Intensive supportive ambulatory aftercare decreases suicide reattempts and depressive symptoms in patients after a suicide attempt

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Abstract

Patients who survive a suicide attempt present a high risk for relapse during post-discharge period. Developing and assessing the efficacy of methods for reducing risks in the post-discharge period after a suicide attempt is critical to the field of suicide prevention. The aim of this study was to compare the efficacy of an Intensive Psychosocial Care program after discharge for a suicide attempt with the Standard Treatment. The former treatment program significantly decreased the level of depressive symptoms and the time lag between discharge and the improvement of depressive symptoms. A greater number of personalized contacts and the continuity of care after a suicide attempt, seem to be a useful approach to suicide prevention.

Keywords: Suicide; Suicidal Ideation; Depressive Disorder; Prevention; Psychosocial approach;

1. Introduction

Suicide is responsible for eight thousand deaths every year in the world, is ranked as the second leading cause of death among young adults and represent 1,5% of the global burden of disease (1).

Suicide reattempt is a primary concern during the early post-discharge period (2, 3). In the first year after a suicide attempt, 15% to 23% of patients will need medical attention for a subsequent episode of deliberate self-harm and in 0.5 to 2% suicide will die by suicide (4). The absolute risk of death by suicide in subjects followed-up for 5 to 37 years after a suicide attempt has been estimated at 7 to 13% (3).

Contributory factors to suicide reattempts include psychiatric illnesses, availability of lethal means, alcohol, and drug abuse, poor access to psychiatric treatment, help-seeking behavior, impulsivity, lack of social support, physical illness, marital status (being alone), advanced age and male gender (5).

Psychiatric illness is a major contributing risk factor for suicide attempts. One study estimated that more than 90% of suicidal subjects present a diagnosable mental disorder and 60% of then have a depressive disorder (6-8). Treating depressive disorders in suicidal patients is an effective way to reduce the suicide mortality rate.

Post-discharge care, after a suicide attempt, has been reported to decrease suicide risk, especially in patients with mood disorders. Although only 56% of suicide attempters seek treatment after discharge, as they do not perceive the need to seek for help and attitudinal and structural barriers, such as the wish to handle the problem alone and, financial limitations, respectively (9).

Continued outpatient care of patients who attempt suicide has a potential for prevention of new suicide attempts, particularly patients with mood disorders (6). Interventional studies assessing the effect of 1. frequent contact by mail (10) or; 2. the use of

an emergency contact green card (11) or; 3; referencing patients to a suicide intervention counsellor to coordinate assessment and long-term treatment (12) resulted in fewer suicides compared with a control group. Moreover, some researchers reported a lower drop-out rate and fewer repeated suicide attempts when a multidisciplinary team of professionals provided continuity of care to suicide attempters after hospital discharge (13). In the United Kingdom, provision of 24-hour crisis care was associated with a significant reduction in suicide rates from 11.4 before to 9.32 per 10 000 patient contacts per year (14).

The aim of this study was to compare standard care provided to suicide attempters with a post-discharge intensive psychosocial care program (IPC) for suicide prevention. We hypothesize that IPC may:

1. Decrease depressive symptom severity;

2. Increase adherence to treatment of suicide attempters;

3. Increase time to suicide reattempt;

4. Reduce suicide reattempt rate; at each endpoint during a six-month follow-up, when compared with standard care.

2. Methods

2.1 Design

This study was a monocentric, open-label and prospective study comparing two different treatment approaches for suicide attempters after discharge from the emergency ward. The Rouen University Hospital Ethics Committee approved the research protocol. We used Columbia Classification Algorithm of Suicide Assessment (C-CASA) (15, 16) to define Suicide Attempt (SA): “a potentially self-injurious behavior with a nonfatal outcome, for which there is evidence, either explicit or implicit, that the individual intended to kill himself or herself”.

2.2 Setting

The study was performed in the Emergency Department (ED) of the Rouen University Hospital in France. This hospital receives the majority of cases of emergencies and trauma patients of the region. The average number of psychiatric admissions is ten patients a day, including suicide attempters.

