Psicothema

Prevention of recurrent suicidal behavior: Case management and psychoeducation

Sergio Fernández-Artamendi[1], Susana Al-Halabí[2,3], Patricia Burón[2,3,4], Julia Rodríguez-Revuelta[2,4,5,6], Marlén Garrido[2],
Leticia González-Blanco[3,4,5,6], Leticia García-Álvarez[2,4,5], Paz García-Portilla[2,3,4,5,6], Pilar Sáiz[2,3,4,5,6], and Julio Bobes[2,3,4,5,6]

[1] Universidad Loyola Andalucía, [2] Universidad de Oviedo, [3] Centro de Investigación en Red de Salud Mental, CIBERSAM, [4] Instituto Universitario de Neurociencias del Principado de Asturias, INEUROPA, [5] Instituto de Investigación Sanitaria del Principado de Asturias, ISPA, and [6] Servicio de Salud del Principado de Asturias, SESPA

Abstract

Background: Development of effective programs for suicide prevention is a global priority. This study evaluated the differential effectiveness of the combination of several strategies to prevent repetition of suicide attempts. **Methods:** Participants were patients who entered the Emergency Department after a non-fatal suicide attempt. A total of 163 participants (68.1% females, mean age = 41.39) met the inclusion criteria and were spread across three groups: One group received a passive strategy consisting of preventive information, a second group received the passive strategy combined with an active component of case management (MAC), and a third group received the passive strategy, case management and a psychoeducational programme (PSyMAC). Randomization of participants was not possible. The study included assessments at the beginning, and follow-ups every six months up to 30 months. **Results:** The study showed no significant differences between groups in the number of re-attempts. Logistic regression showed a positive effect for MAC. **Conclusions:** The present study showed that the use of case management could be a promising strategy, but more research is needed.

Keywords: Prevention, suicide, case management, psychoeducation, PSyMAC.

Resumen

***Prevención de las conductas suicidas recurrentes: manejo de casos y psicoeducación.* Antecedentes:** el desarrollo de programas efectivos para la prevención del suicidio es una prioridad global. Este estudio ha evaluado la efectividad diferencial de la combinación de diversas estrategias para la prevención de la repetición de los intentos suicidas. **Método:** los participantes del estudio son pacientes que acudieron al Servicio de Urgencias tras un intento de suicidio. Un total de 163 participantes (68,1% mujeres, edad media = 41,39 años) cumplieron los criterios de inclusión y fueron repartidos en tres grupos: un grupo recibió una estrategia pasiva de información preventiva, un segundo grupo recibió la estrategia pasiva combinada con un componente activo de manejo de casos (MAC) y un tercer grupo recibió la estrategia pasiva, el manejo de casos y un programa psicoeducativo (PSyMAC). La aleatorización de los participantes no fue posible. El estudio incluyó evaluaciones al inicio y seguimientos cada seis meses hasta los 30 meses. **Resultado:** el estudio no mostró diferencias significativas entre grupos en el número de reintentos. La regresión logística mostró un efecto positivo para el MAC. **Conclusiones:** el presente estudio muestra que el uso del manejo de casos puede ser una estrategia prometedora, pero se requiere de más investigación.

Palabras clave: prevención, suicidio, manejo de casos, psicoeducación, PSyMAC.

Prevention of suicide must be a global priority (The Lancet Global Health, 2017) and a central component of health care (Rezaeian, 2017; World Health Organization, 2014) and mental health policies (Graves, Mackelprang, Van Natta, & Holliday, 2018; Nakanishi & Endo, 2017). In Spain, the National Health Service has made suicide prevention one of its central objectives; but in practice there is a considerable scarcity of state-run prevention programmes (Sáiz & Bobes, 2014). Although the development of evidence-based practices is crucial (Zalsman et al., 2017), the lack

of independent and systematic evaluations (Arensman, 2017), the limited number of preventive interventions with effective results (Riblet et al., 2018) and inconsistent effects in previous research are on-going challenges that call for further investigation (Zalsman et al., 2016).

