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Characteristics of Attempted Suicide Patients Presenting to a Greek Emergency Department

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Abstract

Background: Attempted suicide is a major health problem internationally and a common cause of presentation to emergency department. The identification of the potential contributing factors associated with suicide attempts is of great importance for effective suicide prevention.

Objectives: The aim of the study was to determine the demographic and clinical characteristics of patients with attempted suicide presenting in a Greek emergency department.

Methods: A cross-sectional, retrospective study was conducted including all episodes of attempted suicide attending to emergency departments in a general hospital in Greece from January 2014 to December 2014. Data was collected using a standard registration form. Descriptive statistics and chi-square tests were used to identify the factors associated with attempted suicide.

Results: A total of 203 suicide attempt presentations were made to the emergency department by 195 individuals. The male-to-female attempted suicide ratio was 1:1.5. The mean age of patients was 40.5 ± 15.6 years and the largest numbers by age groups were 25-34 year-old (28.6%). The most common method used for attempted suicide was self-poisoning (80.8%) mainly with benzodiazepines (36.6%) and analgesics (18.6%). The majority of self-harm involved self-cutting/stabbing (63.9%) and hanging (13.9%). The most frequently reported reason for attempted suicide was related to interpersonal relationships (59.6%). Psychosocial assessment by specialist mental health personnel occurred in 44.3% of cases. Self-poisoning were significantly associated with gender and education in multivariable analysis.

Conclusions: Attempted suicide is a multi-determined act which results from an interaction between a wide range of socio-demographic and clinical factor. Further researches are required to enhance our understanding of patients' profile that predispose to suicide attempt and contribute to implementation of targeted treatment approaches.

Keywords: Suicide attempt; Emergency department; Epidemiology

Introduction

Suicide continues to be a major public health problem which accounts for more than 800.000 annual deaths worldwide [1] and by 2020, it is estimated that will contribute more than 2% of the global burden of disease [2].

It is also generally acknowledged that attempted suicide occurs more frequently than suicide and it is among the most powerful predictors of subsequent suicidal behaviors [1,2]. A study was concluded that for every death by suicide there were 12 or 15 attempted suicide-related emergency department visits and for every self-poisoning death there were 33 attempted self-poison reported to poison control centers [3]. At least 16% of patients who present to the emergency department for attempted suicide will repeat the attempt within 1 year after their index attempt and about 4% of them will kill themselves in the next 5 years [4]. The highest rates of both repeated attempts and suicide occurred within a week of discharge from an emergency department following the index attempt [5] and approximately half of all repeat event will occur in the first 3 months [6,7]. The risk of repetition also increase sharply with the increasing number of repeat attempted suicide presentation and tended to be associated with shorter intervals between episodes of attempted suicide [6,7].

For suicide attempters, the emergency department frequently functions as the primary or sole point of contact

with the health care system due to the urgency of the situation. In England, there be over 200.000 presentations for self-harm to emergency departments annually and trends in rates of attempted suicide appeared to have a steady increase since 2008 [8,9]. These visits accounted for 0.4% and 4,7% of the total ED visits in USA and Japan, respectively [10,11]. In Greece, the rate of attempted suicides presented to emergency department was calculated to be 16.69-40.34 per 10 (5) inhabitants for males and 41.43-110.82 for females [12].

Given the clinical and public health significance of suicidal behavior, there is considerable interest in identifying proximal factors that increase the risk for suicide attempts. The existence of different clinical profiles and temporal factor may require more tailored models for intervention. In Greece most studies have focused on changes of suicide-related mortality rates [13,14] and the differentiation of suicide attempters on demographic and clinical parameters at hospitalized patients and general population during financial crisis [15,16]. However the characteristics of the methods used to completed suicide may be associated with different characteristics of the methods used to attempted suicide as well as the characteristics of attempters who were hospitalized do not reflect the patterns of attempted suicide seen in emergency departments.

In this study, we aimed to evaluate demographic traits and clinical features of patients with attempted suicide who presented in a Greek emergency department.

Methods

Study design and setting

This was a cross-sectional, retrospective study of patients who presented to emergency departments in a Greek general hospital of West Attica. It serves a catchment population of around 600 thousand, according to the 2011 population estimate of the Hellenic Statistical Authority, with an annual ED census of approximately 55000 visits.

Data collection

Patients 14 years of age and older presented to the ED for care after a suicide attempt were identified through scrutiny of records of presentations from January 2014 to December 2014. A suicide attempt was defined as explicit documentation of attempted suicide recorded by a health care professional during that episode of care. Cases of accidental or recreational poisoning and non-suicidal self-injury were excluded. Those who presented solely with suicidal ideation were also not included.

