Psicothema

Are previous suicide attempts a risk factor for completed suicide?

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Abstract

Background: A previous suicide attempt is a clinically relevant factor for completed suicide. In this paper people who committed suicide on their first attempt are compared with those who did so after previous attempts. **Method:** A review of the Computerised Clinical Histories in the Navarro Health Service-Osasunbidea (2010-2013) in Spain. **Results:** Of the 166 cases, 31.9% (n = 53) presented at least one prior attempt. Of these 53, 65.3% modified the method of suicide. Women presented significantly more attempts (χ^2 = 14.3; df = 3; p = .002). Three sub-samples were identified according to the attempts and diagnoses. The diagnoses of personality disorders (90.9%; n = 10) and women under 51 years of age with a diagnosis of affective, anxiety, or substance abuse disorders (82.4%; n = 14) presented the highest numbers of attempts. People without a psychiatric diagnosis and with psychotic or organic mental disorders presented the smallest proportion of attempts (13.2%; n = 10) together with people over 51 years of age diagnosed with affective, anxiety, or substance abuse disorders (22.5%; n = 9). **Conclusions:** Prior attempts are suicide risk factors only in specific clinical sub-samples. Prevention and intervention programs should consider these results.

Keywords: Completed suicide, prior attempts, mental disorder, method of suicide.

Resumen

¿El intento de suicidio previo constituye un factor de riesgo para el suicidio consumado? **Antecedentes:** el intento previo de suicidio es un factor clínicamente relevante para el suicidio consumado. En este trabajo se comparan las personas que se suicidaron en su primer intento con quienes lo hicieron tras intentos previos. **Método:** revisión de las historias clínicas del Servicio Navarro de Salud-Osasunbidea (2010-2013). **Resultados:** de los 166 casos, el 31,9% (n = 53) presentaba algún intento previo. De estos 53, el 65,3% modificó el método de suicidio. Las mujeres presentaban más intentos (χ^2 = 14,3; g.l. = 3; p = ,002). Se identificaron tres submuestras: los diagnósticos de trastornos de personalidad (90,9%; n = 10) y las mujeres menores de 51 años con diagnóstico de trastornos afectivos, de ansiedad o por consumo de sustancias (82,4%; n = 14) presentaban los mayores porcentajes de intentos. Las personas sin diagnóstico psiquiátrico, con trastornos psicóticos u orgánicos fueron quienes menor proporción de intentos presentaban (13,2%; n = 10) junto con las personas mayores de 51 años diagnosticadas de trastornos afectivos, de ansiedad o por consumo de sustancias (22,5%; n = 9). **Conclusiones:** los intentos previos son factores de riesgo únicamente en submuestras clínicas específicas. Los programas de prevención e intervención deberían confeccionarse teniendo en cuenta este resultado.

Palabras clave: suicidio consumado, intentos previos, trastorno mental, método de suicidio.

The World Health Organization estimates that approximately 800,000 people commit suicide every year, with the principal risk factors being suffering from a mental disorder (Cavanagh, Carson, Sharpe, & Lawrie, 2003) and having a history of prior suicide attempts (Nock et al., 2008). That being said, there are many more people who make suicide attempts than people who complete them. It is estimated that for every completed suicide, there are between 10 and 40 non-lethal attempts (Platt et al., 1992). Women present higher rates of attempts than men, and they are between 1.5 (Nock et al., 2008; Parra-Uribe et al., 2013; Schmidtke et al., 1996; Vázquez-Lima, Rodríguez, Lamas, Landeira, & Alvarez, 2012) and 3 times (Gabilondo et al., 2007) more likely to attempt it. The

suffering this causes for the person and his or her social network, the cost to the health system, the possible disabilities generated, and the loss that comes from a potentially avoidable death justify the importance of understanding the relationship between prior attempts and subsequent suicide (Schmidtke et al., 1996).