The greatest risk factor for later suicide attempts in the general population is having made a previous attempt (Oquendo, Currier, & Mann, 2006); nonetheless some studies circumscribe this predictive role to clinical populations (Goñi-Sarriés, Blanco, Azcárate, Peinado, & López-Goñi, 2018). Preventive assistance with this population through case management (Inagaki et al., 2015) has become widespread. Different programmes have shown varying degrees of efficacy in preventing later attempts (Hvid et al., 2011; Kawanishi et al., 2014; Pan et al., 2013), delaying and reducing rates of re-attempts (Cebria et al., 2015) and in lengthening the time frame before death by suicide (Pan et al., 2013). Conversely, other

studies have reported an absence of significant effects (Hawton et al., 2016; Johannessen, Dieserud, De Leo, Claussen, & Zahl, 2011) or merely short-term effects (Inagaki, 2015; Kawanishi et al., 2014) of such programmes. Results suggest that treatments with active features (Carter, Clover, Whyte, Dawson, & D'Este, 2013) and carried out shortly after the attempt (Vaiva et al., 2006) are more useful for people who have tried to end their own lives more than once, whereas passive treatments could be more successful after a first attempt (Evans, Evans, Morgan, Hayward, & Gunnell, 2005). Research combining strategies focused on both profiles has been carried out (Vaiva et al., 2011), but no data on its efficacy is available.

An alternative strategy yielding promising results in several mental health contexts is psychoeducation (Yanagida, Uchino, & Uchimura, 2017; Zhao, Sampson, Xia, & Jayaram, 2015). The reviews by Riblet et al. (2017) and Meerwijk et al., (2016); and studies such as that of Fleischmann et al. (2008) yield positive results for psychosocial and psychoeducation programmes in the prevention of suicide attempts. Online psychoeducation on suicide management and prevention aimed at mental health practitioners has also been suggested as promising (Gryglewicz et al., 2017). Nevertheless, psychoeducation programs for suicide prevention are practically non-existent in comparison to other psychosocial interventions, and requires further evaluation (Bennett et al., 2015).

The aim of this study is to compare the efficacy of various preventive strategies. For this purpose, we apply a design that combines different strategies: a passive treatment consisting of leaflets containing information aimed at preventing suicide, an active case management strategy (MAC) and an active strategy based on a preventive programme of psychoeducation (PSyMAC).

Method

Participants

During three years, all patients who entered the emergency department of Central University Hospital of Asturias (HUCA) after a suicide attempt were considered as possible participants in the study. Inclusion criteria were: 1) being at laest 18 years of age; 2) admission to the emergency department after a suicide attempt according to WHO/EURO criteria (De Leo, Bille-Brahe, Kerkhof, & Schmidtke, 2004); 3) belonging to Asturias Health Area IV; and 4) acceptance of invitation to participate in the study and informed consent. Those who 1) did not meet all the above criteria or 2) were unable to understand the significance of their action were excluded. A total of 163 individuals participated in the study (68.1% were female) with ages ranging from 18 to 80 ($M = 41.39$; $SD = 12.91$).

Instruments

The protocol included a baseline assessment at inclusion and follow-up assessments at 3 and 6 months, and then every 6 months until the end of the treatment (30 months), unless the patient dropped out.

Baseline assessment. The assessment protocol followed recommendations by García-Nieto et al. (2012) and collected: 1) sociodemographic data, family history, personal history, clinical situation (psychiatric disorder, and type of treatment and clinic), psychosocial assessment and characteristics of the current attempt; 2) SAD-PERSONS scale for the evaluation of the risk of suicide (Patterson, Dohn, Bird, & Patterson, 1983); 3) Beck's scale of medical damage caused by the suicide attempt (MDS; Beck, Beck, & Kovacs, 1975); MDS scores classified previous attempts as of high (MDS ≥ 4) or low lethality (MDS < 4) (Wasserman et al., 2007); 4) Suicide Intent Scale to evaluate the impulsive/non-impulsive profile of the attempt (SIS; Beck, Schuyler, & Herman, 1974); SIS Scale classified them as impulsive (SIS < 6) or not impulsive (SIS ≥ 6) (Díaz et al., 2003); 5) Columbia scale to evaluate the severity of the suicidal ideation (C-SSRS; Al-Halabi et al., 2016; Posner et al., 2011); 6) The Brugha's scale of life-threatening experiences (LTE; Brugha, Bebbington, Tennant, & Hurry, 1985), and 7) Hamilton Depression Rating Scale to evaluate the severity of depressive symptoms (HDRS; Hamilton, 1960).

Follow-up assessment. It was carried out at 3 and 6 months, and then every 6 months until treatment termination, collecting: 1) Suicide attempts since the inclusion in the study, and 2) C-SSRS.

