Clinical Dimensions Associated With Psychological Pain in Suicidal Patients: One-Year Follow-up Study

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ABSTRACT

Objective: Psychological pain is a transdiagnostic factor in mental health and a key clinical dimension to understand suicide in patients with mood disorders. However, less is known about the clinical characteristics that predict high psychological pain. The aim of this study was to fill this gap in a sample of patients with mood disorders.

Methods: Inpatients admitted for a major depressive episode, according to *DSM-IV* criteria, from 2010 to 2017 were divided into 3 groups: 178 recent suicide attempters (within the last 7 days), 101 past suicide attempters (lifetime history of suicide attempt), and 93 nonattempters (no lifetime history of suicidal act). At inclusion, current psychopathology, medication, personality traits (impulsivity, anxiety, hopelessness), and childhood trauma were assessed. At inclusion and at 1-year follow-up, depressive symptomatology and current and maximal (within the 15 last days) psychological and physical pain were assessed.

Results: At baseline, maximal psychological pain was higher in recent than in past suicide attempters (odds ratio [OR] = 1.18 [1.04–1.35]) and nonattempters (OR = 1.32 [1.16–1.50]). In the multivariate model, depression severity (OR = 1.11 [1.08–1.16]) and worst physical pain (OR = 2.53 [1.28–5.02]) predicted high psychological pain, whereas bipolar disorder (OR = 0.54 [0.29–0.98]) predicted low psychological pain. During the follow-up, the change in maximal psychological pain was predicted by changes in depressive symptomatology (β = 0.46, $P < .001$) and maximal physical pain (β = 0.42, $P < .003$). Finally, among depressive symptoms, guilt, lack of initiative, and loss of appetite better explained maximal psychological pain, both at inclusion and at 1 year (all $P < .050$).

Conclusions: Psychological pain is associated with a recent suicidal act and depressive severity. Due to the strong link between psychological pain and physical pain, future studies should investigate whether psychotropic drugs with analgesic effects protect from psychological pain and therefore from suicide.

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Many authors have proposed that suicide behavior stems from the need to escape from unbearable psychological pain.[1–3] A recent meta-analysis by Ducasse et al[4] showed consistent relationships between higher levels of psychological pain and suicide behaviors (from current or lifetime suicidal ideation to recent or lifetime suicide attempt) independent of depression. Indeed, psychological pain is a strong predictor of suicidality in clinical[5–9] and nonclinical populations.[10,11] In a prospective study, we reported that psychological pain predicts future suicidal events (ie, hospitalization for suicidal ideation, suicide attempt, and completed suicide) in patients with depression at 1 year of follow-up.[12] Therefore, psychological pain is an essential clinical factor to understand suicide in the context of mood disorders. Some authors have tried to define psychological pain; according to Shneidman,[3] psychological pain is "the introspective experience of negative emotions such as dread, despair, fear, grief, shame, guilt, frustrated love, loneliness, and loss." Other authors proposed different terms and definitions.[13] Meerwijk and Weiss[14] performed a concept analysis to provide a unifying definition of psychological pain as "a lasting, unsustainable, and unpleasant feeling resulting from negative appraisal of an inability or deficiency of the self." As these definitions highlight that the conceptualization of psychological pain depends on subjectivity, Olié et al[15] developed Visual Analog Scales (VAS) to measure the subjective level of psychological and physical pain in clinical settings. Due to the close relationship between psychological pain and suicidal behavior, it is important to identify the clinical factors that contribute to psychological pain in high-risk populations in order to better define the concept of psychological pain and to develop targeted interventions.

It is critical to understand the link between psychological pain and other features strongly related to suicide. For instance, Cáceda et al[5] found that transient impulsive choice abnormalities (delay discounting) are associated with suicidal behavior and psychological pain. Similarly, in suicide attempters, psychological pain, assessed with the Psychache scale[16] and the 3-dimensional psychological pain scale,[17] has been positively correlated with self-reported impulsive personality.[8] Moreover, in adults, psychological pain is more severe in individuals with history of childhood trauma or abuse.[18,19] The relationship between psychological pain and depression remains debated. For a long time, psychological pain has been considered as a core component

Clinical Points

- Psychological pain is at the core of suicidal behavior, but little is known about the clinical characteristics associated with high levels of psychological pain.
- Patients reporting high levels of psychological pain often also have high levels of physical pain and severe depressive symptoms, particularly guilt, lack of initiative, and loss of appetite.
- Psychological pain should be a therapeutic target in suicidal patients with depression.

of depression,[20] but its link with suicidal behavior seems independent from depression.[4]

In this study, we wanted (1) to characterize and compare psychological pain in recent suicide attempters (within the last 7 days), past suicide attempters (lifetime history of suicide attempt), and nonattempters, all with depression, and (2) to identify the clinical dimensions (particularly lifetime psychopathology, treatments, physical pain, impulsivity trait, childhood trauma, and depression symptoms) most associated with psychological pain. As psychological pain is a transient state, we hypothesized that recent suicide attempters would report higher psychological pain than past suicide attempters and nonattempters. Moreover, we expected relationships between psychological pain and impulsivity trait, history of childhood trauma, physical pain, and depression.

METHODS

Participants

The study population included 371 patients (259 women), aged between 18 and 71 years (mean age ± SEM = 42.07 ± 0.65 years), admitted for a major depressive episode (MDE), according to *DSM-IV* criteria, to the Department of Psychiatric Emergency and Acute Care, Academic Hospital (CHU) of Montpellier, France, from 2010 to 2017. Inclusion criteria were age greater than 18 years and having a current MDE according to the *DSM-IV* criteria. Exclusion criteria were lifetime diagnosis of schizoaffective disorder or schizophrenia. Current and lifetime psychiatric disorders were diagnosed by senior psychiatrists using the French version of the Mini-International Neuropsychiatric Interview (MINI 5.0).[21]

Patients were divided in 3 subgroups according to their suicidal act history: (1) recent suicide attempters (SA-R), ie, patients hospitalized following a suicide attempt in the previous 7 days (N = 178); (2) past suicide attempters (SA-P), ie, patients with a lifetime history of suicide attempt (N = 101) who attempted suicide at latest 8 days before the evaluation; and (3) affective controls (AC), ie, patients without a history of suicide attempt (N = 93). A suicide attempt was defined as a self-damaging act carried out with the intention to die. It is different from self-mutilation, the use of substances, or noncompliance with medical treatment.[22]

The Montpellier University Hospital ethics committee (CPP Sud Mediterranée IV) approved the study. Informed written consent was obtained from all participants.