Prior attempts are present in one-third of completed suicides, and they are considered a clinically relevant predictor of suicidal behaviour (Cavanagh et al., 2003; DeJong, Overholser, & Stockmeier, 2010; Isometsa & Lonnqvist, 1998; Parra-Uribe et al., 2013) because people with prior attempts have between 40 (Harris & Barraclough, 1997) and 66 times (Hawton, Zahl, & Weatherall, 2003) more risk of suicide than the general population. Indeed, 16% of the people who have made a non-fatal attempt will try again within one year, and between 0.5% and 2% will complete the suicide (Owens, Horrocks, & House, 2002). The risk of completing it is higher for men (1.1%) than it is for women (0.5%) (Hawton et al., 2003), and in both cases, it increases with age, especially in women older than 55 years of age. After a failed attempt, the risk of repetition is high during the subsequent decade, especially in people who made the attempt in a

planned manner, who had a mental disorder, who were undergoing psychiatric treatment, or who had a physical illness (Hawton et al., 2003; López-Castroman et al., 2011; Suokas, Suominen, Isometsa, Ostamo, & Lonnqvist, 2001).

With regard to the methods utilised, it is estimated that 82% of the people who commit suicide have used at least two different methods in their prior attempts to achieve lethality (Isometsa & Lonnqvist, 1998), without finding differences between the sexes (Hawton et al., 2003; Suokas et al., 2001). The change in method in the subsequent attempts can lead to a high probability of completed suicide, although this relationship remains unclear (Suokas et al., 2001).

However, for some authors, prior attempts are a risk factor with limited sensitivity because they are not found in 60-90% of completed suicides (De Jong et al., 2010; Isometsa & Lonnqvist, 1998; Parra-Uribe et al., 2013). For this reason, the objectives of this study are: 1) to evaluate and compare clinical variables, and the variable of the method(s) employed, of people who committed suicide on their first attempt and people who committed suicide after prior attempt; 2) to determine whether there was a change in method of suicide among those who had prior attempt; 3) to establish different patient profiles according to the existence or absence of prior suicide attempts that can guide interventions in at-risk populations.

Method

Participants

All people who died in the period 2010-2013 in the Chartered Community of Navarre (Spain) as a result of a completed suicide and who had their clinical history computerised were included (n = 166).

Instruments

A database was created for the purpose of data collection. Of the computerised clinical histories of patients, the following variables were collected: principal diagnosis according to the ICD-10 if there was one; the existence or lack thereof of prior suicide attempts and the method used in each attempt; and the existence of family history and other sociodemographic variables.

As O'Carroll et al. propose, a suicide attempt was defined as a potentially harmful behaviour, with a non-fatal result, self-directed, and with the intention of dying (O'Carroll et al., 1996) that would have necessitated attention in an Emergency Psychiatric Services Ward. In addition to the aforementioned data, the date of suicide and the method employed were collected from the legal autopsy.

Procedure

The study began after the approval of the Clinical Research Ethics Committee of Navarre (Ref. 44/2012). To determine which persons had died as a result of suicide, the starting point was the information provided by the Navarre Institute of Legal Medicine in the corresponding period.

Once the persons were identified, the computerised clinical histories were reviewed in the Navarro Health Service- Osasunbidea (SNS-O by its initials in Spanish), and the database built for this purpose was completed. Each clinical history was reviewed twice by two different researchers with the purpose of ensuring the

reliability of the data collected. In cases of disagreement between the two researchers, the rest of the research team participated until a consensus was reached on the datum in question.

The clinical diagnoses were grouped into the following categories (ICD-10): affective disorders (F31, F32, F33, F34), anxiety disorders (F41), substance abuse disorders (F10, F12, F13, F14, F15, F19), psychotic disorders (F20, F21, F22, F23, F25, F28, F29), personality disorders (F60, F61, F69), and organic mental disorders (F01, F03, F05, F07, F09). Two diagnoses (eating F50 and impulse control F63 disorders) were included as "other diagnoses" to take a single case into account. These two cases were not included in the multivariate analysis.

One previous study has been developed with this sample describing the sociodemographic, temporal characteristics and the methods employed (Azcárate et al., 2015).