Procedure

Study design

This is an open, controlled and multicentric study to examine the effectiveness of three strategies aimed at preventing repetition of suicide attempts. The study was approved by the Clinical Research Ethics Committee of the Hospital Universitario Central de Asturias (HUCA), conforms to the Helsinki Declaration, the Convention on Human Rights and Biomedicine of the Council of Europe, and the universal declaration of human rights of UNESCO. All participants provided informed consent. More information regarding study design, procedures, instruments and interventions can be found in (Sáiz et al., 2014).

Interventions

All participants continued to receive the standard clinical treatment prescribed by their mental health professional and were offered the following interventions: firstly, at the beginning of the study and before being assigned to groups, a passive treatment consisting of an information leaflet about the prevention of suicidal behaviour. Secondly, an active case management treatment module with 1) regular interviews to review the clinical situation of the participant, preferably face-to-face, but on the phone if necessary; 2) encouragement to continue with their standard clinical treatment prescribed by their mental health professional, and promotion of treatment adherence at their mental health centre; 3) coordination of regular appointments with the referring psychiatrist; 4) encouragement of patients who had dropped out of treatment to take it up again; and 5) contact with available social resources in the community when necessary. Thirdly, a programme of psychoeducation based on the guidelines of the WHO and the International Association for Suicide Prevention IASP) (Sáiz et al., 2014). The psychoeducational programme was expressly developed for the study and consisted of 10 weekly group sessions (8-10 people) of approximately 60 minutes. The program included topics related to the suicidal behaviour, including: prevention through communication skills, reinforcement of coping skills to face crisis situations, analysis of psychological changes leading to high-risk situations, risk and protective factors, introduction to

stress management and understanding of the role of social support and health services, among others. For a more detailed description of session contents, please consult (Sáiz et al., 2014).

Groups

Three groups were created: a) Control Group (CG); where the only intervention was a passive strategy consisting of information leaflets; b) Experimental group I: Case Management (MAC); where patients received active case management treatment (MAC) as well as the passive information leaflet; and c) the experimental group II: Case Management and Psychoeducation (PSyMAC); where patients received the passive information leaflet intervention as well as the active case management and the psychoeducation program. Once the patients had entered the study, they were assigned to the PSyMAC or control group, depending on availability and personal preference. Patients who were assigned to the PSyMAC group but who finally decided not to attend the psychoeducation sessions made up the MAC group.

Data analyses

Descriptive statistics were conducted for all participants in the study. Results were analysed in search of significant differences between the three groups (95% CI) using χ^2 statistic for categorical variables. Effect size was calculated using Cramer's Phi in case significant differences were found. Analysis of Variance (ANOVA) was used for continuous variables. Post-hoc analyses were carried out in case significant differences were detected, as well as Eta squared to calculate the effect size.

To detect possible intervention effects on suicide events, differences between groups were calculated for: 1) number of days from baseline to first suicide event (attempted or completed); 2) number of patients with at least one suicide attempt before the last follow-up; 3) proportion of patients reporting more than one suicide event before the last follow-up; and 4) the variation, measured by means of the McNemar test for paired data, in the number of patients who recorded high severity of suicidal ideation (4 or 5 points on the C-SSRS suicidal ideation subscale) in each group, from baseline assessment to the first follow-up (3 months).

Next, a cumulative curve of suicide events was plotted for each group, including all patients admitted on the study based on the principle of intent-to-treat (i.e.: all participants attending at least the first session were entered in the analyses). The number of days was measured as the period from baseline to the first suicide event. Also, a comparison was made between the number of suicide events in each group using a proportion test.

This was followed by a test of logistic regression, with the forward selection method, of the possible variables with predictive power regarding suicide attempts. Bivariate analyses (Student's *t* and χ^2) were run to determine the variables that could be potentially included in the model, adding potential significant factors as claimed in the literature (Burón et al., 2016).

Results

Table 1 shows the sociodemographic data and the psychopathological profile per group. Significant differences were found between groups in HDRS (F = 4.127; *p* = .016), SAD (F = 3.079; *p* = .049), LTE (F = 3.616; *p* = .029) and impulsive attempts according to SIS (χ^2 = 8.742; *p* = 013). Although the scores on the HDRS were significantly higher in the CG compared to PSyMAC (*p* = .013), the mean score of the three groups reveals a moderate to severe depression profile, and the effect size (η^2 = .05) indicates that its effect is between small and medium (Vacha-Haase & Thompson, 2004), accounting for only 5% of variation (Pierce, Blocks, & Aguinis, 2004). In the case of the SAD, scores are significantly higher in the PSyMAC group when compared