2.3 Participants

We included all adults, aged 18 to 65 years, admitted after an SA and examined by a physician of urgency and/or a psychiatrist within 24-48 hours of admission and excluded:

1. Patients requiring inpatient care for more than 48 hours;

2. Patients requiring a psychiatric hospitalization due to severe mental illness;

3. Patients with a current psychiatric follow-up;

4. Subjects living outside the catchment area of the hospital;

5. Patients who performed scarification and/or had alcohol or illicit drugs overdose without any suicidal intent. All patients included signed an informed consent term.

2.4 Intervention

After discharge, the patients received the standard treatment protocol (STP) or the intensive psychosocial care program (IPC).

The STP corresponded to the French National Agency recommendations (FSR) for the treatment of suicide attempters. FSR comprised: 1. an evaluation by a psychiatrist in the emergency ward; 2. clinical monitoring for a maximal duration of 48 hours before discharge (at least one night); 3. giving the coordinates of a psychiatrist or psychologist after discharge and asking the patient to make an appointment; and 4. a short hospitalization report sent by mail to the patient´s general practitioner.

The IPC consisted of STP complemented by pharmacological, psychological and/or social interventions offered on as needed basis, accordingly to initial and consecutive evaluations. Instead of only addressing the patient to a psychiatrist or psychologist, the

patients in the IPC were followed by an outpatient care team (OCT). A psychiatrist coordinator; a psychologist; a social worker; and a psychiatric nurse composed the OCT. The same team responsible for the initial assessment, in the emergency ward, performed the outpatient care. After discharge, the OCT organized the appointments with the psychiatrist, the psychiatric nurse, the psychologist and the social worker, on an as needed basis. The staff contacted the patient´s family physician to implement a collaborative outpatient treatment schedule accordingly to patients needs. Weekly phone calls were performed during the first month of follow-up to evaluate patient´s mood, suicide intentions and his/her compliance to follow-up. During the follow-up, at least, one of the members of the OCT could intervene at patient´s home on a flexible schedule, if requested by the psychiatrist or psychologist or on patient request. Patients and their families were frequently encouraged to contact the OCT in a case of crisis. A weekly staff was performed to discuss the particular needs of each patient after discharge and the need to carry on the follow-up. Psychological support was based on empathy, reassurance, and psychoeducation.

2.5 Follow-up protocol

Patients were consecutively assigned to either the IPC group or to the STP group in order of admission to the ED. After group assignment, each subject was evaluated by a psychiatrist using a semi-structured. The questionnaire assessed demographic characteristics, past or current physical and/or mental illness, according to DSM-IV criteria, history of family or suicide attempts, history of family psychiatric disorders, previous psychiatric hospitalizations, clinical description of the current suicide attempt. The Beck Depression Inventory-SF(BDI-SF) assessed depressive symptoms severity and the French version of the Beck Suicide Intent Scale evaluated suicidal risk (17).

Telephonic appointments were scheduled for all subjects on the eighth day (D8), at the end of the first month (M1), third (M3) and sixth (M6) months after hospital discharge. A

medical doctor, blind to the patient treatment group of the participant, performed these assessments. Every participant was asked to answer the BDI-SF; to report his or her current treatment status; and the occurrence of a new suicidal attempt if any. Information regarding new suicide attempts, completed suicide or death in lost to follow-up subjects was also recorded from the hospital and local psychiatric hospital files; throughout phone and mail contact with patient´s relatives; and through state registers using the participants home addresses.

2.6 Sample size

The number of patients needed was calculated using G-Power 3.1 (Universitat Dusseldorf, Germany), in agreement with the results of previous studies for an effect size of 0.65 an allocation ratio of 0.85 (STP/IPC). The study required 126 participants to detect a reduction in BDI-SF for the specified effect size with a power of 90% (two-sided, unpaired t-test at a significance level of 5%). We adjusted the sample size to 260 patients, assuming a dropout rate of 50%.