Clinical Assessment at Inclusion

At admission, patients completed the VAS[15] to evaluate current and worst (within the last 15 days) psychological pain and physical pain. This VAS is a straight horizontal line with the labels "no pain" at the left end (score = 0) and "worst pain" at the right end (score = 10). Instructions were limited to the following sentence: "Please score the level of your psychological/physical pain." Instructions did not include any explicit definition of psychological pain, in order not to influence each patient's experience of psychological pain.

Demographic characteristics, education level, marital status, and smoking history were collected during a face-to-face interview. Current psychotropic treatments were recorded to calculate a general index of medication load. This index was based on the sum of the doses of all psychotropic drugs taken by the patient. The dose of each drug was coded from 0 to 4, as previously described,[23] to differentiate among drug dose levels. The total medication load (doses and types of drugs taken) was computed by adding all individual medication codes for each medication category and for each individual participant.

Depressive symptomatology was evaluated using the short version of the Beck Depression Inventory (BDI).[24] Several personality traits were assessed: impulsivity using the French version of the Barratt Impulsivity Scale,[25] affective intensity and lability using the Affect Intensity Measure[26] and the Affective Lability Scale,[27] hopelessness using the Beck Hopelessness Scale,[28] and history of childhood trauma, including history of abuse or neglect, using the Childhood Trauma Questionnaire.[29]

Follow-up

Patients were followed for 1 year. Three follow-up interviews were scheduled at months 3, 6, and 12 after inclusion. Follow-up visits were performed in person by a trained psychologist or psychiatrist. At each visit, patients completed the VAS for psychological and physical pain and the short version of the BDI. From the whole sample, 123 patients completed at least 1 follow-up visit.

Data Description and Statistical Analyses

Sociodemographic and clinical variables were compared with the χ^2 test for qualitative variables and analysis of variance for quantitative variables and the 3 patient groups (SA-R, SA-P, and AC) as independent variables to test whether they were comparable among groups.

Then, multinomial regression analysis was performed using the 3 groups as independent variables and psychological pain as predictor. A different regression analysis was performed for each pain category (current and worst) with 2 models: (1) unadjusted multinomial regression and (2) adjusted multinomial regression using

Table 1. Descriptive Characteristics of the Sample[a]

Characteristic	SA-R (N = 178)	SA-P (N = 100)	AC (N = 93)	*P* value	Post hoc analysis
Sociodemographic					
Age, mean ± SEM, y[b]	41.51 ± 1.02	41.50 ± 1.18	43.76 ± 1.16	< .178	
Education years, mean ± SEM[b]	13.08 ± 0.22	13.50 ± 0.29	14.23 ± 0.24	< .007	SA-R < AC
Women	123 (69.1)	75 (74.3)	61 (65.6)	< .399	
Current smoker	83 (46.9)	55 (55.6)	34 (37.0)	< .079	
Sep/div/wid	48 (27.0)	21 (20.8)	13 (14.0)	< .047	SA-R > AC
Children	103 (57.9)	54 (53.5)	69 (74.2)	< .007	SA < AC
Current psychiatric comorbidity					
Mixed episode	12 (6.7)	9 (8.9)	3 (3.2)	< .267	
Anxiety disorder	102 (65.8)	46 (45.5)	7 (7.5)	< .001	SA > AC
Eating disorder	20 (11.2)	13 (12.9)	7 (7.5)	< .467	
Alcohol abuse/dependence	68 (38.2)	41 (40.6)	52 (55.9)	< .016	SA < AC
Substance abuse/dependence	20 (11.2)	18 (17.8)	13 (14.0)	< .306	
PTSD	35 (19.8)	20 (19.8)	4 (4.3)	< .002	SA > AC
Having 1 psychiatric comorbidity	149 (83.7)	83 (82.2)	64 (68.8)	< .012	SA-R > AC
Lifetime psychiatric comorbidity					
Bipolar disorder	45 (27.1)	57 (58.8)	40 (43.0)	< .001	SA-R < SA, AC
Medication					
Antidepressants	131 (73.6)	58 (58.0)	57 (61.3)	< .015	SA-R > SA-P
Anxiolytics	154 (86.5)	70 (70.0)	49 (52.7)	< .001	SA-R > SA-P > AC
Antiepileptics	28 (15.7)	33 (33.0)	30 (32.3)	< .001	SA-P, AC > SA-R
Antipsychotics	96 (53.9)	45 (45.0)	41 (44.1)	< .195	
Lithium	3 (1.7)	20 (20.0)	14 (15.1)	< .001	SA-P, AC > SA-R
Analgesics	17 (9.6)	8 (8.0)	2 (2.2)	< .080	
Medication load, mean ± SEM[b]	3.76 ± 0.13	4.01 ± 0.21	3.66 ± 0.23	< .327	
Suicidal history and clinical variables					
Depressive symptomatology (BDI), mean ± SEM	16.57 ± 0.59	18.32 ± 0.82	12.98 ± 0.86	< .001	SA > AC
Current physical pain, mean ± SEM	2.82 ± 0.22	2.88 ± 0.29	1.92 ± 0.24	< .022	SA > AC
Worst physical pain, mean ± SEM	4.57 ± 0.25	4.43 ± 0.34	3.51 ± 0.36	< .046	SA-R > AC
Violent suicide lifetime	31 (17.6)	21 (22.1)	…	< .370	
Severe suicide lifetime	46 (25.8)	29 (28.7)	…	< .603	
No. of suicide attempts, mean ± SEM	2.44 ± 0.19	2.61 ± 0.32	…	< .619	
Childhood Trauma Questionnaire, Moderate/Severe					
Total, mean ± SEM[b]	47.85 ± 1.41	51.92 ± 1.93	45.51 ± 1.75	< .080	
Physical abuse	32 (19.8)	25 (20.4)	19 (20.7)	< .393	
Physical neglect	43 (26.7)	31 (33.0)	23 (24.7)	< .410	
Emotional abuse	70 (42.7)	50 (53.2)	33 (37.1)	< .079	
Emotional neglect	62 (40.0)	48 (50.5)	37 (41.6)	< .245	
Sexual abuse	49 (30.8)	21 (22.8)	19 (20.4)	< .142	

[a]Values expressed as n (%) unless otherwise noted.
[b]Log-transformed.
Abbreviations: AC = affective controls, BDI = Beck Depression Inventory, MADRS = Montgomery-Asberg Depression Rating Scale, PTSD = posttraumatic stress disorders, SA = suicide attempters, SA-P = past suicide attempters, SA-R = recent suicide attempters, sep/div/wid = separated, divorced, or widowed.

as covariates the significant variables for suicide attempt (ie, variables showing significant differences among groups).

