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Outcomes of a suicide prevention program in the general population. Barcelona dreta eixample district

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Background and objective. Suicide and self-destructive behaviors are not only health problems but are also related to social and personal aspects. Public health and community action can play an important role in increasing survival among those at risk. We present the results of a program based on health education among the general population and in a specific health care setting to monitor the at risk population.

Subjects and Method. The Suicide Behavior Prevention Program (SBPP) developed in the Dreta de l'Eixample district in Barcelona city included 219 patients, 148 (67.5%) of whom completed a 12-month follow-up. We selected a comparison group from a neighboring district that did not have a SBPP. This group was made up of 180 patients, 167 of whom completed the 12-month follow-up.

Results. Main differences between the two groups were that patients who were enrolled in the SBPP consulted more often for suicidal thoughts than those in the comparative group (36% vs 25%), had fewer hospital admissions (6% vs 36%), presented fewer repeated suicide attempts over the 12-month follow-up (11% vs 32%) and showed longer time to repeat attempt.

Conclusions. Early detection of suicidal ideation and adherence to post-suicide attempt treatment reduce the risk of recurrent suicide attempts. Further studies with longer follow up may help to reduce suicide mortality.

Key words (MEDLINE MeSH):
Suicide, "Suicide, attempted", Risk reduction behavior, Health education, Follow-up studies, "Outcome assessment (Health care)"

Actas Esp Psiquiatr 2011;39(5):280-7

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Resultados del programa de prevención de la conducta suicida. Distrito de la Dreta de l'Eixample de Barcelona

Fundamento y objetivo: el suicidio y las conductas autodestructivas son en parte un problema sanitario pero también social y personal. En este sentido, la actuación desde la salud pública y comunitaria es importante para aumentar la supervivencia de las personas en riesgo suicida. El objetivo de este trabajo es mostrar algunos resultados de un programa basado en la educación sanitaria de la población general y el establecimiento de circuitos asistenciales específicos para el seguimiento de esta población de riesgo.

Material y método: El Programa de Prevención de la Conducta Suicida (PPCS), llevado a cabo en el distrito de la Dreta de l'Eixample de Barcelona, incluyó a 219 pacientes de los que 148 (67,5%) completaron el seguimiento al año. Se seleccionó un grupo de comparación de 180 pacientes, procedentes de otros distritos colindantes en los que no se realizaba el PPCS, 167 de los cuales completaron el seguimiento.

Resultados: en las comparaciones de ambos grupos las principales diferencias significativas fueron que los pacientes que entran en el PPCS consultaron más frecuentemente por ideas suicidas que el de comparación (36 % *vs* 25%), presentaron menos ingresos hospitalarios (6% *vs* 36%), repitieron menos tentativas suicidas al año de seguimiento (11% *vs* 32%) y el tiempo hasta la repetición fue mayor.

Conclusiones: La detección precoz de las ideas suicidas y la adherencia a la terapia post-tentativa, como se observa en los pacientes del PPCS, disminuye las recidivas. Se requieren nuevos estudios más prolongados que reduzcan también la mortalidad suicida.

Palabras clave (de acuerdo al DeCS):
Suicidio, Intento de suicidio, Conducta de reducción del riesgo, Educación en salud, Estudios de seguimiento, "Evaluación de procesos y resultados (Atención de salud)"

INTRODUCTION

Suicide may be the most devastating death, both for the subject as well as for those who survive the victim. It is frequently ignored by the social media. In Spain, it is the primary cause of death due to external agents since 2009. Every year, almost one million persons in the world commit suicide. Of these, 163,000 are Europeans, this representing a rate of 17.5 suicides per 100,000 inhabitants.[1] In Spain, the suicide rate is lower.[2] In Spain, it was about 8 per 100,000 inhabitants in 2006, with a greater frequency among men (12.6) than among women (3.5).

For every suicide consumed, there are 20 to 30 suicide attempts, so that the risk of recurrence is important. Up to 35-50% repeat the attempt, above all by voluntary drug poisonings. Among death by suicide, 40% have previously attempted suicide and thus attempt becomes an elevated risk of subsequent consummation. Ten to 15% of the persons with an initial attempt commit suicide within the next 10 years. The risk of recurrence of a suicide attempt has been increasing with time and the appearance of "large repeaters" who make multiple low lethal intention attempts has been observed, giving rise to the concept of para-suicide or chronic suicide.[3]

Health care authorities have approached this problem with proposals to reduce suicidal mortality by up to 20%.[1, 4, 5]

