Five-Year Outcomes of First Suicide Attempts:

Insights on Lethality, Recurrence, and Mortality

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Abstract

Introduction: Suicide is a leading cause of death globally. Although prior suicidal behavior is the strongest predictor of future attempts, clinical outcomes following a first suicide attempt (FSA) remain poorly understood. This study evaluates 5-year outcomes after an FSA, focusing on recurrence, lethality, and mortality to address gaps in understanding clinical trajectories and risk factors.

Methods: A cohort of 387 FSA patients was followed for 5 years. Sociodemographic and clinical data were collected at baseline and during follow-up. Outcomes included recurrence, lethality of subsequent attempts, and all-cause mortality. Multivariable logistic and Cox regression models were used to identify risk factors.

Results: During follow-up, 37.2% of patients experienced recurrence, with 27.8% classified as frequent reattempters (≥3 attempts). Overall, 5.7% of participants died, including 1.8% by suicide. High-lethality FSAs were observed in 17.3% of the sample and were strongly associated with alcohol use (odds ratio [OR], 2.142; 95% CI, 1.231–3.724; $P = .021$). Female sex was a significant risk factor for multiple reattempts (OR, 2.388; 95% CI, 1.036–5.507; $P = .041$). High-lethality FSAs significantly increased the risk of suicide deaths (hazard ratio [HR], 5.430; 95% CI, 1.189–24.792; $P = .029$), while older age was associated with a higher risk of nonsuicidal deaths (HR, 1.093; 95% CI, 1.035–1.153; $P = .001$).

Conclusions: Lethality, recurrence, and mortality following an FSA are influenced by distinct risk factors. Alcohol use predicted high-lethality FSAs, female sex predicted multiple reattempts, high-lethality FSAs predicted suicide deaths, and age predicted nonsuicidal deaths. Targeted interventions for these high-risk populations are needed.

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Suicide remains a critical public health issue globally, with the World Health Organization estimating over 700,000 deaths by suicide annually.[1] It is the 18th leading cause of death worldwide and ranks as the second leading cause of death among individuals aged 15 to 29 years.[2] While various risk factors for suicide have been identified, prior suicidal behavior has emerged as the most consistent predictor of future attempts or suicide.[3–6] It is estimated that 20–25 suicide attempts occur for every suicide death,[1,7] underscoring the urgent need to address suicide attempts as a central focus of prevention efforts. Among individuals who attempt suicide, a subgroup known as "major repeaters"—those with more than 5 attempts—constitutes about 10% of the population, reflecting the chronic and recurrent nature of suicidality in some individuals.[8]

Despite decades of research, the clinical trajectories and long-term outcomes following a first suicide attempt (FSA) remain poorly understood. A recent meta-analysis indicates that approximately 1 in 5 individuals who attempt suicide will reattempt.[7] However, reported rates of recurrence vary widely across studies, ranging from 15% to 37% over follow-up periods of 6 months to 5 years.[4,9–11] While it is well-documented that the risk of recurrence is highest within the first 6 months—reaching 15% during that period and rising to over 24% by year 3[10]—relatively few studies have focused specifically on individuals following an FSA, or on how this risk evolves over time.

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Clinical Points

- Clinical outcomes following a first suicide attempt are poorly understood, especially regarding lethality, recurrence, and mortality over long-term follow-up.
- High lethality at first suicide attempt predicts suicide-specific mortality within 5 years; therefore, clinicians should systematically assess and document the lethality of initial attempts.
- Patients surviving a first high-lethality attempt represent a critical target for intensive monitoring and tailored suicide prevention efforts.

The medical lethality of suicide attempts lacks a consistent definition in the literature. It is often described as the probability of causing irreversible damage and the potential to perform self-harm that results in death.[12–14] Levi-Belz and his team highlight the lack of consensus and propose a new definition that includes 3 dimensions: medical lethality, the potential lethality of the method used, and the severity of the circumstances of the suicide attempt.[15,16] Moreover, the lethality of the index attempt is rarely accounted for, despite evidence linking high-lethality attempts to worse outcomes, including higher mortality.[17–20] Some studies have investigated the association between mortality and recidivism without finding an association.[21] Our group has recently shown that high-lethality attempts were related to a history of multiple suicide attempts, but despite this, no correlation was found between the total number of reattempts and maximum lethality.[22] Many studies fail to distinguish between low- and high-lethality first attempts, limiting the ability to assess risk accurately and to design appropriate interventions.[17] The progression of attempt lethality over time is also understudied, leaving important gaps in our understanding of how the severity of suicidal behavior may change across the clinical course.

There is also a critical need to examine how psychiatric, demographic, and socioeconomic factors intersect to influence recurrence and outcomes after an FSA. Mental health disorders—such as personality, mood, and psychotic disorders—are well-established risk factors, approximately doubling the likelihood of reattempt.[6,7] Additional factors, including female gender, younger age, socioeconomic adversity, and coexisting medical conditions, further increase risk.[16] However, these variables are often examined in isolation, and their interaction with attempt lethality remains inadequately explored.[23,24] Particularly underresearched are individuals who make medically serious suicide attempts, defined by Beautrais' criteria as those requiring medical care lasting at least 24 hours.[25,26] These individuals face the highest risk of future suicide yet constitute a subgroup that remains insufficiently characterized in the literature.

Addressing these gaps—especially in research centered on first-time attempters—could provide valuable insights for developing more targeted and effective suicide prevention strategies tailored to those at greatest risk for severe outcomes.

This study seeks to address these gaps by evaluating the 5-year outcomes of patients following an FSA, with a focus on lethality, recurrence, and mortality. To our knowledge, it is the first investigation to examine these factors in a cohort exclusively composed of first-time suicide attempters, explicitly excluding those with prior episodes. By identifying key risk factors and outcomes, this research aims to support more informed clinical decision-making and improve prevention efforts for repeated suicide attempts and suicide-related deaths.

METHODS

Study Design and Participants

This cohort study investigates patients with an FSA and monitors their outcomes over a 5-year follow-up period. Participants are drawn from the MCOSUL Cohort,[27] which encompasses individuals who attempted suicide and received treatment from the Liaison and Interconsultation Psychiatry team at Arnau de Vilanova University Hospital and the Psychiatry Emergency Service at Santa María University Hospital in Lleida, Spain, both of which share a psychiatry department. The MCOSUL Cohort collects sociodemographic and clinical data at the time of the initial suicide attempt and tracks participants for further suicide attempts or until death since 2009. Clinical data at inclusion are collected through structured face-to-face assessments conducted by psychiatrists trained in standardized documentation, ensuring consistency across the cohort.