Then, the whole sample was divided in 2 groups (ie, high and low psychological pain) according to the median worst psychological pain score in the SA-R group. The effect of each sociodemographic and clinical variable on psychological pain was tested using unadjusted logistic regression and adjusted logistic regression models with depression (ie, BDI score) as covariate. A multivariate logistic regression analysis was performed with the significant variables after controlling for depression.

To identify depression symptoms strongly associated with worst psychological pain, a backward stepwise regression analysis was performed using the BDI items. Then, a relative importance weight analysis[30] was carried out using only the meaningful items extracted in the stepwise regression.

Finally, to test whether worst psychological pain changes over time were associated with changes in physical pain and depression (and to what extent), the temporal variations of worst psychological pain, physical pain, and depression scores were evaluated by calculating the linear regression coefficient for each patient using the data obtained at inclusion and during the follow-up. The association between these variations (coefficient obtained by linear regression) was tested with linear regression models.

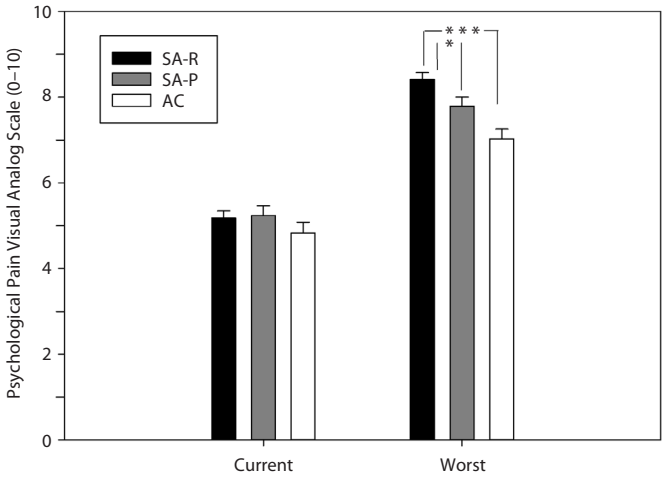
The α significance level was fixed at 0.05. Post hoc tests were adjusted using the Bonferroni correction. All statistical analyses were performed with SPSS 22.0.

RESULTS

Population Characteristics

The descriptive characteristics of the 3 groups are summarized in Table 1. Compared with the AC group, fewer patients had children ($\chi^2 = 9.92$, $P < .007$) and more patients had a current anxiety disorder ($\chi^2 = 63.72$, $P < .001$) or current posttraumatic stress disorder ($\chi^2 = 12.49$, $P < .002$) in the SA-P and SA-R groups. Similarly, the BDI mean score

Figure 1. Current and Worst Psychological Pain in Recent Suicide Attempters (SA-R), Past Attempters (SA-P), and Affective Controls (AC; Depression Only) as Measured by Psychological Pain Visual Analog Scale (Mean ± SEM Scores)



*P < .050.
***P < .001.

($F_{2, 369}$ = 11.08, P < .001, η^2 = 0.06) and the current physical pain level ($F_{2, 368}$ = 3.85, P < .022, η^2 = 0.02) were higher in the SA-P and SA-R groups than in the AC group.

Compared with the AC group, patients in the SA-R group had lower education level ($F_{2, 369}$ = 5.07, P < .007, η^2 = 0.03) and higher worst physical pain level ($F_{2, 368}$ = 3.12, P < .045, η^2 = 0.02). Similarly, more patients were separated/divorced/widowed (χ^2 = 6.12, P < .047), had current psychiatric comorbidity (χ^2 = 8.91, P < .012), and were taking antidepressants (χ^2 = 8.37, P < .015) and/or anxiolytics (χ^2 = 36.87, P < .001) in the SA-R group than in the SA-P and AC groups. Fewer patients had current alcohol abuse and/or dependence (χ^2 = 8.21, P < .016) in the SA-R and SA-P groups than in the AC group. Conversely, more patients in the SA-P and AC groups were taking lithium (χ^2 = 27.49, P < .001) and antiepileptic drugs (χ^2 = 14.32, P < .001) compared with those in the SA-R group.

Psychological Pain and Suicidality

The mean scores ± SEM of the two categories of psychological pain (current and worst) in the 3 groups are shown in Figure 1. The relationship between psychological pain and suicidal behavior was assessed with unadjusted regression models (Supplementary Table 1) and then adjusted for education level, children, marital status, medication load, current psychiatric comorbidity, and levels of depression (BDI) and physical pain.

In the adjusted model, the relationship between worst psychological pain and history of SA was significant in the SA-R group compared with the AC group (odds ratio [OR] = 1.32, 95% CI = 1.16–1.50, P < .001) and the SA-P group (OR = 1.18, 95% CI = 1.04–1.35, P = .014) (Table 2).

Psychological Pain and Associated Clinical Variables

Then, the whole sample was divided into 2 groups using the median worst psychological pain score in the SA-R group as a cutoff: high psychological pain (worst psychological pain ≥ 9; n = 207) and low psychological pain (worst psychological pain < 9; n = 164). Among the 207 patients (55.8% of the whole group) with high psychological pain, 66.9%, 55.0%, and 35.5% belonged to the SA-R, SA-P, and AC groups, respectively.

The characteristics of these two groups (high and low psychological pain) and the results of the unadjusted and adjusted analyses to detect sociodemographic and clinical features associated with high psychological pain are summarized in Supplementary Table 2.