The efficacy of many programs has been evaluated in the scientific literature. The results are moderate when an attempt is made to decrease mortality but with a significant effect on the decrease of repetition and survival after the suicide attempt. However, the fundamental criticisms on these studies are focused on their short-term, the exclusion of these patients due to ethical limits linked to randomized clinical trials or the exclusion of patients in studies that evaluate the efficacy of antidepressants.[6-9]

Education and sensitization programs have shown their relevance in primary care. In this setting, up to 25% of the patients attended have psychiatric symptoms. It has been demonstrated that 60% of suicide victims were seen during the month prior to the death without detecting the risk. Furthermore, up to 30% of the suicide victims over 65 years were not being attended in a Mental Health Center, their care being performed only by the family physician. Adequate knowledge of these professionals on depressive disorders and suicide risk factors, especially the detection of suicide ideas, are decisive for prevention.[10-12]

On the other hand, *"gatekeepers"* or social network catalysts also play an important role in the detection of signs of alarm and risk behavior.[13]

Suicide continues to be a taboo in almost all the societies for the general population. Therefore, already in the year 1960, the community prevention programs were publicizing a series of myths and prejudice on suicide whose validity continues for the general population.[14] Medical education makes it possible to identify real pre-suicidal plans, decreasing social censorship and facilitating communication of the auto-destructive ideas.

Mental disorders[15] and suicidal backgrounds are the most relevant risk factors, so that some programs have analyzed different symptoms and evolution times with greater risk.[16, 17]

Evaluation of interventions aimed at decreasing suicidal behavior has shown unequal results. Comparison between different antidepressants has not shown conclusive results, since some studies have indicated that in the countries where antidepressants are prescribed more frequently, the rate of suicidal behaviors has decreased, but not in other countries.[18-21] The results are better if lithium is administered to responding bipolar patients,[22] or if chronic schizophrenic patients are treated with clozapine.[23]

On the other hand, the cognitive -behavioral psychotherapy approaches have been shown to decrease recurrences of suicidal attempts, in personality disorders or traits that facilitate impulse dyscontrol.[24-26]

Intervention and follow-up programs of suicidal attempts have demonstrated that in the months 12 to 24 following the attempts, the risk of both repetition and consummation increases.[27, 28]

The risk of provoking imitation in suicidal behavior has lead to caution, sometimes excessive, that results in the silencing of the problem of suicide and its conditioning factors. However, the means are also effective for adequate information on the suicidal reality. Internet deserves special comment, above all for the adolescent and young population.[29-32]

In Catalonia, the Mental Health Department of the Conselleria de Sanitat de Catalunya promoted a suicide prevention program in the district of Dreta del Eixample of Barcelona.[4]

The purpose of this work is to show the results of this program, aimed at verifying if early detection of suicidal ideation decreases the proportion of suicidal acts and if it also has a repercussion on the repetition of the suicidal behavior.

METHODOLOGY

The Suicide Behavior Prevention Program (SBPP) (PPCS in Spanish) was carried out in the district of Dreta de

l'Eixample of Barcelona. It is coordinated by the Psychiatry Service of the Hospital de la Santa Creu i Sant Pau (HSCSP) and the Adult Mental Health Center of Dreta de l'Eixample – Centre Psicoteràpia Barcelona – Mental Health Service (CSMA.CPB.SSM). The SBPP was developed in 4 phases between September 2005 and December 2008.

A multidisciplinary team was created to enter into contact with the different care levels and social facilities in which the SBPP would be set up in the first phase from September 2005 to April 2006. A data collection protocol was agreed on and the care circuits for the patients from the different facilities involved were designed.

In the second phase, an information, education and sensitization program aimed at health care professionals and social workers through informative sessions adapted to each group was elaborated. In addition, a series of audiovisual material (leaflets, DVD) were elaborated to inform and alert on the subject of suicide.[34] A website (www.suicidioprevencion.com) was also created for early identification of the alert signs. This site offers the possibility to consult directly with professionals attached to the SBPP by E-mail address.[31]

On the community level, the psychoeducational activity on suicide risk was extended to the basic health areas, *"gatekeepers:"* social welfare services, geriatric care facilities, hospital emergency services, civil associations of the district, businessmen, relatives of mental patients, diocesan pastoral commission, security forces and firemen, public transport agencies, and communication media.

The third phase of the SBPP, between April 2006 and December 2007, was aimed at providing attention to patients with suicidal ideation or behavior. The different care resources were aimed at preferential care in a maximum of 48 hours to assure care continuity. An individualized treatment plan was designed, in which a reference psychiatrist in charge of coordinating the care for 3-6 months in which the patient was attended to in the SBPP was designed. After said period, the patient was incorporated into the mental health care circuit. Cognitive-behavior and crisis intervention psychotherapy groups as well as help to the survivors were also organized. Beginning with the hospital inter-consultation, hospitalized patients who required medical-surgical care were seen.

