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# Lifetime suicidal-related behaviour among patients in treatment for substance use disorder: A cross-sectional study

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ABSTRACT

Suicidal-related behaviours are an important concern in individuals who present with substance use disorders (SUDs). The distinction among the specific characteristics of the different patients might help to improve prevention strategies. We describe and compare the sociodemographic characteristics, severity of addiction, and psychopathology of the participants depending on the severity of their lifetime suicidal behaviour. In addition, we examine whether the number of suicide attempts can be estimated based on the variables that differentiate the groups. A sample of 318 men and 86 women who sought treatment for addiction were assessed. The sample was divided into: no ideation or attempts, suicidal ideation, one suicide attempt, and two or more suicide attempts. The group with two or more suicide attempts exhibited a greater severity in the addiction profile. The group with one suicide attempt presented a higher psychopathological symptomatology at the time of the assessment. The severity of the Psychiatric area was related to the group with two or more attempts and to the number of suicide attempts. The presence of any number of attempts is associated with greater severity of addiction. Providing specific intervention strategies for SUD patients depending on their suicidal behaviours is promising for clinical application.

## 1. Introduction

Suicidal-related behaviours (i.e., suicidal ideation and suicide attempts) are influenced by multiple and correlated individual, psychological, family, social, cultural, and environmental factors (Franklin et al., 2017; Poorolajal et al., 2016; Rontziokos and Deane, 2019). In addition to these factors, people who present with substance use disorders (SUD) have an elevated risk and high rates of suicidal ideation, suicide attempts, and suicide (Franklin et al., 2017; Maloney et al., 2007; Ostergaard et al., 2017; Poorolajal et al., 2016; Yuodelis-Flores and Ries, 2015). There is therefore an important concern in this regard in clinical settings attending this population (Espinet et al., 2019).

Rates of suicidal ideation among clinical samples of SUD patients are between 16% and 55%, whereas rates of suicide attempts range from 17.7% to 47% (López-Goñi et al., 2018; Rodríguez-Cintas et al., 2018; Rontziokos and Deane, 2019). Moreover, in SUD patients who additionally present with any lifetime physical and/or sexual abuse, rates increase up to 62.2% for ideation and up to 30.5% for attempts (Fernández-Montalvo et al., 2019). Despite the severity of these data, it is necessary to emphasize that suicide and suicide attempts are preventable with integrated and evidence-based interventions (World Health Organization, 2021).

Suicidal behaviour is considered a continuum (Yuodelis-Flores and Ries, 2015). The spectrum begins with suicide ideation, which can progress to suicide attempts, ending with suicide as the last consequence (Keefner and Stenvig, 2020). There is an exponential progression of risk in the aforementioned phases of this continuum. In this regard, much of the previous literature has considered suicide attempts as a whole, subsuming under a unique category both single and multiple attempters (Forman et al., 2004; Rudd et al., 1996). This has led to inaccuracies and generalizations, especially because little attention has been given to multiple attempters (Brezo et al., 2008; Haw et al., 2007). Evidence indicates that the presence of previous suicide attempts is an important risk factor for future suicide and represents a serious suicidal problem (Haw et al., 2007; Laget et al., 2006; Osváth et al., 2003). Therefore, the difference between making a single attempt and repeated suicide attempts over the lifespan should no longer be overlooked.

The research that has studied these groups separately in different

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samples points out differential clinical and sociodemographic characteristics as well as significantly increased levels of risk for suicide among those who made multiple suicide attempts. In this sense, the systematic review conducted by Méndez-Bustos et al. (2013) found that compared with single attempters, multiple attempters presented with a more severe clinical profile, increased presence of mental disorders, increased prevalence of alcohol and substance abuse, an increased number of experiences of maltreatment during childhood, increased unemployment, and increased prevalence of family members with psychiatric problems or a history of suicide.

Although substantial research has been conducted with the SUD population to assess suicide and its related behaviours, the distinction between groups according to the number of suicide attempts has been particularly ignored in these studies (Capron et al., 2016; Icick et al., 2018). Hence, it becomes important to perform this classification in individuals with SUD and to identify the particular clinical and sociodemographic features of each group (Méndez-Bustos et al., 2013). This information would help clinicians and researchers recognize the underlying processes and assess the differential levels of risk at each phase of the continuum to develop effective prevention and intervention strategies.