Data analysis

The distribution of missing data was analysed, without finding significant differences between subjects with and without available data in all variables studied. Therefore, the pairwise deletion method was selected, analysing the available cases in each variable. Descriptive analyses were performed for all of the variables. In the tables, the number of cases in which the information was recorded in the clinical histories is included. In the following analyses, the clinical histories that did not contain the pertinent data are excluded. For the bivariate comparisons, the χ^2 analysis or the t test was used for independent groups according to the nature of the variables analysed, considering $p < .05$ to be significant.

For the multivariate analysis between people with or without at least one prior attempt, CHAID *(Chi-Squared Automatic Interaction Detection)* segmentation analysis was used. This technique evaluates the discriminant capacity of a nominal variable (in this case, the presence or absence of at least one prior suicide attempt) by means of the χ^2 signification. All statistical analyses were performed using the statistical package SPSS (v. 15.0).

Results

Table 1 presents the number of prior attempts and the method used. In 31.9% (n = 53) of patients, at least one prior suicide attempt was found. Women presented a larger proportion of prior suicide attempts (χ^2 = 14.3; df = 3; p < .002).

With regard to the evolution of the method of attempting suicide, it was found that 32 patients modified the method (65.3%) and that 17 repeated it (Table 2). Among those who modified the method of suicide (n = 32), the primary violent methods were hanging (n =

Table 1
Number of prior attempts by gender

Number of prior attempts	Total (N = 166)		Men (n = 125)		Women (n = 41)		χ^2	(df)	p
	N	%	n	%	n	%			
0	113	68.1	94	75.2	19	46.3			
1	25	15.1	17	13.6	8	19.5	14.3	(3)	.002
2	13	7.8	7	5.6	6	14.6			
3 or more	15	9.0	7	5.6	8	19.5			

15; 46.9%), fall from a height (n = 6; 18.8%), and pharmacological overdose (n = 4; 12.5%). Among the 17 people who did not modify the method, the primary method was pharmacological overdose (n = 10; 58.8%), followed by hanging (n = 3; 17.6%). No gender differences were found with regard to the modification of the suicide method.

Table 3 presents the sociodemographic and clinical variables as a function of the existence or absence of at least one prior attempt. In total, 107 people (64.5%) had a mental health diagnosis recorded in the clinical history.

With regard to the multivariate analysis, starting with the diagnosis, three primary subsets were identified (Figure 1). The first was composed of people diagnosed with personality disorders and who in 90.9% of cases (n = 10) presented at least one prior suicide attempt. The second was composed of people without a diagnosis or with diagnoses of psychotic or organic mental disorders. In these cases, 86.8% (n = 66) did not present prior attempts. The third was composed of people diagnosed with affective, anxiety, and substance abuse disorders. In this group, 58.2% of the patients presented prior attempts.

That being said, in this final subsample, four other subsamples were identified. Among people older than 51 years of age, 77.5% (n = 31) had no prior attempts, compared to 38.5% (n = 15) of patients younger than 51 years of age. In addition, among those younger than 51 years of age, 82.4% (n = 14) of the women had at least one prior attempt compared to the men.

Discussion

In this study, centred on a Spanish sample of people who completed suicide, the majority (68.1%) died on their first attempt.

Consequently, the prognostic value of the attempts is limited because the majority of suicides are completed on the first attempt both in Spanish (Parra-Uribe et al., 2013) and international studies (Cavanagh et al., 2003; DeJong et al., 2010; Isometsa & Lonnqvist, 1998; Stenbacka & Jokinen, 2015). In addition, almost half of those who did not complete suicide on their first attempt did so on their second. Clinical and epidemiological studies have highlighted that the lethality of the attempt increases with repetition (López-Castroman et al., 2011), especially in persons diagnosed with a mental disorder. That being said, in this study, some significant relationships have been found between diagnoses, prior attempts, and completed suicide.