The patients came to the SBPP referred from the psychiatry emergency services, from the family physicians of the sector and from the hospital interconsultation. All the patients referred to the program were evaluated by a psychiatry, who determined their definitive inclusion. The inclusion criteria were:

1. being over 18 years,
2. having attempted suicide or having active suicidal ideation at the time of the initial evaluation,
3. that the patient voluntarily came to participate in the SBPP.

The study protocol included sociodemographic variables (gender, age, civil status, living arrangement and work status), family psychiatry and suicidal behavior backgrounds, personal psychiatric and suicidal behavior backgrounds, psychiatric diagnosis according to DSM IV-TR criteria, if treatment was performed previously, evaluation of current suicidal behavior according to the RTM-III[33] therapeutic recommendations in mental disorders (type, method, somatic severity, impulsiveness, existence of previous attempt and number of previous attempts), evaluation of suicidal ideation with the item of suicide on the Hamilton depression rating scale and with the suicide item of the Beck depression self-applied scale, drug treatment and/or psychotherapy indication, referral.

The protocol data were collected by the psychiatrist, by a standardized, semi-structured interview.

During the time that the patients were in the SBPP, they had visits with the psychiatrist, individual or group psychotherapy with a clinical psychologist and nursing, visits with social care, if necessary.

In the fourth and final phase, in 2008, the follow-up was performed. The patients were evaluated through protocol-based face-to-face or telephone interviews at 6 and 12 months, conducted by the psychiatrist or nurse, collecting data on the repetition of the suicide behavior, if there had been hospital admission due to suicide behavior, the follow-up in the program or mortality.

The results presented in the following compare the patients who underwent the program in the study sector with other patients who had consulted for the same reason and who were in different sectors, outside of the SBPP area.

The Dreta del Eixample is a neighborhood with 125,000 inhabitants whose sociodemographic characteristics are similar to those of the surrounding neighborhoods of the city of Barcelona. Most of the population is made up of young persons (34%) and adults (34%), while 22% are over 65 years of age. A total of 55% are women and 15 % live alone.

The data were processed through descriptive statistical analysis. The description of the categorical variables was made using contingency tables, verifying inference (p value) with the Chi-square test or Fisher's exact test, as corresponded. For the quantitative variables, the means and respective

standard deviations (SD) were calculated for each group, and in this case, the inference was calculated with the Student's T test for independent data. The approach was always bilateral, with a 5% significance level (α= 0.05). The statistical analysis was performed with the SPSS program v.15.0.

RESULTS

From September 2005 to December 2007, 1316 patients with suicidal ideation behavior were seen. From the initiation of the Care Program in April 2006 to its completion in December 2007, 325 subjects were attended in the Dreta de l'Eixample and 664 from other zones. Figure 1 shows the subpopulations based on sector of origin and the initiation of the care program (before and after April 2006). In the following, the results observed in the populations attended to after the initiation of the care program in April 2006 are described.

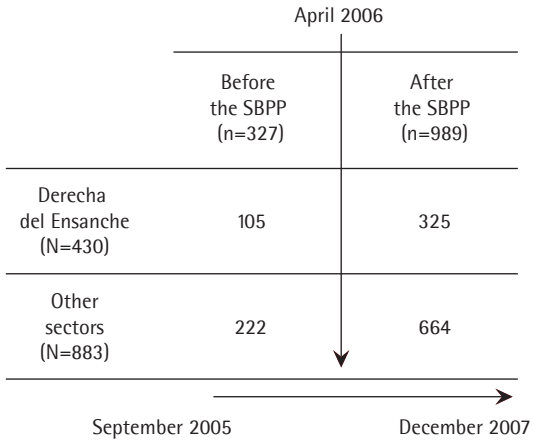

Figure 1 Subpopulations of the total

Only 219 of the 325 patients from Dreta de l'Eixample were included in the Program. The rest did not participate and were referred to their usual psychiatrist (60%). They were either included within drug addict programs (20%) or did not participate for other reasons (20%).

Only 180 of the 664 patients from other zones were included in the control group, these belonging to the same neighborhood. These 180 patients received care at the same time as the SBPP patients and who came voluntarily to receive monitoring at months 6 and 12.

Therefore, the data of 219 patients from the Dreta de l'Eixample included in the SBPP were compared with 180 patients from the control group.