A standard registration form was used to collect information on demographic and clinical information of suicide attempters. It is comprised of the following parts: patient's sociodemographic characteristics (age, gender ethnicity, employment status, marital status, educational level), patient's clinical characteristics (psychiatric history, medication, prior attempts, alcohol use) suicide details (location, methods,

reason, time and months of presentation) and patient's management (psychosocial assessment, outcome, hospitalization clinic and days).

All Emergency department nurse involved in the treatment of patients presented for suicide attempt recorded patient data into this form as part of initial assessment. In cases of hemodynamic or mental instability, information regarding the patient was obtained from the family.

Ethics statement

This study was reviewed and approved by the institutional review board of Hospital (approval number: 49/05.02.2014).

Statistical analysis

A statistical analysis was conducted using SPSS 18.0 for Windows. Descriptive analyses were performed to evaluate the general characteristics of the patients. For univariate analysis, we used a t-test for the comparison of continuous variables and Pearson's chi-square test for categorical variables. Logistic regression models were used for multivariate analysis. A probability level of $p < 0.05$ was considered statistically significant.

Results

A total of 203 suicide attempt presentations were made to the ED by 195 individuals. These presentation accounted for 0.35% of the total annual ED presentation. The male-to-female attempted suicide ratio was 1:1.5 ($P < 0.001$). The mean age of the sample was 40.5 ± 15.6 years, ranging from 15 to 91 years, and did not differ between the sexes ($P = 0.130$).

As shown in **Table 1**, most of the cases were in the age group of 25 to 34 years (28,6.9%) and Greek nationality (84.7%). Unmarried (44.8%) and married (43.3%) status was equal the most represented status. The majority of patients did not work, being 49.8% unemployment and 14.3% retired/disabled. Of the sample, 74.4% had a primary or secondary school education. More than one third of the cases (37.9%) had a psychiatric history and one in five attempters had history of a previous attempt suicide. A total 42 patients (20.7%) had alcohol misuse history and 52 patients (25.6%) had consumed alcohol at the time of attempt suicide.

Table 1 The demographic and clinical characteristics of attempted suicide patients.

Parameters	No. (n = 203) (%)
Gender	
Male	81 (39.9%)
Female	122 (60.1%)
Age (Year)	
15-24	30 (14.8%)
25-34	58 (28.6%)

35-44	40 (19.7%)
45-54	39 (19.2%)
55-64	21 (10.3%)
65+	15 (7.4%)
Ethnicity	
Greek	172 (84.7%)
Non Greek	31 (15.3%)
Marital Status	
Married	88 (43.3%)
Unmarried	89 (44.8%)
Separated/Divorced	7 (3.4%)
Widowed	19 (9.4%)
Occupation	
Employed	36 (17.7%)
Unemployed	101 (49.8%)
Retired/Disabled	29 (14.3%)
Student	18 (8.9%)
Other	19 (9.4%)
Education	
Primary/Illiterate	56 (27.6%)
Secondary	101 (49.8%)
Higher	46 (22.6%)
Past psychiatric history	
Yes	77 (37.9%)
Treated with psychiatric drugs	
Yes	66 (32.5%)
Previous suicide attempts	
Yes	41 (20.2%)
Once	16 (39%)
Twice	11 (26.8%)
Three times or more	14 (34.1%)
Alcohol misuse history	
Yes	42 (20.7%)
Alcohol at time of AS	
Yes	52 (25.6%)

Regarding the management and outcome of patients presented with attempted suicide (**Table 2**), psychosocial assessments were recorded in less than half of cases (44.3%).

One hundred and twelve patients (55.1%) were admitted to the hospital and a notable proportion of cases (27.6%) discharged against medical advice.

Three patients (1.5%) died neither at ED or in hospital. Approximately one third of the visits (36.3%) were admitted to the hospital for a day or less and almost another third (30.1%) were hospitalized for 2-3 days.

Table 2 Management and outcome of attempted suicide patients presented to emergency department.

	No. (n=203) (%)
Psychiatrist consultation at ED	
Yes	90 (44.3%)
Outcome	
Admission	112 (55.1%)
Discharge	15 (7.4%)
Discharge against medical advice	56 (27.6%)
Transfer to other facilities	17 (8.4%)
Death	3 (1.5%)
Hospitalization clinic	
General ward	86 (76.8%)
Psychiatric ward	20 (17.8%)
Intensive care unit	6 (5.4%)
Hospitalization day	
1	41 (36.3%)
02-Mar	34 (30.1%)
04-Jul	12 (10.7%)
Aug-14	7 (6.3%)
≥ 15	19 (16.6%)

The details of suicide attempt are summarized in **Table 3**. Poisoning was the most common methods of attempted suicide accounting for 80.8% of cases. Self-poisoning was used most frequently by female and self-harm by men ($p < 0.001$).