Table 1 Sample description at baseline assessment					
	Groups			**χ^2 / F**	**p**
	Control Group (CG) (57)	**MAC (51)**	**PSYMAC (55)**		
Sex (women [n (%)])	35 (61.4%)	34 (66.7%)	42 (76.4%)	2.954	.228
Age (M, SD)	42.53 (14.62)	37.94 (12.05)	43.44 (11.34)	2.787	.065
Marital status [n (%)]					
– Single	19 (33.3%)	19 (37.3%)	13 (23.6%)		
– Married/living together	18 (31.6%)	15 (29.4%)	26 (47.3%)		
– Separated/divorced	16 (28.1%)	11 (21.6%)	15 (27.3%)	11,536	.317
– Widower	4 (7.0%)	4 (7.8%)	1 (1.8%)		
– Other	0	2 (0.6%)	0		
HDRS (M, SD)	18.69 (5.62)*	17.12 (6.58)	15.33 (6.05)*	4.217	.016
SAD (M, SD)	3.68 (1.47)*	3.37 (1.55)	2.96 (1.60)*	3.079	.049
LTE (M, SD)	2.07 (1.41)	2.98 (2.28)*	2.03 (2.33)*	3.616	.029
High lethality (MDS ≥ 4) [n (%)]	12 (21.4%)	13 (25.5%)	17 (30.9%)	1.306	.520
Impulsive attempt (SIS < 6) [n (%)]	35 (62.5%)	19 (37.3%)*	34 (61.8%)	8.742	.013
Previous attempt (yes/no) [n (%)]	35 (62.5%)	35 (68.6%)	36 (66.7%)	.470	.790
Previous attempts (M, SD)	1.68 (2.23)	2.55 (3.08)	2.22 (2.94)	1.364	.259
Intention to repeat [n (%)]	19 (35.2%)	23 (46.9%)	14 (25.9%)	4.952	.084
Family history: first degree relatives with completed suicide [n (%)]	2 (3.5%)	1 (2.0%)	1 (1.8%)	.410	.815

*Note: *Significant differences (p < .05) between groups according to post-hoc analyses*

to the CG (p = .043) and significantly higher in the MAC versus PSyMAC groups (p = .029). Despite this, the scores were below the cut-off point of 4 established by Warden, Spiwak, Sareen and Bolton (2014) for hospitalisation, and the effect size (η^2 = .05) indicates a small to medium effect. There was a greater proportion of planned suicide attempts in the MAC group compared to CG and PSyMAC (p = .013), with a small effect size (Cramer's Phi = .01). Finally, and regarding LTE, post-hoc analyses revealed no significant pair-wise differences between groups.

A comparison of the median number of days before the first suicide attempt detected significant differences (p < .001) between the CG (357 days), PSyMAC (534 days) and MAC (182 days). Upon carrying out the two-by-two group comparisons and using the *post-hoc* Bonferroni correction, significant differences were revealed in the median number of days between CG and MAC (p = .012) and between PSyMAC and MAC (p < .001), but not between CG and PSyMAC (p = .201). The χ^2 analyses showed no significant differences in the number of suicide events between groups (p = .318) (Table 2). All the suicide events were attempted suicides, with the exception of one completed suicide in the CG. Table 2 presents the number of patients per group with more than one event during the follow-up. Results showed no significant differences between the groups (p = .728). Nevertheless, the tendency observed in these results points to a lower rate of attempted suicides (13.7%) and fewer patients with more than one attempted suicide in the MAC group (3.9%) compared to the CG (21.1% and 7.0% respectively) and PSyMAC (25.5% and 7.3%). According to the results of the McNemar test at the 3 month follow-up stage, a significant reduction in the number of patients with severe suicidal ideation took place within the MAC group (p = .002), with no significant changes in the CG (p = 1.000) nor in the PSyMAC (p = .092).

Figure 1 shows the cumulative curve of suicidal events per group. In a comparison of the proportion of events between the three groups after the 30-month follow-up, results showed no significant differences (p = .775), although the curve for the MAC reveals a positive development in comparison to the CG and PSyMAC. A later two-by-two analysis comparing the proportion of suicide events at the 30-month follow-up stage in the groups

also yields no statistically significant differences (for the CG and PSyMAC: p = .684; CG and MAC: p = .671, PSyMAC and MAC: p = .990).