Logistic regression analyses adjusted for depression (BDI score) showed that patients with high psychological pain more often had a lifetime history of substance abuse and/or dependence (P < .024, OR = 1.83, 95% CI = 1.08–3.09), history of childhood sexual abuse (P < .032, OR = 1.18, 95% CI = 1.05–3.11), anxiolytic intake (P < .004, OR = 2.14, 95% CI = 1.27–3.59), and higher worst physical pain (P < .001, OR = 1.15, 95% CI = 1.08–1.24) compared with patients with low psychological pain. Patients were younger (P < .003, OR = 0.97, 95% CI = 0.96–0.99) and had lower hopelessness scores (P < .033, OR = 0.93, 95% CI = 0.87–0.99) in the group with high versus low psychological pain. Similarly, the percentages of patients with bipolar disorder (P < .001, OR = 0.45, 95% CI = 0.28–0.72) and taking lithium (P < .018, OR = 0.38, 95% CI = 0.17–0.85) and antiepileptics (P < .041, OR = 0.58, 95% CI = 0.34–0.98) were lower in the high psychological pain group. Impulsivity, affective lability and intensity, self-reported anxiety, and suicidal ideation were comparable between groups (all P > .05).

Depression (BDI score) (P < .001, OR = 1.11, 95% CI = 1.08–1.16), worst physical pain (P = .008, OR = 2.53, 95% CI = 1.28–5.02), and bipolar disorder (P = .041, OR = 0.54, 95% CI = 0.29–0.98) remained significantly associated with high psychological pain in the multivariate model (Table 3).

Psychological Pain and Associated Depressive Symptoms

Backward stepwise regression showed that sadness, guilt, suicidal ideation, lack of initiative, and loss of appetite were the depressive symptoms that better explained worst psychological pain (R^2 = 0.29 of explained variance). All symptoms were significantly associated with worst psychological pain (P < .010) except suicidal ideation (P < .071). Relative importance analyses showed that guilt was the most important factor (explaining the 36% of the total R^2), followed by sadness (21%) and lack of initiative (17%). Loss of appetite and suicidal ideation accounted each for 13% of the total variance. Dominance and relative weights are summarized in Table 4.

Based on the previous analysis, a composite score (BDI psychological pain composite) was calculated using the 5 depression items showing meaningful

Table 2. Multinomial Regression Analysis of Suicide Attempt Using Current and Worst Psychological Pain as Predictor[a]

Current psychological pain (R^2_{cs} = .15, R^2_N = .17, $\Delta\chi^2$ = 60.59***)				Worst psychological pain (R^2_{cs} = .19, R^2_N = .22, $\Delta\chi^2$ = 79.04***)			
	B (SE)	*P* value	OR [95% CI]		*B* (SE)	*P* value	OR [95% CI]
SA-P vs AC				SA-P vs AC			
Current psychological pain	0.08 (0.07)	.230	1.09 [0.95–1.24]	Worst psychological pain	0.11 (0.07)	.114	1.12 [0.97–1.28]
Education years	−0.09 (0.06)	.110	0.91 [0.81–1.02]	Education years	−0.11 (0.06)	.063	0.89 [0.79–1.01]
Children (Y = 1)	**−1.16 (0.35)**	**.001**	**0.31 [0.16–0.62]**	Children (Y = 1)	**−1.09 (0.35)**	**.002**	**0.34 [0.17–0.66]**
Sep/div/wid (Y = 1)	**1.00 (0.43)**	**.018**	**2.73 [1.19–6.27]**	Sep/div/wid (Y = 1)	**0.87 (0.43)**	**.043**	**2.39 [1.03–5.55]**
Medication load	0.09 (0.08)	.237	1.09 [0.94–1.28]	Medication load	0.11 (0.08)	.142	1.12 [0.96–1.31]
Psychiatric comorbidity (Y = 1)	0.02 (0.39)	.953	1.02 [0.48–2.19]	Psychiatric comorbidity (Y = 1)	−0.05 (0.41)	.898	0.95 [0.43–2.01]
Depression (BDI)	**0.05 (0.02)**	**.018**	**1.06 [1.01–1.10]**	Depression (BDI)	**0.05 (0.02)**	**.028**	**1.05 [1.01–1.10]**
Current physical pain	0.08 (0.06)	.210	1.08 [0.96–1.23]	Worst physical pain	0.04 (0.05)	.401	1.04 [0.95–1.15]
SA-R vs AC				SA-R vs AC			
Current psychological pain	0.08 (0.06)	.227	1.08 [0.95–1.22]	Worst psychological pain	**0.28 (0.07)**	**.001**	**1.32 [1.16–1.50]**
Education years	**−0.15 (0.05)**	**.005**	**.86 [0.77–0.96]**	Education years	**−0.17 (0.06)**	**.002**	**0.84 [0.76–0.94]**
Children (Y = 1)	**−1.07 (0.31)**	**.001**	**0.34 [0.19–0.63]**	Children (Y = 1)	**−1.01 (0.32)**	**.002**	**0.36 [0.19–0.68]**
Sep/div/wid (Y = 1)	**1.21 (0.38)**	**.001**	**3.35 [1.59–7.01]**	Sep/div/wid (Y = 1)	**1.11 (0.39)**	**.004**	**3.05 [1.43–6.51]**
Medication load	0.03 (0.07)	.660	1.03 [0.89–1.18]	Medication load	0.08 (0.07)	.288	1.08 [0.94–1.25]
Psychiatric comorbidity (Y = 1)	0.38 (0.31)	.277	1.46 [0.74–2.87]	Psychiatric comorbidity (Y = 1)	0.14 (0.37)	.708	1.15 [0.56–2.36]
Depression (BDI)	0.03 (0.02)	.189	1.03 [0.99–1.07]	Depression (BDI)	0.001 (0.02)	.960	1.00 [0.96–1.04]
Current physical pain	0.07 (0.06)	.265	1.07 [0.95–1.19]	Worst physical pain	0.03 (0.05)	.468	1.03 [0.95–1.13]
SA-R vs SA-P				SA-R vs SA-P			
Current psychological pain	−0.01 (0.06)	.895	0.99 [0.89–1.11]	Worst psychological pain	**0.17 (0.07)**	**.014**	**1.18 [1.04–1.35]**
Education years	−0.06 (0.05)	.227	0.95 [0.86–1.04]	Education years	−0.06 (0.05)	.179	0.94 [0.86–1.03]
Children (Y = 1)	0.09 (0.29)	.753	1.09 [0.63–1.91]	Children (Y = 1)	0.08 (0.28)	.791	1.08 [0.62–1.88]
Sep/div/wid (Y = 1)	0.21 (0.33)	.534	1.23 [0.64–2.34]	Sep/div/wid (Y = 1)	0.24 (0.34)	.468	1.28 [0.66–2.46]
Medication load	−0.06 (0.07)	.345	0.94 [0.83–1.07]	Medication load	−0.04 (0.07)	.571	0.96 [0.85–1.09]
Psychiatric comorbidity (Y = 1)	0.35 (0.36)	.321	1.42 [0.71–2.86]	Psychiatric comorbidity (Y = 1)	0.19 (0.36)	.600	1.21 [0.59–2.46]
Depression (BDI)	−0.03 (0.02)	.150	0.97 [0.94–1.01]	Depression (BDI)	**−0.05 (0.02)**	**.008**	**0.95 [0.92–0.99]**
Current physical pain	−0.02 (0.05)	.766	0.99 [0.89–1.09]	Worst physical pain	−0.01 (0.04)	.819	0.99 [0.92–1.07]

[a] $R^2_{cs} = R^2$ Cox and Snell, $R^2_N = R^2$ Nagelkerke, $\Delta\chi^2$ = change in χ^2. Boldface indicates statistical significance. "Y = 1" indicates that in the statistical analysis, an answer of "yes" for the variable is equal to 1.

