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Factors Associated with Hospitalization after Suicide Spectrum Behaviors: Results From a Multicentre Study in Spain

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Factors Associated with Hospitalization after Suicide Spectrum Behaviors: Results from a Multicentre Study in Spain

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Abstract

Objectives: to identify factors associated with admission after suicide spectrum behaviors.

Methods: Patient's characteristics, the nature of their suicidal behavior, admission rates between centres, and factors associated with admission have been examined in suicide spectrum presentations to emergency departments in three Spanish cities.

Results: Intent of the suicidal behavior had the greatest impact on hospitalization. Older age, living alone, self-harm method not involving drug overdose, previous history of suicide spectrum behaviors and psychiatric diagnosis of schizophrenia, mood or personality disorder were independently associated with being admitted. There was a three-fold between-centre difference in the rate of hospitalization.

Conclusions: widespread differences in the rate of hospitalization were primarily accounted for by characteristics of the individual patients and their suicidal behavior.

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KEYWORDS: suicide; epidemiology; hospitalization

Suicide spectrum behaviors are recognized as a major public health problem and they place considerable burden on both primary and secondary health care services in many countries (Bertolote, 2001; Chishti et al., 2003; Claassen et al., 2006; Deavoll, Mulder, Beautrais, & Joyce, 1993; Platt et al., 1992; Smichdtke et al., 1996; Smichdtke et al., 2004).

Suicides in the world amount to 782 thousand in 2008 according to the WHO estimate (Värnik, 2012), and for every suicide there are, on average, five hospital admissions and 22 emergency department visits related to a suicide attempt, representing between 10% to 20% of the psychiatric emergency cases (Jiménez-Treviño, Saiz-Martínez, Paredes-Ojanguren, & Bobes-García, 2004). Considering that non-fatal suicidal behavior is the strongest risk factor for suicide (Hawton & van Heeringen, 2009), assessment and treatment of suicide spectrum behaviors in emergency departments is a key factor in preventing suicide (Baca-Garcia et al., 2004).

Although clinical guidelines have been produced to support the provision of standardised treatment and management in several countries (American Psychiatric Association, 2004; Department of Health, 2002; NSW Department of Health, 2004; New Zealand Guidelines Group, 2003; Risk Management Foundation, 1996; The State Hospitals Board for Scotland, 2006), the observation of widespread differences in admission rates of patients

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who present to hospital with suicide spectrum behaviors (from 19% to 80%) suggests a lack of such standardisation (Bennewith, Gunnell, Peters, Hawton, & House, 2004; Hawton et al., 2007; Kapur et al., 1998; National Suicide Research Foundation, 2012; Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005).

General management of suicide spectrum behaviors includes rapid assessment of physical and psychological need, treatment for the physical consequences of self-harm, and assessment of risk of further self-harm and psychosocial assessment. Based upon the combined assessment of needs and risk, suicidal patients may be discharged without follow-up, refered for further assessment and treatment, or hospitalized. Figure 1 shows a general model of of the evaluation process of suicide spectrum behaviors at the emergency room, including factors that drive to admission. However, clinical guidelines do not agree on specific suicide management issues such as admisson criteria. For example, different guidelines consider that hospitalization is *especially effective in the treatment of acute suicidality* (Risk Management Foundation, 1996) or it *may have little predictable benefit and even an element of increased risk for some people* (NSW Department of Health, 2004). Therefore, none of the proposed guidelines are universally accepted (Baca-Garcia et al., 2004).

Admission policies for suicide spectrum presentations vary greatly from hospital to hospital (Bennewith et al., 2004, Kapur et al., 1998). It has been associated with many clinical and psychosocial factors such as older age, male gender, poor physical health, psychosis, leaving a suicide note, high suicidal intent, plan to use a lethal method, low

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psychosocial function, previous psychiatric hospitalizations, an attempt in the past year, and low expectations of being found after an attempt (Baca-Garcia et al., 2004; Goldberg, Ernst, & Bird, 2007; Miret et al., 2011; Owens, Dennis, Jones, Dove, & Dave, 1991; Suominen & Lönnqvist, 2006). Less is known about factors influencing the acute management and disposition of people with suicidal ideation who present to a psychiatric emergency service without a recent attempt.

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Also, local population characteristics are likely to affect suicide spectrum behaviors rates and characteristics of suicidal patients, and differences in clinical services will influence management of patients (Bennewith et al., 2004). Therefore local data may be misleading if interpreted as indicating nationwide trends in rates and management of suicide spectrum behaviors (Hawton et al., 2007). The need for multicentre monitoring to avoid regional bias in suicide research has been highlighted by the WHO as well as national suicide prevention strategies in many countries (American Psychiatric Association, 2004; Department of Health, 2002; Smichdtke, et al., 2004).

We have endeavoured to establish such multicentre monitoring of suicide spectrum behaviors management in Spain through a project involving Oviedo, Madrid and Santa Cruz de Tenerife. The objective of this study was to examine the emergency assessment and discharge of suicide spectrum presentations to emergency departments in three different Spanish cities. More specifically, we compared the patient characteristics, the nature of their suicidal behaviors and admission rates between centres to finally identify factors associated with psychiatric admission. The differences between these three cities

in terms of population, socio-economic development, and suicide rates, as well as the lack of national guidance on the management of self-harm suggest that differences between centres in the management of suicide spectrum behaviors can be anticipated. A second objective of this study includes the quantification of these differences as well as identification of variables associated to the differences. Based on the review of the literature, there are no a priori expectations about what these differences might be.

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METHOD

Definitions

We used suicide spectrum behaviors definitions according to the Operational Criteria for the Determination of Suicide (OCDS) developed by the US Centre for Disease Control (O'Carrol et al, 1996). Their proposed definitions have been commonly adopted in contemporary suicidology and include:

Suicidal ideation: Any self-reported thoughts of engaging in suicide-related behavior.

Non-suicidal self-injury (NSSI) or Instrumental suicide-related behavior: Potentially self-injurious behavior for which there is evidence that the person did not intend to kill him/herself and the person wished to use the appearance of intending to kill him/herself in order to attain some other end (e.g., to seek help, to punish others, or to receive attention). NSSI can result with or without injuries, or with fatal outcome (i.e. accidental death).

Suicide attempt without injuries: A potentially self-injurious behavior with a non-fatal outcome, for which there is evidence that the person intended at some level to kill

him/herself.

Suicide attempt with injuries: An action resulting in non-fatal injury, poisoning, or suffocation where there is evidence that the injury was self-inflicted and that he/she intended at some level to kill him/herself.

Hospitalization: This was defined as being admitted to general or psychiatric inpatient care after treatment in the emergency department. Some patients admitted to general inpatient care will have been admitted subsequently to psychiatric inpatient care. The data available to the study did not allow patients following this trajectory to be identified. In any case, general and psychiatric inpatient settings employ the same suicide risk management protocol which includes 24-hour observation and daily psychiatric visits.

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Setting

The study took place in three cities in Spain: Madrid (pop. 3,128,000), the Spanish capital city located in the center of the country; Oviedo (pop. 214,000), the capital city of the autonomous region of Asturias located on the north coast of Spain; and, Santa Cruz de Tenerife (pop. 223,000) capital city of the island of Tenerife, the largest of the seven Canary Islands. The study setting was the emergency department of the only university hospital in Oviedo (Hospital Universitario Central de Asturias) and Santa Cruz de Tenerife (Hospital Universitario de Canarias) and the emergency department of one of the university hospitals in Madrid (Hospital Universitario Doce de Octubre).

Data from the National Institute for Statistics (INE) for year 2005, showed that Oviedo, Madrid and Tenerife had a similar preponderance of women in the population (Madrid:

53.0%; Oviedo: 53.4%; Tenerife: 51.8%) but some differences in age profiles. There were larger proportions of people under 45 years of age in Madrid (62.5%) and Tenerife (65.8%) than in the region surrounding Oviedo (51.1%) and Spain overall (60.2%). Although all three cities have universities, Madrid had the largest proportion of university students in Spain (20.4%). The employment and economic activity structure differed, with rates of short- and long-term unemployment lower in Madrid (6.7%) than Tenerife (12.8%), Oviedo (10.4%) and Spain overall (11.0%). Tenerife had the largest percent of people below the poverty threshold (28.5%) compared with Oviedo (15.2%) and Madrid (12.0%). In terms of the annual suicide rate per 100,000 population, Oviedo had the highest suicide rate (5.3) followed by Tenerife (3.7) and then Madrid (2.1) (Instituto Nacional de Estadistica, 2006).

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Suicidal Behavior Assessment Services

The three centres had similar characteristics in terms of resources and staff to attend to suicide spectrum behaviors. All centres were universitary hospitals with on-call duty psychiatrists or mental health liaison team members routinely assessing patients. Senior psychiatric staff provided daily supervision and training for junior staff and general practitioner trainees.

At the time of the study, Spain did not have national guidance on the management of self-harm. Management of patients involved physical evaluation and treatment by the general emergency physicians followed by a psychiatric evaluation by a senior psychiatrist. After the evaluation patients might be (figure 1): a) discharged to a mental health ambulatory

setting; b) admitted to a psychiatric ward (plus medical/surgical liaison follow-up for injuries); c) admitted to a general hospital bed (plus psychiatric liaison follow-up)

Subjects

Subjects were a non-consecutive sample of suicide spectrum presentations assessed at the hospital emergency department in Oviedo, Madrid, and Santa Cruz de Tenerife during the period 2002-2006. A member of the research team interviewed all the self-harm and suicidal ideation presentations, made the clinical assessment of the suicidal behavior and took the discharge decision. Subjects were only recruited while one of the psychiatrists of the research team was on duty. Although the research team included 8 to 12 clinicians involved in the evaluation process in each centre, there was not 24x7 availability of a research team member for evaluation, thus the sample was non-consecutive. Each centre participating in the project was required to provide standardised information about the local catchment area. Data were collected as part of the National Suicide Network (ReNEPCA). The ReNEPCA was established in January 2003 and its aim was to conduct national studies on suicide.

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Collection Of Data

Data were collected using a standardised study protocol, derived from the international monitoring sheet of the WHO/EURO Multicentre Study on Parasuicide (Smichdtke et al., 1996). The protocol included sociodemographic (sex, age, nationality, civil status, domestic situation, educational level, and employment situation) and clinical (lethality and intent of the attempt, psychiatric diagnosis, previous attempts, and hospitalization

after the attempt) variables. All presentations were personally interviewed by a research team clinician. Intent was classified by the research clinician after a comprehensive evaluation of the suicidal behavior, including the patient's intention to harm himself or herself by the attempt, knowledge of the lethality of the attempt, and intention to die as a result of the attempt. Research clinicans held three consensus meetings prior to the study to avoid classification bias. Suicide methods were recorded using ICD-10 codes (WHO, 1993). Case fatality rates (Spicer & Miller, 2000) were used to establish the lethality of methods. Up to 4 different methods were recorded for each presentation. In case of alcohol consumption, patients were specifically asked for the role of alcohol in the suicidal behavior. Alcohol was recorded a a suicide method only if so stated by the patient.

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Ethical Approval

The protocol was approved by the consultative committee of the Fundación Española de Psiquiatría y Salud Mental and by the Health/Psychiatric Research Ethics Committee.

Statistical Analysis

Chi-square tests were used to assess the association between pairs of categorical variables such as centre and gender. Logistic regression was used to assess the association between demographic and clinical factors and the outcome of being hospitalized or not.

Because of the large number of factors with significant crude associations with hospitalization, a two-staged approach was adopted for the multivariate analysis. The first

stage consisted of two separate stepwise logistic regressions, one considering only demographic factors as independent variables and the other considering only clinical factors as independent variables. The second stage involved the estimation of one hierarchical logistic regression.

Demographic factors identified in stage one as independently associated with hospitalization comprised the first block of independent variables and these were automatically entered into the model. Similarly-identified clinical factors comprised the second block of independent variables and a stepwise selection method was adopted for these variables. Only centre was in the third block of independent variables and was entered into the model in order to establish whether there was a centre effect on hospitalization independent of all associated demographic and clinical factors. Any independent variables no longer significantly associated with the outcome hospitalization were removed one by one and the multivariate model re-estimated in order to arrive at a final model describing all independent significant associations with minimal attrition due to missing values.

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For the stepwise selection approach, entry into the model was based on the significance (using $p < 0.05$) of the score statistics and removal was based on the probability of the Wald statistic (using $p > 0.1$). The omnibus tests of model coefficients and the Hosmer-Lemeshow goodness-of-fit test were examined to ensure that the final multivariate logistic regression model provided a fair representation of the data. Whether centre modified any of the associations in the final model was assessed by the statistical

significance of the Wald chi-square statistic for the interaction term in the relevant logistic regression model. Multinomial logistic regression was used to assess the association between demographic and clinical factors and the outcome of being admitted to general inpatient care, psychiatric inpatient care or not admitted. Not admitted was used as the reference category of these three outcomes.

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RESULTS

Demographic Characteristics

There were a total of 2,281 suicide spectrum presentations to hospital in the three centres, 29.0%, 34.3% and 36.7% in Oviedo, Madrid and Tenerife, respectively. The majority of presentations were made by women (62.6%) and this gender difference did not vary by centre (Chi-square = 0.57, df = 2, p = 0.751; Table 1). There were between-centre differences with respect to civil status (Chi-square = 32.18, df = 6, $p < 0.001$) and domestic situation (Chi-square = 27.31, df = 6, $p < 0.001$). Most notably, half of the Tenerife and Madrid samples were never married compared to less than 40% of the Oviedo sample. The centres also differed regarding level of education (Chi-square = 415.72, df = 4, $p < 0.001$) and employment status (Chi-square = 71.52, df = 4, $p < 0.001$). Education levels attained by the Madrid sample were generally higher. Only about one in three of the Oviedo sample was employed compared to approximately half of the other two samples. In Oviedo and Tenerife, 96-97% of patients were of Spanish nationality, which was significantly higher than the 87% of Spanish nationality in Madrid (Chi-square = 62.83, df = 2, $p < 0.001$).

There was a clear pattern in the age distribution of the patients who presented (Figure 2). Very few presentations were made by persons less than 15 years of age or over 55 years. The peak age was 25-34 years, accounting for 29.9% of all presentations whereas 20.7% and 26.7% of the presentations involved 15-24 and 35-44 year-olds, respectively. The age pattern differed by centre (Chi-square = 124.86, df = 14, $p < 0.001$) primarily because one in four presentations in Tenerife (25.6%) and Madrid (23.2%) were made by 15-24 year-olds compared to just 11.4% in Oviedo.

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Methods Of Self-Harm

An ICD-10 method of self-harm was recorded for 2,163 (94.8%) of the 2,281 presentations. Of these, more than one ICD-10 method of self-harm code was recorded for 362 (16.7%) cases. Use of multiple methods varied significantly by centre (Chi-square = 34.79, df = 2, $p < 0.001$), from 11.2% in Tenerife to 17.7% in Oviedo and 22.4% in Madrid. Intentional drug overdose was by far the most common method used, accounting for 80.8% (1,748) of the method-specified cases. In 71.6% (1,252) of these cases, the drugs used were sedative-hypnotic, antiepileptic, antiparkinsonism or psychotropic drugs. The only other common methods used were alcohol (324, 15.0%) and sharp objects (233, 10.8%). There was significant variation in the frequency of the common methods of self-harm across the three centres (Drug overdose: chi-square = 6.91, df = 2, $p = 0.032$; Alcohol: chi-square = 42.50, df = 2, $p < 0.001$; Sharp objects: chi-square = 16.41, df = 2, $p < 0.001$). Respectively, alcohol was involved in 9.0%, 16.7% and 20.6% of the cases treated in Tenerife, Oviedo and Madrid. Sharp objects were

involved in 7.5% of the cases treated in Tenerife compared with 11.7% in Oviedo and 13.8% in Madrid.

Clinical Factors

Just 4.3% of the presentations were judged to have involved a highly lethal suicide attempt (Table 2). The proportion of highly lethal attempts varied by centre (Chi-square = 9.42, df = 2, p = 0.009), 2.9% in Madrid to 4.1% in Tenerife and 6.2% in Oviedo. NSSI was deemed to be the intent in approximately two-thirds (66.0%) of all presentations. This was also the case for presentations treated in Tenerife (66.6%) but NSSI was less common in Oviedo (49.8%) and more common in Madrid (79.1%; Chi-square = 189.75, df = 6, p < 0.001). A previous suicide attempt preceded most of the presentations (58.5%) and again this varied by centre (Chi-square = 11.26, df = 2, p = 0.004) because of the higher prevalence of previous attempts in patients treated in Oviedo (63.9%).

Overall, a primary psychiatric diagnosis was specified for the vast majority (81.9%) of patients who presented with suicidal behavior. Among these patients, diagnoses related to mood disorder, adjustment disorders and personality disorders each accounted for approximately one in four cases. This varied by centre (Chi-square = 142.06, df = 12, p < 0.001). Mood disorder was more common in patients treated in Oviedo whereas adjustment disorders were more common in Madrid and Tenerife. Approximately one in four presentations resulted in hopsitalisation (either psychiatric or general). There was a three-fold between-centre difference in the rate of hospitalization (Chi-square = 139.94, df = 2, p < 0.001) from 14.0% in Madrid to 26.8% in Tenerife and 42.2% in Oviedo.

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Factors Associated With Hospitalization

All demographic and clinical factors were statistically significantly associated with hospitalization, except civil status and use of alcohol before presentation (Table 3). The final multivariate logistic regression model showed that the intent of the suicidal behavior had the greatest impact on the odds of the patient being hospitalized. Hospitalization was more common for patients with suicide ideation only than patients whose act was without suicide intent (NSSI). It was more common again following suicide attempts without injuries whereas a suicide attempt with injuries was virtually guaranteed hospitalization. In addition, age and domestic situation were independently associated with hospitalization. With increasing age, hospitalization was generally more common whereas patients living with a partner were less likely to be admitted compared to patients living alone. Drug overdose as a method of self-harm was associated with reduced odds of being hospitalized whereas patients with a history of attempted suicide were more often admitted. Patients with a primary diagnosis related to a schizophrenia, mood or personality disorder were also more often hospitalized. These demographic and clinical associations greatly attenuated the striking between-centre difference in hospitalization but an independent centre effect remained, patients in Oviedo being admitted more often than those in Madrid.

A further multinomial logistic regression model splitting hospitalization in general and psychiatric admissions helped us to explain the nature of the between-centre differences. Nine factors were selected into the multivariate multinomial logistic regression model

(Table 4) and this model explained 42% of the variation in hospital admission (Nagelkerke's pseudo r-squared statistic = 0.42). Most of the demographic and clinical factors previously associated with hospitalization increased the odds of psychiatric admission but they were not associated with general hospitalizati were independently associated with admission to psychiatric inpatient care but not general inpatient care. Being male emerged as a new factor associated with psychiatric hospitalization. The intent of the suicidal behavior had the greatest impact on the odds of a patient being admitted and this was the case for general and psychiatric inpatient care. Either form of inpatient care was more common for patients with suicide ideation only than patients whose act was without suicide intent (NSSI). An independent centre effect remained as relative to Madrid, general admission was more common for patients in Oviedo and psychiatric admission more common for patients in Tenerife.

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There was evidence that the association between the intent of the suicide spectrum behavior and hospitalization differed by centre (Wald chi-square = 24.66, df = 6, $p < 0.001$). The nature of this interaction with respect to the crude association is detailed in Table 5. In each centre, approximately 85% of suicide attempts with injuries resulted in hospitalization but this was far higher relative to NSSI acts in Oviedo than in Madrid and Tenerife. In Oviedo and Madrid, patients presenting with suicide ideation only were more likely to be admitted than NSSI patients but this was not the case in Tenerife.

DISCUSSION

Admission Rates

The global admission rate of 26.8% of our sample is similar to that previously found in Finland 24% (Suominen & Lönnqvist, 2006), though it is much lower than admission rates found in England, Switzerland and the WHO/Euro Multicentre Study on Parasuicide, in which hospitalization after suicide attempts happened in almost half the patients (Gunnell et al., 2004; Hepp, Moergeli, Trier, Milos & Schnyder, 2004; Smichdtke et al., 1996). These differences in admission rates of suicide attempters are not only accounted for by differences in patients' characteristics (our sample is the only one including suicide ideation patients), but also substantially by differences in hospitals' structures and practices.

In this study, admission rates varied from 14.0% to 42.2% between the three Spanish centres. Even greater variation (22% to 83%)has been found by studies in the UK of self-harm presentations to hospital emergency departments. The authors suggest that variability in organisation and provision of services for patients with self-harm may be the cause for these variations (Bennewith et al., 2004). However, an analysis incorporating individual characteristics of the patients and their suicidal behavior was not carried out. Although we have studied samples from three centres with similar characteristics in terms of service provision, our findings suggest that differences at the individual level have the greatest influence on whether the patient is admitted. In our sample, the main differences in hospitalization were found in general admissions but not in psychiatric hospitalization. These results suggest that the physical consequences after the attempt may play a key role in the observed differences.

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Type Of Suicide Spectrum Behavior

The finding that intent of the suicide spectrum behavior was the strongest predictor of hospitalization, whether it is general or psychiatric hospitalization, is reassuring as previous reports show that individuals who engage in suicide spectrum behaviors with intent to die differ significantly from those without such intent (Nock & Kessler, 2006), being the former more likely to sustain more medically lethal injuries and are more likely to ultimately die by suicide (Brown et al., 2004; Harriss et al., 2005). Our results agree with previous research from the United States and England in which suicidal intent was the main predictor of hospitalization (Goldberg et al., 2006; Owens et al., 1991).

All centres were consistent in admitting over 80% of suicide attempts with injuries while only 12% of NSSI patients were finally admitted. It is interesting to note that suicide ideation led to hospitalization more frequently than NSSI (44.5% vs. 12%) even though physical consequences of NSSI may lead to general hospitalization, thus increasing the global admission. It may be that the clinicians consider the intent of the suicidal behavior more relevant for psychiatric admissions than the consequences of the behavior itself. In a similar study from a different Spanish hospital, high suicidal intent and a plan to use a lethal method were among the variables associated with increased odds of hospitalization (Baca-Garcia et al., 2004). The authors suggest that clinicians' decisions appear to be better explained by the self-report of the patient who attempted suicide than by the typical variables included in the suicide assessment guidelines.

The very high rate of NSSI (66%) is striking, given that previously published data on

suicide spectrum behaviors show lower rates such as 42% in the National Comorbidity Survey (Nock & Kessler, 2006). This difference is specially remarkable in Madrid and Tenerife, where NSSI accounted for over two-thirds of the presentations, whereas the Oviedo sample showed a proportion of NSSI (49.8%) similar to those previously published (Nock & Kessler, 2006). Although NSSI has been stated as a predictor of future suicide in cohort studies (Jiménez-Treviño et al., 2004), our results agree with The American Psychiatric Association "Practice Guideline for the Assessment and Treatment of Patients With Suicidal Behaviors", suggesting high lethality and intent as factors to favour inpatient hospitalization over alternative treatment settings for suicidal patients (American Psychiatric Association, 2004).

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Clinical Factors

Depression is the most common psychiatric disorder in patients who attempt or die by suicide (Houston, Haw, Townsend, & Hawton, 2003; Marquet, Bartelds, Kerkhof, Schellevis, & van der Zee, 2005; Rihmer, 2001). Schizophrenia and personality disorders were also independently associated with increased admission and both disorders are strongly associated with risk of fatal and non-fatal suicidal behavior (Goldberg et al., 2007; Hawton & van Heeringen, 2009; Skegg, 2005). Panic and anxiety disorders have also been associated with parasuicide, as have schizophrenia, psychotic disorders, personality disorders, and adjustment disorders (Welch, 2001).

Alcohol and substance use disorders are also well-recognized suicide risk factors but were not associated with hospitalization decisions in our study sample. Our results differ

from previous research findings on the association between alcohol misuse and suicide risk (Flensborg-Madsen et al., 2009; Miller, Mahler & Gold, 1991; Schneider, 2009; Sher et al., 2009; Welch, 2001), but they are coincident with recent studies from Finland (Suominen & Lönnqvist, 2006), India (Kumar, Mohan, Ranjith, & Chandrasekaran, 2006), United States (Goldberg et al., 2007) and Spain (Baca-Garcia et al., 2004; Miret et al., 2011), although the Spanish data have been reanalyzed using computer mining methods and this time, the authors found drug and alcohol consumption during the attempt among the main variables associated with the clinican's decision of hospitalization (Baca-Garcia et al., 2006).

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There were some differences between centres regarding clinical factors. Our results showed mood disorders to be more frequent in Oviedo, but in the other two centres, the most frequent diagnoses were adjustment disorders. Although both diagnoses include affective symptoms and depression, the diagnosis of a mood disorder was strongly associated with psychiatric admission but that was not the case for the adjustment disorders. These results are consistent with the higher admission and suicide rates observed in the catchment area of Oviedo.

Sociodemographic Factors

With a male:female ratio of 1:1.67 and a preponderance of young adults, our sample was similar in sex and age distribution to those of previous studies (Baca-Garcia et al., 2004, Bland, Newman, & Dyck, 1994; Dieserud, Loeb, & Ekeberg, 2000; Smichdtke, et al., 1996). The higher rate of psychiatric hospitalization among male patients is in agreement

with previuos research as well as with suicide management guidelines reporting male sex as a risk factor of suicide (American Psychiatric Association, 2004; Jiménez-Treviño et al., 2004; National Collaborating Centre for Mental Health, 2004; New Zealand Guidelines Group, 2003; NSW Department of Health, 2004; The State Hospitals Board for Scotland, 2006). The risk of psychiatric hospitalization increased with age, but in the multivariate analysis risk of hospitalization was higher for the 45-54 years than the over 55 years group. In a previous report from the ReNEPCA network, authors found that adults admitted after a suicide attempt were significantly more certain of the possible fatal outcome of their attempt and had a significantly more severe intention when harming themselves when compared with adolescent suicide attempters (Parellada, 2008). The reduction of the admission rates in the over 55 years group from our study, suggests that confounding risk factors associated with age may be the cause of the higher risk and prevalence of suicide in older people found in previous research (Hawton & van Heeringen, 2009).

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Patients living alone, with a low level of education or either unemployed or economically inactive were generally twice as likely to be admitted as their respective reference groups. These factors, and unemployment in particular, have long been associated with risk of fatal and non-fatal suicidal behavior (Dieserud et al., 2000; Hjelmeland, 1996; Kjoller & Helweg-Larsen, 2000; Pirkis, Burgess, & Dunt, 2000; Platt & Hawton, 2000; Skegg, 2005). Whereas unemployment may be the better-recognized risk factor for subsequent suicide or further suicidal behavior (Kapur, 2006) domestic situation may be more often included in clinical assessment and more relevant in deciding management (Skegg,

2005). Our findings were in support of this as domestic situation remained significantly associated with hospitalization in the multivariate analysis.

Methodological Issues

Strengths of the study include being the first multicentre study on suicide spectrum behaviors in Spain and one of the first multicentre studies on suicide spectrum behaviors in one country. We included samples from diverse Spanish regions in terms of geography and socio-cultural background. The study examined presentations to hospital emergency department which is a more comprehensive approach than studies confined to inpatient data only. Standardised definitions of suicidal behavior were used in the three centres and data were available for large numbers of patients.

Limitations of this study include the lack of data on past medical history of patients. Furthermore, for data protection reasons, we did not collect patient identifiers and so we were unable to describe healthcare trajectories or identify repeat episodes of self-harm occurring within the study period. We did not collect data in family history of suicidal behaviour either. This is usually another factor that may be important in the clinical decision of being admitted or discharge due to its association with completed suicide as shown in familial aggregation, twin or genetic association studies. Although the use of non-consecutive cases meant there was potential for bias and we could not estimate the incidence of suicidal behaviors, clinical researchers were randomly on duty during 24-hour periods in any day of the week, thus avoiding selection bias. Research clinicians held consensus meetings prior to the study, but there have not been any reliability checks

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after the beginning of the study, thus the high rates of NSSI in Madrid and Tenerife may be explained by a classification bias.

CONCLUSIONS

This study of suicide spectrum presentations to hospital emergency departments in three Spanish cities identified widespread differences in the rate of hospitalization and showed that this was primarily accounted for by characteristics of the individual patients and their suicidal behavior. Initial differences in admission rates were largely due to confounding factors and may represent the different suicidal risk of the population from each catchment area. The nature of the suicide spectrum behavior was the strongest predictor of hospital admission. In each centre, approximately 85% of patients who had made a suicide attempt with injuries were admitted. NSSI patients were least likely to be admitted though this varied by centre. Older age, living alone, method of self-harm not involving drug overdose, previous history of self-harm and psychiatric diagnosis of schizophrenia, mood or personality disorder were independently associated with being admitted.

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REFERENCES

American Psychiatric Association (2004) Practice Guideline for the Assessment and Treatment of Patients With Suicidal Behaviors. *American Psychiatric Association, Arlington*.

Baca-Garcia, E., Diaz-Sastre, C., Resa, E.G., Blasco, H., Conesa, D.B., Saiz-Ruiz, J., De

Leon, J. (2004) Variables associated with hospitalization decisions by emergency psychiatrists after a patient's suicide attempt. *Psychiatric Services* 55:792–797.

Baca-Garcia, E., Perez-Rodriguez, M.M., Basurte-Villamor, I., Saiz-Ruiz, J., Leiva-Murillo, J.M., De Prado-Cumplido, M., Santiago-Mozos, R., Artes-Rodriguez, A., De Leon, J. (2006) Using Data Mining to Explore Complex Clinical Decisions: A Study of Hospitalization After a Suicide Attempt . *Journal of Clinical Psychiatry* 67(7):1124-1132

Bennewith, O., Gunnell, D., Peters, T.J., Hawton, K., House, A. (2004) Variations in the hospital management of self-harm in adults in England: observational study. *BMJ* 328:1108–1109.

Bertolote, J.M. Suicide in the world: an epidemiological overview, 1959-2000 (2001) In: Wasserman, D. (Ed.) Suicide - an unnecessary death. *London, Dunitz, pp 3–10*.

Bland, R.C., Newman, S.C., Dyck, R.J. (1994) The epidemiology of parasuicide in Edmonton. *Canadian Journal of Psychiatry* 39:391–396.

Brown, G. K., Henriques, G. R., Sosdjan, D., & Beck, A. T. (2004). Suicide intent and accurate expectations of lethality: Predictors of medical lethality of suicide attempts. *Journal of Consulting and Clinical Psychology* 72:1170–1174.

Chishti, P., Stone, D.H., Corcoran, P., Williamson, E., Petridou, E., Eurosave Working Group (2003) Suicide mortality in the European Union. *European Journal of Public Health* 3:108-114.

Claassen, C., Trivedi, M., Shimizu, I., Stewart, S., Larkin, G., Litovitz, T. (2006) Epidemiology of nonfatal deliberate self-harm in the United States as described in three medical databases. *Suicide and Life-Threatening Behavior* 36:192–212.

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Deavoll, B.J., Mulder, R.T., Beautrais, A.L., Joyce, P.R. (1993) One hundred years of suicide in New Zealand. *Acta Psychiatrica Scandinavica* 87:81–85.

Dieserud, G., Loeb, M., Ekeberg, O. (2000) Suicidal behavior in the municipality of Baerum, Norway: a 12-year prospective study of parasuicide and suicide. *Suicide and Life-Threatening Behavior* 30:61–73.

Flensborg-Madsen, T., Knop, J., Mortensen, E.L., Becker, U., Sher, L., Grønbaek, M. (2009) Alcohol use disorders increase the risk of completed suicide--irrespective of other psychiatric disorders. A longitudinal cohort study. *Psychiatry Research* 167(1-2):123-310

Goldberg, J.F., Ernst, C.L., Bird, S. (2007) Predicting hospitalization versus discharge of suicidal patients presenting to a psychiatric emergency service. *Psychiatric Services* 58(4):561-565

Harriss, L., Hawton, K., & Zahl, D. (2005). Value of measuring suicidal intent in the assessment of people attending hospital following selfpoisoning or self-injury. *British Journal of Psychiatry* 186*:*60–66.

Hawton, K., Bergen, H., Casey, D., Simkin, S., Palmer, B., Cooper, J., Kapur, N., Horrocks, J., House, A., Lilley, R., Noble, R., Owens, D. (2007) Self-harm in England: a tale of three cities. *Social Psychiatry and Psychiatr Epidemiology* 42: 513 –521.

Hawton, K., Van Heeringen, K. (2009) Suicide. *Lancet* 373:1372-1381.

Hepp, U., Moergeli, H., Trier, S. N., Milos, G., Schnyder, U. (2004) Attempted suicide: factors leading to hospitalization. Canadian Journal of Psychiatry 49:736-742

Hjelmeland, H. (1996) Repetition of parasuicide: a predictive study. Suicide and Life-*Threatening Behavior* 26:395–404.

Downloaded by [University College Cork] at 01:05 24 October 2014

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Houston, K., Haw, C., Townsend, E., Hawton, K. (2003) General practitioners contacts with patients before and after deliberate selfharm. *British Journal of General Practice* 53:365-70.

Instituto Nacional De Estadistica (2006) Estadística del suicidio en España 2005. Retrieved from *http://www.ine.es/jaxi/menu.do?type=pcaxis&file=pcaxis&path=%2Ft18%2Fp427%2F%2Fa2005.*

Jiménez-Treviño, L., Saiz-Martínez, P.A., Paredes-Ojanguren, B., Bobes-García, J. (2004) Epidemiología de los comportamientos suicidas. In: Bobes-García, J., Saiz-Martínez, P.A., García-Portilla, M.P., Bascarán-Fernández, M.T., Bousoño-García, M. (Eds.) Comportamientos suicidas: prevención y tratamiento. *Psiquiatría Editores, Barcelona,* pp 11-24.

Kapur, N., House, A., Creed, F., Feldman, E., Friedman, T., Guthrie, E. (1998) Management of deliberate self poisoning in adults in four teaching hospitals: descriptive study. *BMJ* 316:831–832.

Kapur, N. (2006) Self-harm in the general hospital. *Clinical Medicine* 6:529-532.

Kjoller, M., Helweg-Larsen, M. (2000) Suicidal ideation and suicide attempts among adult Danes. *Scandinavian Journal of Public Health* 28:54–61.

Kumar, C.T., Mohan, R., Ranjith, G., Chandrasekaran, R. (2006) Characteristics of high intent suicide attempters admitted to a general hospital. *Journal of Affective Disorders* 91(1):77-81.

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ACCEPTED MANUSCRIPT

Marquet, R.L., Bartelds, A.I., Kerkhof, A.J., Schellevis, F.G., Van Der Zee, J. (2005) The epidemiology of suicide and attempted suicide in Dutch General Practice 1983-2003. *BMC Family Practice* 6:45.

Miller, N.S., Mahler, J.C., Gold, M.S. (1991) Suicide risk associated with drug and alcohol dependence. *Journal of Addictive Diseases* 10(3):49-61.

Miret, M., Nuevo, R., Morant, C., Sainz-Cortón, E., Jiménez-Arriero, Má., López-Ibor, J.J., Reneses, B., Saiz-Ruiz, J., Baca-García, E., Ayuso-Mateos, J.L. (2011) The role of suicide risk in the decision for psychiatric hospitalization after a suicide attempt. *Crisis* 32(2):65-73.

National Collaborating Centre For Mental Health (2004). Self-harm: the short-term physical and psychological management and secondary prevention of self-harm in primary and secondary care (full guideline). Clinical Guideline 16. *National Institute for Clinical Excellence: London*

National Suicide Research Foundation (2012) National Registry of Deliberate Self Harm Ireland Annual Report 2011. *National Suicide Research Foundation, Cork.*

New Zealand Guidelines Group (2003) The Assessment And Management Of People At Risk Of Suicide. *New Zealand Guidelines Group (NZGG) and Ministry of Health. Wellington, New Zealand.*

Nock, M.K., Kessler, R.C. (2006). Prevalence of and Risk Factors for Suicide Attempts Versus Suicide Gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology* 115(3):616-623

Nsw Department Of Health (2004) Framework for Suicide Risk Assessment and Management for NSW Health Staff. *NSW Department of Health, Sidney.*

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O'Carrol, P., Berman, A., Maris, M., Moscicki, E., Tanney, B., Silverman, M. (1996) Beyond the tower of Babel: A nomenclatura for suicidology. *Suicide and Life-Threatening Behavior* 26:237–252.

Olfson, M., Gameroff, M.J., Marcus, S.C., Greenberg, T., Shaffer, D. (2005) Emergency treatment of young people following deliberate self-harm. *Archives of General Psychiatry* 62(10):1122-1128.

Owens, D., Dennis, M., Jones, S., Dove, A., Dave, S. (1991) Self-poisoning patients discharged from accident and emergency: risk factors and outcome. *Journal of the Royal College of Physicians of London* 25:218-222.

Parellada, M., Sáiz, P., Moreno, D., Vidal, J., Llorente, C., Alvarez, M., Garcia-Portilla, P., Ruiz-Sancho, A., Arango, C., Bobes, J. (2008) Is attempted suicide different in adolescent and adults? *Psychiatry Research* 157: 131–137.

Pirkis, J., Burgess, P., Dunt, D. (2000) Suicidal ideation and suicide attempts among Australian adults. *Crisis* 21(1):16–25.

Platt, S., Bille-Brahe, U., Kerkhof, A., Schmidtke, A., Bjerke, T., Crepet, P., De Leo, D., Haring, C., Lonnqvist, J., Michel, K., Philippe, A., Pommereau, X., Querejeta, I., Salander-Renberg, E., Temesvary, B., Wasserman, D., Sampaio-Faria, J. (1992) Parasuicide in Europe: The WHO/EURO Multicentre Study on Parasuicide. I. Introduction and preliminary analysis for 1989. *Acta Psychiatrica Scandinavica* 85:97–104.

Platt, S., Hawton, K. (2000) Suicidal behaviour and the labour market. In: HAWTON, K., VAN Heeringen, K. (Eds.) The international handbook of suicide and attempted suicide. *Wiley, Chichester,* pp 309-384.

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Rihmer, Z. (2001) Can better recognition and treatment of depression reduce suicide rates? A brief review. *European Psychiatry* 16:406-409.

Risk Management Foundation (1996). Guidelines for Identification, Assessment, and Treatment Planning for Suicidality. *Cambridge: Harvard Medical Institutions*.

Schmidtke, A., Bille-Brahe, U., De Leo, D., Kerkhof, A., Bjerke, T., Crepet, P., Haring, C., Hawton, K., Lönnqvist, J., Michel, K., Pommereau, X., Querejeta, I., Phillipe, I., Salander-Renberg, E., Temesvary, B., Wasserman, D., Fricke, S., Weinacker, B., Sampaio-Faria, J.G. (1996) Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989–1992. Results of the WHO/EURO Multicentre Study on Parasuicide. *Acta Psychiatrica Scandinavica* 93:327–338.

Schmidtke, A., Weinacker, B., Löhr, C., Bille-Brahe, U., De Leo, D., Kerkhof, A., Apter, A., Batt, A., Crepet, P., Fekete, S., Grad, O., Haring, C., Hawton, K., Van Heeringen, C., Hjelmeland, H., Kelleher, M., Lönnqvist, J., Michel, K., Pommereau, X., Querejeta, I., Philippe, A., Salander-Renberg, E., Sayil, I., Temesvary, B., Varnik, A., Wasserman, D., Rutz, W. (2004) Suicide and suicide attempts in Europe—an overview. In: Schmidtke, A., Bille-Brahe, U., De Leo, D., Kerkhof, A. (Eds.) Suicidal behaviour in Europe: results from the WHO/EURO multicentre study on suicidal behaviour. *Hogrefe & Huber, Göttingen,* pp 15–28.

Schneider, B. (2009) Substance use disorders and risk for completed suicide. *Archives of Suicide Research* 13(4):303-316.

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Sher, L., Oquendo, M.A., Richardson-Vejlgaard, R., Makhija, N.M., Posner, K., Mann, J.J., Stanley, B.H. (2009) Effect of acute alcohol use on the lethality of suicide attempts in patients with mood disorders. *Journal of Psychiatry Research* 43(10):901-905

Skegg, K. (2005) Self-harm. *Lancet* 366:1471-1483.

Spicer, R.S., Miller, T.R. (2000) Suicide acts in 8 states: incidence and case fatality rates by demographics and method. *American Journal of Public Health* 90(12):1885-1891

Suominen, K., Lönnqvist, J. (2006) Determinants of psychiatric hospitalization after attempted suicide. *General Hospital Psychiatry* 28(5):424-430.

The State Hospitals Board For Scotland (2006) Suicidal Behaviour Awareness & Good Practice. *NHS Scotland. Lanark, Scotland*.

Värnik, P. (2012) Suicide in the world. *International Journal of Environmental Research and Public Health* 9(3):760-771

Welch, S.S. (2001) A Review of the Literature on the Epidemiology of Parasuicide in the General Population. *Psychiatric Services* 52(3):368-375.

World Health Organization (1993). The ICD-10 classification of mental and behavioural disorders. Diagnostic Criteria for ResearchWorld Health Diagnostic Criteria for Research. *World Health Organization, Geneve.*

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Table 1. Demographic characteristics by centre

		Oviedo		Madrid		Tenerife		Total	
		n	(%)	n	(%)	n	(%)	n	(%)
Sex	Male	242	(36.6%)	291	(37.2%)	321	(38.4%)	854	(37.4%)
	Female	420	(63.4%)	492	(62.8%)	515	(61.6%)	1427	(62.6%)
Civil status	Never married	245	(37.6%)	309	(49.1%)	409	(48.9%)	963	(45.5%)
	Married/ legal couple	227	(34.9%)	203	(32.3%)	226	(27.0%)	656	(31.0%)
	Divorced/ separated	152	(23.4%)	102	(16.2%)	176	(21.1%)	430	(20.3%)
	Widowed	27	(4.2%)	15	(2.4%)	25	(3.0%)	67	(3.2%)
Domestic situation	Alone	82	(12.6%)	60	(8.8%)	90	(10.9%)	232	(10.7%)
	With partner +/- children	317	(48.6%)	309	(45.1%)	368	(44.7%)	994	(46.0%)
	With parent(s)	204	(31.3%)	214	(31.2%)	289	(35.1%)	707	(32.7%)
	Other	49	(7.5%)	102	(14.9%)	77	(9.3%)	228	(10.6%)

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Education level	Primary	437	(69.3%)	173	(22.7%)	474	(66.8%)	1084	(51.6%)
	Secondary	145	(23.0%)	386	(50.7%)	187	(26.3%)	718	(34.2%)
	Third level	49	(7.8%)	202	(26.5%)	49	(6.9%)	300	(14.3%)
Employment status	Employed	199	(31.1%)	388	(50.9%)	344	(47.0%)	931	(43.6%)
	Unemployed	170	(26.5%)	179	(23.5%)	141	(19.3%)	490	(22.9%)
	Economically inactive	272	(42.4%)	196	(25.7%)	247	(33.7%)	715	(33.5%)
Spanish nationality	Yes	630	(96.8%)	657	(87.4%)	799	(95.8%)	2086	(93.2%)
	No	21	(3.2%)	95	(12.6%)	35	(4.2%)	151	(6.8%)

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Table 2. Clinical factors by centre

		Oviedo		Madrid		Tenerife		Total	
		n	(%)	n	(%)	n	(%)	n	(%)
High lethality	No	621	(93.8%)	760	(97.1%)	802	(95.9%)	2183	(95.7%)
	Yes	41	(6.2%)	23	(2.9%)	34	(4.1%)	98	(4.3%)
Intent	Non-suicidal self-injury (NSSI)	319	(49.8%)	599	(79.1%)	557	(66.6%)	1475	(66.0%)
	Ideation	70	(10.9%)	40	(5.3%)	25	(3.0%)	135	(6.0%)
	Attempt without injuries	154	(24.0%)	95	(12.5%)	203	(24.3%)	452	(20.2%)
	Attempt with injuries	98	(15.3%)	23	(3.0%)	51	(6.1%)	172	(7.7%)
Previous suicide attempt	No	229	(36.1%)	204	(43.6%)	365	(44.4%)	798	(41.5%)
	Yes	405	(63.9%)	264	(56.4%)	457	(55.6%)	1126	(58.5%)
Psychiatric diagnosis	Organic disorder	14	(2.2%)	21	(3.8%)	15	(2.2%)	50	(2.7%)

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specified	Substance use disorders	74	(11.8%)	89	(16.2%)	52	(7.5%)	215	(11.5%)
	Schizophrenia disorders	34	(5.4%)	30	(5.5%)	44	(6.3%)	108	(5.8%)
	Mood disorders	226	(36.2%)	100	(18.2%)	148	(21.3%)	474	(25.4%)
	Neurotic disorders	38	(6.1%)	38	(6.9%)	76	(10.9%)	152	(8.1%)
	Adjustment disorders	84	(13.4%)	159	(29.0%)	232	(33.4%)	475	(25.4%)
	Personality disorders	155	(24.8%)	111	(20.3%)	128	(18.4%)	394	(21.1%)
Hospitalized	No	364	(57.8%)	656	(86.0%)	566	(73.2%)	1586	(73.2%)
	Yes	266	(42.2%)	107	(14.0%)	207	(26.8%)	580	(26.8%)

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Table 3. Variation in hospital admission by demographic and clinical factors

		Not admitted	General inpatient	Psychiatric inpatient	P-value[1]
Sex	Male	65.5%	9.6%	24.9%	<0.001
	Female	77.8%	6.0%	16.3%	
Age	<25 years	85.5%	5.3%	9.1%	<0.001
	25-34 years	75.9%	6.0%	18.1%	
	35-44 years	69.6%	7.3%	23.1%	
	45-54 years	62.5%	10.9%	26.5%	
	>55 years	58.8%	11.9%	29.4%	
Domestic situation	Alone	61.4%	7.2%	31.4%	<0.001
	With partner	75.5%	6.6%	17.9%	
	With parent(s)	73.7%	8.4%	17.9%	
	Other	69.3%	7.8%	22.9%	
Education level	Primary	67.1%	10.9%	22.0%	<0.001
	Secondary	80.9%	3.6%	15.5%	
	Third level	79.7%	4.1%	16.2%	
Employment status	Employed	79.6%	5.8%	14.6%	<0.001
	Unemployed	66.0%	8.3%	25.6%	

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	Economically inactive	69.3%	8.7%	22.0%	
Spanish nationality	Yes	72.4%	7.6%	20.1%	0.007
	No	84.4%	4.1%	11.6%	
Drug overdose	No	62.4%	13.5%	24.1%	<0.001
	Yes	76.5%	5.4%	18.1%	
High lethality	No	74.6%	6.5%	18.9%	<0.001
	Yes	41.3%	25.0%	33.7%	
Intent	Non-suicidal self-injury (NSSI)	88.0%	3.3%	8.7%	<0.001
	Ideation	55.6%	18.3%	26.2%	
	Attempt without injuries	52.4%	8.7%	38.9%	
	Attempt with injuries	15.6%	29.3%	55.1%	
Previous attempt	No	81.2%	6.1%	12.7%	<0.001
	Yes	63.5%	9.1%	27.4%	
Psychiatric disorder	Organic	85.1%	6.4%	8.5%	<0.001
	Substance use	79.2%	5.9%	14.9%	

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specified	Schizophrenia	46.6%	8.7%	44.7%	
	Mood	59.0%	10.0%	31.0%	
	Neurotic	83.8%	5.4%	10.8%	
	Adjustment	83.3%	4.8%	11.8%	
	Personality	61.4%	10.6%	27.9%	
Centre	Madrid	86.0%	3.1%	10.9%	<0.001
	Tenerife	73.2%	3.1%	23.7%	
	Oviedo	57.8%	17.5%	24.8%	

[1] from chi-square tests

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Table 4. Factors associated with general vs. psychiatric inpatient admission following suicide spectrum behaviour

		General inpatient		Psychiatric inpatient	
		OR[1]	(95% CI)	OR[1]	(95% CI)
Sex	Male	1.55	(1.00-2.41)	1.50*	(1.10-2.04)
	Female	1.00	(ref. group)	1.00	(ref. group)
Age	<25 years	1.00	(ref. group)	1.00	(ref. group)
	25-34 years	0.90	(0.47-1.73)	2.02**	(1.24-3.31)
	35-44 years	1.28	(0.64-2.57)	2.40**	(1.42-4.05)
	45-54 years	1.86	(0.83-4.15)	3.41***	(1.88-6.20)
	>55 years	1.55	(0.64-3.74)	2.54**	(1.30-4.99)
Domestic situation	Alone	1.00	(ref. group)	1.00	(ref. group)
	With partner	1.09	(0.54-2.20)	0.53**	(0.35-0.81)

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	With parent(s)	1.92	(0.90-4.12)	0.67	(0.42-1.09)
	Other	2.04	(0.83-5.06)	0.99	(0.56-1.75)
Employment status	Employed	1.00	(ref. group)	1.00	(ref. group)
	Unemployed	1.05	(0.63-1.76)	1.41	(0.98-2.02)
	Economically inactive	0.98	(0.60-1.61)	1.70**	(1.20-2.40)
Drug overdose	No	1.00	(ref. group)	1.00	(ref. group)
	Yes	0.52**	(0.32-0.85)	0.71	(0.49-1.03)
Intent	Non-suicidal self-injury (NSSI)	1.00	(ref. group)	1.00	(ref. group)
	Ideation	3.06**	(1.51-6.17)	3.00***	(1.71-5.26)
	Attempt without injuries	3.69***	(2.20-6.19)	6.13***	(4.45-8.45)
	Attempt with		(10.82-		(11.12-

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	injuries	20.30***	38.08)	18.81***	31.80)
Previous attempt	No	1.00	(ref. group)	1.00	(ref. group)
	Yes	1.50	(0.94-2.39)	1.76**	(1.27-2.45)
	Unknown	1.18	(0.51-2.76)	0.84	(0.46-1.56)
Psychiatric disorder specified	Organic	1.01	(0.21-4.94)	0.73	(0.15-3.43)
	Substance use	0.69	(0.29-1.61)	1.11	(0.62-2.01)
	Schizophrenia	1.27	(0.47-3.44)	3.74***	(1.96-7.14)
	Mood	1.28	(0.66-2.49)	2.79***	(1.78-4.39)
	Neurotic	0.93	(0.35-2.43)	1.06	(0.53-2.09)
	Adjustment	1.00	(ref. group)	1.00	(ref. group)
	Personality	1.52	(0.76-3.05)	2.34***	(1.46-3.76)
	None specified	1.15	(0.49-	0.97	(0.53-

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			2.72)		1.80)
Centre	Madrid	1.00	(ref. group)	1.00	(ref. group)
	Tenerife	1.04	(0.50-2.15)	1.79**	(1.20-2.67)
	Oviedo	5.27***	(2.82-9.85)	1.25	(0.83-1.89)

[1] Not admitted is the reference category of the dependent variable

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Table 5. Between-centre variation in the association between intent of the suicide spectrum behavior and hospitalization

	Oviedo			Madrid			Tenerife		
Intent	Hospitalized	OR[1]	(95% CI)	Hospitalized	OR[1]	(95% CI)	Hospitalized	OR[1]	(95% CI)
Non-suicidal self-injury (NSSI)	22.6%	1.00	(ref.)	6.8%	1.00	(ref.)	11.6%	1.00	(ref.)
Ideation	51.5%	3.63***	(2.10-6.26)	48.6%	13.07***	(6.36-28.86)	14.3%	1.27	(0.36-4.43)
Attempt without injuries	51.0%	3.56***	(2.34-5.42)	30.1%	5.95***	(3.44-10.27)	53.3%	8.68***	(5.87-12.83)
Attempt with	85.6%	20.28***	(10.84-	85.0%	78.20***	(21.99-	82.0%	34.59***	(16.00-74.77)

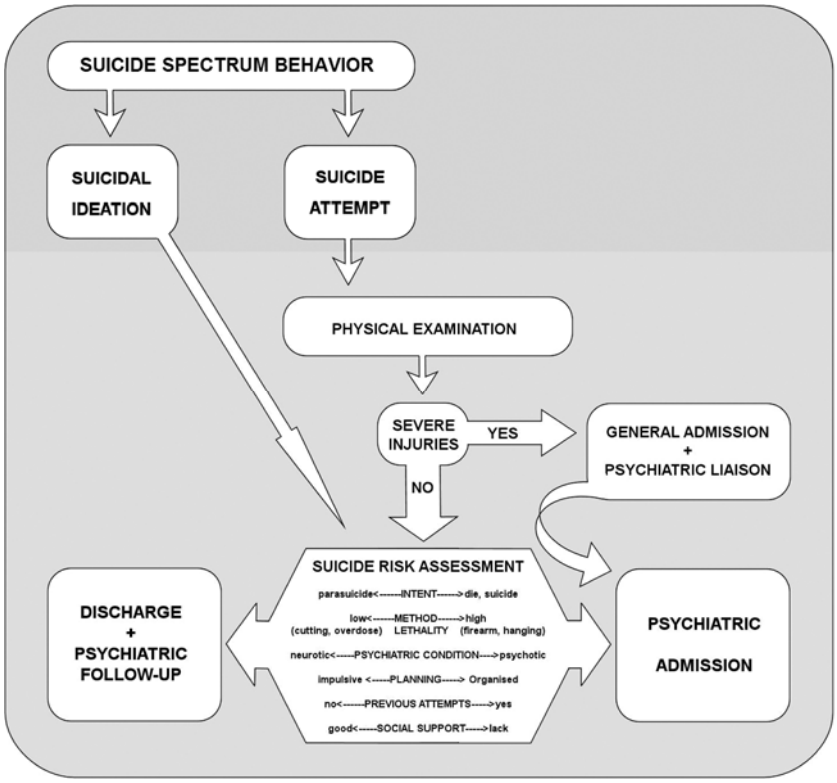
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injuries			37.94)			278.08)			

[1] Crude odds ratio

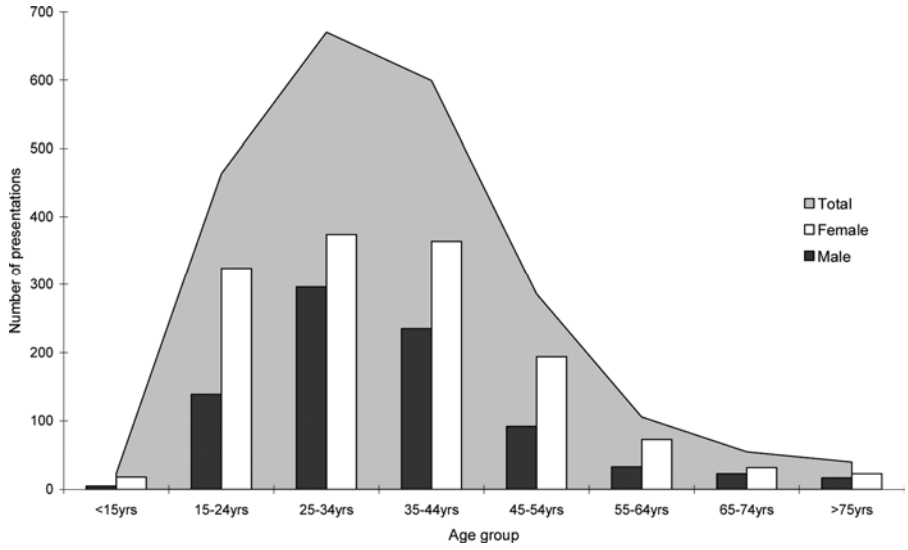
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Figure 1. Suicide spectrum behaviors assessment at the emergency room.



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Figure 2. Age distribution of presentations



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