All follow-up data, including repeated suicide attempts and mortality, were obtained through the region's integrated electronic health record system. This system captures all health care interactions in the province, including those from primary care, psychiatric and general emergency departments, hospital admissions, and official mortality registries.

This study complies with ethical standards as established by relevant national and institutional committees on human experimentation, adhering to the 1975 Declaration of Helsinki, revised in 2013.[28] The study protocol was approved by the ethics and clinical research committee of Arnau de Vilanova University Hospital (CEIC-2698). To ensure comprehensive and transparent reporting, we adhered to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines.[29]

Variables

Sociodemographic and clinical information collected during the FSA included age (in years), sex (male/female),

marital status (single, partnered, separated or widowed), occupation (employed, unemployed, or on sick leave/retired), foreigner status (yes/no), and primary diagnosis based on *DSM-IV* criteria.[30] Comorbid diagnoses were not collected due to register-based limitations. Substance use reported by patients, even if it did not meet the criteria for a substance use disorder diagnosis, was recorded. This included alcohol, cannabis, cocaine, opioids, and polysubstance use, defined as the use of 3 substances excluding tobacco and methadone. Somatic lethality was assessed based on the duration of general medical care required for somatic stabilization, including care provided in a general emergency department, a medical-surgical unit, or an intensive care unit. Follow-up data included subsequent reattempts and their lethality, with fatal outcomes documented.

Exposure

We defined a suicide attempt as a self-inflicted behavior with a potentially harmful outcome, demonstrating evidence of intent to die, following the criteria established by Silverman.[31] We included individuals experiencing their FSA, defined as those with no prior history of suicidal behavior and a minimum of 5 years of follow-up in the cohort after the FSA, or until the occurrence of the 10th reattempt or death from any cause. Lethality of the FSA was assessed using Beautrais' criteria,[32] classifying patients as high-lethality attempters (requiring more than 24 hours of general medical care) or low-lethality attempters (requiring 24 hours or less). Beautrais' criteria assess the somatic consequences of suicide attempts based on the duration of required medical care (≥24 hours), rather than the type of intervention. This objective and clinically relevant measure enables standardized classification of attempt lethality and is widely used in suicide research, as longer durations of medical care have been linked to greater suicidal intent and poorer prognosis. High lethality at FSA was not considered a follow-up outcome; however, due to its clinical relevance, a separate logistic regression model was performed to examine which baseline characteristics were associated with it.

Outcomes

The primary outcomes measured were (1) reattempt, defined as the occurrence of at least 1 suicide reattempt after the FSA, using the same criteria as outlined by Silverman[31]; (2) frequent reattempt, defined among those who reattempted, according to Beck criteria[33]: individuals with 1 or 2 reattempts were classified as infrequent reattempters, and those with 3 or more as frequent reattempters; and (3) death from any cause during the follow-up period, further categorized as suicidal or nonsuicidal based on the documented cause.

Study Follow-Up

The follow-up period began at discharge following the initial suicide attempt and continued for 5 years or until the occurrence of the 10th reattempt, whichever came first. This restriction was implemented to ensure comparability among patients and to focus on the initial years following a suicide attempt. No specific time restrictions were applied between reattempts. For survival analyses, follow-up time also started at discharge after the FSA and continued until death or censoring at 5 years. As data were obtained from the region's integrated electronic health record system—which captures all health care events and deaths—there was no loss to follow-up.

Statistical Analysis

Statistical analyses were conducted using IBM-SPSS v.23 software. Continuous variables were assessed for normality using the Shapiro-Wilk test and visual inspection of histograms. When normally distributed, they are reported as mean ± SD; otherwise, they are presented as median and interquartile range. In figures, means are occasionally plotted for visualization purposes, with appropriate nonparametric analyses applied as described. Categorical variables are expressed as percentages. Variables with fewer than 5 observations were excluded to ensure statistical reliability.[34]

Differences between groups were analyzed using χ^2 tests or Fisher exact test for categorical variables, as appropriate. For categorical variables with more than 2 categories (eg, marital status, employment status, and psychiatric diagnosis), a global P value was calculated using χ^2 tests, and post hoc comparisons were performed based on adjusted residuals when significant. For continuous variables, group comparisons were conducted using Student t test or the Mann-Whitney U test, depending on the distribution.

Given the marked non-normality of hospitalization days—a key indicator of somatic lethality—nonparametric tests were used, as illustrated in Supplementary Figure 1. These comparisons were applied across key clinical groupings (eg, lethality at FSA, reattempt status, reattempt frequency, and mortality type). In addition, a Kruskal-Wallis test and pairwise Wilcoxon rank-sum tests (with Benjamini-Hochberg correction) were used to compare hospitalization duration across 5-year outcome groups (alive, suicide deaths, and nonsuicidal deaths), as detailed in the Supplementary Statistical Analysis.

Univariable analyses explored associations between sociodemographic and clinical variables, lethality, and reattempts. Significant variables ($P < .05$) from univariable analyses were included in a bivariable logistic regression model using the enter method.[35] Variables with $P < .05$ in univariable analyses were included in the multivariable logistic regression models. Fisher exact test was used to determine significance, and

odds ratios (ORs) with 95% confidence intervals (CIs) were calculated as effect size measures. A significance level of 5% ($\alpha = .05$) was employed. The Benjamini-Hochberg method was applied to account for multiple comparisons within each outcome model, and corrected P values are reported.[36] Significant associations were determined using a threshold of corrected $P < .05$.

Four main models were conducted: (1) a logistic regression model exploring baseline characteristics associated with high lethality at the FSA (yes/no); (2) a logistic regression predicting the occurrence of at least 1 suicide reattempt during follow-up (yes/no); (3) a logistic regression examining predictors of frequent reattempts (≥3) (yes/no); and (4) Cox regression models for all-cause, suicide, and nonsuicide mortality. Additionally, a sensitivity analysis was conducted using multinomial logistic regression to examine predictors of reattempt frequency across 3 categories (0, 1–2, and ≥3 reattempts). The first model was considered exploratory and aimed to identify sociodemographic and clinical features associated with medically serious suicide attempts at baseline.