The final regression model (Table 4) included: sex, marital status, age group (15-24, 25-44, 45-64 and 65+ years of age), history of completed suicides among first-degree relatives (father, mother or siblings), history of previous attempts, severity of suicidal ideation, impulsivity and lethality of the baseline attempt, and treatment group. According to the model, the only variables that resulted significant predictors of the repetition of suicidal behaviour were history of previous attempts ($o.r.$ = 3.936; p = .021; CI: 1.23-12.56) and intention to repeat ($o.r.$ = 5.722; p ≤ .001; CI = 2.31-14.15). In addition, inclusion in the MAC group proved to be a significant predictor of a reduced likelihood of suicidal behaviour ($o.r.$ = .319; p ≤ .001; CI = .11 – .89).

Discussion

At 30 months, results showed no significant differences between the three groups in the number of suicide attempts nor in the number of patients with more than one suicide attempt, confirmed by the cumulative curve analyses. Additionally, and in line with previous research (Teti, Rebok, Rojas, Grendas, & Daray, 2014), both the presence of suicide attempts prior to joining the study and the stated intention to repeat them proved to be significant predictor variables of a greater risk of suicidal behaviours. Despite the absence of significant differences across groups regarding history of previous attempts and stated intention to repeat (the two variables that finally turned out to be predictors of suicide attempts), we cannot rule out that baseline differences are influencing our results, including also psychiatric diagnoses or prescribed medication, which have not been controlled in the present study. Moreover, the relatively low rates of repetition (ranging between 13% and 25%) is a considerable methodological limitation, and results have to be interpreted with caution.

The logistic regression results revealed that participating in the MAC group was a significant predictor of a lower risk of repeating suicide attempts, in line with previous studies in these contexts (Cebria et al., 2015). This suggests a positive trend towards MAC

Table 2
Proportion of patients with at least one suicide event, and with more than one suicide attempt, per group

| Group | At least one suicide event | | | | More than one suicide attempt | | | |
	Yes	No	χ^2	p	Yes	No	χ^2	p
CG	12 (21.1%)	45 (78.9%)			4 (7.0%)	53 (93.0%)	.635	.728
MAC	7 (13.7%)	44 (86.3%)	2.290	.318	2 (3.9%)	49 (96.1%)		
PSyMAC	14 (25.5%)	41 (74%)			4 (7.3%)	51 (92.7%)		

Table 3
Predictor variables for suicide attempt

| Factor | B | S.E. | Wald | df | p | Exp (B) | C.I. 95% for Exp (B) | |
							Lower	Upper
Existence of previous attempts	1.370	0.592	5.360	1	0.021	3.936	1.234	12.555
Intention to repeat	1.744	0.462	14.257	1	0.001	5.722	2.314	14.150
MAC Group	-1.143	0.524	4.764	1	0.029	0.319	0.114	0.890
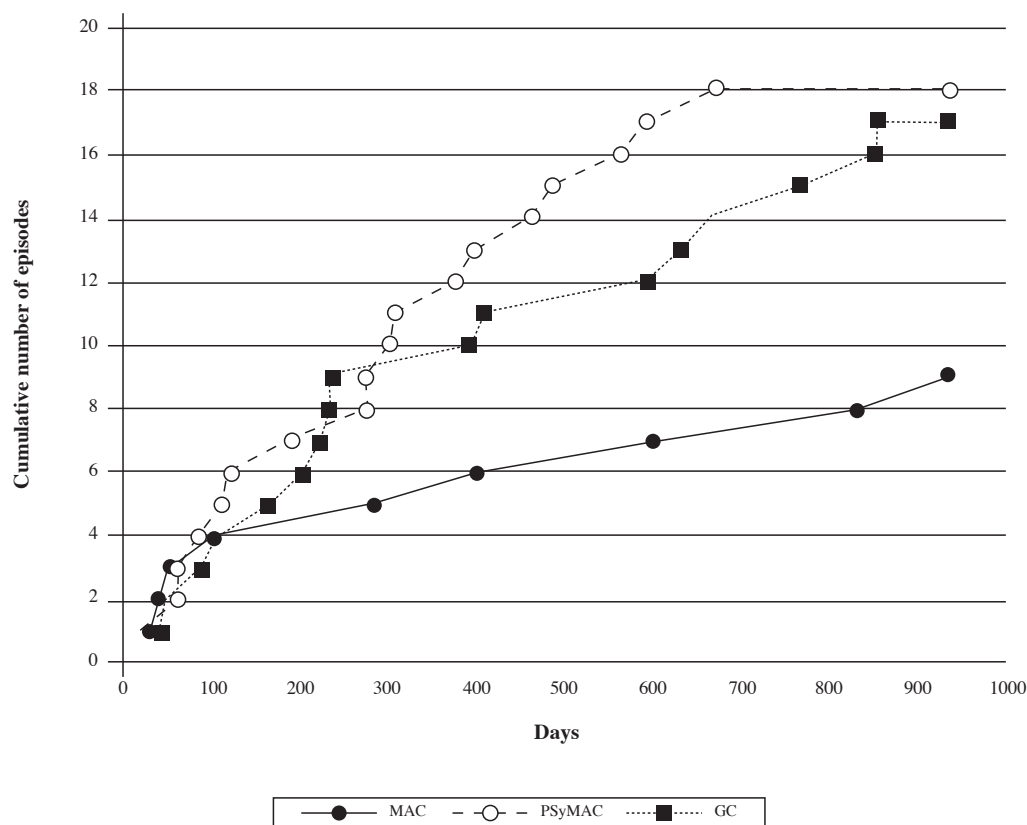
Figure 1. Cumulative curve. Suicide events per group