2.7 Primary outcomes

The primary outcome was the level of depressive symptoms evaluated by the Beck Depression Inventory short-form (BDI-SF) (18, 19). With a cut-off value of 9/10, this scale yielded a sensitivity of 86.4%; a specificity of 81.8% and a negative predictive value of 93.8% and a positive predictive value of 65.5% (20). To avoid the interference of fatigue, intoxication symptoms, and confusional states the first evaluation was performed on D8.

The secondary outcomes evaluated were: 1. adherence to follow-up measured by the participation in the scheduled meetings and response the telephonic appointments; 2. occurrence of another suicide attempt or completed suicide (based on hospital referral for further deliberate self-harm and on interviews with patients in order to identify those which did not result in hospital referral).

2.8 Statistical methods

The statistical analysis aimed to compare outcome measures on each endpoint. Normality was assessed using Kolmogorov-Smirnov test. We used the Mann-Whitney tests to compare the baseline characteristics of the two groups for quantitative variables and chi-square tests for qualitative variables. As BDI-SF scores were not normally distributed, we used Mann-Whitney test assess the hypothesis if IPC may decrease more intensely than STP. Z-test was used to compare two population proportions to determine if IPC increases adherence to treatment of suicide attempters. Kaplan-Meyer survival curves with log-rank (Mantel-Cox) analysis was used to assess if IPC increases the time to suicide reattempt. The goodness of fit of the logistic regression model, in multivariate analysis, was determined by the Hosmer-Lemeshow test.

A p-value of <0.05 was determined as statistically significant. Statistical analyzes were performed using SPSS 21.0 for Windows, (SPSS Inc., USA) and GraphPadPrism software (La Jolla, CA, USA) was used for data preparation and diagrams.

3. Results

3.1 Sample description

At endpoint, we included 260 patients who attempted suicide: 120 patients in the STP group and 140 patients in the IPC group. Four patients in the STP group and eight in the IPC group refused to participate in the study. The maximal duration of follow-up was six months (Figure 1).

The sample of suicide attempters was composed of 76% of women; the mean age was 33±13.2 years old. In 31% of cases, a family history of SA was reported. Half of the patients received psychotropic drugs at the time of the SA (in 31% of cases, an antidepressant treatment). Forty percent of the subjects reported current illicit drug use and 6% had alcohol

dependence. The patients presented mood disorder and anxiety disorders in 60% and 10% of cases, respectively (Table 1 and Table 2).

The STP group differed from the IPC group by a higher proportion of women, subjects with a higher educational level or a higher prevalence of current anxiety disorders and a lower proportion of illicit drug consumption. The number of previous suicide attempts (SA) did not differ between the STP and the IPC groups at baseline (about 40% of the patients in each group had, at least, one previous SA (only 1 in 60% of cases) (Table 2). In 65% of cases, the former SA has occurred during the year preceding inclusion. Moreover, the Beck Suicidal Intent Scale (BSI) scores were comparable between the two groups at inclusion (Table 2).

3.2 Patients lost to follow-up and compliance with outpatient care

At endpoint, 68 (57%) and 97 (69%) patients remained in the STP and IPC groups, respectively. In the sample, the lost to follow-up corresponded to 36.5% of patients, 43% in the STP group and 31% in the IPC group ($p>0.05$). Significantly more patients were lost to follow-up in the STP group in comparison to the IPC group at all endpoints (Table 1). The compliance with outpatient care was significantly higher in the IPC group as compared to the STP group at all times (Table 3 and Figure 2).

3.3 Depressive symptoms

The severity of depressive symptoms does not differ between the two groups at D8. The proportion of patients having BDI-SF scores above or equal to 9 in the STP and IPC groups did not significantly differ at D8 (67 and 70% ($p=0.55$)). A gradual decrease in the mean BDI-SF scores was observed in both groups from the first month, and BDI-SF scores became significantly lower in the IPC group as compared to the STP group at final endpoint (M6) ($p=0.04$).

3.4 Suicide attempts during the follow-up period and time to relapse

No lethal suicide attempts occurred up to the completion of the study. At day 8, only one case of suicide reattempt was observed in the STP group only. In total, 13 patients (11% of the 120 included and 19% of those remaining in the cohort at month 6) in the STP group and, 12 patients (8.5% of the 140 included and 12% of those remaining in the cohort at month 6) in the IPC group re-attempted suicide. The overall comparison using log-rank (Mantel-Cox) analysis was not significant (Chi2=1.2; p=0.27), despite the lower number of repeat suicide attempts found in the IPC group. The number of SA observed in both groups was too small to show significant differences.

As may be seen in the survival curve (Figure 3), the mean time between discharge and suicide reattempt was longer in the IPC group when compared to the STP group, 83.7 [95%C.I.: 45.8-121.7] versus 75.6 [95%C.I.: 38.8-112.4] days, respectively.

3.5 Comparison of relapse and non-relapse groups (re-occurrence of suicidal behavior)

Re-occurrence of suicide attempt was best predicted in both groups by: 1. the antecedents of suicide attempts (p=0.007) and, 2. The severity of depressive disorders at day 8 (p=0.004). Patients who performed, at least, two suicide attempts are 4.65 times more prone to re-attempt suicide during the six-month follow-up period. For each point of increase of the BDI-SF score at day 8, there is 6.8% more chance to a patient re-attempt suicide during the follow-up period. The Hosmer-Lemeshow goodness-of-fit test showed that the model is adequate.

5. Discussion

In this study, a personalized, intensive psychosocial care program (IPC) initiated immediately after a suicide attempt (SA), has 1. significantly reduced the level of depressive symptoms; 2. decreased the time lag between discharge and improvement of depressive symptoms. These are important contributory factors to the reduction of suicidal risk and

suicidal behavior. Moreover, patients in the IPC group were significantly more likely to attend the follow-up until the endpoint, suggesting a better compliance with the treatment. The patients in the IPC (as compared to usual care) group had a slightly albeit non-significantly lower risk of further suicide attempts over the 6-month follow-up period. These positive results may be explained by the intensive and personalized follow-up based on regular appointments with a team composed of a psychiatrist, a psychiatric nurse, a psychologist and a social worker. The continuity of care, by professionals related to the initial assessed of the patient after the SA, seems to be an important factor to improve compliance with treatment and consecutively to reduce the number of repeat SA.

As regard to aftercare of suicide attempters, reviews highlighted the uncertainty about which forms of interventions are the most effective for preventing the repetition of suicide attempts (21-23). Psychosocial assessments and access to ambulatory after-care vary in clinical practice, and clinical studies measuring the effectiveness of structured ambulatory care after a suicide attempt are needed (23). Most studies were limited by the small sample sizes, the short duration of follow-up and, the cross-sectional rather than prospective designs (14). In summary, intervention studies have produced mixed results. Among the studies evaluating programs intended to preserve a contact with suicide attempters at risk of recurrence after discharge, most have shown efficacy. A randomized controlled trial conducted in five countries has evaluated the effectiveness of regular contacts (by trained staff, either by phone or home visits) during 18 months in 1,867 patients after a suicide attempt, those who refused treatment received letters: these interventions significantly decreased the number of deaths by suicide (24). In the same way, Vaiva et al. (25) reported that SA patients contacted by phone, one month after discharge from an emergency department, were less likely to re-attempt suicide (12% versus 22% in the usual care group) at one-year follow-up. In parallel, a systematic program of contact with persons at risk of suicide

who refused to remain in the health care system appeared to exert a significant preventive influence on death by suicide, after two years of follow-up (10). Aoun (12) reported a decrease in the rate of hospital admissions, for repeat suicide attempts, in 171 suicide attempters managed with a high-intervention approach, including a counselor designated to identify and manage suicide crisis, plan management, with an intensive follow-up of the patient during the first six weeks following discharge. Finally, Allard et al. (26), observed, in a randomized study, a suicide reattempt rate of 35% as compared to 30% in the usual care group using 18 therapy appointments over one year, including one home visit, and measures to improve attendance in a sample of 63 subjects. These studies reinforce the need for producing a feeling of connectedness between the SA patients and the health professionals.