People who complete their suicides on the first attempt do not have prior psychiatric diagnoses or are diagnosed with psychotic disorders or organic mental disorders. With respect to those who do not have psychiatric diagnoses, they have not accessed mental health services; thus, preventive interventions should be performed by other means. With regard to psychotic disorders, the result found is consistent with the prior understanding that in these patients, there is a high mortality rate by suicide because they choose violent methods with high lethality for their attempts (Gómez-Durán, Martin-Fumadó, & Hurtado-Ruiz, 2012). Concerning organic mental disorders, the illness itself could be a key stressing factor that may determine a planned suicide attempt and that may carry with it a higher lethality. In these three patient subsamples, there may not be a second opportunity to avoid death; thus, preventative measures cannot wait for an attempt to raise the alarm.

In the opposite case are found personality disorders. In the majority of these cases, there was at least one prior attempt. The cause of the intentionality of these patients has been attributed to

Table 2
Method of suicide of the lethal and previous attempts

Methods	Method used						χ² (df) p	Died on their first attempt						χ² (df) p
	Total (N = 166)		Men (n = 125)		Women (n = 41)			Total (N = 113)		Men (n = 94)		Women (n = 19)		
	N	%	n	%	n	%		N	%	n	%	n	%	
Hanging	57	34.3	45	36.0	12	29.3		38	33.6	34	36.2	4	21.1	
Fall from a height	38	22.9	30	24.0	8	19.5		31	27.4	26	27.7	5	26.3	
Pharmacological overdose	20	12.0	9	7.2	11	26.8		5	4.4	3	3.2	2	10.5	
Firearm	15	9.0	13	10.4	2	4.9	12.2 (4)	13	11.5	11	11.7	2	10.5	
Drowning	9	5.4	6	4.8	3	7.3	.016	9	8.0	6	6.4	3	15.8	n. a.
Intoxication by gas	9	5.4	8	6.4	1	2.4		7	6.2	6	6.4	1	5.3	
Stepping in front of a vehicle[a]	6	3.6	5	4.0	1	2.4		3	2.7	2	2.1	1	5.3	
Slitting wrists	6	3.6	4	3.2	2	4.9		5	4.4	4	4.3	1	5.3	
Poisoning	3	1.8	3	2.4	0	--		1	0.9	1	1.1	0	–	
Burning	2	1.2	1	0.8	1	2.4		1	0.9	1	1.1	0	–	
Asphyxiation (suffocation)	1	0.6	1	0.8	0	–		0	–	0	–	0	–	

	Method is modified						χ² (df) p	Method is repeated						χ² (df) p
	Total (N = 32)		Men (n = 20)		Women (n = 12)			Total (N = 17)		Men (n = 9)		Women (n = 8)		
Violent	26	81.3	16	80.0	10	83.3	0.1 (1)	6	35.3	4	44.4	2	25.0	0.7 (1)
Non violent	6	18.8	4	20.0	2	16.7	.815	11	64.7	5	55.6	6	75.0	.402

Note: Violent: Hanging, fall from a height, firearm, drowning, stepping in front of a vehicle, slitting wrists, burning, asphyxiation (suffocation); No violent: Pharmacological overdose, intoxication by gas, poisoning; [a]For the calculation of χ², the following categories have been grouped; n. a. = not applicable (excess of categories)

Table 3
Sociodemographic and clinical variables according to the existence or lack of prior attempts