Therefore, two main objectives guided this study. First, we describe and compare the sociodemographic characteristics, addiction severity, and the psychopathological symptoms across the lifespan of the participants depending on the progression of the severity of their suicidal behaviour. Second, we examined whether the number of suicide attempts can be estimated from the variables that differentiate the four identified groups (see method below). Accordingly, the hypothesis of this study is that there is a gradation in addiction severity and psychopathological profile based on the severity of suicidal behaviour. Specifically, it is hypothesized that the group with two or more suicide attempts will have the most severe psychopathological profile and the greatest need for addiction treatment.

## 2. Methods

### 2.1. Study design and participants

A cross-sectional study was conducted. The sample was composed of patients attending an addiction treatment program. They were consecutively recruited between 2010 and 2021 from both the inpatient and outpatient settings developed by the Proyecto Hombre Navarra Foundation (Spain). This program is public and provides treatment to individuals with addiction problems. The intervention is based on cognitive-behavioural therapy and is abstinence oriented. It has been demonstrated that both outpatient and inpatient modalities are effective in the treatment of addictions (Fernández-Montalvo and López-Goñi, 2010; Fernández-Montalvo et al., 2008). This sample is representative of Spanish people entering treatment for SUD.

The sample inclusion criteria were (a) fulfilling the diagnostic criteria of alcohol and/or substance use disorders of the DSM-5 (American Psychiatric Association, 2013); (b) being in the age range of 18 to 65 years; (c) receiving treatment for SUD; (d) having answered all the questions related to suicidal ideation and attempts; and (e) providing informed consent to participate in the study. After fulfilling these criteria, the sample was divided into the following four groups depending on suicidal behaviour: no ideation or attempts, suicidal ideation, one suicide attempt, and two or more suicide attempts.

The ethics committees of the Universidad Pública de Navarra (PI-006/16) and Fundación Proyecto Hombre Navarra (PHN2016/01) approved the protocol for this study. All participants signed informed consent forms.

### 2.2. Assessment measures

The EuropASI (Kokkevi and Hartgers, 1995) is the European version of the Addiction Severity Index scale (ASI) (McLellan et al., 1980). The Spanish version of this instrument (Bobes et al., 1996) was administered to all participants. The EuropASI is a semistructured interview that assesses the need for treatment based on seven areas: general medical condition, employment and financial situation, alcohol consumption, use of other drugs, legal problems, family and social relationships, and psychiatric state. The Interviewer Severity Rating (ISR) was used, which has shown good predictive validity in different studies conducted in the context of treatment (López-Goñi et al., 2012; López-Goñi et al., 2010). The score for each area ranges from 0 (*no problem*) to 9 (*extreme problem*). The higher the score, the greater the need for treatment. For the assessment of the overall prevalence of both suicidal ideation and suicide attempts across the lifespan, three specific questions of the EuropASI Psychiatric area were used: 9 ("*Did you experience severe suicidal ideation?*"), 10 ("*Did you make suicide attempts?*"), and 10A ("*How many times?*"). Additional questions of the EuropASI were used to obtain information about psychological problems (family/social relationships scale: questions 18A, 18B, and 18C during the lifetime; psychiatric scale: questions 1, 3, 4, 5, 6, 7, and 8). The one-week test retest reliabilities of the Spanish version of this instrument range from .67 to .96 in the seven different areas (González et al., 2002).

The Symptom Checklist-90-Revised (SCL-90-R) (Derogatis, 1992; González de Rivera, 2002) is a self-administered general psychopathological assessment questionnaire. It consists of 90 questions that are answered on a 5-point Likert-type scale, ranging from 0 (*none*) to 4 (*very much*). The questionnaire aims to assess the respondent's psychiatric symptoms. The instrument has been shown to be sensitive to therapeutic change and may therefore be used for either single or repeated assessments. The SCL-90-R measures nine areas of primary symptoms: somatization, obsessive-compulsive behaviours, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. It also provides three indices that reflect the subject's overall level of severity: the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST). The internal consistency for the Spanish version ranges from .81 to .90 (González de Rivera, 2002).

### 2.3. Procedure

After participant selection, the assessment was performed over two sessions before the beginning of the addiction treatment. The interviews for the assessment were performed by clinical psychologists who had at least ten years of experience in assessing and treating addictions. Self-report measures were administered in the presence and with the support of these interviewers. These sessions occurred once a week for two weeks. In the first session, data related to sociodemographic characteristics, drug consumption, and lifetime suicidal ideation and attempts were collected using the EuropASI. In the second session, the SCL-90-R was completed to assess the presence of psychopathological symptoms.

