Complejo Hospitalario Universitario of Ourense and Interterritorial Council of the National Health System.

This program has been funded by the interterritorial cohesion funds of the national health system, which were granted by the General Subdirection of the Socio-sanitaria e Saúde Mental del Servicio Galego de Saude (SERGAS).

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