	Total (N = 166)		Without prior attempts (n = 113)		With prior attempts (n = 53)		t (df) p
	M	**SD**	**M**	**SD**	**M**	**SD**	
Age	53.6	19.0	56.2	21.1	48.1	11.8	3.1 (158.7) .002
Years with mental disorder	11.2	8.2	9.7	8.0	13.0	8.2	2.1 (108) .037
Sex	**N**	**%**	**n**	**%**	**n**	**%**	
Men	125	75.3	94	83.2	31	58.5	11.8 (1) .001
Women	41	24.7	19	16.8	22	41.5	
Marital Status[a]	130	78.3	82	72.6	48	90.6	
Single	65	50.0	46	56.1	19	39.6	6.9 (1) .009
Married	41	31.5	26	31.7	15	31.3	6.4 (2) .041
Divorced	24	18.5	10	12.2	14	29.2	
Employment status[a]	140	84.3	94	83.2	46	86.8	
Employed	49	35.0	29	30.9	20	43.5	0.3 (1) .551
Unemployed	22	15.7	12	12.8	10	21.7	5.9 (2) .052
Retired	69	49.3	53	56.4	16	34.8	
Current diagnosis[a]	107	64.5	63	55.7	44	83.0	
Affective disorders	33	30.8	22	34.9	11	25.0	
Anxiety disorders	28	26.2	16	25.4	12	27.3	11.7 (1) .001
Substance abuse disorders	14	13.1	6	9.5	8	18.2	n. a.
Psychotic disorders	14	13.1	12	19.0	2	4.5	
Personality disorders	11	10.3	1	1.6	10	22.7	
Organic mental disorders	7	6.5	6	9.5	1	2.3	
Psychiatric family antecedents (1st grade)[a]	95	57.3	57	50.4	38	71.7	6.7 (1) .010
None	61	64.2	41	71.9	20	52.6	3.7 (1) .055
Violent Method[b]	146	81.1	110	87.3	36	66.7	10.5 (1) .001

Note: n. a. = not applicable (excess of categories); [a]In the calculation of the following percentages, subjects in which no data were recorded have been excluded; [b]Violent: Hanging, fall from a height, firearm, drowning, stepping in front of a vehicle, slitting wrists, burning, asphyxiation (suffocation)

the lack of resources to face stressful life events (Blasco-Fontecilla et al., 2010), but because they proceed impulsively and not in a planned manner, the attempts tend to be less lethal (De Jong et al., 2010; Giner et al., 2013). In these cases, a prior attempt, together with the appearance of possible stressful life events, should signal the possibility of another, possibly lethal, attempt.
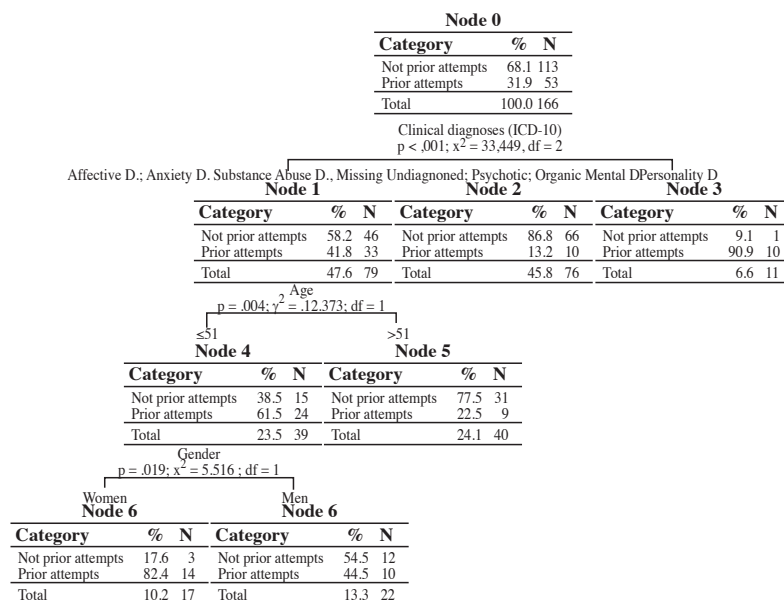

Figure 1. CHAID segmentation analysis

Regarding affective and anxiety disorders, prior attempts are found to be more comparable. That being said, above 51 years of age, only 22.5% of the sample present prior attempts. This datum is consistent with studies that indicate that the risk of presenting suicide attempts lessens with age (Schmidtke et al., 1996) because in advanced ages, there is more intentionality, more lethal methods are used, and there is a lower probability of surviving the physical effects of the attempt, which means that those attempts tend to be fatal (Beautrais, Collings, & Ehrhardt, 2005). For this reason, one should be attentive with this type of patient because, again, prior attempts will not be a datum that alerts one of possible risk.

However, among women younger than 51 years of age with a diagnosis of an affective disorders, anxiety disorders, or substance abuse disorders, there was a higher proportion of at least one prior attempt than among men. Both in studies with psychological autopsy (Isometsa & Lonnqvist, 1998) and in population surveys (Kessler, Borges, & Walters, 1999), the fact that men tend to die on the first attempt stands out; thus, although relevant in those cases in which it exists, the existence of prior attempts is, again, a datum of limited sensitivity.

It is a confirmed fact that men present higher rates of suicide and women present more prior attempts. One data point to highlight from this study is that almost half of the women die on their first attempt and choose for it a violent method, as occurs in the European population (Varnik et al., 2008). Men approach suicide differently from women (Mergl et al., 2015). It is known that men choose more violent methods for suicidal acts (Callanan & Davis, 2012). Thus, lethality is not associated with gender, but rather with the method chosen for suicide (Bostwick, Pabbati, Geske, & McKean, 2016).

It is necessary to highlight that the people with at least one prior attempt were, significantly, women, younger than 51 years of age, and who had a diagnosis of affective disorders, anxiety disorders, or drug abuse. It seems that it is in this profile of patients in which a prior attempt should signal a possible repeated attempt.

In the different methods employed, significant differences are found with regard to the use of firearms. Access to firearms outside of the United States is more associated with specific professions, the majority of which are practiced by men (e.g. soldiers, police officers…). Women are less familiar with this method, and when they use it, they have a greater probability of failure (Callanan & Davis, 2012).

In relation to the change in the method of suicide, 65.3% of this sample changed their lethal attempt, transitioning to a high-lethality method, hanging. These data coincide with those that affirm that more than half of people who commit suicide change their method in the lethal attempt and that the method chosen is hanging (Isometsa & Lonnqvist, 1998; Suokas et al., 2001). However, among those who repeat their method, the majority of women choose pharmacological overdose as a non-violent method, as found by Huang et al. (Huang, Wu, Chen, & Wang, 2014), who affirm that people who choose a low-lethality method remain at the same level of lethality in their subsequent attempts. In the same line, people who choose a high-lethality method remain at a high-level of lethality in further attempts (Runeson, Tidemalm, Dahlin, Lichtenstein, & Långström 2010).

The change to a more lethal method in the next suicide attempt is a strong predictor of completed suicide in subjects who chose a low-lethality method. Consequently, the intention to modify the method should be considered an important element in the clinical evaluation of suicidal behaviour, especially in those who initially chose a low-lethality method (Wang, Huang, Lee, Wu, & Chen, 2015).

Finally, it is important to be cautious when extrapolating the results of this investigation because it presents some limitations. It is based on information registered in the clinical histories of those who committed suicide. It is possible that some suicide attempts were not collected because no medical attention was sought. Consequently, the total number of attempts could be undervalued, although those would be low-lethality because they did not require attention. Another limitation related to the use of clinical histories is the absence of data in some of the variables analysed. It is important to take into account that the clinical history is not oriented towards use in research; thus, some variables are not systematically collected, and in some cases, important data for this study are not recorded, especially among those who did not have prior attempts. A future line of research could be the incorporation of improvements in the information system that would make it possible to collect relevant variables. Finally, this study is a retrospective study; it collects only completed suicides, and therefore, it is not possible to make a prediction based on the variables related to the prior attempts and subsequent suicide. It is necessary to continue with new studies, both psychological autopsies and prospective studies, so that to improve the understanding of suicide in order to be able to intervene prior to an attempt. This will allow the development of more effective prevention strategies. Therefore, it is necessary to disseminate prevention programs that have shown effective in reducing the suicidal behaviour and to incorporate the new findings in this field (Sáiz & Bobes, 2014).

Nevertheless, despite the limitations noted above, this study relies on the strength of collecting all the cases produced in a Spanish community and therefore has good ecological validity.

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