### 2.4. Data analysis

Descriptive analyses were conducted for all variables. Comparisons between the groups were performed using $\chi^2$ or analysis of variance depending on the nature of the variables. Effect sizes (Eta squared or Phi) were provided for all comparisons and were interpreted as follows: $\eta^2 = 0.01$ (small effect size), $\eta^2 = 0.06$ (medium effect size), and $\eta^2 = 0.14$ (large effect size); Phi = 0.1 (small effect size), Phi = 0.3 (medium effect size), and Phi = 0.5 (large effect size).

A multinomial logistic regression analysis was performed to determine the most relevant variables that could differentiate each group. For this analysis, only the variables with statistically significant differences between groups were included. Finally, a stepwise linear regression analysis was carried out to determine the number of suicide attempts from the statistically significant variables. A difference of $p < .05$ was considered significant. Statistical analyses were performed using SPSS

software (version 27.0).

## 3. Results

The initial sample was composed of 408 participants, but 4 patients (1%) were excluded from the study because they did not report the number of suicide attempts during their lifetime. Consequently, the final sample consisted of 404 participants (99%). Of them, 318 were men (78.7%), and 86 were women (21.3%). The mean age of the participants was 38.1 years ($SD = 9.7$). The main substances of consumption were alcohol (42.6%) and cocaine (46.5%) followed by other substances, such as heroin, cannabis, and amphetamine at smaller percentages (10.9%).

### 3.1. Prevalence of suicidal behaviour among SUD patients

Slightly more than half of the sample (57.7%; $n = 233$) had never had any suicidal ideation or suicide attempt. Lifetime suicidal ideation was reported by 26.5% ($n = 107$) of the participants. In addition, 7.4% ($n = 30$) had made one suicide attempt, and 8.4% ($n = 34$) reported two or more attempts.

### 3.2. Comparison of sociodemographic and consumption variables

The only sociodemographic variable with significant differences was gender ($p < .001$) (Table 1). Women were more likely than men to have multiple suicide attempts (19.8%, $n = 17$ vs. 5.3%, $n = 17$). No significant differences in age, marital status, education level, or the main type of substance motivating treatment was noted between the four groups.

### 3.3. Comparison of drug addiction severity

With regard to the seven areas of the EuropASI, statistically significant differences between groups were found in all of the areas, except for the Legal area.

As shown in Table 2, the group with no suicidal ideation had the lowest mean scores in all the assessed variables.

The group with two or more attempts had significantly higher mean scores in the seven areas than the no ideation group (Table 2). Compared to the ideation group, those with two or more attempts showed significantly higher mean scores in Employment/Support (mean 4.0 versus 3.1, $p < .001$), Drug (mean 4.8 versus 3.7, $p = .029$), Family/Social (mean 5.5 versus 4.4, $p < .001$), and Psychiatric (mean 6.1 versus 4.0, $p < .001$) areas. Finally, compared with the participants with one attempt (mean 4.8, $SD = 1.7$), those with multiple attempts (mean 6.1, $SD = 1.4$) showed significantly higher mean scores only in the Psychiatric area ($p < .001$).

There is a progression in the number of EuropASI areas that score above 4 as suicidal behaviour becomes more severe (from none in the no ideation group to five in the group with two or more attempts).

### 3.4. Comparison of psychopathological symptoms

The no ideation group had significantly lower mean scores in all the SCL-90-R variables than the other three groups (Table 3). The group with two or more attempts showed significantly higher mean scores in the GSI (mean 74.8 versus 59.1, $p < .001$), PSDI (mean 62.0 versus 41.4, $p < .001$), PST (mean 78.4 versus 64.1, $p < .001$), interpersonal sensibility (mean 76.7 versus 57.7, $p = .001$), depression (mean 73.7 versus 55.4, $p < .001$), anxiety (mean 71.5 versus 52.0, $p < .001$), and phobic anxiety (mean 67.9 versus 44.0, $p < .001$) variables compared with the no ideation group. No significant differences were found between the group with two or more attempts and the group with one attempt.