Kaplan-Meier survival curves and Cox regression analysis estimated time to death, suicide, and nonsuicidal death. Log-rank tests compared median time to relapse between patients with high and low lethality at FSA. Significant variables from univariable analyses ($P < .05$) were included in the Cox regression models using the enter method. Results were reported as adjusted hazard ratios with corresponding 95% CIs. The proportional hazards assumption for Cox regression was tested using Schoenfeld residuals.

RESULTS

Sample Description

The study sample comprised 387 patients, with 58.6% being female. The average age at FSA was 44.3 years (SD = 16.8). The most common diagnosis among participants was depressive disorder (34.1%), followed by adjustment disorder (22.7%). During the follow-up period, 37.2% of patients experienced at least 1 suicide reattempt, and 27.8% had 3 or more reattempts, categorizing them as frequent reattempters. Additional details are provided in Table 1.

Low and High Lethality at FSA

Most patients (82.7%) experienced low-lethality suicide attempts, while 17.3% had high-lethality attempts. Significant differences were observed between the low-lethality and high-lethality groups. Patients in the high-lethality group were older (mean age of 48.1 years compared to 43.5 years; $P = .041$) and reported higher rates of alcohol use (44.7% compared to 29.6%; $P = .016$) (see Table 1). Figure 1A illustrates the frequency of high-lethality patients at FSA based on reattempts during follow-up, showing a trend of increased lethality in those with 1–2 and >3 reattempts compared to those with no reattempts, though this difference was not statistically significant. In the multivariable logistic regression analysis, alcohol use emerged as a significant predictor of high lethality, with an OR of 2.142 (95% CI = 1.231–3.724; $P = .007$) (see Table 2; Supplementary Table 2).

Subsequent Recurrence

The recurrence rate during the 5-year follow-up period was 37.2%. Those who reattempted suicide were more likely to be single (31.2% vs 17.2%; $P = .001$) and less likely to be married (33.3% vs 53.9%; $P < .001$). They also had a higher prevalence of nonalcohol substance use disorders (41.1% vs 11.1%; $P = .018$) and a greater number of other mental health diagnoses (9.0% vs 4.1%; $P = .048$) (see Table 1). In the multivariable logistic regression analysis, being employed (OR = 0.507; 95% CI, 0.307–0.835; $P = .032$) and having a personality disorder (OR = 0.027; 95% CI, 0.287–0.928; $P = .039$) were identified as significant protective factors against reattempting suicide (see Table 2 and Supplementary Table 2).

Among participants, 27.8% had 3 or more reattempts, categorizing them as frequent reattempters (see Table 1). Compared to those with fewer attempts, frequent reattempters were more likely to be female (75% vs 56.7%; $P = .043$) and more frequently unemployed (47.5% vs 26.0%; $P = .012$). In multivariable analysis, being female emerged as a significant risk factor for multiple reattempts (OR = 2.388; 95% CI, 1.036–5.507; $P = .041$) (see Table 2; Supplementary Table 2). As a sensitivity analysis, we performed a multinomial logistic regression to assess whether baseline predictors varied across reattempt frequency categories (0, 1–2, and ≥3 reattempts). The results, presented in Supplementary Table 3, were consistent with the primary findings, confirming female sex as a significant predictor of frequent reattempts.

Mortality

During the 5-year follow-up, 18 patients (4.7%) died, corresponding to an all-cause mortality rate of 5.7%. Of these, 7 patients (1.8%) died by suicide, and 11 (2.8%) died from nonsuicidal causes (Supplementary Table 1). In terms of overall mortality, patients who died were older (65.5 vs 43.3 years; $P = .041$), less frequently employed (11.1% vs 40.6%; $P = .012$), and more often disabled (55.5% vs 29.2%; $P = .018$). Additionally, a higher proportion of deceased patients belonged to the high-lethality group (44.4% vs 15.9%; $P = .006$). Figure 1B illustrates the lethality at FSA (measured in days of general medicine health care) across 4 groups based on the 5-year follow-up outcomes: alive, all deaths, suicidal

Table 1.

Sociodemographic and Clinical Characteristics of the Sample by Lethality of First Suicide Attempt and Reattempt Status During 5-Year Follow-Up[a]

	Total (N = 387)	Low lethality at FSA (n = 320; 82.7%)	High lethality at FSA (n = 67; 17.3%)	*P* value	No reattempt (n = 243; 62.8%)	Reattempt (n = 144; 37.2%)	*P* value	Infrequent reattempter[b] (n = 104; 72.2%)	Frequent reattempter[c] (n = 40; 27.8%)	*P* value
Female, n (%)	227 (58.6)	188 (58.7)	39 (58.2)	.935	138 (56.7)	89 (61.8)	.333	59 (56.7)	30 (75)	**.043***
Age at index episode, years (SD)	44.3 (16.8)	43.5 (16.4)	48.1 (18.1)	**.041***	45.2 (17.7)	42.9 (15.1)	.218	43.9 (15.4)	40.4 (14.3)	.209
Marital status, n (%)										
Single	87 (22.4)	74 (23.1)	13 (19.4)	.552	42 (17.2)	45 (31.2)	**<.001***	32 (30.7)	13 (32.5)	.418
Married/coupled	179 (46.2)	144 (45)	35 (52.2)		131 (53.9)	48 (33.3)		32 (30.7)	16 (40)	
Divorced/widower	121 (31.3)	102 (31.9)	19 (28.4)		70 (28.8)	51 (35.4)		40 (38.4)	11 (27.5)	
Employment status, n (%)										
Employed	152 (39.2)	133 (41.5)	19 (28.3)	.132	103 (42.3)	49 (34)	.250	41 (39.4)	8 (20.0)	**.021***
Unemployed	117 (30.2)	93 (29)	24 (35.8)		71 (29.2)	46 (31.9)		27 (26.0)	19 (47.5)	
Disabled	118 (30.4)	94 (29.3)	24 (35.8)		69 (28.3)	49 (34)		36 (34.6)	13 (32.5)	
Foreigner, n (%)	68 (17.5)	53 (16.5)	15 (22.3)	.255	48 (19.7)	20 (13.8)	.143	13 (12.5)	7 (17.5)	.437
Psychiatric diagnosis, n (%)										
Psychotic disorder	13 (3.3)	11 (3.4)	2 (2.9)	.820	5 (2)	8 (5.5)	**<.001**	7 (6.7)	1 (2.5)	.152
Depressive disorder	132 (34.1)	110 (34.3)	22 (32.8)		79 (32.5)	53 (36.8)		41 (39.4)	12 (30)	
Anxiety disorder	11 (2.8)	9 (2.8)	2 (2.9)		6 (2.4)	5 (3.4)		3 (2.8)	2 (5)	
Adjustment disorder	88 (22.7)	76 (23.7)	12 (17.9)		63 (25.9)	25 (17.3)		18 (17.3)	7 (17.5)	
Alcohol use disorder	19 (4.9)	16 (5)	3 (4.5)		14 (5.8)	5 (3.5)		12 (11.5)	4 (10)	
Nonalcohol-related substance use disorder	26 (6.7)	21 (6.6)	5 (7.5)		10 (4.1)	16 (11.1)		–	–	
Personality disorder	75 (19.3)	57 (17.8)	18 (26.8)		56 (23)	19 (13.1)		15 (14.4)	4 (10)	
Other	23 (5.9)	20 (6.3)	3 (4.5)		10 (4.1)	13 (9.0)		8 (7.6)	10 (25)	
Substance use, n (%)										
Alcohol	125 (32.2)	95 (29.6)	30 (44.7)	**.016***	74 (30.4)	51 (35.4)	.313	38 (36.5)	13 (32.5)	.650
Cannabis	37 (9.5)	33 (10.3)	4 (5.9)	.195	21 (8.6)	16 (11.1)	.425	10 (9.6)	6 (15)	.357
Cocaine	14 (3.6)	11 (3.4)	3 (4.4)	.448	8 (3.2)	6 (4.1)	.656	5 (4.8)	1 (2.5)	.535
Polysubstance use[d]	28 (7.2)	25 (7.8)	3 (4.4)	.251	14 (5.7)	14 (9.7)	.146	11 (10.5)	3 (7.5)	.577
High lethality, n (%)	67 (17.3)	–	–	–	37 (15.2)	30 (20.8)	.159	20 (19.2)	10 (25)	.445
Reattempt (yes), n (%)	144 (37.2)	114 (35.6)	30 (44.8)	.159	–	144 (100)	–	–	–	–
Frequent reattempter,[b] n (%)	40 (10.3)	30 (26.3)	10 (33.3)	.548	–	40 (27.8)	–	–	–	–
No. of reattempts, mean (SD)	0.8 (1.7)	0.8 (1.6)	1.1 (2.1)	.198	–	2.3 (2.1)	–	–	–	–

[a]*P* values were corrected for multiple comparisons using the Benjamini-Hochberg procedure within each comparison block. Statistically significant associations after correction ($P < .05$) are in boldface and marked with an asterisk (*).
[b]Infrequent reattempter: <3 reattempts.
[c]Frequent reattempter: ≥3 reattempts.
[d]Polysubstance use refers to the use of 3 substances excluding tobacco and methadone.
Abbreviations: FSA = first suicide attempt, OH = alcohol.

deaths, and nonsuicidal deaths. As the data were non-normally distributed, nonparametric tests were used (see Supplementary Figure 1). Patients who died by suicide or from any cause showed significantly longer hospitalizations compared to survivors ($P < .01$). Detailed statistics are presented in the Supplementary Material. The Cox regression models indicated that age (HR = 1.069, 95% CI, 1.032–1.107; $P < .001$) and high-lethality FSA (HR = 2.803, 95% CI, 1.072–6.755; $P = .041$) were significant risk factors for overall mortality (see Table 3; Supplementary Table 4).

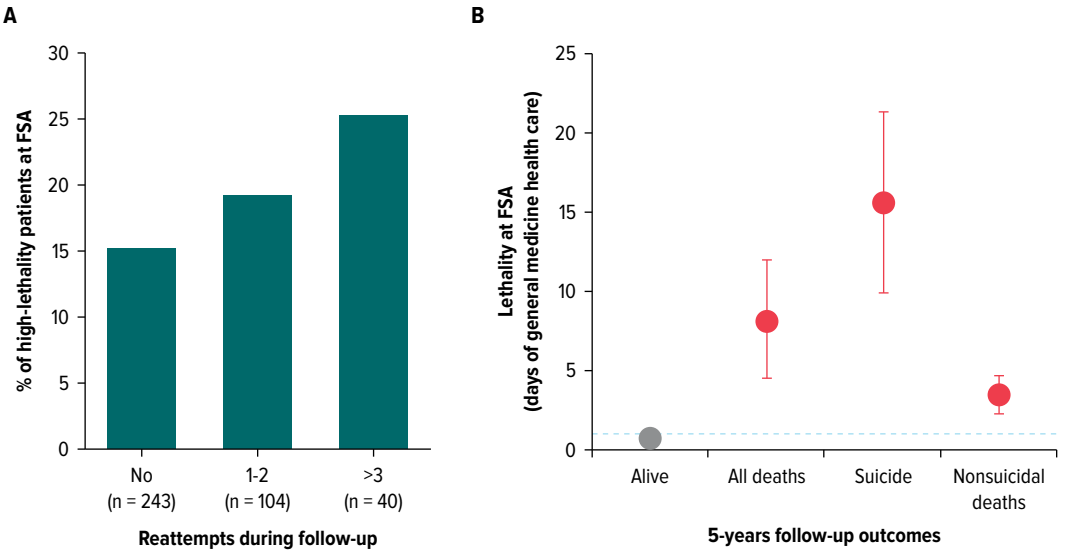
Regarding suicide deaths, patients who died by suicide were significantly older (57.4 vs 43.3 years; $P = .038$) and had a higher prevalence of high-lethality FSA (57.1% vs 15.9%; $P = .017$). The Cox regression analysis showed that high lethality was a significant factor, indicating more than a 5-fold increased risk of suicide (HR = 5.430, 95% CI, 1.189–24.792; $P = .029$) (see Table 3; Supplementary Table 4).

In terms of nonsuicidal deaths, patients were significantly older (70.6 vs 43.3 years; $P < .001$), less frequently employed (9% vs 40.6%; $P = .030$), and more frequently disabled (63.3% vs 29.2%; $P = .021$). Additionally, these patients were less likely to have a history of reattempts during follow-up (9% vs 37.3%; $P = .047$). The Cox regression model revealed that age was a significant predictor of nonsuicidal death (HR = 1.093, 95% CI, 1.035–1.153; $P = .001$) (see Table 3 and Supplementary Table 4).

Kaplan-Meier survival curves for overall mortality, shown in Figure 2, indicated higher mortality rates for both overall mortality (HR = 3.954; CI, 1.560–10.018; log-rank $P = .002$) and suicide deaths (HR = 6.528; CI,

Figure 1.

High Lethality at First Suicide Attempt, Reattempts, and 5-Year Outcomes[a]



[a]Panel A shows the percentage of high-lethality patients at FSA according to the number of reattempts during follow-up. Panel B shows the lethality at FSA, measured in days of general medicine hospitalization, according to 5-year follow-up outcomes. A dashed horizontal line in panel B marks the Beautrais' 24-hour threshold used to define high somatic lethality. Due to the non-normal distribution of hospitalization days, nonparametric statistical tests were used; full distribution including outliers is shown in Supplementary Figure 1.
Abbreviations: FSA = first suicide attempt; HR = hazard ratio.

Table 2.

Multivariable Logistic Regression Models for High-Lethality First Suicide Attempt, Any Suicide Reattempt, and Multiple Reattempts (≥3) During 5-Year Follow-Up[a]

Outcome	Predictor	Adjusted OR (95% CI)	*P* value
High lethality at FSA	Age	1.015 (0.998–1.031)	.126
	Employed	0.625 (0.337–1.158)	.136
	Alcohol	2.142 (1.231–3.724)	**.021***
Suicide reattempt	Single	1.463 (0.829–2.581)	.189
	Employed	0.507 (0.307–0.835)	**.032***
	Non-alcohol-related substance use disorder	2.132 (0.903–5.035)	.084
	Personality disorder	0.516 (0.287–0.928)	**.039***
Multiple reattempts (≥3)	Female	2.388 (1.036–5.507)	**.041***
	Employed	0.614 (0.189–1.401)	.193
	Unemployed	1.933 (0.802–4.659)	.142
	Other	0.714 (0.244–1.890)	.139

[a]*P* values were corrected for multiple comparisons using the Benjamini-Hochberg procedure within each outcome model. Statistically significant associations after correction ($P < .05$) are in boldface and marked with an asterisk (*).
Abbreviations: FSA = first suicide attempt, OR = odds ratio.

1.461–29.168; log rank $P = .005$) among those with initially high lethality. However, no significant results were found for nonsuicidal deaths.

DISCUSSION

The findings of this 5-year cohort study provide critical insights into the outcomes of 387 individuals following an FSA. Key results include the following: (1) 37.2% of participants experienced a recurrence of suicide attempts, with 27.8% classified as frequent re-attempters (≥ 3 attempts); (2) 5.7% of the cohort died during the 5-year follow-up, with 1.8% of deaths attributed to suicide; (3) alcohol use was associated with an increased risk of a high-lethality initial attempt; (4) being female was linked to a higher likelihood of frequent re-attempts; and (5) high medical lethality of the

Table 3.

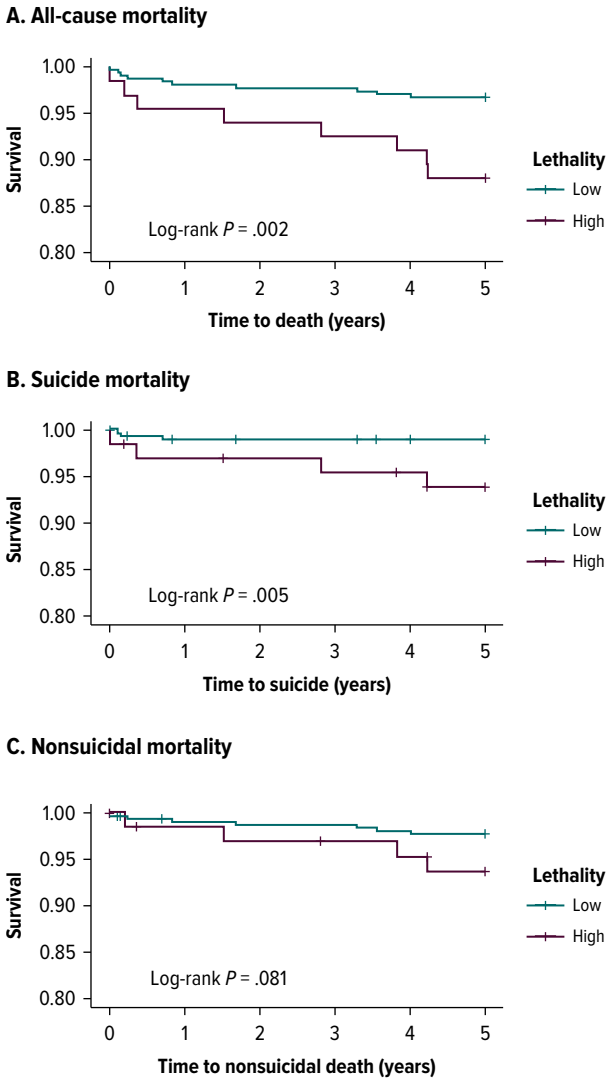
Multivariable Cox Regression Models for All-Cause, Suicide, and Nonsuicide Mortality During 5-Year Follow-Up[a]

Outcome	Predictor	Adjusted HR (95% CI)	*P* value
All-cause death	Age	1.069 (1.032–1.107)	**<.001***
	Employed	0.409 (0.079–2.097)	.284
	Disabled	0.475 (0.139–1.612)	.233
	High lethality	2.803 (1.072–6.755)	**.041***
Suicide death	Age	1.036 (0.995–1.076)	.080
	High lethality	5.430 (1.189–24.792)	**.029***
Nonsuicidal death	Age	1.093 (1.035–1.153)	**.001***
	Employed	0.446 (0.043–4.621)	.499
	Disabled	0.410 (0.073–2.268)	.307
	Reattempt (yes)	0.297 (0.036–2.423)	.257

[a]*P* values were corrected for multiple comparisons using the Benjamini-Hochberg procedure within each mortality outcome model. The proportional hazards assumption was tested using Schoenfeld residuals; no violations were detected (global $P > .05$). Statistically significant associations after correction ($P < .05$) are in boldface and marked with an asterisk (*).
Abbreviation: HR = hazard ratio.

Figure 2.

Kaplan-Meier Curves and Log-Rank Test for Mortality Outcomes[a]



[a]Panel A shows time to all-cause mortality, panel B shows time to suicide, and panel C shows time to nonsuicidal death (all in years), stratified by lethality of the first suicide attempt. Comparisons between groups were conducted using the log-rank test.

initial attempt and older age were significant predictors of mortality. High lethality increased the risk of suicide-specific mortality 5-fold, while older age was more predictive of nonsuicidal deaths. These findings highlight the importance of targeted interventions for this vulnerable population, particularly in the early stages following an FSA.

The overall recurrence rate of 37.2% exceeds those reported in prior studies, such as Owens et al (23% over 4 years)[11] and Esmaeili et al (11.7% over 5 years, mostly within 18 months).[37] This higher rate may reflect differences in methodology or the characteristics of the sample, as our study population includes the entire population of the Lleida region (447,343 people as of 2023). Our Department of Psychiatry, shared by the two hospitals, encompasses the province's only psychiatric emergency centers, with minimal interprovincial mobility. Furthermore, there has likely been an increase in the number of suicide attempts in recent decades, both globally and in our regional setting.[38,39] Among the various characteristics associated with recurrence, employment emerged as a protective factor, supporting previous studies that highlight its stabilizing effect on mental health.[6,40]

An unexpected finding was the protective effect of personality disorders against recurrence, which contradicts prior literature identifying them as a risk factor.[4] This discrepancy may be explained by diagnostic coding biases, as personality disorders often co-occur with other psychiatric conditions.[41] In our study, we recorded only the primary diagnosis and did not capture comorbid psychiatric conditions. This omission could have biased the results, particularly for patients with personality disorders, as they are often comorbid with other mental health conditions and may not be considered the primary diagnosis in clinical settings. Consequently, personality disorders may have been underrepresented in our register, potentially misinterpreting their role in recurrence risk. It is also noteworthy that adjustment disorders at FSA were associated with a lower likelihood of reattempt. This suggests that a significant proportion of FSAs may have been the result of acute crisis states triggered by recent stressors, rather than reflecting enduring psychopathology. This interpretation is strongly supported by the literature on the suicide crisis syndrome, which conceptualizes suicidal mental states as acute responses to overwhelming external stressors

that activate underlying long-term vulnerabilities.[42,43] Similarly, the narrative crisis model describes how these acute crisis episodes predict short-term suicide risk, highlighting the dynamic interplay between situational stress and pre-existing diatheses.[44–46] These findings underscore the importance of distinguishing between chronic vulnerability and acute crisis responses in both research and clinical suicide prevention efforts.

The 27.8% of participants who were classified as frequent reattempters exhibited distinctive sociodemographic and clinical characteristics, such as a higher prevalence of being female and unemployed. These findings mirror previous studies,[47,48] emphasizing the need for focused interventions for this subgroup, which is particularly vulnerable.

In terms of lethality, 17.3% of participants presented with high-lethality FSA. Alcohol use emerged as a significant predictor of high-lethality attempts, consistent with current evidence that identifying alcohol as an acute facilitator of suicidal behavior by reducing inhibitions and physical pain at the time of the attempt.[49,50] However, in our study, alcohol use disorder (AUD) did not show an association with the lethality of the attempt. This distinction aligns with previous findings indicating that transient alcohol use during an attempt and chronic alcohol use patterns captured by AUD diagnoses reflect different phenomena. Diagnostic coding biases may further contribute to underreporting of AUD, especially given the frequent comorbidity with other psychiatric disorders.[51] Nevertheless, we captured patient-reported substance use, including alcohol, in our dataset. Interestingly, a trend toward higher lethality at FSA and reattempts was observed, although it did not reach statistical significance. This finding is consistent with trajectory models of suicidal behavior[52] and should be further explored in future studies with designs capable of disentangling the acute versus chronic effects of alcohol use in suicidal trajectories.

High-lethality FSA emerged as a key predictor of mortality in our cohort, with an all-cause mortality rate of 5.7% and suicide-specific mortality of 1.8%. These figures align with studies with similar follow-up periods, although such studies often include patients selected based on an index episode, regardless of whether it was a first attempt or a recurrence.[18,53] However, our rates are lower than those observed in studies with longer follow-up periods.[54,55] In our cohort, patients with high-lethality FSA had a 5-fold increased risk of suicide, reinforcing the importance of lethality as a predictor of severe outcomes.[17,56,57] Age and unemployment were also significant predictors of mortality, in line with previous studies.[58,59] In total, 1.8% of participants died by suicide, while up to 2.8% died from nonsuicidal causes. Importantly, the proportion of suicide deaths among first attempt survivors was substantially higher than in the general population, highlighting the need to systematically record initial attempt lethality in suicide risk assessments.

The substantial proportion of nonsuicidal deaths compared to suicidal deaths (2.8% vs 1.8%) aligns with findings from other population-based studies on first-time suicide attempters, which suggest that excess mortality in this population is largely due to physical health conditions.[54] These results highlight the need for public health efforts that address both suicide prevention and the improvement of physical health in this vulnerable population.

Limitations and Strengths

This study has several limitations that should be considered when interpreting the results. First, the relatively small sample size limits the generalizability of the findings. Second, data were collected from clinical records, which, despite being standardized across a single department of psychiatry, may still have inherent limitations, such as incomplete or inaccurate documentation. Third, only the primary diagnosis was recorded, potentially overlooking psychiatric comorbidities and introducing diagnostic bias. This is particularly relevant for personality disorders, as subtype distinctions (eg, borderline) were not available and may have influenced our findings. Fourth, although somatic severity was assessed based on the duration of general medical care, the specific method used in the suicide attempt was not recorded, potentially limiting the granularity of risk profile analysis. Furthermore, the study did not use validated lethality instruments such as the Beck Lethality Scale, which might have improved the reliability of severity assessment.[60] Additionally, the operational definition of high lethality—medical care exceeding 24 hours, as proposed by Beautrais—may overestimate true lethality in certain scenarios, particularly in sedative overdoses, where extended observation is often required despite lower actual fatality risk. Fifth, individuals who died during their FSA were not included in this study, as the cohort was limited to those who survived the index episode. This may have important implications for the interpretation of our findings, given that prior research suggests approximately 79% of suicide deaths occur on the first attempt.[61] Sixth, the study did not use standardized psychometric scales and lacked detailed information on psychiatric severity beyond the primary diagnosis. Finally, although competing risk models may provide a more refined analysis of cause-specific mortality, we opted for separate Cox models given the limited number of deaths, which constrained the statistical power required for such approaches.

Despite these limitations, this study has several major strengths. First, we focus exclusively on patients experiencing their FSA, rather than recurrent episodes. Second, we use a longitudinal design with a 5-year follow-up period to track various outcomes. Third, the study population is well-defined, covering the entire

Lleida region (447,343 people as of 2023) through the province's only 2 psychiatric emergency centers, with minimal interprovincial mobility.

CONCLUSIONS

This study highlights the significant risks of recurrence and frequent suicide attempts following an FSA, emphasizing the need for targeted prevention efforts. High-lethality attempts strongly predict suicide-related deaths, while older age is associated with nonsuicidal mortality. Interventions should prioritize reducing high-lethality behaviors and addressing key risk factors to improve long-term outcomes in this high-risk population.

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References

1. WHO. *Suicide worldwide in 2019: Global Health Estimates*. World Health Organization; 2019. Accessed August 19, 2025:4–9. https://www.who.int/publications/i/item/9789240026643.
2. Sher L, Oquendo MA. Suicide: an overview for clinicians. *Med Clin North Am*. 2023;107(1):119–130.
3. Franklin JC, Ribeiro JD, Fox KR, et al. Risk factors for suicidal thoughts and behaviors: a meta-analysis of 50 years of research. *Psychol Bull*. 2017;143(2):187–232.
4. Irigoyen M, Porras-Segovia A, Galván L, et al. Predictors of re-attempt in a cohort of suicide attempters: a survival analysis. *J Affect Disord*. 2019;247:20–28.
5. Parra-Uribe I, Blasco-Fontecilla H, Garcia-Parés G, et al. Risk of re-attempts and suicide death after a suicide attempt: a survival analysis. *BMC Psychiatry*. 2017;17(1):1–11.
6. Pemau A, Marin-Martin C, Diaz-Marsa M, et al. Risk factors for suicide reattempt: a systematic review and meta-analysis. *Psychol Med*. 2024;54(9):1897–1904.
7. de la Torre-Luque A, Pemau A, Ayad-Ahmed W, et al. Risk of suicide attempt repetition after an index attempt: a systematic review and meta-analysis. *Gen Hosp Psychiatry*. 2023;81:51–56.
8. Kreitman N, Casey P. Repetition of parasuicide: an epidemiological and clinical study. *Br J Psychiatry*. 1988;153:792–800.
9. Carroll R, Metcalfe C, Gunnell D. Hospital management of self-harm patients and risk of repetition: systematic review and meta-analysis. *J Affect Disord*. 2014;168:476–483.
10. Liu BP, Lunde KB, Jia CX, et al. The short-term rate of non-fatal and fatal repetition of deliberate self-harm: a systematic review and meta-analysis of longitudinal studies. *J Affect Disord*. 2020;273:597–603.
11. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm. Systematic review. *Br J Psychiatry*. 2002;181(9):193–199.
12. Oh SH, Kim HJ, Kim SH, et al. Which deliberate self-poisoning patients are most likely to make high-lethality suicide attempts? *Int J Ment Health Syst*. 2015;9:35.
13. Levi-Belz Y, Beautrais A. Serious suicide attempts. *Crisis*. 2016;37(4):299–309.
14. Aguglia A, Solano P, Parisi VM, et al. Predictors of relapse in high lethality suicide attempters: a six-month prospective study. *J Affect Disord*. 2020;271:328–335.
15. Czernin S, Vogel M, Flückiger M, et al. Cost of attempted suicide: a retrospective study of extent and associated factors. *Swiss Med Wkly*. 2012;142:w13648.
16. Mann JJ, Apter A, Bertolote J, et al. Suicide prevention strategies: a systematic review. *JAMA*. 2005;294(16):2064–2074.
17. Gvion Y, Levi-Belz Y. Serious suicide attempts: systematic review of psychological risk factors. *Front Psychiatry*. 2018;9(3):56.
18. Beautrais AL. Subsequent mortality in medically serious suicide attempts: a 5 year follow-up. *Aust N Z J Psychiatry*. 2003;37(5):595–599.
19. Beautrais AL. Further suicidal behavior among medically serious suicide attempters. *Suicide Life Threat Behav*. 2004;34(1):1–11.
20. Cai Z, Junus A, Chang Q, et al. The lethality of suicide methods: a systematic review and meta-analysis. *J Affect Disord*. 2022;300:121–129.
21. Irigoyen-Otiñano M, Puigdevall-Ruestes M, Mur-Laín M, et al. Absence of association between the level of lethality and the recidivism of suicide attempts in a Spanish province. *Actas Esp Psiquiatr*. 2019;47(5):179–189.
22. Nicolau-Subires E, Llorca-Bofí V, Arenas-Pijoan L, et al. Lethality and recidivism in suicide attempters: a longitudinal study. *J Psychiatr Res*. 2025;189:148–156.
23. Park CHK, Lee JW, Lee SY, et al. Suicide risk factors across suicidal ideators, single suicide attempters, and multiple suicide attempters. *J Psychiatr Res*. 2020;131:1–8.
24. Tachikawa H, Takahashi S, Nemoto K, et al. Predictive factors for recurrent suicide attempts: evidence from the ACTION-J study. *PCN Rep*. 2022;1(2):e7.
25. Quesada-Franco M, Braquehais MD, Valero S, et al. A comparison of medically serious suicide attempters admitted to intensive care units versus other medically serious suicide attempters. *BMC Psychiatry*. 2022;22(1):805–810.
26. Aguglia A, Solano P, Parisi VM, et al. Predictors of relapse in high lethality suicide attempters: a six-month prospective study. *J Affect Disord*. 2020;271:328–335.
27. Irigoyen-Otiñano M, Llorca-Bofí V, Adrados-Pérez M, et al. The MCOSUL Cohort: lethality, recurrence, and mortality in suicide attempts in the Lérida Region, Spain—Rationale, objectives, and preliminary findings. *Psiquiatr Biológica*. 2024:100548.
28. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*. 2013;310(20):2191–2194.
29. von Elm E, Altman DG, Egger M, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol*. 2008;61(4):344–349.
30. American Psychiatric Association. *DSM-IV Text Revision (DSM-IV-TR)*. 4th ed. Text Rev. American Psychiatric Association; 2000.
31. Silverman MM. The language of suicidology. *Suicide Life Threat Behav*. 2006;36(5):519–532.
32. Beautrais AL. Suicides and serious suicide attempts: two populations or one? *Psychol Med*. 2001;31(5):837–845.
33. Beck AT, Schuyler D, Herman I. Development of suicidal intent scales. In: BecK AT, Resnik HL, Lettieri DJ, eds. *The Prediction of Suicide*. Charles Press Publishers; 1974:45–58.
34. Wisniewski SR, Leon AC, Otto MW, et al. Prevention of missing data in clinical research studies. *Biol Psychiatry*. 2006;59(11):997–1000.
35. Hidalgo B, Goodman M. Multivariate or multivariable regression? *Am J Public Health*. 2013;103(1):39–40.
36. Jafari M, Ansari-Pour N. Why, when and how to adjust your P values? *Cell J*. 2019;20(4):604–607.
37. Esmaeili ED, Farahbakhsh M, Sarbazi E, et al. Predictors and incidence rate of suicide re-attempt among suicide attempters: a prospective study. *Asian J Psychiatr*. 2022;69:102999.
38. Bommersbach TJ, Olfson M, Rhee TG. National trends in emergency department visits for suicide attempts and intentional self-harm. *Am J Psychiatry*. 2024;181(8):741–752.
39. Instituto Nacional de Estadística. 2023

40. Demesmaeker A, Chazard E, Vaiva G, et al. Risk factors for reattempt and suicide within 6 months after an attempt in the French ALGOS cohort: a survival tree analysis. *J Clin Psychiatry*. 2021;82(1):20m13589.
41. Qadeer Shah A, Prasad D, Caropreso L, et al. The comorbidity between borderline personality disorder (BPD) and generalized anxiety disorder (GAD): a systematic review and meta-analysis. *J Psychiatr Res*. 2023;164: 304–314.
42. Cohen LJ, Imbastaro B, Peterkin D, et al. A suicide-specific diagnosis—the case for. *Crisis*. 2023;44(3):175–182.
43. Galynker, I, Bloch-Elkouby, S, Cohen, LJ. Suicide crisis syndrome: a specific diagnosis to aid suicide prevention. *World Psychiatry*. 2024;23(3): 362–363.
44. Bloch-Elkouby S, Yanez N, Chennapragada L, et al. The narrative crisis model of suicide: a novel and empirically grounded diathesis-stress model of suicide. *Suicide Risk Assess Prev*. 2022;1-16;151–166.
45. Bloch-Elkouby S, Rogers ML, Goncearenco I, et al. The narrative crisis model of suicide: a review of empirical evidence for an innovative dynamic model of suicide and a comparison with other theoretical frameworks. *Personalized Med Psychiatry*. 2024;45:100131.
46. Bloch-Elkouby S, Barzilay S, Gorman BS, et al. The Revised Suicide Crisis Inventory (SCI-2): validation and assessment of prospective suicidal outcomes at one month follow-up. *J Affect Disord*. 2021;295:1280–1291.
47. Blasco-Fontecilla H, Jaussent I, Olié E, et al. A cross-sectional study of major repeaters: a distinct phenotype of suicidal behavior. *Prim Care Companion CNS Disord*. 2014;16(4). doi: 10.4088/PCC.14M01633.
48. Irigoyen-Otiñano M, Puigdevall-Ruestes M, Prades-Salvador N, et al. Further evidence for major repeaters as a subgroup of suicide attempters. *Rev Psiquiatr Salud Ment*. 2018;11(1):19–26.
49. Amiri S, Behnezhad S. Alcohol use and risk of suicide: a systematic review and meta-analysis. *J Addict Dis*. 2020;38(2):200–213.
50. Lange S, Jiang H, Kaplan MS, et al. Association between Acute alcohol use and firearm-involved suicide in the United States. *JAMA Netw Open*. 2023;6(3): e235248–e235248.
51. Castillo-Carniglia A, Keyes KM, Hasin DS, et al. Psychiatric comorbidities in alcohol use disorder. *Lancet Psychiatry*. 2019;6(12):1068–1080.
52. Nagin DS. Group-based trajectory modeling: an overview. *Ann Nutr Metab*. 2014; 65(2–3):205–210.
53. Hirot F, Ali A, Azouvi P, et al. Five-year mortality after hospitalisation for suicide attempt with a violent method. *J Psychosom Res*. 2022;159:110949.
54. Jokinen J, Talbäck M, Feychting M, et al. Life expectancy after the first suicide attempt. *Acta Psychiatr Scand*. 2018;137(4):287–295.
55. Suominen K, Isometsä E, Suokas J, et al. Completed suicide after a suicide attempt: a 37-year follow-up study. *Am J Psychiatry*. 2004;161(3):562–563.
56. Giner L, Jaussent I, Olié E, et al. Violent and serious suicide attempters: one step closer to suicide? *J Clin Psychiatry*. 2014;75(3):e191–e197.
57. Witt K, Pirkis J, Scott D, et al. Trajectories in suicide attempt method lethality over a five-year period: associations with suicide attempt repetition, all-cause, and suicide mortality. *PloS One*. 2021;16(1):e0245780.
58. Hawton K, Zahl D, Weatherall R. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *Br J Psychiatry*. 2003;182(6):537–542.
59. Liu BP, Jia CX, Qin P, et al. Associating factors of suicide and repetition following self-harm: a systematic review and meta-analysis of longitudinal studies. *eClinicalMedicine*. 2022;49:101461.
60. Barker J, Oakes-Rogers S, Leddy A. What distinguishes high and low-lethality suicide attempts in older adults? A systematic review and meta-analysis. *J Psychiatr Res*. 2022;154:91–101.
61. Jordan JT, McNiel DE. Characteristics of persons who die on their first suicide attempt: results from the National Violent Death Reporting System. *Psychol Med*. 2020;50(8):1390–1397.