***$P < .001$.

Abbreviations: AC = affective controls, BDI = Beck Depression Inventory, OR = odds ratio, SA-P = past suicide attempters, SA-R = recent suicide attempters, sep/div/wid = separated, divorced, or widowed.

relationships with psychological pain at inclusion (Cronbach α = .72), and then their covariation during the follow-up was analyzed.

Psychological Pain Covariation With Depression Items During the Follow-up

There was no significant difference at inclusion between patients with and without follow-up data (Supplementary Table 3). Worst psychological pain, worst physical pain, and depressive symptomatology improved during the follow-up (Supplementary Figure 1). Univariate analysis showed that worst psychological pain variation was positively related with the variation in worst physical pain (β = 0.42, $P < .003$), total BDI score (β = 0.46, $P < .001$), and BDI psychological pain composite score (β = 1.03, $P < .001$). Therefore, a slower improvement of physical pain and depression symptomatology predicted a slower improvement of psychological pain.

To identify which items were important to explain psychological pain variation during the follow-up, the change in the 5 items of the BDI psychological pain composite was calculated and their relative weights were computed. Variations of worst psychological pain were associated with variations of guilt, lack of initiative, and loss of appetite during the follow-up ($P < .010$), but not with variations of sadness and suicidal ideation ($P > .100$). The model with the 5 items had an $R^2 = 0.54$. Relative importance analyses showed that the change in guilt was the most important factor (39%), followed by lack of initiative (34%) and loss of appetite (19%). The variation of sadness and suicidal ideation accounted for 6% and 2%, respectively, of the total explained variance. Dominance and relative weights are summarized in Table 4.

DISCUSSION

Our results show higher worst psychological pain in recent suicide attempters than in past suicide attempters and nonattempters (even after adjusting for several confounders, such as depression and physical pain) and confirm the relationship between suicidal behavior and psychological pain, independently of depression.

The meta-analysis by Ducasse et al[4] showed a strong relationship between level of psychological pain and recent (< 72 hours) and past history of suicide attempt. While the relationship between recent suicide attempt and psychological pain is clear, previous studies reported contradictory results on the relationship between psychological pain and lifetime history of suicide attempt in patients with depression.[8,15,17,19] Recently, we found that worst psychological pain is predictive of future suicide events in patients with depression at 1 year

Table 3. Multivariate Logistic Regression Analysis to Identify Variables Associated With High Psychological Pain (Threshold: Worst Psychological Pain Score ≥ 9)[a]

	High vs low psychological pain (R^2_{cs} = .25, R^2_N = .33, χ^2 = 93.36***)		
Variable	*B* (SE)	*P* value	OR [95% CI]
Depression (BDI)	**0.11 (0.02)**	**.001**	**1.11 [1.08–1.16]**
Age	−1.68 (0.26)	.069	0.19 [0.03–1.14]
Lifetime bipolar disorder	**−0.62 (0.30)**	**.041**	**0.54 [0.29–0.98]**
Lifetime substance abuse/ dependence	0.39 (0.31)	.196	1.49 [0.81–2.71]
Anxiolytics	0.39 (0.30)	.201	1.47 [0.81–2.67]
Antipsychotics	−0.51 (0.34)	.139	0.60 [0.31–1.18]
Lithium	−0.31 (0.47)	.502	0.73 [0.29–1.83]
Worst physical pain	**0.93 (0.35)**	**.008**	**2.53 [1.28–5.02]**
Childhood sexual abuse	0.55 (0.29)	.067	1.73 [0.96–3.11]

[a] $R^2_{cs} = R^2$ Cox and Snell, $R^2_N = R^2$ Nagelkerke. Boldface indicates statistical significance.
***$P < .001$.
Abbreviations: BDI = Beck Depression Inventory, OR = odds ratio.

Table 4. General Dominance Weights and Relative Importance Weights for Predicting Each Category of Psychological Pain Using the 5 Meaningful BDI Items at Inclusion and at 1 Year of Follow-up[a]

	β (SE)	DW	$RW^{Sig\ 95\%\ CI}$	% From R^2
Worst psychological pain				R^2 = .29
I-1 Sadness	0.35 (0.13)**	.063	.063	21%
I-5 Guilt	0.59 (0.11)***	.105	$.105^{7, 13}$	36%
I-7 Suicidal ideation	0.22 (0.12)†	.039	.039	13%
I-11 Lack of initiative	0.39 (0.15)**	.049	.049	17%
I-13 Loss of appetite	0.34 (0.12)**	.037	.037	13%
Worst psychological pain across follow-up				R^2 = .54
I-1 Sadness slope	−0.15 (0.59)	.035	.035	6%
I-5 Guilt slope	1.74 (0.46)***	.211	$.211^{1, 7}$	39%
I-7 Suicidal ideation slope	0.05 (0.44)	.008	.008	2%
I-11 Lack of initiative slope	1.68 (0.55)**	.182	$.182^{1, 7}$	34%
I-13 Loss of appetite slope	1.57 (0.70)*	.107	$.107^{7}$	19%

[a] *Slope* refers to the variation in the items across the follow-up. Superscripted numbers in the $RW^{Sig\ 95\%\ CI}$ column refer to which items show significant difference from the item (according to 95% CI) in their relative importance; for example, in the cross-sectional analysis, I5-Guilt is significantly more important (has significantly greater weight) in the model than I-7 and I-13 according to 95% CI.
*$P < .05$. **$P < .01$. ***$P < .001$. †$P < .10$.
Abbreviations: BDI = Beck Depression Inventory, DW = dominance importance weight, I = item of Beck Depression Inventory, RW = relative importance weight.

of follow-up.[12] Altogether, we could hypothesize that higher worst psychological pain is a risk factor for suicidal acts when the level of psychological pain becomes unbearable. Psychological pain is transient. Therefore, the observed difference among groups only in worst psychological pain in the last 15 days, but not in current psychological pain, might reflect the pain experienced during the suicidal crisis. As high-intensity psychological pain triggers the experience of time slowing, thus increasing the perceived duration of the suicidal process,[31] it would be interesting to ask patients when they felt the worst pain to better understand the suicidal process chronology.