When rates of lifetime psychopathological symptoms were assessed with the EuropASI, all of the variables showed statistically significant differences between the four groups with the exception of the variables trouble understanding and hallucinations (Table 3). Compared to the group with ideation and the groups with attempts, the group with no ideation had the lowest rates on all the scales. The group with two or more attempts did not show significant differences compared to the group with one attempt. However, the group with multiple attempts had

**Table 1**
Comparisons of sociodemographic and consumption variables.

| | **Total sample ($n = 404$)** | | **No ideation (a) ($n = 233$)** | | **Ideation (b) ($n = 107$)** | | **One attempt (c) ($n = 30$)** | | **Two or more attempts (d) ($n = 34$)** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***M*** | **(*SD*)** | ***M*** | **(*SD*)** | ***M*** | **(*SD*)** | ***M*** | **(*SD*)** | ***M*** | **(*SD*)** | ***F*** [a] | ***p*** | **Eta** [b] | |
| **Age** | 38.1 | (9.7) | 37.9 | (10.2) | 38.5 | (9.2) | 40.1 | (8.5) | 36.6 | (9.1) | 0.8 | .514 | 0.01 | |
| | ***N*** | **(%)** | ***n*** | **(%)** | ***n*** | **(%)** | ***N*** | **(%)** | ***n*** | **(%)** | **$\chi^2$ (*df*)** | ***p*** | **Phi** | **One-to-one comparisons** |
| **Gender** | | | | | | | | | | | | | | |
| Men | 318 | (78.7) | 195 | (83.7) | 83 | (77.6) | 23 | (76.7) | 17 | (50.0) | 20.3 (3) | <.001 | 0.22 | (a, b, c) ≠ d** |
| Women | 86 | (21.3) | 38 | (16.3) | 24 | (22.4) | 7 | (23.3) | 17 | (50.0) | | | | |
| **Marital status** | | | | | | | | | | | | | | |
| Married | 118 | (29.2) | 70 | (30.0) | 31 | (29.0) | 10 | (33.3) | 7 | (20.6) | 1.7 (6) | .942 | 0.07 | |
| Separated/Divorced | 78 | (19.3) | 44 | (18.9) | 22 | (20.6) | 5 | (16.7) | 7 | (20.6) | | | | |
| Single | 208 | (51.5) | 119 | (51.1) | 54 | (50.5) | 15 | (50.0) | 20 | (58.8) | | | | |
| **Education level** | | | | | | | | | | | | | | |
| No studies | 58 | (14.4) | 26 | (11.2) | 18 | (16.8) | 5 | (16.7) | 9 | (26.5) | 8.5 (9) | .485 | 0.15 | |
| Primary | 168 | (41.6) | 101 | (43.3) | 46 | (43.0) | 11 | (36.7) | 10 | (29.4) | | | | |
| Secondary | 133 | (32.9) | 80 | (34.3) | 32 | (29.9) | 11 | (36.7) | 10 | (29.4) | | | | |
| University | 45 | (11.1) | 26 | (11.2) | 11 | (10.3) | 3 | (10.0) | 5 | (14.7) | | | | |
| **Substance motivating treatment** | | | | | | | | | | | | | | |
| Alcohol | 172 | (42.6) | 91 | (39.1) | 51 | (47.7) | 14 | (46.7) | 16 | (47.1) | 4.6 (6) | .590 | 0.11 | |
| Cocaine | 188 | (46.5) | 113 | (48.5) | 45 | (42.1) | 15 | (50.0) | 15 | (44.1) | | | | |
| Other | 44 | (10.9) | 29 | (12.4) | 11 | (10.3) | 1 | (3.3) | 3 | (8.8) | | | | |

*Note.*
** $p < .01$
[a] $F$ = ANOVA
[b] *Eta* = Effect Size.

**Table 2**
Comparisons of drug addiction severity.

| | Total sample ($n$ = 404) | | No ideation (a) ($n$ = 233) | | Ideation (b) ($n$ = 107) | | One attempt (c) ($n$ = 30) | | Two or more attempts (d) ($n$ = 34) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***F***[a] | ***p*** | **Eta**[b] | **One-to-one comparisons** |
| **EuropASI** | | | | | | | | | | | | | | |
| Medical | 2.3 | (1.7) | 1.9 | (1.5) | 2.7 | (1.8) | 2.5 | (1.7) | 2.9 | (1.9) | 7.8 | <.001 | 0.06 | (b, d) ** > a |
| Employment/Support | 2.8 | (1.9) | 2.5 | (1.8) | 3.1 | (2.0) | 3.2 | (1.9) | 4.0 | (2.0) | 7.0 | <.001 | 0.05 | (d**, b*) > a; d > b* |
| Alcohol | 4.1 | (2.1) | 3.8 | (2.1) | 4.3 | (2.1) | 4.2 | (2.1) | 4.8 | (2.4) | 2.8 | .042 | 0.02 | d > a* |
| Drug | 3.8 | (2.3) | 3.7 | (2.2) | 3.7 | (2.3) | 4.4 | (2.6) | 4.8 | (2.5) | 3.0 | .029 | 0.02 | d > a**; b* |
| Legal | 2.0 | (1.7) | 1.9 | (1.5) | 2.0 | (1.7) | 2.4 | (2.0) | 2.1 | (2.2) | 0.9 | .430 | 0.01 | |
| Family/Social | 4.0 | (1.9) | 3.5 | (1.8) | 4.4 | (1.8) | 4.6 | (1.9) | 5.5 | (1.9) | 15.1 | <.001 | 0.11 | (b, c, d) > a**; d > b** |
| Psychiatric | 3.7 | (1.9) | 3.1 | (1.9) | 4.0 | (1.4) | 4.8 | (1.7) | 6.1 | (1.4) | 36.3 | <.001 | 0.22 | (b, c, d) > a**; c > b*; d > (b, c)** |

*Note.*
* $p < .05$;
** $p < .01$;
[a] $F$ = ANOVA;
[b] Eta = Effect Size.

**Table 3**
Comparisons of psychopathological symptoms.

| | Total sample ($n$ = 404) | | No ideation (a) ($n$ = 233) | | Ideation (b) ($n$ = 107) | | One attempt (c) ($n$ = 30) | | Two or more attempts (d) ($n$ = 34) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***M*** | ***(SD)*** | ***F***[a] | ***p*** | **Eta**[b] | **One-to-one comparisons** |
| **SCL-90-R** | | | | | | | | | | | | | | |
| GSI | 65.4 | (32.7) | 59.1 | (32.7) | 72.4 | (31.2) | 78.3 | (27.6) | 74.8 | (32.0) | 7.4 | <.001 | 0.05 | (b, c, d) > a** |
| PSDI | 48.0 | (30.9) | 41.4 | (28.5) | 56.4 | (32.5) | 54.1 | (30.6) | 62.0 | (31.5) | 9.5 | <.001 | 0.07 | c > a*; (b, d) > a** |
| PST | 69.5 | (31.0) | 64.1 | (31.7) | 75.1 | (29.2) | 82.0 | (26.0) | 78.4 | (28.7) | 6.3 | <.001 | 0.05 | (b, c, d) > a** |
| Somatisation | 59.3 | (32.3) | 55.1 | (31.9) | 65.5 | (31.3) | 70.2 | (30.2) | 59.7 | (35.8) | 3.9 | .009 | 0.03 | b > a**; c > a* |
| Obsession-compulsion | 61.6 | (32.7) | 57.1 | (32.7) | 66.0 | (32.6) | 73.7 | (29.7) | 67.5 | (31.4) | 3.9 | .009 | 0.03 | b > a*; c > a** |
| Interpersonal sensibility | 63.4 | (32.8) | 57.7 | (32.6) | 69.4 | (31.7) | 70.2 | (34.6) | 76.7 | (29.1) | 6.0 | .001 | 0.04 | (b, d) > a**; c > a* |
| Depression | 61.8 | (32.8) | 55.4 | (32.1) | 68.3 | (31.5) | 75.1 | (31.5) | 73.7 | (32.4) | 7.9 | <.001 | 0.06 | (b, c, d) > a** |
| Anxiety | 59.4 | (33.2) | 52.0 | (32.7) | 66.8 | (32.4) | 75.9 | (25.7) | 71.5 | (32.4) | 10.2 | <.001 | 0.07 | (b, c, d) > a** |
| Hostility | 52.5 | (32.6) | 48.1 | (32.6) | 59.1 | (31.8) | 59.0 | (28.3) | 56.0 | (35.1) | 3.5 | .017 | 0.03 | b > a** |
| Phobic anxiety | 50.8 | (37.5) | 44.0 | (36.4) | 55.5 | (38.4) | 67.4 | (30.2) | 67.9 | (36.2) | 7.9 | <.001 | 0.06 | (b, c, d) > a** |
| Paranoid ideation | 62.7 | (38.0) | 58.5 | (33.3) | 69.7 | (29.9) | 65.3 | (35.2) | 67.2 | (38.0) | 3.2 | .025 | 0.02 | b >a ** |
| Psychoticism | 67.4 | (33.3) | 61.4 | (34.1) | 74.5 | (30.5) | 82.0 | (25.1) | 73.0 | (34.1) | 6.7 | <.001 | 0.05 | (b, c) > a** |
| | ***N*** | **(%)** | ***n*** | **(%)** | ***n*** | **(%)** | ***n*** | **(%)** | ***n*** | **(%)** | $\chi^2$ ***(df)*** | ***p*** | **Phi** | **One-to-one comparisons** |
| **EuropASI (lifetime)** | | | | | | | | | | | | | | |
| Depression | 225 | (55.7) | 90 | (38.6) | 80 | (74.8) | 26 | (86.7) | 29 | (85.3) | 67.0 (3) | <.001 | 0.41 | (b, c, d) > a** |
| Anxiety | 262 | (64.9) | 124 | (53.2) | 80 | (74.8) | 27 | (90.0) | 31 | (91.2) | 37.1 (3) | <.001 | 0.30 | d > b > a; c > a** |
| Violence control problems | 164 | (40.6) | 75 | (32.2) | 51 | (47.7) | 16 | (53.3) | 22 | (64.7) | 19.3 (3) | <.001 | 0.22 | (b, c, d) > a** |
| Psychopharmacological treatment | 202 | (50.0) | 83 | (35.8) | 65 | (61.3) | 25 | (83.3) | 29 | (85.3) | 54.5 (3) | <.001 | 0.37 | c, d > b > a** |
| Trouble understanding | 175 | (43.3) | 93 | (39.9) | 50 | (46.7) | 16 | (53.3) | 16 | (47.1) | 3.0 (3) | .388 | 0.09 | |
| Hallucinations | 68 | (16.8) | 32 | (13.9) | 18 | (16.8) | 9 | (30.0) | 9 | (26.5) | 7.4 (3) | .060 | 0.14 | |
| Emotional abuse | 184 | (45.5) | 83 | (36.9) | 62 | (57.9) | 18 | (60.0) | 21 | (61.8) | 19.4 (3) | <.001 | 0.22 | (b, c, d) > a** |
| Physical abuse | 91 | (22.5) | 36 | (16.0) | 30 | (28.3) | 9 | (30.0) | 16 | (47.1) | 19.8 (3) | <.001 | 0.22 | d > b > a** |
| Sexual abuse | 38 | (9.4) | 11 | (4.9) | 11 | (10.3) | 6 | (20.0) | 10 | (29.4) | 24.7 (3) | <.001 | 0.25 | d > (b, a); c > a** |

*Note.*
* $p < .05$;
** $p < .01$;
[a] $F$ = ANOVA;
[b] Eta = Effect Size.

significantly higher rates of lifetime anxiety (91.2% versus 74.8%, $p < .001$), psychopharmacological treatment (85.3% versus 61.3%, $p < .001$), physical abuse (47.1% versus 28.3%, $p < .001$), and sexual abuse (29.4% versus 10.3%, $p < .001$) than the group with ideation.

### 3.5. Variables related to the group with two or more attempts

The results showed that the main variable related to having two or more attempts compared with having no ideation or attempts and only ideation was presenting with a greater severity in the Psychiatric area of the EuropASI ($B = 0.418$, 95% CI [0.296-0.589]; $p < .001$) (Table 4). No statistically significant differences in any of the variables were found between the group with one attempt and the group with two or more attempts.

The stepwise linear regression analysis included only the Psychiatric area of the EuropASI in the model related to the number of suicide attempts ($B = 0.344$; 95% CI [0.114 - 0.202]; $p < .001$).

## 4. Discussion

There are three main strengths of this study. First, having a specific sample of patients with SUD undergoing treatment provides ecological validity to the existing literature. Second, four groups have been differentiated on the basis of their suicidal-related behaviour. This distinction between groups has hardly been used in previous research with SUD patients. This is the study's major contribution to the existing literature, as it is essential to provide findings from different samples and cultural contexts to test whether this distinction of suicidal-related behaviours is clinically relevant. Finally, most previous research with SUD-related problem population has only considered the presence/absence of the addiction. The advantage of this study is that a specific standardized instrument to assess the gradation of the addiction severity has been used.

**Table 4**
Variables related with two or more suicide attempts.

| | Exp (*B*) | *p* | Confidence interval (95%) | |
|---|---|---|---|---|
| | | | Lower | Upper |
| No ideation or attempts = 0; two or more attempts = 1 | | | | |
| Intersection | | <.001 | | |
| Gender (man) | 1.939 | .235 | 0.650 | 5.787 |
| Employment/Support | 0.905 | .446 | 0.700 | 1.170 |
| Drug | 0.892 | .258 | 0.732 | 1.087 |
| Family/Social | 1.086 | .607 | 0.793 | 1.489 |
| Psychiatric | 0.418 | <.001 | 0.296 | 0.589 |
| Anxiety | 2.073 | .388 | 0.396 | 10.841 |
| Psychopharmacological treatment | 3.311 | .059 | 0.954 | 11.495 |
| Physical abuse | 1.016 | .979 | 0.317 | 3.260 |
| Sexual abuse | 2.789 | .138 | 0.719 | 10.823 |
| Ideation = 0; two or more attempts = 1 | | | | |
| Intersection | | .005 | | |
| Gender (man) | 2.492 | .097 | 0.848 | 7.325 |
| Employment/Support | 0.934 | .599 | 0.725 | 1.204 |
| Drug | 0.902 | .295 | 0.743 | 1.094 |
| Family/Social | 1.211 | .231 | 0.885 | 1.658 |
| Psychiatric | 0.521 | <.001 | 0.372 | 0.729 |
| Anxiety | 1.661 | .551 | 0.314 | 8.798 |
| Psychopharmacological treatment | 1.817 | .351 | 0.518 | 6.377 |
| Physical abuse | 0.736 | .600 | 0.235 | 2.308 |
| Sexual abuse | 2.233 | .215 | 0.627 | 7.953 |
| One attempt = 0; two or more attempts = 1 | | | | |
| Intersection | | .318 | | |
| Gender (man) | 3.842 | .051 | 0.991 | 14.891 |
| Employment/Support | 0.920 | .602 | 0.674 | 1.257 |
| Drug | 0.991 | .942 | 0.781 | 1.258 |
| Family/Social | 1.052 | .790 | 0.726 | 1.523 |
| Psychiatric | 0.682 | .057 | 0.460 | 1.011 |
| Anxiety | 0.896 | .913 | 0.123 | 6.517 |
| Psychopharmacological treatment | 0.873 | .862 | 0.187 | 4.071 |
| Physical abuse | 0.715 | .632 | 0.181 | 2.822 |
| Sexual abuse | 1.249 | .777 | 0.268 | 5.821 |
| $R^2 = .353$ | | | | |

*Note.* Only variables with statistically significant differences were included in the model.

We hypothesized a more severe psychopathological profile and a greater need for addiction treatment among participants with two or more suicide attempts. The findings partially support this prediction. Participants with multiple suicide attempts scored higher in all areas of the EuropASI, except for the Legal area. In this regard, excluding the medical domain, the mean scores in the remaining areas are greater than 4, indicating a specific need that requires the implementation of additional treatment for the patient (Bobes et al., 1996). Regarding psychopathological symptoms, the mean scores for most of the SCL-90-R variables were greater in the group with one suicide attempt, but the prevalence of most of the EuropASI psychopathological variables was greater in the group with two or more suicide attempts. However, in contrast with what might be expected and previous research with the SUD population (Icick et al., 2018; Ilgen et al., 2010), no statistically significant differences were found in any variable between the group with one attempt and the group with two or more attempts. This result might imply that the mere presence of a single attempt is associated with an increased severity of addiction.

The only variable related to the group with two or more attempts compared to the no ideation and ideation groups was the Psychiatric area of the EuropASI. This finding is consistent with that reported by Icick et al. (2018), who found an association between psychiatric hospitalizations and recurrent suicide attempts, as well as with that reported by Christiansen and Jensen (2007), who concluded that psychiatric morbidity was a significant risk factor for repetition. However, the explanation for this difference could be tautological given that an increased severity in the Psychiatric area may lead to an increased risk of suicide attempts, whereas an increased prevalence of suicide attempts may lead to a higher psychiatric severity assessment.

Previous studies with general population have linked the repetition of suicide attempts with higher rates of depression, anxiety (Brezo et al., 2008; Laget et al., 2006; Lopez-Castroman et al., 2011), and hopelessness (Forman et al., 2004). These symptoms are also very prevalent in patients with SUD (Rezaeisharif et al., 2021). Hakansson et al., (2011) found that the repetition of suicide attempts is associated with substance abuse characteristics. Therefore, the association between the severity of addiction and the repetition of suicide attempts might be derived from common underlying factors, such as psychopathology, family issues, maltreatment history, social or cultural factors, etc.

The absence of significant differences between the group with one attempt and the group with multiple attempts could be explained by several facts. In this sense, it is important to note that a single assessment of suicidal behaviour was performed. Thus, considering that people who attempt suicide frequently repeat (Méndez-Bustos et al., 2013), it can be expected that in the group with one attempt, there are participants who will try more times or would have tried it again if they had had the opportunity. Accordingly, as individuals with repeated attempts are at high risk for suicide (Rontziokos and Deane, 2019), it becomes especially important to promote the assessment of suicidal behaviour and to propose suicide prevention action plans in SUD treatment programs (Lapierre et al., 2011). Another explanation related to the above has to do with the fact that among the multiple correlated factors that interact with suicidal behaviour, being treated for SUD may have influenced and prevented further suicide attempts at the time of the assessment.

The results of this study should be interpreted with caution for several reasons. First, the cross-sectional design of the study does not allow for establishing causal relationships between the studied variables and suicidal behaviour. Second, the small number of women in the sample prevented us from performing subgroup analyses based on gender, but the significantly higher percentage of women with multiple suicide attempts makes us suspect that these women may have a more severe history, psychopathological profile and/or addiction (Simoneau et al., 2017). Thus, it would be convenient to analyse suicidal behaviour across specific samples of women with SUD in future studies. Third,

participants were in treatment at the time of the assessment, which is likely to have interacted with their suicidal behaviour. In addition, suicidal behaviour was determined by the participants' status at the time of the assessment. Therefore, the results should not be understood as a static and finished process. It would be interesting to develop extended follow-up periods of those who had suicidal ideation and those who made suicide attempts to make more accurate assessments including psychiatric comorbidities. Finally, and related to the above, it should be noted that the exact time in the participants' life when they thought of or attempted suicide was not recorded. Consequently, there may be some participants who developed suicidal behaviour several years ago but not recently, and this information should be interpreted with caution for treatment purposes.

## 5. Conclusions

In summary, the SUD population is a high-risk group for suicidal behaviour (Espinet et al., 2019; Poorolajal et al., 2016). Promising results were found in this study in terms of the severity of addiction among those with any attempt. Being in treatment for SUD should be an opportunity to improve coping skills for suicidal-related behaviours. For efficient prevention, clinicians providing substance abuse treatments should be aware of these particularities and should address and regularly screen their patients for suicidal behaviour (Ilgen et al., 2010; Rodríguez-Cintas et al., 2018; Yuodelis-Flores and Ries, 2015). After identifying patients with suicidal risky behaviours, clinicians should identify vulnerability factors and detect cognitive processes relevant to suicidal behaviour. Subsequently, specific therapeutic goals should be stablished and treatment should be aimed at providing adaptive coping strategies, increasing the number of reasons for living and improving social resources (Substance Abuse and Mental Health Services Administration, 2015). These treatment programs should pay special attention to the multiple factors underlying both suicidal behaviour and SUD (Espinet et al., 2019; Ostergaard et al., 2017), especially those related to prior trauma (López-Goñi et al., 2018; Rontziokos and Deane, 2019).

Further research with long-term assessments among SUD patients is needed to properly differentiate those with one attempt who never try it again from those with several attempts (Méndez-Bustos et al., 2013; Rontziokos and Deane, 2019). It is crucial to define, identify, assess, and treat the different stages of suicidal behaviour because suicide is preventable (Keefner and Stenvig, 2020). Given that individuals with SUD exhibit elevated rates of suicide (Capron et al., 2016), a better understanding of its characteristics will be essential to manage the degree of risk and to prevent suicide in as many cases as possible through accurate prevention strategies.

## Data availability statement

Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

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## Ethical approval statement

The ethics committees of the Universidad Pública de Navarra (PI-006/16) and Proyecto Hombre Navarra (PHN2016-01) approved the protocol for this study. All participants signed informed consent forms.

## Declaration of Competing Interest

Sandra Siria, Leire Leza, José J. López-Goñi, and Javier Fernández-Montalvo do not have any competing interests that may be interpreted as influencing the research.

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