						C.I. 95% for Exp (B)	
Table 4							
Predictor variables for suicide attempt							
	B	S.E.	Wald	df	Sig	Exp (B)	Lower	Upper
Existence of previous attempts	1.370	0.592	5.360	1	0.021	3.936	1.234	12.555
Intention to repeat	1.744	0.462	14.257	1	0.001	5.722	2.314	14.150
MAC Group	-1.143	0.524	4.764	1	0.029	0.319	0.114	0.890

as opposed to PSyMAC and CG. This was also noticeable in the reduction in the number of patients with severe suicidal ideation and in the proportion of patients who made suicide attempts until the end of follow-ups, since the fewest suicide attempts were made in the MAC group. However, figures in the CG and PSyMAC groups are very similar, and differences in the number of attempts and cases with severe ideation were not statistically significant. It is surprising though that this positive trend in favour of case management component was not observed in the PSyMAC group.

Significant differences were found between groups in the median number of days before the first suicide attempt, with MAC showing the shortest median time (182 days). This is significantly shorter than in the CG (357) and the PSyMAC (534). This could indicate that, as mentioned above, the MAC would have a positive overall effect on repeated suicide attempts, but that PSyMAC manages to significantly delay the first attempt, in line with previous studies with case management (Hyeonjae, 2018). Nevertheless, compared to the MAC group, a significantly longer

latency period before the first attempt was also found in the CG, and without significant differences with respect to the PSyMAC. One of the reasons why the time before the first attempt was shorter in the MAC group could lie in the higher proportion of planned attempts in this group, a significant risk factor for suicide (Burón et al., 2016; Kapur et al., 2013; Méndez-Bustos, de León-Martínez, Miret, Baca-García, & López-Castroman, 2013). Nevertheless, in our study, this factor did not result a significant predictor of further attempts. It is also worth mentioning that, while the differences were not significant in the intention to repeat the suicide attempts, it was MAC group patients who most frequently stated their intention to do so, another important risk factor (Miranda et al., 2008). Regarding these results, it could be that the sample size of the study, the relatively low global number of suicide attempts and the lack of control of additional variables may have hindered the detection of significant differences in other relevant variables.

This study has limitations. Firstly, randomization of participants between groups was not possible. Given the severity of the clinical

profile of participants, group assignment was based on their preferences. Descriptive results showed only minor baseline differences between groups, with size effects between small and medium, and without clinical relevance; however, we cannot rule out their possible influence on our results. Secondly, assessment tools met recent recommendations (Oquendo & Bernanke, 2017), but measures of variables such as patients' trait impulsivity, medication and clinical diagnoses were not included despite their possible influence on suicidal behaviours (García-Vega, Camero, Fernández, & Villaverde, 2018; Gómez-Durán, Forti-Buratti, Gutiérrez-López, Belmonte-Ibáñez, & Martín-Fumadó, 2010; Goñi-Sarriés, Blanco, Azcárate, Peinado, & López-Goñi, 2018). Thirdly, suicide is a rare event that makes the design of powerful studies a challenge (Berrouiguet et al., 2018), and in our study the absence of significant differences may be a consequence of the limited sample size, and the relatively limited amount of overall suicide attempts during the study. Fourthly, the use of

thorough assessments, the handing out of information leaflets and the multiple contacts over the course of the study established a minimum level of intervention in all groups, masking potential differences between treatments and hindering the detection of the active ingredient of the interventions. Despite its limitations, the current study has significant practical implications. Results highlight a positive trend towards case management and suggest that psychoeducation in the prevention of suicide attempts still requires more research.

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