It is critical to assess psychological pain in patients with depression. Our multivariate model showed that higher depressive symptomatology and higher physical pain exacerbated the odds of high psychological pain (> 8/10). In agreement, slower reduction of physical pain during the follow-up predicted slower decrease of psychological pain. Previous studies showed that physical pain increases the odds of suicidal ideation/act.[32] Physical pain is also involved in the development of depression that negatively influences pain perception, in a vicious circle.[33] Similarly, physical pain may exacerbate psychological pain and vice versa. Higher psychological pain has been related to higher physical pain thresholds.[6] Our results confirm the relationship between physical and psychological pain using subjective self-assessments, including in patients with non-chronic pain.

Our univariate analysis found that intake of lithium and anticonvulsant drugs was inversely correlated with high psychological pain. Both lithium and anticonvulsants have analgesic effects on neuropathic pain.[34,35] However, this correlation was not significant in the multivariate model. The protective effect of bipolar disorder on pain could be partly explained by the use of these medications.* Interestingly, both drug types protect against suicide in patients with bipolar disorder,[36] particularly lithium.[37] This suggests that they could be useful to target psychological pain in suicidal patients similarly to low-dose buprenorphine.[38]

Although this study and some previous works[10,11] found a relationship between psychological pain and suicidal act independently of depression, this does not mean that psychological pain and depression are not interrelated. Our study highlighted this relationship by showing that higher worst psychological pain is associated with more severe depressive symptomatology both at inclusion and during the follow-up. Five depressive symptoms were important to predict psychological pain: sadness, guilt, lack of initiative, loss of appetite, and suicidal ideation. Several of these symptoms are present in the proposed definitions of psychological pain.[3,39] When considering these symptoms at inclusion and their variations during the 1 year of follow-up, guilt was the most important variable to explain the higher psychological pain score at inclusion and the higher variations during the follow-up. Moreover, lack of initiative and loss of appetite maintained their significance during the follow-up, but sadness and suicidal ideation did not. This suggests that psychological pain might remain high despite variations in suicidal ideation and sadness. This result may seem contradictory. However, psychological pain, sadness, and suicidal ideation are transient and highly dynamic symptoms. They may change faster than other symptoms of depression. For instance, it has been shown that the severity of depressed mood and suicidal ideation was different in 2 separate MDEs, while symptoms related to self-blame or anhedonia were more stable.[40] The relationship of psychological pain with suicidal ideation and sadness at

* In our sample, the percentage of patients taking lithium or anticonvulsants was higher ($P < .001$) in patients with (lithium = 23.4%; anticonvulsants = 44.0%) than without (lithium = 1.9%; anticonvulsants = 12.1%) lifetime diagnosis of bipolar disorder.

inclusion could be due to the fact that many patients were facing a suicidal crisis and scores were high, which was not the case during the follow-up. For this reason, other, more stable, depression symptoms, such as culpability and lack of appetite, may explain the faster or slower recovery of psychological pain when patients overcome the initial suicidal crisis. This result highlights the difference between symptoms that enhance psychological pain and symptoms that predict this pain. For instance, self-blame was previously correlated with the insula,[41] one of the central regions of the psychological pain network.[42] The close association between pain and guilt may explain why, for a long time, psychological pain was considered part of severe forms of depression. For instance, Henri Ey[20] considered psychological pain as a core component of depression, in addition to inhibition and low mood, and particularly of melancholia. As a matter of fact, suicide risk is very high in patients with melancholia. However, this exploratory analysis should be interpreted with caution because we did not test all depression symptoms that may influence these relationships.

Our study presents some limitations. First, the cross-sectional analysis limits the causality assumptions when predicting suicidal behavior. Second, physical conditions were not exhaustively assessed. However, an exhaustive evaluation of physical conditions related to chronic physical pain may help to better understand the relationship between physical and psychological pain. Finally, patients were asked to evaluate psychological pain after admission, which may have led to a memory bias. Moreover, medical care and treatment adaptation during hospitalization may have decreased the intensity of current psychological pain, thus explaining the absence of between-group differences for current psychological pain.

CONCLUSION

In conclusion, our results are in agreement with previous research putting psychological pain at the core of the suicidal act. Moreover, physical and psychological pain are interrelated in patients at risk of suicide. Clinicians should pay special attention to patients who report high levels of physical pain or have severe depressive symptoms, particularly guilt, lack of initiative, and loss of appetite. The protective effect of lifetime bipolar disorder might be partly explained by the associated pharmacologic treatments. Future studies should determine whether psychotropic drugs with analgesic effects may protect from psychological pain and, therefore, suicide.

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Supplementary material: Available at PSYCHIATRIST.COM.

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Supplementary Material

Article Title: Clinical Dimensions Associated With Psychological Pain in Suicidal Patients: One-Year Follow-up Study

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List of Supplementary Material for the article

1. Table 1 — Unadjusted Logistic Regression Analysis of Suicidal Ideation Using Current and Worse Psychological Pain as Predictors of Suicide
2. Table 2 — Variables Explaining High Psychological Pain
3. Table 3 — Description of the Baseline Sociodemographic and Clinical Variables of Patients With and Without Follow-up Data
4. Figure 1 — Mean ± SE of Psychological Pain, Physical Pain and Depression Across the Follow-up

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Supplementary table 1: Unadjusted logistic regression analysis of suicidal ideation using current and worse psychological pain as predictors of suicide:

Current psychological pain	R^2_{cs} = .04, R^2_N = .04, $\Delta\chi^2$ = 14.49***			*Worse psychological pain*	R^2_{cs} = .09, R^2_N = .11, $\Delta\chi^2$ = 38.40***		
	B *(SE)*	*p-value*	OR [95% CI]		B *(SE)*	*p-value*	OR [95% CI]
SA-P (1) vs AC (0)	**.19 (.05)**	**.001**	**1.21 [1.09 - 1.34]**	SA-P (1) vs AC (0)	**.21 (.06)**	**.001**	**1.23 [1.11 - 1.37]**
SA-R (2) vs AC (0)	**.14 (.05)**	**.003**	**1.15 [1.05 - 1.26]**	SA-R (2) vs AC (0)	**.30 (.05)**	**.001**	**1.35 [1.22 - 1.49]**
SA-R (2) vs SA-P (1)	-.05 (.05)	.256	.95 [.87 - 1.04]	SA-R (2) vs SA-P (1)	.09 (.06)	.118	1.09 [.98 - 1.23]

Note: *** $p < .001$; R^2_{cs} = R^2 Cox & Snell; R^2_N = R^2 Nagelkerke; $\Delta\chi^2$ = Change in chi-square; AC = Affective controls; SA-P = Past suicide attempters; SA-R = Recent suicide attempters.

Supplementary table 2: Variables explaining high psychological pain:

	High pain	Low pain	*p*-values	Ad. *p*-values, OR [CI95%]
N =	207	164		
Sociodemographic				
Age	39.81 ± .84	44.78 ± .99	***p* < .001**	***p* < .003, .97 [.96 - .99]**
Education years	13.53 ± .18	13.43 ± .23	*p* < .411	*p* < .313, 1.04 [.96 - 1.13]
Women, n (%)	140 (67.6 %)	118 (72.0 %)	*p* < .369	*p* < .102, .67 [.41 - 1.09]
Current smoker, n (%)	106 (52.0 %)	66 (40.5 %)	***p* < .029**	*p* < .151, 1.39 [.89 - 2.17]
Sep./Div./Wid., n (%)	46 (22.2 %)	35 (21.3 %)	*p* < .838	*p* < .543, 1.18 [.69 - 2.02]
Children, n (%)	116 (56.0 %)	109 (66.5 %)	***p* < .041**	*p* < .235, .76 [.48 - 1.19]
Lifetime psychiatric comorbidity				
Bipolar disorder, n (%)	63 (32.5 %)	78 (48.4 %)	***p* < .002**	***p* < .001, .45 [.28 - .72]**
Anxiety disorder, n (%)	171 (83.0 %)	114 (69.5 %)	***p* < .002**	*p* < .235, 1.38 [.81 - 2.36]
Eating disorder, n (%)	44 (21.4 %)	21 (12.8 %)	***p* < .032**	*p* < .468, 1.25 [.68 - 2.31]
Alcohol abuse/dependence, n (%)	74 (35.7 %)	57 (34.8 %)	*p* < .843	*p* < .957, .99 [.62 - 1.57]
Substance abuse/dependence, n (%)	62 (30.0 %)	31 (18.9 %)	***p* < .015**	***p* < .024, 1.83 [1.08 - 3.09]**
PTSD, n (%)	53 (25.9 %)	32 (19.5 %)	*p* < .151	*p* < .765, 1.09 [.63 - 1.86]
Current psychiatric comorbidity				
Mixed episode, n (%)	13 (6.3 %)	11 (6.7 %)	*p* < .868	*p* < .909, .95 [.39 - 2.32]
Anxiety disorder, n (%)	103 (50.0 %)	52 (31.7 %)	***p* < .001**	*p* < .533, 1.08 [.86 - 1.36]
Eating disorder, n (%)	29 (14.0 %)	11 (6.7 %)	***p* < .024**	*p* < .186, 1.51 [.82 - 2.78]
Alcohol abuse/dependence, n (%)	94 (45.4 %)	67 (41.6 %)	*p* < .379	*p* < .722, .96 [.75 - 1.22]
Substance abuse/dependence, n (%)	34 (16.4 %)	17 (10.4 %)	*p* < .092	*p* < .053, 1.77 [.99 - 3.15]
PTSD, n (%)	37 (18.0 %)	22 (13.4 %)	*p* < .235	*p* < .981, .99 [.53 - 1.85]
Having a Psych. comorbidity, n (%)	177 (85.5 %)	119 (72.6 %)	***p* < .002**	*p* < .497, 1.22 [.69 - 2.17]
Current treatment				
Antidepressants, n (%)	144 (69.9 %)	101 (61.6 %)	*p* < .093	*p* < .058, 1.11 [.99 - 2.53]
Anxiolytics, n (%)	170 (82.5 %)	103 (62.8 %)	***p* < .001**	***p* < .004, 2.14 [1.27 - 3.59]**
Antiepileptics, n (%)	43 (20.9 %)	48 (29.3 %)	*p* < .063	***p* < .041, .58 [.34 - .98]**
Antipsychotics, n (%)	101 (49.0 %)	80 (48.8 %)	*p* < .962	*p* < .399, .83 [.53 - 1.29]
Lithium, n (%)	12 (5.8 %)	24 (14.6 %)	***p* < .005**	***p* < .018, .38 [.17 - .85]**
Analgesics, n (%)	17 (8.3 %)	10 (6.1 %)	*p* < .429	*p* < .398, 1.45 [.62 - 3.39]
Medication load[lg]	3.83 ± .13	3.75 ± .16	*p* < .482	*p* < .920, 1.01 [.89 - 1.13]
Suicidal history and clinical variables				
Depressive symptomatology (BDI)	18.91 ± .54	12.73 ± .59	***p* < .001**	–
BDI suicidal ideation, n (%)	97 (56.4 %)	41 (32.8 %)	***p* < .001**	*p* < .354, 1.30 [.75 - 2.27][1]
Trait Anxiety (STAI-T)	62.08 ± .76	55.42 ± 1.05	***p* < .001**	*p* < .357, 1.02 [.98 - 1.06]
State Anxiety (STAI-S)	57.41 ± .99	52.75 ± 1.14	***p* < .002**	*p* < .177, .98 [.98 - 1.01]
Hopelessness	11.28 ± .45	10.04 ± .53	*p* < .089	***p* < .033, .93 [.87 - .99]**
Affective lability (ALS)	1.57 ± .06	1.45 ± .06	*p* < .201	*p* < .263, .72 [.41 - 1.28]
Affective Intensity (AIM)	3.84 ± .05	3.66 ± .06	***p* < .022**	*p* < .139, 1.47 [.88 - 2.46]
Current physical pain	3.00 ± .21	2.13 ± .19	***p* < .002**	*p* < .100, 1.07 [.99 - 1.16]
Worse physical pain	5.08 ± .25	3.26 ± .23	***p* < .001**	***p* < .001, 1.15 [1.08 - 1.24]**
Violent suicide lifetime, n (%)	36 (21.2 %)	16 (16.0 %)	*p* < .298	*p* < .210, 1.53 [.79 - 2.98]
Severe suicide lifetime, n (%)	44 (25.3 %)	30 (28.8 %)	*p* < .516	*p* < .332, .76 [.43 - 1.33]
N of suicide attempts	2.49 ± .27	2.51 ± .21	*p* < .939	*p* < .692, .98 [.89 - 1.08]
Impulsivity (BIS-10)				
Total	62.04 ± 1.49	55.59 ± 1.33	***p* < .001**	*p* < .416, 1.01 [.99 - 1.02]
Motor	20.23 ± .65	16.41 ± .65	***p* < .001**	*p* < .103, 1.03 [.99 - 1.06]
Cognitive	21.54 ± .52	21.08 ± .52	*p* < .530	*p* < .209, .98 [.94 - 1.01]
Planning	19.53 ± .58	18.98 ± .54	*p* < .495	*p* < .725, .99 [.96 - 1.03]
Childhood trauma questionnaire, Moderate/Severe				
Total	50.28 ± 1.43	46.03 ± 1.22	*p* < .121	*p* < .432, 1.01 [.99 - 1.02]
Physical abuse, n (%)	51 (26.8 %)	25 (16.0 %)	***p* < .016**	*p* < .146, 1.54 [.86 - 2.74]
Physical neglect, n (%)	62 (32.1 %)	35 (22.7 %)	*p* < .053	*p* < .302, 1.32 [.78 - 2.21]
Emotional abuse, n (%)	90 (47.4 %)	63 (40.4 %)	*p* < .193	*p* < .954, .99 [.62 - 1.57]