In contrast, other studies using less intensive interventions after discharge, for example, telephone follow-up (only two phone calls, at respectively months one and five) (27), or cards allowing patients to be quickly readmitted to the hospital (28) did not reduce the number of repeat SA. Similarly, Evans et al. (29) have reported no effectiveness of the provision of a card offering 24-h crisis telephone consultation on repetition of self-harm in the 12-month follow-up in a large randomized controlled trial (OR=1.19, 95% CI [0.85-1.67]).

Fleischmann et al. (24) supported the fact that maintaining repeated contacts with a suicide attempter after discharge is crucial and probably the most important factor in the prevention of relapse. In their review, du Roscoät and Beck (30) have also emphasized interventions aiming the continuity of therapeutic management by specialists upon discharge from the hospital as well as assertive outreach for poorly compliant patients. Van Heeringen et al. (31), reported that home visits by a nurse in order to assess reasons for non-compliance and to motivate patients to comply with referral for outpatient aftercare has significantly increased compliance with referral (from 42.5 to 51% after the home visit) and decreased, albeit not significantly, the rate of repeat suicidal behavior at one year (from 17.4 to 10.7%).

In addition to continuity of care, helping the patient to identify and resolve problems, treating psychiatric comorbidities, as provided in our IPC program, contributed to reducing the risk of further suicide attempts (32).

Our results should be regarded in the light of some methodological limitations. The first regards the fact that this is a monocentric, open-label study, limiting the generalizability of our results. Second, although our efforts to randomly allocate the subjects, the groups differed, at baseline, accordingly to sex, the number of previous SA, lower educational status, and anxiety disorders. To limit this bias, we performed a multivariable analysis using a logistic regression model and except for the number of previous SA and the BDI-SF score at day 8, no other characteristics significantly influenced the results. Third, although we have calculated the sample size and performed a six-month follow-up of the sample, we observed a small number of suicide reattempts and no death by suicide. These facts and our favorable results warrant further research assessing the IPC approach in a larger sample.

Another source of bias regards the lack of standardization of the pharmacological intervention. A psychiatrist, as used in the IPC group, is more prone to prescribe antidepressant medication than a general practitioner. According to reviews and international guidelines, the use of the antidepressant in adults is associated with a prevention of completed suicide, and the risk-benefits ratio is in favor of antidepressants in the case of mental disorder associated with suicidal behavior (6, 33, 34). In our study, a psychiatric team trained to diagnose and to treat psychiatric comorbidities demonstrated a benefice concerning the improvement of depressive symptoms and suicide relapse in comparison to STP.

To conclude, our results support that an approach of patients based on a multi-professional team, providing intensive psychosocial follow-up, to assure the continuity of care and maintaining substantial personalized contacts after discharge of a suicide attempt, could

significantly reduce the levels of depressive symptoms, improve compliance with treatment and slightly decrease the number of repeat SA.

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Table 1: Baseline socio-demographic and clinical characteristics in Standard Treatment Protocol and Intensive Psychosocial Care groups. Values are expressed in the number of subjects and proportions. Significance at the level of 5%.

Variables		Standard Treatment (n=120)		Intensive Psychosocial Care (n=140)				
		n	%	n	%	Total	Chi-square test	p
Gender	Women/men	84/36	70/30	115/25	82/41	199/61	5,3	0,02*
Urban or rural settlement	Metropolitan Area/non metropolitan area	80/39	67/33	94/46	67/33	174/85	0,91	0,63
Living alone (yes/no)		25/95	21/79	32/108	23/77	57/203	0,15	0,694
Educational Status	Elementary	54	45	34	25	88		
	College	33	28	50	36	83		
	High school	32	27	54	39	86	12,3	0,002 *
Professional status	Employed/unemployed	55/65	57/43	61/79	59/41	116/144	3,4	0.493

Table 2 – Baseline characteristics of the past and current suicide attempt (SA) in Standard Treatment Protocol and Intensive Psychosocial Care groups. Significance at 5% level.

		Standard Treatment (n=120)		Intensive Psychosocial Care (n=140)				
		n	%	n	%	Total (%)	$\chi 2$ test	p
Past Suicide Attempt (yes/no)		47	39	52	37	99 (38%)	0.11	0.73
Number of past SA	1	27	22	31	22	58 (59%)	0,16	0.92
	≥2	20	17	21	15	41(41%)		
Mean used for current SA	Benzodiazepines alone	89	76	93	65	182 (70%)	12.4	0.53
	SSRIs alone	27	23	35	24	62 (24%)		
	Analgesics	22	19	36	25	58(22%)		
	Other Medications	38	32	51	36	89 (34%)		
	Non drug overdose	8	7	12	8	20 (8%)		
Concurrent alcohol intake		49	42	32	23	81(31%)	1.08	0.001
Beck Suicide Intent Scale scores	Mean±S.D.	9.8±9.4		8.6±9.7				0.28

Table 3 – Patients lost to follow-up in Standard Care Protocol and Intensive Psychosocial Care groups. Z-test was used to compare two population proportions, significance at 5% level.

	Standard Care (n=120)	Intensive Psychosocial Care (n=140)	p
Patients lost to follow-up at day 8	17 (14%)	7 (5%)	0.011*
Patients lost to follow-up at month 1	29 (24%)	18 (13%)	0.018*
Patients lost to follow-up at month 3	40 (33%)	26 (19%)	0.006*
Patients lost to follow-up at month 6	52 (43%)	43 (31%)	0.035*

Table 4 – Median scores obtained with the Beck Depression Inventory-SF in Standard Care

	Usual Care (n=120)	Intensive Psychosocial Care (n=140)	Mann-Whitney U	p
Beck Depression Inventory –SF at day 8	11.5	12	5943.5	0.90
Beck Depression Inventory –SF at month 1	10	10	4305.0	0.94
Beck Depression Inventory –SF at month 3	8	6	3325.0	0.19
Beck Depression Inventory –SF at month 6	5	3	2351.0	0.04*

Protocol and Intensive Psychosocial Care groups. Significance at 5% level, Independent-samples Mann-Whitney Test.

Figure legends

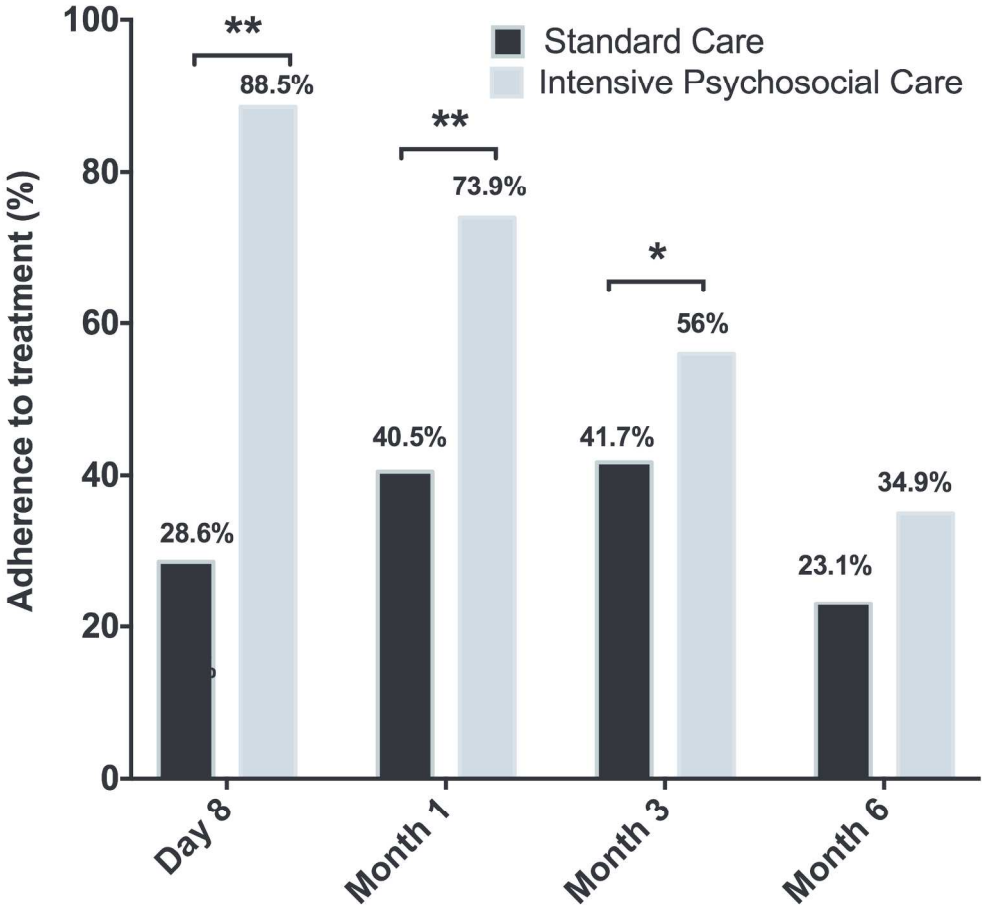
Figure 1: Patients flow chart. Patients committing a suicide attempt were allocated in Standard Care protocol (n=120) or Intensive Psychosocial Care protocol (n=140).

Figure 2: Compliance with treatment rates during each endpoint up. Adherence to treatment is significantly higher in the Intensive Psychosocial Care protocol up to the third month of follow-up. *p≥0,05; ** p≥0,005.

Figure 3: Survival curve for attempt suicide relapse during the six-month follow-up. The mean time between discharge and suicide reattempt was longer in the Intensive Psychosocial care.

Patients flow chart. Patients committing a suicide attempt were allocated in Standard Care protocol (n=120) or Intensive Psychosocial Care protocol (n=140).

144x124mm (72 x 72 DPI)



Compliance with treatment rates during each endpoint up. Adherence to treatment is significantly higher in the Intensive Psychosocial Care protocol up to the third month of follow-up. *p≥0,05; ** p≥0,005.
183x171mm (300 x 300 DPI)

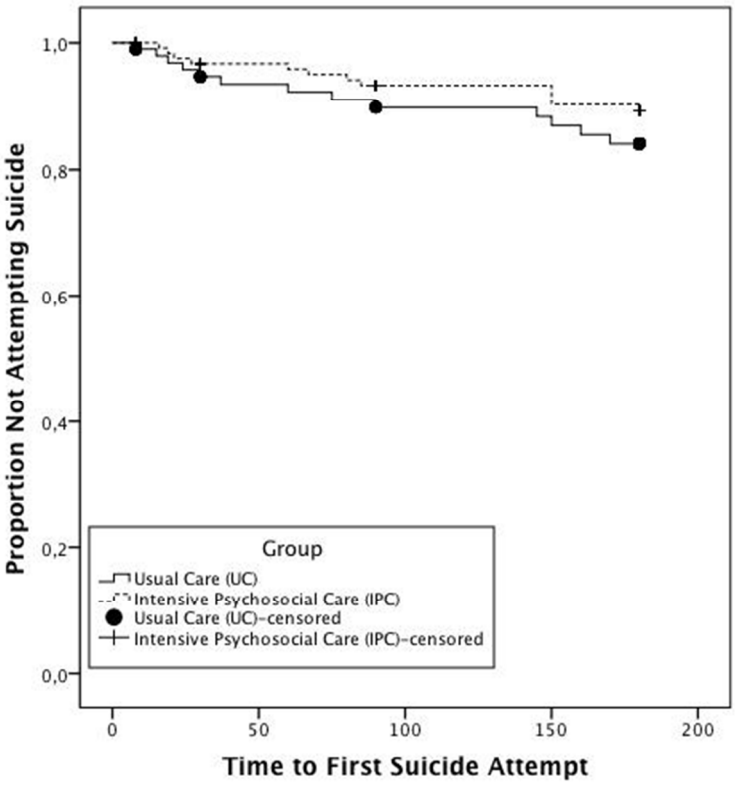


Figure 3: Survival curve for attempt suicide relapse during the six-month follow-up. The mean time between discharge and suicide reattempt was longer in the Intensive Psychosocial care.

220x176mm (72 x 72 DPI)