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Article

Sociodemographic and clinical characteristics associated with suicidal behaviour and the relationship with a nurse-led suicide prevention program.

Judit Pons-Baños[1], David Ballester-Ferrando[2]*, Lola Riesco-Miranda[1], Santiago Escoté-Llobet[1], Jordi Jiménez-Nuño[1], Concepció Fuentes-Pumarola[2] and Montserrat Serra-Millàs[1]

[1] Department of Psychiatry and Mental Health. Consorci Hospitalari de Vic (Catalonia). Faculty of Health Sciences and Welfare. University of Vic (Catalonia). Mental Health and Social Innovation - Interinstitutional Research Group; judit.pons@uvic.cat

[2] Department of Nursing, University of Girona, Health and Healthcare Research Group, 17003 Girona, Spain

* Correspondence: david.ballester@udg.edu; Tel.: +34-972-418771

Abstract: A single paragraph of about 200 words maximum. For research articles, abstracts should give a pertinent overview of the work. We strongly encourage authors to use the following style of structured abstracts, but without headings: (1) Background: Place the question addressed in a broad context and highlight the purpose of the study; (2) Methods: Describe briefly the main methods or treatments applied; (3) Results: Summarize the article's main findings; and (4) Conclusions: Indicate the main conclusions or interpretations. The abstract should be an objective representation of the article, it must not contain results which are not presented and substantiated in the main text and should not exaggerate the main conclusions.

(1) Aims: To analyse the relationship between demographic and clinical characteristics and particular kinds of suicidal behaviour and its relationship with a nurse-led suicide prevention program. (2) Methods: A 5-year cross-sectional study design. Study performed in the region of Osona (Catalonia) during 2013-2017. Suicidal behaviour was classified as suicidal ideation, interrupted self-directed violence, suicide attempt and completed suicide. (3) Results: The sample included 753 patients ─ of whom 53 died by suicide─ and encompassed 931 suicidal behaviour episodes. Men represented 38.4% of the sample but 81.1% of deaths by suicide. Mental disorders were associated with suicidal behaviour in 75.4% of the sample. 66.4% of the individuals were engaged in the nurse-led Suicidal Behaviour Case Management Program, of which 0.8% (n=4) died by suicide. (4) Conclusion: The main risk factors were female sex for suicidal behaviour, and male sex and older age for suicide. Mental disorders, widowhood and retirement were also associated with suicide. A high proportion of patients was engaged to the nurse-led suicide prevention program with a low proportion of suicides.

Keywords: Attempted, Suicide. Mental Disorders. Nursing. Preventive Health Services. Risk Factors. Social Determinants of Health. Suicidal Ideation. Suicide.

1. Introduction

Suicide is a public health problem that results in 800,000 deaths worldwide every year; in addition, for every adult who dies by suicide, another 20 are estimated to attempt suicide [1].

Mental health nurses have the opportunities to recognize and respond to expressions of mental distress that are possible warning signs of suicide or self-harm and may have an important role in preventing suicidal acts among patients [2]. They can play an essential role in education programs related to suicide prevention, especially in outpatients' services, as the relational factor represents a

key point both as a trigger for the suicide attempt and for promoting the communication of the intent or for preventing a repeated suicide attempt [3].

Background

[734 words]

Suicidal behaviour occurs along a continuum that reflects the severity of suicidal tendencies, ranging from fleeting and unplanned suicidal ideation to completed suicide. In the interest of advancing research worldwide, experts have pointed to the importance of reaching a consensus on definitions [4,5]

Certain demographic characteristics are associated with suicide. In terms of age, suicide rates are higher among middle-aged and elderly men, although rates are also increasing among teenagers [6]. In teenagers and young adults, the worldwide reported lifetime prevalence rates for suicidal ideation and suicidal behaviour are 12.1%-33% and 4.1%-9.3%, respectively [6]. Regarding sex, suicide rates are higher for the male than the female sex worldwide, with some exceptions, such as China [6]. In Europe, while there are 3.47 male suicides for every female suicide, suicide ideation and attempt rates are higher among women [7].

Risk factors for suicide include socioeconomic factors [8], with a number of studies pointing to a significant association between suicide and unemployment in particular [9]. It has also been reported that economic recessions have a negative impact on suicide rates [9–12] Poor quality relationships and interpersonal conflicts are other contributing factors, as they play an important role in precipitating suicidal behaviour. The loss of a partner through divorce/separation or widowhood is also associated with an increase in suicides [13,14]. With regard to the impact of migration, it has been reported that migrants from high to low suicide-risk countries are at a greater risk of suicide than the host population and vice versa [15].

Psychiatric comorbidity is one of the most important risk factors for suicide, most especially mood disorders, borderline personality disorder and substance use disorders [16]. Despite the fact that the prevalence of mental disorders in deaths by suicide is widely held to be 90% [17], some studies point to worldwide rates of 80% for suicides among people with mental disorders, with great variability depending on the geographical area [17,18].

Another main factor associated with suicide are previous attempts, as individuals with a history of suicide attempts have a five- to six-fold greater risk of trying again [19]. Studies show an estimated incidence of a repeated suicide attempt of 16.3% at 1 year, 16.8% at 2 years and 22.4% at 5 years, and of suicide of 1.6% at 1 year, 2.1% at 2 years, 3.9% at 5 years and 4.2% at 10 years [20]. It is estimated that people who have made a previous suicide attempt are 66 times more likely to die by suicide than people with no such history [21].

Follow-up and community support have been effective in reducing suicide deaths and attempts among patients who have been recently discharged [22]. Follow-up of people who attempt suicide should be included in suicide prevention strategies despite the scarce and heterogeneous evidence on the chain of care and follow-up interventions [23]. After a suicide attempt there is a peak in risk of suicide which follows immediately after discharge from hospital. This underscores the need for provision of early and effective follow-up care [24].

Community Based Case Management has been shown to be an effective intervention that reduces healthcare costs and increases patient satisfaction. Nurse-led case management improved access outcomes, cost effectiveness and patient satisfaction. It also helped control patient symptoms and improved clinical outcomes, even in suicide attempters [25]. In addition, mental health nurses have been shown to assess suicide risk in a manner comparable to psychiatrists [26]. Therefore, after a suicide attempt a follow-up in a nurse-led case management program may be appropriate.

The purpose of this study was to explore the links between suicidal behaviour and sociodemographic and clinical factors in an area of Catalonia (Osona) in order to identify issues to take into account in a local suicide prevention programme carried out by a mental health nurse. This study aimed to identify the sociodemographic and clinical characteristics of individuals with suicidal behaviour in the Osona region of Catalonia in terms of suicidal ideation, interrupted self-directed violence, suicide attempt and suicide, and to analyse differences between patients included in a nurse-led prevention program and those who were not.

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2. Materials and Methods

2.1. Design

Five-year cross-sectional descriptive study

2.2 Sample/Participants

All individuals with suicidal behaviour who were attended during the period 2013-2017 in the Emergency Room of the Hospital Consortium of Vic (CHV), a public health consortium englobing the area of Osona, region of Catalonia (population 156,572) [27].

2.3. Data collection

The variables were classified into 4 main categories:

Suicidal behaviour. Classified as: [28,29]

- Suicidal ideation: thinking about, considering, or planning suicide
- Interrupted self-directed violence: taking steps to injure self but stopped by self/another person prior to fatal injury
- Suicide attempt: A non-fatal self-directed potentially injurious behaviour with any intent to die as a result of the behaviour. A suicide attempt may or may not result in injury
- Suicide: a self-inflicted death with evidence of intent to die.

Clinical variables. History, number and type of mental disorders, referrals to the mental health service in the previous year, suicidal behaviour in the previous year, and presence of toxic substances in urine.

Also recorded were hospitalization details, specifically, length of stay and department where the patient was treated for analyses.

Sociodemographic variables. Age, sex, country of birth, occupational status, civil status, family composition, and rural/urban residence.

Admission to the Suicidal Behaviour Case Management Program (SBCMP): The program is led by a mental health nurse, who provides care by telephone and face-to-face for one year to adult patients with suicidal behaviour who have been referred from the emergency room. Participation is voluntary. It consists of a nurse's first face-to-face visit in the week following the discharge from the hospital, during which the therapeutic relationship is initiated and various health and environmental aspects related to suicidal behaviour are evaluated, as well as adherence to treatment, persistence of precipitating factors and current suicide risk. The scheduling of visits with different professionals is reviewed and, if necessary, new visits are scheduled and/or the patient is referred to other units. A direct contact telephone number and an open schedule for consultation are provided. Subsequently, telephone visits are made one, three and six months after the suicidal behaviour that led to the inclusion in the program. During these telephonic visits, adherence to treatment, persistence of precipitating factors and current suicide risk are re-evaluated. During this whole year, the patient may contact the nurse in person during open consultation hours or by telephone as often as necessary. The program ends at the end of a year in a face-to-face visit during which the usual aspects are evaluated and the episode is closed, although the possibility to re-consult using the usual channels of the service and the program itself (direct telephone and open consultation) remain open to the patient.

Included in our registry are all suicide attempts and interrupted self-directed violence incidents attended to in the emergency room as well as cases of suicidal ideation that the duty psychiatrist rates as requiring follow-up care.

Deaths by suicide are included in a forensic registry, created in 2006 by means of a collaboration agreement between CHV and the Catalan forensic institute (IMLCFC) [30]. The data for all cases included in this study were supplemented with information taken from medical records.

2.4. Ethical considerations

The research was performed according to the principles of the Declaration of Helsinki and the study was approved by the Clinical Research Ethics Committee of the Osona Foundation for Healthcare Research and Education (FORES) on 14 April 2016.

2.5. Data analysis

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The data were analysed using SPSS v.22. Qualitative variables were expressed as frequencies and percentages, and quantitative variables as means and standard deviations (SD). Contingency tables were created for the bivariate and multivariate analyses. Qualitative variables were compared using the Chi square test and, when the expected count was less than 5, Yates' correction or Fisher's exact test were used to readjust the variables. Quantitative and qualitative variables were compared using analysis of variance (ANOVA). Univariate and multivariate logistic regression analyses identified the variables most associated with death by suicide. For the statistical analyses, a confidence interval (CI) of 95% was presented ($p \leq 0.05$).

All recorded cases of suicidal behaviour attended to in the emergency room during the study period (2013-2017) were included in the study. Profiles reflecting more than one episode of suicidal behaviour were classified according to the most serious episode (suicide>suicide attempt>interrupted self-directed violence>suicidal ideation).

3. Results

In the period 2013-2017, 753 individuals manifested suicidal behaviour, 464 (61.6%) of whom were women. The mean (SD) age of the sample was 43.44 (16.72) years (median 45 years; range 12-95 years), whereas that of the sub-group of individuals who died by suicide was 57.89 (17.51) years (median 54 years; range 27-91 years).

Of the 753 individuals manifesting suicidal behaviour, 116 had experienced more than one episode and the mean (SD) number of episodes was 2.53 (1.1). There were 931 episodes in total: 562 (60.4%) suicide attempts, 259 (27.8%) suicidal ideation episodes, 57 (6.1%) interrupted self-directed violence episodes and 53 (5.7%) completed suicides. Per 100,000 inhabitants/year [27], the mean (SD) episode rate was 119.79 (24.48) and the mean (SD) suicide rate was 6.82 (0.85).

The most frequently used methods were self-poisoning (83.1%; n=467) for suicide attempts and asphyxia (hanging/strangulation/suffocation) (43.4%; n=23) for suicide (Figure 1).

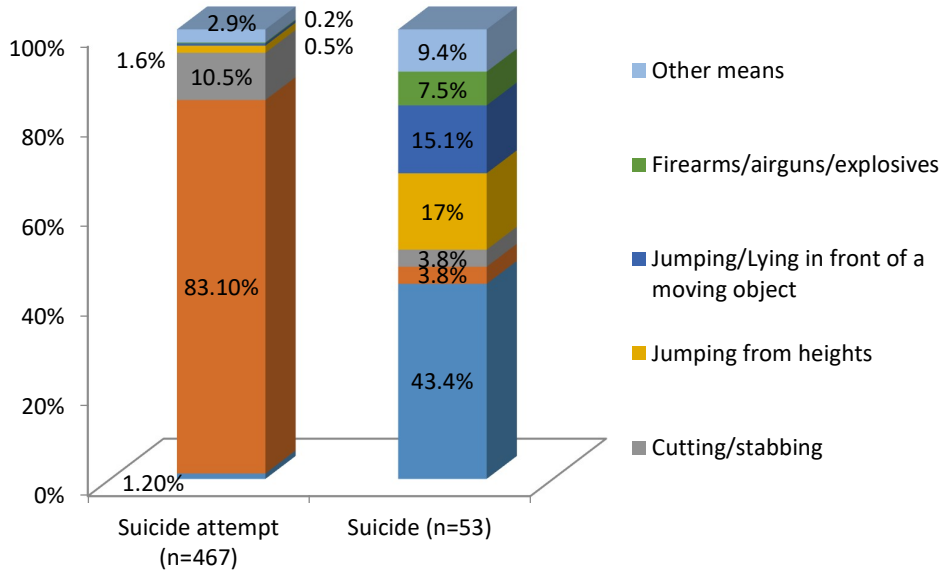

Figure 1. Suicide and suicide attempt methods compared.

Immigrants represented 14.6% (n=110) of the sample. By continent, nearly half were from America (42.7%; n=47), over a third were from Africa (37.3%; n=41) and the remainder were from other European countries (17.3%; n=19) and Asia (2.7%; n=3). By nationality, Moroccans accounted for a third of the immigrants (32.7%; n=36), followed by Colombians (13.6%; n=15) and Ecuadorians (8.2%; n=9).

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In terms of civil status at the time of the suicidal behaviour, 37.5% (n=282) were in a stable relationship, 28.4% (n=214) were separated/divorced, 26.2% (n=197) were single and 6.2% (n=47) were widowed.

Nearly half of the sample were employed (46%; n=335) and the remainder were either unemployed (28.7%; n=209) or retired (25.4%; n=185). Around half of the patients lived with a formed family (52%; n=383), just under a quarter each lived with their family of origin (24%; n=177) or alone (22.7%; n=167) and 1.2% (n=9) lived in a residence (Table 1).

Table 1. Sociodemographic characteristics according to type of suicidal behaviour.

		Suicidal ideation n (%) 209 (100)	**Interrupted self-directed violence** n (%) 45 (100)	**Suicide attempt** n (%) 446 (100)	**Suicide** n (%) 53 (100)	**Test**	**p†**
Age, mean (SD)		45.62 (14.4)	44.78 (16.09)	40.57 (16.69)	57.89 (17.51)	F=20.29	**<0.001** [a]
Sex	Male	91 (43.5)	24 (53.3)	131 (29.4)	43 (81.1)	F=22.74	**<0.001** [b]
	Female	118 (56.5)	21 (46.7)	315 (70.6)	10 (18.9)		
Immigrant	No	188 (90)	40 (88.9)	366 (82.1)	49 (92.5)	F=3.36	**0.018** [c]
	Yes	21 (10)	5 (11.1)	80 (17.9)	4 (7.5)		
Stable relationship	Yes	71 (34)	19 (42.2)	172 (39.3)	20 (41.7)	F=0.78	0.505
	No	138 (66)	26 (57.8)	266 (60.7)	28 (58.3)		
Occupational status	Employed	99 (47.4)	21 (46.7)	200 (46.7)	15 (31.9)	F=4.5	**0.004** [d]
	Unemployed	63 (30.1)	15 (33.3)	124 (29)	7 (14.9)		
	Retired	47 (22.5)	9 (20)	104 (24.3)	25 (53.2)		
Family composition	Formed family	108 (51.7)	24 (53.3)	229 (52.3)	22 (50)	F=1.73	0.160
	Family of origin	38 (18.2)	12 (26.7)	123 (28.1)	4 (9.1)		
	Living alone/in residence	63 (30.1)	9 (20)	86 (19.6)	18 (40.9)		
Urban/rural	Rural	107 (52.2)	17 (39.5)	195 (45.2)	27 (52.9)	F=1.46	0.22
	Urban	98 (47.8)	26 (60.5)	236 (54.8)	24 (47.1)		

† Tukey post-hoc test differences:

[a] Suicide attempt vs suicidal ideation (p=0.001), suicide vs suicidal ideation (p<0.001), suicide vs interrupted self-directed violence (p<0.001), suicide vs suicide attempt (p<0.001)

[b] Suicide attempt vs suicidal ideation (p=0.002), suicide attempt vs interrupted self-directed violence (p=0.006), suicide attempt vs suicide (p<0.001), suicide vs suicidal ideation (p<0.001), suicide vs interrupted self-directed violence (p=0.018)

Civil status analysed by type of suicidal behaviour revealed that widowed persons accounted for nearly a fifth of those who died by suicide (18.8%; n=9), whereas they accounted for only a small proportion of cases of ideation (5.7%; n=12), self-directed violence (4.4%; n=2) and suicide attempts (5.5%; n=24). However, Yates' correction rendered this result non-significant.

In terms of clinical characteristics, three quarters of the overall individuals had a mental disorder (75.4%; n=568), half had been seen by a mental health professional in the previous year (50.3%; n=379) and 7.6% (n=57) had experienced an episode of suicidal behaviour in the previous year. (Table 2).

Table 2. Clinical characteristics according to type of suicidal behaviour.

Suicidal ideation n=209 (100%)	**Interrupted self-directed violence** n=45 (100%)	**Suicide attempt** n=446 (100%)	**Suicide** n=53 (100%)	**Test**	**p†**

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Previous mental disorder, n (%)	164 (78.5)	29 (64.4)	345 (77.4)	30 (56.6)	F=5.07	**0.002** [a]
Previous diagnoses, mean (SD)	1.30 (0.498)	1.34 (0.484)	1.24 (0.461)	1.37 (0.615)	F=1.26	0.288
Mental health referral in the previous year, n (%)	117 (56)	17 (37.8)	223 (50)	22 (41.5)	F=2.4	0.067
Suicidal behaviour in the previous year, n (%)	7 (3.3)	1 (2.2)	46 (10.4)	3 (5.9)	F=4.13	**0.006** [b]
DISORDERS, n (%) ‡						
- Mood	90 (43.1)	11 (24.4)	135 (30.3)	13 (24.5)	F=4.82	**0.002**[b]
- Psychotic	2 (1)	1 (2.2)	16 (3.6)	4 (7.5)	F=2.43	0.064
- Anxiety/adaptive	54 (25.8)	13 (28.9)	114 (25.6)	5 (9.4)	F=2.47	0.06 [c]
- Personality	27 (12.9)	5 (11.1)	51 (11.4)	4 (7.5)	F=0.41	0.747
- Substance use-related	31 (14.8)	7 (15.6)	73 (16.4)	13 (24.5)	F=0.97	0.402
- Other	9 (4.3)	2 (4.4)	39 (8.7)	2 (3.8)	F=1.93	0.123

[†] Tukey post-hoc test differences:

[a] Suicide vs suicidal ideation (p=0.005), suicide vs suicide attempt (p=0.005)

[b] Suicide attempt vs suicidal ideation (p=0.009)

Hospitalization was necessary for a fifth of the episodes (21.1%; n=196). Mean (SD) stay was 17.90 (25.91) days (median 9 days), with half of the patients admitted to an acute psychiatric unit (49%; n=96), a quarter to an observation unit (26%; n=51) and 11.7% (n=23) to an intensive care unit (ICU). In 43.4% (n=404) of the episodes, patients underwent urine testing for substance use, with nearly half (43.3%; n=175) testing positive. More specifically, 24.75% (n=100) tested positive for alcohol, 13.12% (n=53) for cocaine, 11.9% (n=48) for cannabis and 4.2% (n=17) for other substances.

Regarding the case management program, a 66.4% (n=500) of individuals were included at some time, 93.6% (n=468) of them in the first episode registered in our study. A 6% (n=30) of the patients included were treated twice in the SBCMP, and 0.4% (n=2) were included in the SBCMP 3 times during the period of the study. A 0.8% (n=4) of the patients ever treated in the SBCMP died by suicide.

Focusing on patients who had experienced more than one episode (n=116), the proportion of patients who died by suicide was 4.1% (n=4) in patients treated in the SBCMP and 5.3% (n=1) in those who were not treated in the SBCMP (no significant difference) (Table 3).

Table 3. Sociodemographic and clinical characteristics according to inclusion in the SBCMP.

		Not included in SBCMP n (%) 253 (100)	**Included in SBCMP** n (%) 500 (100)	**Test**	**p**
Age, mean (SD)		42.9 (20.7)	43.72 (14.3)	F=55.82	0.572
Sex	Male	120 (47.4)	169 (33.8)	F=13.2	**<0.001**
	Female	133 (52.6)	331 (66.2)		
Marital Status	Single	94 (39.2)	103 (20.6)	F=34.86	**<0.001**
	Married	82 (34.2)	200 (40)		
	Divorced	46 (19.2)	168 (33.6)		
	Widowed	18 (7.5)	29 (5.8)		
Occupational status	Employed	118 (51.1)	217 (43.6)	F=24.23	**<0.001**
	Unemployed	39 (16.9)	170 (34.1)		
	Retired	74 (32)	111 (22.3)		

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Mental disorder	No	77 (30.4)	108 (21.6)	F=7.08	**0.005**
	Yes	176 (69.6)	392 (78.4)		
Number of mental disorders, mean (SD)		1.21 (0.44)	1.3 (0.5)	F= 14.95	**0.039**
Episodes registered	1	234 (92.5)	403 (80.6)	F=18.22	**<0.001**
	>1	19 (7.5)	97 (19.4)		

Logistic regression was based on comparing patients who died by suicide with the remaining patients. Univariate regression was performed with the statistically significant variables. A multivariate model based on forward selection (adding age, sex, civil status, occupational status, family composition, urban/rural residence and mental disorder variables) pointed to associations between suicide and the male sex, older age and lower mental comorbidity (Table 4).

Table 4. Raw and adjusted odds ratio (OR) values for factors associated with suicide.

		OR (CI 95%) Raw	**OR (CI 95%) Adjusted**
Age		1.057 (1.038-1.075)	1.055 (1.033-1.078)
Sex	Female	1	1
	Male	7.936 (3.920-16.067)	6.798 (3.008-15.363)
Civil status	Stable relationship	1	
	Separated/divorced	0.443 (0.184-1.068)	
	Single	0.850 (0.405-1.781)	
	Widowed	3.103 (1.31-7.311)	
Occupational status	Employed	1	
	Unemployed	0.739 (0.296-1.844)	
	Retired	3.333 (1.710- 6.499)	
Family composition	Formed family	1	
	Family of origin	0.379 (0.129-1.188)	
	Living alone/in residence	1.869 (0.976-3.582)	
Rural/urban residence	Rural	1	
	Urban	1.270 (0.72-2.25)	
Mental disorder	Yes	1	1
	No	2.546 (1.439-4.506)	2.375 (1.185-4.759)

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- **4.**

Discussion

Our study yields new data in relation to research into suicidal behaviour, with some of our results confirming, and others diverging from, the findings of previous studies.

Regarding methods, our results corroborate other studies that report that methods used for suicide attempts are less potentially lethal than for suicides. The method most used for suicide attempts by our patients was self-poisoning (83.10%), followed by cutting (10.5%), corroborating findings elsewhere regarding self-poisoning (82.4%) and cutting (7.1%) [31]. The most frequently used methods of suicide were asphyxia (43.4%) and jumping from tall places (17%), coherent with national data for Spain [32]. However, our results differ thereafter, as suicide by jumping/lying before a moving object was the third most frequent method (15.10%) in our study, but ninth in Spain, where

suicide by self-poisoning occupied third place [32]. One possible explanation for this difference is that the study region has a railway line but no underground rail system.

In terms of age, our results largely corroborate the literature [6,33], which points to a statistically significant difference of some 17 years in the mean age of people who die by suicide compared to those who attempt suicide. In our study, the median age of those who died by suicide was 54 years, higher than the 49.5 years reported elsewhere [34]. In the regression, the odds ratio (OR) for age was 1.06 (1.033-1.078), indicating that the suicide risk increased with each additional year (there were no teenage suicides in our sample).

Regarding sex, our findings confirm the "sex paradox" reported in previous studies [33]. Thus, for our sample, while women accounted for most suicide attempts (70.6%), men accounted for most suicides (81.1%); however, our male suicide rate was much higher than the 74.6% reported for Spain [35]. Our results — except for interrupted self-directed violence, where we found men to be in the majority (53.3%) — corroborate the results of a review for developed countries [7] that found that women were in the majority in all types of suicidal behaviour except for completed suicide. Future studies with a larger sample would enable us to determine whether cases of interrupted self-directed violence are more similar to cases of death by suicide than to cases of suicide attempts and suicidal ideation.

In relation to immigrants, our study confirms findings that suicide rates among immigrants are no higher than for the general population [15]. Immigrants in our study accounted for 14.6% of suicidal behaviour overall, a proportion very similar to the 13.35% (0.54%) mean (SD) immigrant population in the catchment area [36]; the percentage of deaths by suicide was lower (7.5%), whereas the percentage of suicide attempts was higher (17.9%). The suicide rates in the study region for immigrants from Morocco, Colombia and Ecuador were similar to those for their countries of origin (crude all-age suicide rates per 100,000 population of below 5.0 for Morocco and 5.0-9.9 for Colombia and Ecuador [1,22].

In relation to civil status, while the fact that 18.8% of patients who died by suicide were widowed corroborates the literature, our results diverge in that we did not find an association between separation/divorce and suicide [13,37], finding ORs of 0.44 (0.18-1.07) and 0.85 (0.41-1.78) for being separated/divorced and single, respectively, relative to being in a stable relationship. These results contradict those of two reviews, one that pointed to a negative association between being in a stable relationship and suicide [8] and another that reported that being single increased the risk of both suicide and suicidal ideation but not of suicidal intent [38].

We found statistically significant differences regarding occupational status, with retirement being most frequently associated with death by suicide (53.2%). This result is coherent with our other finding regarding deaths by suicide being more frequent in older age groups. Employed people accounted for 31.9% of deaths by suicide in our study, a higher percentage than the 22.9% reported by Gómez-Durán and colleagues [34], although that finding only refers to employed patients with a mental health history. The fact that we found no association between unemployment and death by suicide contradicts studies such as that by Milner and colleagues [9], which reported a relative risk (RR) of 1.41 (1.21-1.60) for unemployment, whereas our finding was an OR of 0.74 (0.29-1.84) for unemployment relative to employment. Note that we did not analyse the quality of employment, which has recently been reported as a factor that should be taken into account [39].

Our study shows that people with any type of suicidal behaviour mostly lived with family. Our finding of 40.9% of patients living alone or in a residence who died by suicide — OR=1.87 (0.98-3.58) — was notably higher than the 28.6% reported by Gómez-Duran and colleagues [34]. Note that we only considered living arrangements associated with suicidal behaviour and not feelings of loneliness, as discussed elsewhere [40].

While there was an important association between mental disorders and suicide in our patients, this association differed from that reported in the literature. Thus, while mental disorders are reported in most other studies to be associated with 80%-90% of suicides [6,17,18] and are also associated with suicide attempts [41], only 56.6% of our patients who died by suicide had mental disorders in contrast with an overall rate for our sample of 75.4%. Gómez-Durán and colleagues [34] found that only 45.5% of those who died by suicide were diagnosed with a mental disorder, but,

unlike our researchers, they had access to very few patients' medical records. The fact that a mental disorder may be incipient or undiagnosed would support the importance of early detection in primary healthcare as a suicide prevention measure [22]. In future studies we should monitor whether this pattern persists, while bearing in mind that findings may be influenced by measures already being implemented in our catchment area to prevent suicidal behaviour.

Our study points to lower psychiatric comorbidity for patients who died by suicide (adjusted OR= 2.37: 1.18-4.76). Psychiatric comorbidity was also higher among the other patients in our sample. The lower prevalence of mental disorders associated with suicides corroborates the findings of the review by Cho and colleagues [18].

The main mental disorders diagnosed among the patients in our sample who died by suicide were mood disorders and disorders associated with substance use (24.5% each). This finding corroborates a meta-analysis [42], which reported ORs for Europe of 10.62 (4.50-25.09) and 6.54 (3.76-11.39) for suicide risk associated with mood disorders and disorders related to substance use, respectively. Our percentage of mood disorders associated with death by suicide (24.5%) is lower than the 54.3% reported by Gómez-Durán and colleagues [34]. As for personality and psychotic disorders, Gómez-Durán and colleagues [34] reported a prevalence of 11.4% and 17.1%, respectively, contrasting with our prevalence of 7.5% each. Anxiety/adaptive disorders represented just 9.4% of our patients who died by suicide (5 cases, all with adaptive disorders), contrasting with findings elsewhere (Bentley, Franklin, Ribeiro, Kleiman, Fox, & Nock, 2016) that post-traumatic stress disorder was the anxiety disorder most associated with suicide. Regarding other types of suicidal behaviour in our patients, mood disorders were most frequently associated with suicidal ideation (43.1%) and suicide attempts (30.3%), while anxiety/adaptive disorders were most frequently associated with interrupted self-directed violence (28.9%). Mental disorders related to substance use were associated with 24.5% of deaths by suicide and 16.4% of suicide attempts in our sample, a finding which differs from reviews reporting a more important association for alcohol abuse (OR=3.13: 2.45-3.81) with suicide attempts than with suicide (OR=2.59: 1.95-3.23) or suicidal ideation (OR=1.86: 1.38-2.35) [44,45].

Regarding previous suicidal behaviour, only 6% of our patients who died by suicide had had an episode in the previous year — a much lower percentage than the 33.3% reported by Bostwick and colleagues [46] or the 19.67% suicide attempt rate for the year prior to death reported by Mallon and colleagues [47].

Our study shows an important engagement of patients after discharge from the Emergency Room. More than two thirds of the individuals were attended in the SBCMP, a large engagement proportion since the program targets only patients over 18 living in the reference area of the hospital, and in this study, all people attended in the emergency room for a suicidal behaviour episode were included, regardless of age or area of residence. Costemale-Lacoste analysed the specialized out-treatment engagement (SOTE) after a suicide attempt and they found that only a 35% attended at least one visit in the first month after the discharge [48]. This is approximately only half of the proportion of engagement that we found in our study, 66.4%. Although they focused only patients without current psychiatric ambulatory care, Hunter's large cohort study without applying this focus, found similar results, with 31.4% of the patients with a mental health visit within 30 days [49].

Patients attended in the SBCMP presented significant differences in relation to those who were not. We found sociodemographic differences in terms of sex (more women in SBCMP group), marital status (more divorced in SBCMP group) and occupation (more unemployed SBCMP group). Sex related differences can be explained because in the group that were not attended in the SBCMP there was a higher rate of suicide and, as Fox revision showed, suicide is more common among men, whereas suicide attempt and suicide ideation is more common among women [7].

We also found clinical differences as patients in SBCMP suffered more mental disorders and registered more episodes of suicidal behaviour. This higher proportion of patients with more than one episode (19.4% in SBCMP group compared to 7.5% in the other group) can be explained by the inclusion of all type of episodes, including suicidal thoughts. When a patient is attended in the SBCMP, the mental health nurse maintains close contact with the patient, and if a high risk is detected, the patient is encouraged to go to the emergency room for a psychiatric assessment.

However, a rate of patients with more than one registered episode of 19.4% during the 5 years of study, is similar to widely cited rates of 16% at 1 year and 23% at 4 years [50], and in other studies in our country as the 20.1% reported by Parra-Uribe also in a 5-year study [51] or Irigoyen with 18.9% at 2 years [52].

Finally, the low suicide rate found in patients who had been in the program correlated with higher psychiatric morbidity. This is a lower proportion than 2.51% and 0.9% of suicides one year after a suicide attempt in individuals with outpatient follow-up [53]. A similar proportion, 1.2%, was found in a one-year telephone management program [51].

However, it should be noted that most individuals who died by suicide and who had not been in the program, had also not been attended during the study period by a previous episode of suicidal behaviour. It would be important to establish mechanisms to be able to detect these cases beforehand and primary health care will probably play an important role here. Mental health nurses could be facilitating agents in this commitment.

5. Conclusions

Age was a key factor in suicide in our sample, with higher suicide mortality in older age groups. Sex clearly determines forms of suicidal behaviour, as while 8 in 10 completed suicides were by men, 7 in 10 suicide attempts were by women. Coherent with the finding of higher suicide mortality among older people was the fact that the risk of death by suicide was 3.3 times higher for retired individuals than for employed individuals and 3.1 times higher for widowed individuals than for people in stable relationships. Mental disorders were less frequent in patients who died by suicide than in those with other suicidal behaviours. The most prevalent mental disorders in our sample were mood disorders. A high proportion of patients suffering more mental disorders were attended in the nurse-led program. The proportion of patients included in this program who died by suicide was low. Future research would require a larger sample size to confirm our findings and to explore health system instruments and programmes that could help prevent death by suicide.

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