Of the 219 patients included in the SBPP, 152 underwent follow-up until month 6 and 148 were completed and were evaluated at the end of 12 months (in the 6 months, 2 patients committed suicide and 2 others were lost). Of the 67 patients who did not complete the study, 44 of them were discharged at the end of 2 or 3 visits since the suicide ideation did not persist or because the crisis situation had been resolved. The remaining 23 abandoned follow-up.

Of the 180 patients in the control group, a total of 172 patients completed the telephone follow-up at 6 months and 167 did so at 12 months. One patient committed suicide between 6 and 12 months, and the rest (4) were not located. Finally, 148 patients completed the SBPP and their results could be compared with that of the 167 patients from other sectors at 1 year of follow-up.

The sociodemographic data are similar between the SBPP and control group in regards to age, distribution by gender and residential status (table 1). A difference was observed as there was a higher percentage in the control group of single persons and young adult pensioners.

Table 2 shows the differences and diagnostic distribution (DSM-IV axes) between the 2 populations, principally on axis I. In the SBPP group, affective and adaptation disorders predominated. On the contrary, in the control group, there were more psychotic disorders and drug dependency disorders. Regarding axes II, the proportion between diagnoses was similar. In regards to the social adaptation level in the last year (axis V), the score is the same in both groups.

Special attention should be given to the characteristics of the suicidal behavior (table 3). The distribution of suicidal attempts and ideation was inverse in person both groups, with a greater percentage of suicidal ideas in the SBPP group (55% *vs* 39%; p<0.0001) and greater percentage of attempts in the control group (31% *vs* 57%; p<0.0001). The suicidal methods used, somatic severity and impulsiveness of the behavior were similar in both groups. In the control group, there were more patients with previous attempts, but the number of previous attempts was similar.

The lower proportion of hospital admissions in the SBPP group (6.5%) compared with that of the rest of the participants (36.5%) is very significant (table 4).

Even though we have made a follow-up at 6 months, we are not presenting these results because they are along the same line as those of 12 months.

At 12 months of follow-up, 32% of the control group repeated the suicidal attempt, a percentage that was only

Table 1 Sociodemographic data. comparison of SBPP and Control group

Sociodemographic Data	SBPP n=219	Control Group n=180	
Gender			
Men	31%	39%	p=n.s.
Women	69%	61%	
Age			p=n.s.
Mean (SD)	41.6 (14.2)	41.9 (15.6)	(CI -3.26, 2.73)
Civil status			
Single	35%	49%	p=0.029
Married	33%	27%	
Others	32%	24%	
Living arrangements			
They live alone	18%	17%	p=n.s.
They live accompanied	82%	83%	
Work status			
Working	60%	43%	
Unemployed	16%	15%	p=0.001
Pensioner	17%	32%	
Others	7%	10%	

Table 2 DSM-IVTR Diagnosis, comparison SBPP *vs* Control group

DSM-IVTR Diagnosis	SBPP n=219	Control Group n=180	
Axis I			
Affective D	**48%**	**32%**	
Psychotic D	4%	**15%**	
Adaptive D	**32%**	**15%**	p<0.0001
Anxiety D	7%	6%	
Drug Addiction D.	3%	**15%**	
Without diagnosis	6%	**17%**	
Axis II			
Cluster B	36%	40%	p=n.s.
Other	6%	5%	
Without diagnosis	**58%**	**55%**	
Axis V			p=n.s.
Mean (SD)	62 (8.7)	62 (11.7)	(CI -2.27, 2.27)

11% among the patients who followed the SBPP program. The latter also had a lower mean of repetitions (1.5 *vs* 2.9; p=0.001). The SBPP group had 50% fewer admissions during follow-up than the control group (9% *vs* 18%; p=0.03) (table 5).

Five patients who were living in the Dreta de l'Eixample sector committed suicide during the study period. Of these,

Table 3 Suicidal behavior, comparison SBPP *vs* Control group

Suicidal behavior	SBPP n=219	Control Group n=180	
Type of Suicidal Behavior			
Attempt	31%	**57%**	
Frustrated Suicide	6%	1%	p<0.0001
Self-harm	4%	5%	
Suicidal ideas	**59%**	37%	
Method Poisoning			
Drugs	73%	81%	p=n.s.
Violent	**18%**	10%	
Others	9%	9%	
Somatic Severity			
Mild	75%	84%	p=n.s.
Moderate	15%	12%	
Severe	**10%**	4%	
Time between idea and act (impulsiveness)			
Less than 1 h	63%	70%	p=n.s.
More than 1 h	37%	30%	
Existence of previous attempt			
Yes	**33%**	**54%**	p<0.0001
No	**67%**	**46%**	
No. previous attempts			p=n.s.
Mean (SD)	3.19 (3.1)	3.44 (3.6)	(CI -1.35, 0.85)