Emotional neglect, n (%)	80 (43.0 %)	67 (44.1 %)	$p < .844$	$p < .166$, .72 [.45 - 1.15]
Sexual abuse, n (%)	59 (31.2 %)	30 (19.5 %)	**$p < .014$**	**$p < .032$, 1.81 [1.05 - 3.11]**

Note: Ad.= Adjusted for depression (BDI); [1] = Adjusted for BDI score without the ideation item; Sep./Div./Wid. = Separated, divorced or widowed; PTSD = Post-traumatic stress disorders; BDI = Beck Depression Inventory; STAI = State-Trait Anxiety Inventory; ALS = Affective Lability Scale; AIM = Affective Intensity Measure.

Supplementary table 3: Description of the baseline sociodemographic and clinical variables of patients with and without follow-up data:

	With follow up data	Without follow up data	*p*-values
N =	123	248	
Sociodemographic at inclusion			
Age	43.15 ± 1.09	41.53 ± .81	$p < .242$
Education years	13.85 ± .25	13.29 ± .18	$p < .071$
Women, n (%)	78 (86.3 %)	181 (73.0 %)	$\mathbf{p < .046}$
Current smoker, n (%)	60 (49.2 %)	112 (45.5 %)	$p < .540$
Sep./Div./Wid., n (%)	24 (19.4 %)	58 (23.4 %)	$p < .376$
Children, n (%)	48 (38.7 %)	98 (39.5 %)	$p < .881$
Psychiatric comorbidity at inclusion			
Mixed episode, n (%)	9 (7.3 %)	15 (6.0 %)	$p < .654$
Anxiety disorder, n (%)	53 (42.7 %)	102 (41.3 %)	$p < .790$
Eating disorder, n (%)	12 (9.7 %)	28 (11.3 %)	$p < .636$
Alcohol abuse/dependence, n (%)	50 (40.3 %)	111 (44.8 %)	$p < .416$
Substance abuse/dependence, n (%)	16 (12.9 %)	35 (14.1 %)	$p < .749$
PTSD, n (%)	15 (23.4 %)	32 (23.5 %)	$p < .789$
Having a Psych. comorbidity, n (%)	95 (76.6 %)	201 (81.0 %)	$p < .317$
Treatment at inclusion			
Antidepressants, n (%)	83 (69.9 %)	163 (66.0 %)	$p < .856$
Anxiolytics, n (%)	94 (75.8 %)	179 (72.5 %)	$p < .492$
Antiepileptics, n (%)	29 (23.4 %)	62 (25.1 %)	$p < .717$
Antipsychotics, n (%)	64 (51.6 %)	118 (47.8 %)	$p < .485$
Lithium, n (%)	17 (13.7 %)	20 (8.1 %)	$p < .089$
Analgesics, n (%)	4 (3.2 %)	23 (9.3 %)	$\mathbf{p < .033}$
Medication load^{lg}	3.71 ± .19	3.85 ± .12	$p < .524$
Suicidal history and clinical variables at inclusion			
Depressive symptomatology (BDI)	15.77 ± .75	16.33 ± .52	$p < .539$
BDI suicidal ideation, n (%)	33 (26.6 %)	69 (28.2 %)	$p < .753$
High Pain, n (%)	65 (52.8 %)	142 (57.3 %)	$p < .420$
Violent suicide lifetime, n (%)	13 (14.9 %)	39 (21.2 %)	$p < .222$
Severe suicide lifetime, n (%)	24 (26.7 %)	51 (27.0 %)	$p < .955$
N of suicide attempts	2.29 ± .27	2.60 ± .21	$p < .398$
Childhood trauma questionnaire, Moderate/Severe			
Total	47.24 ± 1.75	48.88 ± 1.15	$p < .422$
Physical abuse, n (%)	28 (24.3 %)	48 (20.7 %)	$p < .438$
Physical neglect, n (%)	29 (25.0 %)	68 (29.3 %)	$p < .398$
Emotional abuse, n (%)	45 (39.5 %)	108 (46.4 %)	$p < .225$
Emotional neglect, n (%)	46 (41.1 %)	101 (44.5 %)	$p < .550$
Sexual abuse, n (%)	29 (25.4 %)	60 (26.1 %)	$p < .897$

Note: Sep./Div./Wid. = Separated, divorced or widowed; PTSD = Post-traumatic stress disorders; BDI = Beck Depression Inventory;

Supplementary Figure 1: Mean ± SE of psychological pain, physical pain and depression across the follow up: