

Rising Suicide Attempts-A Global Psychiatric Emergency

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ABSTRACT: *Suicide attempt is a significant public health issue globally, and is one of the leading cause of rising death rates. The presence of a prior SA was regarded as the major threat factor for both non-fatal and lethal repeat of suicide attempt. The suicide attempt levels now account for one-third of all mental situations at psychiatric emergency departments (ED) and must be taken into consideration since assessment and suicide threat assessment are essential for the avoidance of potential suicides. 'Suicide Attempt Repeaters' are distinct from 'non repeaters', by being mostly females, with past self-injuries and psychiatric hospitalizations, and visiting the Psychiatric Emergency Department after a recent suicide attempt Study aims to study and compare the profile of suicide repeaters and non-repeaters in the psychiatric emergency ward.*

KEYWORDS: *Suicide ideation, Suicide attempt repetition, Suicide risk factors, Psychiatric emergency departments*

ABBREVIATIONS

SA: Suicide Attempt or Attempts; ED: Emergency Departments; ± SD: Standard Deviation; LR: Binary Logistic Regression Analysis; AUC: Area Under ROC Curve; NSSI: Non-suicidal Self-injuries.

BACKGROUND

SA constitute a major public health problem worldwide with prevalence's 20 to 40 times greater than suicide consummation, considered one of the leading causes of death (World Health Organization, 2014). The SA rates seen in ED have been growing and represent one-third of all psychiatric emergencies (Goldberg et al., 2007; Kawashima et al., 2014) Therefore, all SA should be seriously taken into account at ED, (Ryan & Large, 2015) as evaluation and suicide risk assessment is fundamental for the prevention of future SA (Daigle et al., 2011).

The existence of a previous SA has been considered the main risk factor for both SA non-fatal and fatal repetition (Allen et al. 2013; Beghi et al., 2013) 'SA repeaters' seem to be a specific population among suicide attempters with distinct characteristic features including unmarried status, diagnosis of mental disorders, suicidal ideation and family history of suicidal behaviour (Monnin et al., 2012; Mendez-Bustos et al., 2013; Lopez-Castroman et al 2011).

Although suicidal ideation can be the first step in the progression of suicide risk evolution, the risk factors for suicidal ideation are not necessarily the same as for SA or for suicide consummation (May & Klonsky, 2016). Some authors consider the separation of

passive from active ideation and argue that there is a higher risk of SA repetition in the presence of both, together with a previous SA (Baca-Garcia et al., 2011).

The risk factors' mutability implies a systematic re-evaluation, considering that the SA repetition predictive risk factors occur in combination and change over time (Bryan & Rudd, 2016; Nock et al., 2008). Those risk factors have been mainly classified into sociodemographic, clinical and previous suicidal behaviour related features. From a public health perspective, we also focus on health service access and treatment.

Sociodemographic features are among the main risk factors significantly associated with SA repetition (Beghi et al., 2013; Goldberg et al., 2007). However, the interaction between gender and age can modify those findings. One example is the gender 'paradoxical effect', consisting of higher rates of multiple SA among women, (Allen et al. 2013; Elisei et al., 2012; Lopez-Castroman et al., 2011; Mergl et al., 2015) in opposition to higher rates of suicide consummations in males (Bertolote et al., 2010; Elisei et al., 2012). However, younger male individuals (Monnin et al., 2012) and middle-aged females are predominant among 'SA repeaters' (Narishige, 2014). A low level of education as well as an unmarried marital status associated with the risk of SA repetition also seems to diminish with age, (Bryan & Rudd, 2016) mostly in females (Elisei et al., 2012). Familial antecedents of suicidal behaviours have also been referred to in association with SA repetition (Mendez-Bustos et al., 2013). Unemployment has been associated with a higher risk of SA, but not specifically with SA repetition, and there are contradictory findings, as it has also been found that it may constitute a protective factor against SA (Choi et al., 2013).

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Clinically, personality disorders, especially of the borderline subtype (Ando et al., 2013; Oumaya et al., 2008; Zeppegno et al., 2015) and psychiatric pathology, mostly mood disorders, have been associated with SA repetition (Bertolote et al., 2010; Mendez-Bustos et al., 2013; Nock et al., 2008). A high predominance of coexistent alcohol and substances misuse (Soloff & Chiappetta, 2012), as risk factors for SA repetition have also been noted. The relationship of suicidal ideation with SA is complex and may be influenced by personality disorders (Beghi et al., 2013) and impulsivity traits (Lopez-Castroman et al., 2015), the same happening with antecedents of non-suicidal self-injuries (Ando et al., 2013; Blasco-Fontecilla et al., 2014; Dhingra et al., 2015; Hawton et al., 2012). There have been attempts to explain the differences between ‘SA non-repeaters’ and ‘SA repeaters’ based on addictive behaviours patterns (Dhingra et al., 2015; Horwitz, et al., 2015), which also implicate the choice of lethal methods as part of the suicidal repetition process evolution. Methods have been found to be mediated by other factors such as gender (Blasco-Fontecilla et al., 2016; Elisei et al., 2012; Owens et al. 2015) facility of access and cultural bias. Medical voluntary intoxication (MVI) has been the most frequent lethal method found, independent of the frequency of SA repetition (Atay et al., 2014; Rodríguez et al., 2010; Tsirigotis et al., 2011).

The antecedents of more intensive previous psychiatric treatments have been associated with an increase of SA repetition (Mendez-Bustos et al., 2013; Rodríguez et al., 2010; Runeson et al., 2010) considering previous psychiatric hospitalisations (Allen et al., 2013; Ryan & Large, 2015) and previous number of ED episodes (Hjorthøj et al., 2014) as well as antecedents of psychiatric consultations (Courtet & Lopez-Castroman, 2017; Harada et al., 2014; Kvaran et al., 2015) In particular, in the case of the number of previous psychiatric hospitalisations, there have been some contradictions in interpretation, possibly related to eventual treatment resistance or linked with clinical severity (Choi et al., 2013; Courtet & Lopez-Castroman, et al., 2017; Runeson et al., 2010).

This study’s main goal consists of determining if there is a specific profile for ‘SA repeaters’, targeting the psychiatric ED population, as the usual ‘entrance door’ of SA into the health system and comparing ‘SA non-repeaters’ with ‘SA repeaters’. By focusing on a sample of adults considered ‘at risk of suicide’, at a psychiatric ED, we mean to improve the efficacy of suicide prevention measures in that setting with a positive impact on public health.

METHODS

Sample

In this cross-sectional study at a psychiatric ED of a general hospital, the recruitment of this convenience sample (n = 147) occurred consecutively during the study recruitment period, between September 2015 and April 2016. The inclusion criteria were age (18–65 years) and having been considered suicidal, by any evidence of suicidal behaviour (suicidal ideation, suicidal plans or SA) verbalised during the psychiatric ED observation. The exclusion criteria were incapability of understanding their participation, for clinical or other reasons, or refusal, independent of the verbalised reason.

Definitions

We adopted the following definition of SA (Uribe et al., 2013; Silverman, 2006): ‘A non-fatal, self-inflicted behaviour occurring,

necessarily, in the presence of suicidal ideation’, as distinct from non-suicidal self-injuries (self-injuries without lethal intent) (PORTUGAL: Ministry of Health, 2014). Patients ‘at risk of suicide’ were considered as individuals showing any evidence of suicidal behaviour (suicidal ideation, suicidal plans or SA), (Kawashima et al., 2014; Uribe et al., 2013) even if only when asked about the subject (Goldberg et al., 2007). We distinguished between ‘SA non-repeaters’ (patients with suicidal ideation, suicidal plans or a single SA) and ‘SA repeaters’ (≥ 2 SA) (Monnin et al., 2012; Narishige et al., 2014).

Information sources

Three information sources were used during the clinical interview recruitment process: 1) Patient self-reports and clinical evaluation; 2) Additional information provided by the patients’ relatives; 3) Health Information System.

Two different time periods were considered: a) The five previous years, for personal antecedents, such as health service access and treatment, being the period of this specific ED systematic informatics data registration existence; b) Life time prevalence’s for SA and non-suicidal self-injuries.

Variables description

The risk factors for suicidal behaviours were selected, in agreement with the literature review, including sociodemographic, clinical, previous SA behaviours and health service access and treatment:

- Sociodemographic factors such as gender (male vs. female), age (18–24, 25–34, 35–44 and 55–65 years), marital status (married or similar vs. ‘other’ (meaning “unmarried status” as single, divorced or widow), (Ryan & Large, 2015) nationality (Portuguese vs. Non- Portuguese), educational level (divided by number of completed instruction years: elementary; intermediate; high school; university/other), professional categories (no profession; administrators and scientists; services and specialised workers; manual workers; students/housewives) and job situation (active vs. inactive, including this last one, retired and unemployed) (Table 1).
- Clinical features include the presence of somatic pathology (independent of type), personality disorders and their subtype specification (borderline vs. ‘other’), (Ando et al., 2013; Oumaya et al., 2008) psychiatric diagnostic categories, (Mendez-Bustos et al., 2013) classified by the psychiatrist’s clinical observation and personal clinical records, in accordance with the majority of the literature – mood disorders, anxiety disorders, psychotic disorders, alcohol misuse and ‘other’ (namely, drug misuse, adjustment disorders and eating disorders), familial antecedents (psychiatric pathology, suicidal behaviours or suicide consummation), psychopathology (impulsivity, suicide ideation, mood, psychotic or anxiety` symptoms) (Table 2).
- Antecedents of non-suicidal self-injuries, and their respective type (‘cuts’ vs. other) and previous SA (with inclusion of the one that might have motivated the current emergency visit) (Table 2).
- Current or previous access to health services and treatments, including anti-depressive pharmacotherapy, primary health care consultations, psychiatric consultations, psychiatric ED visits (excluding the current emergency episode) and its episode number (1, 2 or ≥ 3), psychiatric hospital admissions

Table 1.
Socio-demographic description of the sample (n=147)*

Socio-demographic Characteristics	Total (n; %)
Gender	
Male	56 (38.1%)
Female	91 (61.9%)
Age: Mean (±SD); Min-max. (years)	41.9 (±11.9); 19-65
18-24	13 (8.8%)
25-34	29 (19.7%)
35-44	43 (29.3%)
45-54	35 (23.8%)
55-65	27 (18.4%)
Marital Status	
Unmarried status	88 (59.9%)
Married or similar	59 (40.1%)
Nationality	
Portuguese	130 (88.4%)
Non-Portuguese	17 (11.6%)
Educational Level	
Elementary (0-4 years)	34 (23.1%)
Intermediate (5-8 years)	24 (16.3%)
High School Diploma (9-12 years)	63 (42.9%)
University or Other (≥13 years)	26 (17.7%)
Professional Category	
None	9 (6.1%)
Administrators	15 (10.2%)
Services	48 (32.6%)
Manual workers	68 (46.3%)
Students or housewives	7 (4.8%)
Job Situation	
Active	58 (39.5%)
Inactive	89 (60.5%)

*Given the presence of missed values, we only present the valid percentages.
**Standard Deviation (± SD).
***Minimum Value-Maximum Value (Min-max.).

and its episode number (1, 2 or ≥ 3) and length of time since the last psychiatric hospitalisation (< 1 year or ≥ 1 year) (Table 2).

- The reason for the current emergency visit, divided into: 1) SA associated with the current ED visit; and 2) ‘other’ (including suicidal ideation and suicidal plans, even if verbalised only when asked). In case of the existence of both, the SA was considered as the major motive (Table 2).
- Previous SA characteristics such as SA number (including the eventual one that motivated the present emergency visit); the lethal method used in the last SA, classified, according to the literature, (Allen et al., 2013; Daigle et al., 2011; Mergl et al., 2015) as medical voluntary intoxication (MVI) vs. ‘other’ (namely, self-mutilation, hanging, jumping from high places, firearms shots, asphyxiation and poisoning), and time since the first SA (< 1 year or ≥ 1 year) (Table 3).

Statistical analyses

Above the previously described variables, given some small frequencies, reclassifications were made, into distinct categories to help identifying the determinants of ‘SA repeaters’, as previously

explained in the variable’s description, for marital status, job situation, personality disorders type, last SA’s lethal method, and number of previous emergency visits or psychiatric hospital admissions’ episodes, during the last five years (Mergl et al., 2015).

After a descriptive sociodemographic, clinical and health service access characterisation by measures of central distribution (mean, standard deviation (± SD) of the whole convenience sample, we preceded with a subdivision of the sample (n = 147) into two subgroups: 1) ‘SA non- repeaters’ (individuals with suicidal ideation, plans or a single previous SA); and 2) ‘SA repeaters’ (≥ 2 SA).

Variables identified with bivariate analyses for the identification

Table 2.
Clinical and treatment characteristics sample description (n=147)*

Clinical and Treatment Characteristics	Total (n; %)
Personality Disorders	
No	60 (40.8%)
Yes	87 (59.2%)
Borderline	40 (46.0%)
Other	47 (54.0%)
Psychiatric Diagnosis	
No	8 (5.4%)
Yes	139 (94.6%)
Mood disorders	85 (61.2%)
Anxiety disorders	5 (3.6%)
Alcohol misuse	14 (10.1%)
Psychotic disorders	14 (10.1%)
Other	21 (15.1%)
Somatic Pathology	
No	94 (63.9%)
Yes	53 (36.1%)
Suicidal Ideation	
No	7 (4.8%)
Yes	140 (95.2%)
Impulsivity	
No	28 (19.0%)
Yes	119 (81.0%)
Familial Antecedents of Psychiatric Pathology	
No	102 (69.4%)
Yes	45 (30.6%)
Familial Antecedents of Suicide Attempts	
No	133 (90.5%)
Yes	14 (9.5%)
Familial Antecedents of Suicide Consummations	
No	118 (80.3%)
Yes	29 (19.7%)
Non Suicidal Self-injuries	
No	105 (71.4%)
Yes	42 (28.6%)
Cuts	30 (71.4%)
Other	42 (28.6%)
Health Services Access and Treatment Characteristics	
Anti-Depressives	
No	41 (27.9%)
Yes	106 (72.1%)
Psychiatric Consultation	
No	48 (32.7%)

Yes	99 (67.3%)
Previous Psychiatric Hospitalisations	
Mean (\pmSD); Min-max.	1.12 (\pm2.12); 0-10
0	89 (60.5%)
1	23 (15.6%)
2	16 (10.9%)
≥ 3	19 (12.9%)
Time Since Last Psychiatric Admission	
<1 Year	24 (41.4%)
≥ 1 Year	34 (58.6%)
Previous Psychiatric Emergencies	
Mean (\pmSD); Min-max.	2.59 (\pm4.50); 0-34
0	55 (37.4%)
1	28 (19.0%)
2	14 (9.5%)
≥ 3	50 (34.0%)
Motive for the Actual Emergency Visit	
Suicide ideation or plans	96 (65.3%)
Suicide attempt	51 (34.7%)
*Given the presence of missed values, we only present the valid percentages; 95% Confidence Interval (CI).	
**Standard deviation (SD).	
***Minimum value-Maximum value ((Min- max.).	

Table 3.
Previous suicide attempts' sample description (n=147)*

Suicide Attempts' Characteristics**	Total (n; %)
No. of Previous Suicide Attempts	
Mean (\pm SD); Min-max.	1.92 (\pm1.82); 0-10
0	30 (20.4%)
1	46 (31.3%)
Lethal Plan Before Last SA	
No	101 (68.7%)
Yes	46 (31.3%)
Method of Last SA	
Medical voluntary intoxication	84 (72.4%)
Other	32 (27.6%)
Time Since First SA	
<1 Year	32 (21.8%)
≥ 1 Year	41 (27.9%)
*Given the presence of missed values, we only present the valid percentages; CI: 95%; SD: Standard deviation.	
**SA refers to the 'life prevalence' of SAs including the last SA, which might have motivated the actual emergency episode.	

of the statistically significant variables in association with the two subgroups (Chi-squared independence test, $p < 0.05$) were included in binary LR analysis (crude odds ratio and adjusted to age and gender, odds ratio; 95% CI, 0.10–0.20, enter method) were applied. Finally, we identified a multiple model of SA repetition risk (95% CI; binary LR, $p = 0.10$ –0.20, forward method) and calculated the respective area under the ROC curve (AUC). The programme used was SPSS (Version 22).

Informed consent

The study protocol was approved by the Ethics Committee of

the investigator's institution, in accordance with the Helsinki declaration. All responders provided written informed consent.

RESULTS

Sample description

The general characterisation of the sample showed the following sociodemographic features: ages mostly between 35 and 44 years old (29.3%), with a mean age of 41.9 (± 11.9), a majority of females (61.9%), "unmarried status" (59.9%) and in an 'inactive' job situation (60.5%) (Table 1).

Clinically, the majority (94.6%) of patients had a psychiatric diagnosis with a high predominance of mood disorders (61.2%). Personality disorders were identified in the majority of patients (59.2%), with the 'borderline' or impulsive type the most frequent among them (46.0%). The presence of suicidal ideation was detected in 95.2% of the sample (Table 2).

Previous health service access and treatment characterisation included psychiatric consultation in 67.3% and anti-depressive pharmacotherapy in 72.1% of the patients. The mean (\pm standard deviation) number of hospital admissions was 1.12 (± 2.12 ; 0-10) and of emergency visits was 2.59 (± 4.50 ; 0-34) (Table 2).

The previous SA episodes had a mean of 1.92 (± 1.82 ; 0–10); 20.4% of the whole sample had no SA, 31.3% had a single SA, meaning 53.1% of the sample were 'SA non repeaters', while 46.9% were 'SA repeaters'. The most common last SA lethal method used was MVI (72.4%). The motive for this study's recruitment (as well as the reason for the current emergency visit) was a previous SA in 34.7% and 'other' in 65.3%, including suicidal ideation or suicidal plans (Table 3).

Association between individual characteristics and SA repetition

After the division of our sample (n = 147) into 'SA non-repeaters' (≤ 1 SA) and 'SA repeaters' (≥ 2 SA), 53.1% (n = 78) and 46.9% (n = 69), respectively, we compared those subgroups in order to identify the individual characteristics statistically significant in association with SA repetition (Table 4).

Bivariate analyses ($p < 0.05$) revealed that only gender figured among the sociodemographic risk factors significantly associated with SA repetition, showing a higher probability of multiple SA among women (60.8%, $p = 0.05$). The predominant age subgroup among 'SA repeaters' was 25–34 years (51.7%, $p = 0.05$) followed by 35–44 years (48.8%, $p = 0.05$), although not statistically significant. Clinical risk factors significantly associated with SA repetition were: the existence of personality disorders regardless of its subtype, (58.3%, n= 49) among 'SA repeaters', $p = 0.03$) antecedents of non-suicidal self-injuries, of any type (66.7 %, n= 28; $p = 0.004$), and of the 'cuts' type, in particular (76.7%, n= 23; $p = 0.07$), as well as the presence of suicidal ideation (49.3%; n= 69; $p = 0.03$). Among the previous SA features, only two were statistically significant: the existence of a lethal plan before the last SA (58.7%, n= 27; $p = 0.08$), and the time since the first SA being less than one year (78.7%, n=48; $p = 0.000$). The antecedents of previous healthcare access, including psychiatric consultations (52.5%, n=52; $p = 0.08$), psychiatric emergency visits (2 visits: 53.3%, n=49; $p = 0.07$) and episode number (1, 2 and ≥ 3 , $p = 0.05$), psychiatric hospitalisations (67.2%, n= 39; $p = 0.001$) and episode number (1 episode: 65.2, n=15, $p = 0.001$) were also statistically significant in association with SA repetition (Table 4).

Table 4.
Associations between individual characteristics and suicidal attempts repetition (n=147)*

Sociodemographic, Clinical, SA**, Health Services and Access Variables	SA Non-repeaters*** *	SA Repeaters**** *	Test p < 0.05 *
Gender			
Male	36 (64.3%)	20 (35.7%)	0.05
Female	42 (46.2%)	49 (53.8%)	
Age (Years)			
18–24	7 (53.8%)	6 (46.2%)	0.94
25–34	14 (48.3%)	15 (51.7%)	
35–44	22 (51.2%)	21 (48.8%)	
45–54	19 (54.3%)	16 (45.7%)	
55–65	16 (59.3%)	11 (40.7%)	
Educational Level (Years)			
- Elementary (0–4)	18 (52.9%)	16 (47.1%)	0.81
- Intermediate (5–8)	12 (50.0%)	12 (50.0%)	
- High School Diploma (9–12)	32 (50.8%)	31 (49.2%)	
- University or Other (≥ 13)	16 (61.5%)	10 (38.5%)	
Professional Category			
None	4 (44.4%)	95 (55.6%)	0.39
Administrators	8 (53.3%)	7 (46.7%)	
Services	31 (64.6%)	17 (35.4%)	
Manual workers	32 (47.1%)	36 (52.9%)	
Students or housewives	3 (42.9%)	4 (57.1%)	
Job Situation			
Active	46 (51.7%)	43 (48.3%)	0.81
Inactive	32 (55.2%)	26 (44.8%)	
Personality Disorder Types			
Borderline	17 (42.5%)	23 (57.5%)	0.85
Other	22 (46.8%)	25 (53.2%)	
Psychiatric Diagnosis			
Mood disorders	43 (50.6%)	42 (49.4%)	0.62
Anxiety disorders	2 (40.0%)	3 (60.0%)	
Alcohol misuse	10 (71.4%)	4 (28.6%)	
Psychotic disorders	7 (50.0%)	7 (50.0%)	
Other	10 (47.6%)	11 (52.4%)	
Somatic Pathology			
No	48 (51.1%)	46 (48.9%)	0.64
Yes	30 (56.6%)	23 (43.4%)	
Suicidal Ideation			
No	7 (100.0%)	0 (0.0%)	0.03
Yes	71 (50.7%)	69 (49.3%)	
Impulsivity			
No	19 (67.7%)	6 (32.1%)	0.13
Yes	59 (49.6%)	60 (50.4%)	
Mood Symptoms			
No	6 (85.7%)	1 (14.3%)	0.17
Yes	72 (51.4%)	68 (48.6%)	
Psychotic Symptoms			
No	62 (52.1%)	57 (47.9%)	0.79
Yes	16 (57.1%)	12 (42.9%)	
Anxiety Symptoms			
No	9 (45.0%)	11 (55.0%)	0.59
Yes	69 (54.3%)	58 (45.7%)	
Familial Antecedents:			
Familial Antecedents of Psychiatric Pathology			
No	56 (54.9%)	46 (45.1%)	0.62

Yes	22 (48.9%)	23 (51.1%)	
Familial Antecedents of SA*			
No	71 (53.4%)	62 (46.6%)	1
Yes	7 (50.0%)	7 (50.0%)	
Familial Antecedents of Suicide Consummations			
No	61 (51.7%)	57 (48.3%)	0.64
Yes	17 (58.6%)	12 (41.4%)	
Previous Non-Suicidal Self Injuries (NSSI)			
No	64 (61.0%)	41 (39.0%)	0.04
Yes	14 (33.3%)	28 (66.7%)	
Types of Previous NSSI			
'Cuts'	7 (23.3%)	23 (76.7%)	0.07
Other	7 (58.3%)	5 (41.7%)	
Previous Primary Care Consultations			
No	31 (46.3%)	36 (53.7%)	0.17
Yes	46 (59.0%)	32 (41.0%)	
Previous Psychiatric Consultations			
No	31 (64.6%)	17 (35.4%)	0.08
Yes	47 (47.5%)	52 (52.5%)	
Previous Psychiatric Emergencies			
No	35 (63.6%)	20 (36.4%)	0.07
Yes	43 (46.7%)	49 (53.3%)	
N° of Previous Emergencies			
0	35 (63.6%)	20 (36.4%)	0.05
-1	17 (60.7%)	11 (39.3%)	
-2	7 (50.0%)	7 (50.0%)	
- ≥ 3	19 (38.0%)	31 (62.0%)	
Previous Psychiatric Hospitalisations			
No	59 (66.3%)	30 (33.7%)	0
Yes	19 (32.8%)	39 (67.2%)	
N° of Previous Hospitalisations			
0	59 (66.3%)	30 (33.7%)	0.001
-1	8 (34.8%)	15 (65.2%)	
-2	6 (37.5%)	10 (62.5%)	
- ≥ 3	5 (26.3%)	14 (73.7%)	
Time Since Last Hospitalisation (Years)			
- < 1 Y	10 (41.7%)	14 (58.3%)	0.35
- ≥ 1 Y	9 (26.5%)	25 (73.5%)	
Time Since First SA (Years)**			
- < 1 Y	26 (63.4%)	15 (36.6%)	0
- ≥ 1 Y	13 (21.3%)	48 (78.7%)	
Last SA Lethal Plan			
No	59 (58.4%)	42 (41.6%)	0.08
Yes	19 (41.3%)	27 (58.7%)	
Actual Emergency Motive			
Suicidal ideation or plans	56 (58.3%)	40 (41.7%)	0.11
-SA**	22 (43.1%)	29 (56.9%)	

* (Chi-squared independent test, p < 0.05)
** Suicide Attempts (SA)
*** SA Repeaters (0–1 SA; n = 77; 52.4%)
**** SA Non-Repeaters (≥ 2 SA; n = 69; 47.6%)
***** Medical Voluntary Intoxication (MVI)

Binary LR analyses (95% CI; p = 0.10–0.20) were applied to compare the subgroups of 'SA non-repeaters' and 'SA repeaters' (Table 5).

The crude binary LR identified the statistically significant

associations (p=0.10-0.20) between the individual characteristics and the subgroup of 'SA repeaters' including the relevance of the following six variables: 1) female gender; 2) personality disorder regardless of type; 3) non-suicidal self-injuries, antecedents of any type, and of the 'cuts' type in particular; 4) number of previous

Table 5.
Association between individual characteristics and SA repetition (n=147)

Sample Characteristics	LR Crude OR*	LR Adjusted OR** (age and sex)	LR Final Model***
Gender			
*Male	2.10 (1.06-4.16)	2.10 (1.06-4.18)	2.21 (1.01-4.86)
Female	0.03	0.03	0.002
Age (*18-24 years)			
25-34	1.25 (0.34-4.64)	1.15 (0.30-4.38)	-
35-44	0.74	0.84	
45-54	1.11 (0.32-3.86)	1.04 (0.29-3.70)	
55-65	0.86	0.95	
	0.98 (0.27-3.52)	0.94 (0.26-3.44)	
	0.98	0.92	
	0.80 (0.21-3.04)	0.74 (0.19-2.89)	
	0.74	0.67	
Personality Disorders (*No)	2.29 (1.16-4.50)	2.41 (1.19-4.87)	-
Yes	0.02	0.01	
Antecedents of NSSI**** (*No)	3.12 (1.47-6.62)	2.77 (1.27-6.04)	2.42 (1.05-5.57)
Yes	0.003	0.01	0.04
Type of NSSI (*Other)	4.60 (1.11-19.14)	6.42 (1.18-34.81)	-
Cuts	0.04	0.03	
No. Psychiatri Hospitalisations (*0)			
1	3.69 (1.41-9.67)	4.14 (1.51-11.39)	3.94 (1.41-10.99)
	0.01	0.01	0.01
2	3.28 (1.01-9.88)	3.81 (1.20-12.02)	3.97 (1.19-13.23)
	0.04	0.02	0.03
≥3	5.51 (1.81-16.74)	6.03 (1.91-19.00)	6.11 (1.84-20.37)
	0.003	0.002	0.003
No. of Psychiatric Emergencies (*0)			
1	1.13 (0.44-2.89)	1.33 (0.50-3.51)	-
	0.79	0.56	
2	1.75 (0.54-5.71)	1.86 (0.54-6.41)	
	0.35	0.33	
≥ 3	2.86 (1.29-6.31)	3.09 (1.36-7.08)	
	0.01	0.01	
Actual Emergency Visit Motive (*Other)			
SA	1.85 (0.93-3.67)	1.85 (0.92-3.74)	2.53 (1.16-5.49)
	0.08	0.09	0.02

*Logistic binary Regression (LR) Reference Class; p=0.10-0.20, statistical significance; 95% Confidence Interval (CI); Crude OR: LR Crude Odds Ratio; Enter Method.
**LR Adjusted OR: Logistic Binary Regression Adjusted Odds Ratio to age and sex, Enter Method.
***Final Model: Logistic Binary Regression, Forward Method.
****NSSI: Non-Suicidal Self Injuries.

psychiatric hospitalisations; 5) number of previous psychiatric emergency visits; and 6) actual motive for the emergency visit being a recent SA, with 'other' as reference. The adjusted for gender and age, binary LR (enter method) demonstrated similar results as those identified by the crude odds ratio except for the number of psychiatric emergency visits, being only significant if three or more previous visits, compared with one or two. The final LR analyses (forward method) showed a model of SA repetition that included four of the six previously identified variables at LR analyses (enter method): 1) female gender (OR: 2.58; 95% CI: 1.14–5.86; p = 0.02); 2) Non-suicidal self-injuries antecedents of any type (OR: 2.42; 95% CI: 1.05–5.57; p = 0.04); 3) number of previous psychiatric hospitalisations, with zero as reference, being either only one (OR: 3.94; 95% CI: 1.41–10.99; p = 0.01), two (OR 3.97; 95% CI: 1.19–13.23; p = 0.03) or three or more admissions (OR: 6.11; 95% CI: 1.84–20.37; p = 0.003);

and 4) actual motive for the emergency visit being a recent SA compared with 'other' (OR: 2.53; 95% CI: 1.05–5.57; p = 0.02) (Table 5).

The final model presented an AUC (area under curve) of 0.75 (p = 0.00; 95% CI: 0.67–0.83), corresponding to a good discrimination power.

DISCUSSION AND CONCLUSION

The general characterisation of the sample was basically consistent with the literature, concerning sociodemographic features (Daigle et al., 2011; Elisei et al., 2012; Mendez-Bustos et al., 2013; Mergl et al., 2015), with exception for the non-statistical significance for younger ages (< 25 years), in contrast to other studies, (Mendez-Bustos et al., 2013; Monnin et al., 2012; Narishige et al., 2014) and marital status, also in contrast with some studies (Narishige

et al., 2014) but in agreement with others (Choi et al., 2013; Tsirigotis et al., 2011) Clinically there was a lower prevalence of anxiety disorders in comparison to other studies, which showed much higher rates, (Mendez-Bustos et al., 2013) maybe due to the coexistence of other psychiatric diagnoses such as mood disorders.

The statistically significant risk factors associated with SA repetition, included the antecedents of non-suicidal self-injuries of any type, (Pompili et al. 2015) and of the 'cuts' type, in particular, (Horwitz et al., 2015) and the presence of suicidal ideation (Baca-Garcia et al., 2011). However, the most frequent personality disorder type in our sample ('borderline') was not statistically significant in association with SA repetition, in disagreement with most of the literature (Elisei et al., 2012; Oumaya et al., 2008; Zeppegno et al., 2015).

The higher probability of multiple SAs among women was consistent with other authors, (Nock et al., 2008) as well as the MVI as the most common lethal method used (Atay et al., 2014; Tsirigotis et al., 2011).

Finally, the existence of antecedents of previous healthcare access, as psychiatric hospitalisations episode number (1, 2 and ≥ 3) were also statistically significant in association with SA repetition, in accordance with previous studies (Choi et al., 2013; Courtet & Lopez-Castroman, 2017; Mendez-Bustos et al., 2013; Runeson et al., 2010).

In summary, the main statistically significant risk factors in our study, found to be associated with SA repetition, are in accordance with previous findings (Choi et al., 2013; Courtet & Lopez-Castroman, 2017; PORTUGAL: Ministry of Health, 2014; Runeson et al., 2010).

The differences between our final model for SA repetition and the literature can be explained by the high methodological heterogeneity, between most of the studies, with a majority targeting the general ED population and comparing single SA subgroups of patients with 'SA repeaters' (Mendez-Bustos et al., 2013; Monnin et al., 2012; Narishige et al., 2014) In fact, the inclusion in our study, of patients with suicidal ideation but no previous SA, may have increased the disparities in comparison with other studies.

This study has limitations related to the lack of homogeneity between clinical interviewers, the fact that data was self-reported by the patients, together with the low objectivity for definition and quantification of some risk factors, as well as the imprecision of informatics registration data. Only a future longitudinal study could clarify the main risk factors associated with SA repetition in order to develop alternative intervention strategies directed to specific risk-profile populations.

In conclusion, this study confirms the existence of a specific profile for 'SA repeaters', with the main differences being the female gender, having antecedents of non-suicidal self-injuries, a higher number (\geq three) of previous psychiatric hospital admissions and a SA as the motive for the current ED visit. The systematic identification of 'SA repeaters' at ED has implications on prognoses and quality of care improvement at ED. We suggest that future research should target the complexity of the dynamic interactions between SA risk factors by comparing 'SA non-repeaters' (including patients with only suicidal ideation and no SA) and 'SA repeaters', but involving different health care settings. In fact, although ED, as an entrance door of SA into the health system, constitutes an opportunity for research, it cannot operate without a full integration within other levels of care for a better efficacy of suicide prevention strategies.

DECLARATION OF INTEREST

The authors have no single interest to declare. This study had no external or internal funding sources.

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