Table 4 Previous treatment and referral, comparison SBPP *vs* Control group

Treatment and referral	SBPP n=219	Control Group n=180	
Previous treatment done			p=n.s.
Yes	72%	78%	
No	28%	22%	
Referral			
Admission	**6.5%**	**36.5%**	p<0.0001
Day Hospital	2.5%	3%	
Outpatient	**89.5%**	**56.5%**	
Discharge without follow-up	1.5%	4%	

2 women were included within the prevention program, 3 others (one woman and 2 men) had connections with their primary care facility.

Table 5 12 month follow-up, suicidal behavior recurrent. Comparison SBPP *vs* Control group

12 month follow-up	SBPP n=148	Control Group n=167	
Repetition of suicide attempt at 12 months			p<0.0001
Yes	11.5%	32%	
No	88.5%	68%	
No. of repetitions 12 months			p=0.001 (CI -2.12, -0.55)
Mean (SD)	1.59 (0.79)	2.92 (2.49)	
Time in months to first repetition			p=0.049 (CI 0.006, 3.81)
Mean (SD)	5.29 (4.2)	3.38 (3.07)	
Requires admission due to suicide risk at 12 months			p=0.034
Yes	9.5%	18%	
No	90.5%	82%	

CONCLUSIONS

The importance of our work is both in the significant reduction in recurrences of suicidal behavior and hospitalizations as well as the need for and early and correct detection of the suicidal ideas that confirm the effectiveness of the SBPP.

It is also interesting to point out the novelty of the experience in our setting. This is a preventive and community program aimed at the general population, based on health care education regarding self-destructive behaviors and the coordination of health care and social care facilities for immediate, intensive care. It is a program that guarantees follow-up and adherence to the mental health facilities.

The health care information provided through audiovisual media, informing on the immediate care resources for persons at risk, did not cause an "epidemic of suicide attempts" or an over-demand for care. This fact is confirmed in other previous experiences.[34-36]

Among the patients attended for suicidal behavior belonging to the Dreta de l'Eixample sector, there was a much higher percentage of suicidal ideas than in the control group. This may be because the phase of the program aimed at psychoeducation determined the detection of these ideas in an earlier phase, because of the intervention of primary care, or through the initiative of the patients or their family. The results are indicative that reasoned information on suicidal risks facilitates request for help.[35]

One marker of efficacy of the program is reflected in the fact that patients who participated in the SBPP repeated less suicide attempts than those of the control group at one year of follow-up. In this period, described as that of greatest risk of recurrence, the multidisciplinary intervention (psychiatric, individual or group psychology, social work) has been shown to be highly effective for the decrease of the recurrences.[37-39]

Furthermore, having outpatient circuits of immediate care within individual handling of the cases decreases the need for hospital admission. In districts where there is no specific outpatient care, the number of hospitalizations for containing suicide risk is greater during the clinical decompensation or crisis situations of the patient.[40]

The sociodemographic differences found among the patients with SBPP and the control group indicate that there is a higher percentage of single persons and pensioners in the control group. This could be due to the fact that there are more patients in the control group diagnosed of Psychotic Disorder and Drug Addiction Disorder.

On the other hand, the results were evaluated prospectively, in a longitudinal design with a control group, following the design of other studies available in the literature.[8]

Among the limitations, the first one is the difficulty to define which phase of the program has the greatest efficacy regarding the others (health care education individualized care or coordination of the resources). In the second place, there is the sociodemographic and diagnostic differences between the two study groups that could give less importance to some results. This situation could be resolved with a study design having paired cases. In the third place, mortality due to suicide could not be evaluated due to absence of statistical data in each population sector. The descriptions of the known cases were obtained from the neighbors. In the fourth place, the suicide risk, on being maintained over time, suggests the convenience of a longer follow-up period. However, the greatest risk has been observed during the first year follow-up in other studies.[41]

The evaluation of suicide risk is always a psychiatric emergency and there is a need for the existence of specific care circuits for the treatment of this syndrome. Detection of suicidal ideas and treatment adherence after an attempt, as is observed in the SBPP, decreases recurrences and hospitalizations. Longer studies that make it possible to increase the survival time and reduce suicidal mortality are required.

ACKNOWLEDGMENTS

Project financed by Mental Health Department of the Conselleria de Sanitat de Catalunya. Director of the Pla de Salut Mental: Mrs. Cristina Molina

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