Of the self-poisoning cases 36.6% involved benzodiazepines, 18.6% paracetamol or salicylate analgesic, 12.2% antidepressant and 8.4% major tranquilisers or antipsychotic medication.

The majority of self-harm involved self-cutting/stabbing (63.9%) and hanging (13.9%). The remainder included traffic related, self-burning and a variety of other methods (data not shown).

Table 3 Suicidal details by gender: Methods, Places, Reason and Temporal Variation of attempted suicide patients presented an emergency department. *The significance level was set at 5% ($p < 0.05$).

Parameters	Male		Femal		Total Sample		P*
	N	%	N	%	N	%	
Method							
Poisoning	52	64.2	112	91.8	164	80.8	<0.001
Injury	27	33.3	9	7.4	36	17.7	
Both poisoning & injury	2	2.5	1	0.8	3	1.5	
Location							
Home	59	72.8	120	98.4	179	88.2	
Work	0	0	1	0.8	1	0.5	
Prison	18	22.2	0	0	18	8.9	
Public places	2	2.5	0	0	2	1	
Other	2	2.5	1	0.8	3	1.5	
Reasons							
Interpersonal relationships	27	33.3	94	77	121	59.6	
Medical illness	9	11.1	10	8.2	19	9.4	
Financial problems	16	19.8	1	0.8	17	8.4	
Death of someone	3	3.7	11	9	14	6.9	
Work/academy task	14	17.3	1	0.8	15	7.4	
Psychiatric disease	10	12.3	2	1.6	12	5.9	
Others	2	2.5	3	2.5	5	2.5	
Time of day							
Before dawn	15	42.9	20	57.1	35	17.2	
Morning	11	50.0	11	50.0	22	10.8	
Noon	20	25.1	37	64.9	57	28.1	
Night	35	39.3	54	60.7	89	43.8	
Season							
Spring	22	27.2	38	31.1	60	29.6	
Summer	27	33.3	23	18.9	50	24.6	
Autumn	14	17.3	26	21.3	40	19.7	
Winter	18	22.2	35	18.7	53	26.1	

Most attempted suicides occurred at home (88.92%) and the most frequent reason leading to suicide attempt was interpersonal relationship issues. The reasons varied among gender ($p < 0.001$) and age group ($p < 0.001$). Interpersonal conflict was by far the most frequently reported reason for female while financial and work problem was almost equal importance for men.

Interpersonal relationships were a major reason for suicide attempt in the 15-34 year age group. Work or academy stress was the second common reason in the 25-34 year age group and financial problems was the second common reason in the 35-54 year age group. Medical illness was the most common reason in the ≥ 65 year age group (**Table 4**).

Table 4 Reasons for attempted suicide by age group.

Age (Year)	15-24		25-34		35-44		45-54		55-64		65+	
	No	%	No	%								
Interpersonal relationship	25	83.3	37	63.8	24	60.0	21	53.8	11	52.4	3	20.0
Medical illness	0	0	1	1.7	2	5.0	4	10.3	2	9.5	10	66.7
Financial problems	0	0	3	5.2	6	15.0	7	17.9	1	4.8	0	0
Death of someone	2	6.7	3	5.2	1	2.5	4	10.3	2	9.5	2	13.3
Work/academy task	3	10	9	15.5	3	7.5	0	0	0	0	0	0
Psychiatric disease	0	0	4	6.9	3	7.5	2	5.1	3	14.3	0	0
Others	0	0	1	1.7	1	2.5	1	2.6	2	9.5	0	0
Total	30	100	58	100	40	100	39	100	21	100	15	100

Almost half of the attempted suicide occurred during the night time and almost one third of the cases were reported at spring. Attempted suicide was less likely to happen during the autumn (19.7%) and this seasonal pattern was similar for both genders ($p=0.134$).

As displayed by the **Table 5**, the univariate analysis revealed statistically significant relationships between self-poisoning

and gender, ethnicity and education. Female has almost a 6-fold increase in the likelihood of self-poisoning and foreign patients have 80% lower likelihood of self-poisoning. In multivariate logistic regression only gender and education analysis were significantly associated with self-poisoning.

Table 5 Univariable and multivariable analysis of demographic factors associated with self-poisoning. Only cases with self-poisoning were included ($n=164$). *The significance level was set at 5% ($p<0.05$).

Self-poisoning				
Parameters	Univariable		Multivariable	
	OR (95% CI)	P*	OR (95% CI)	P*
Gender				
Male	1		1	
Female	5.76 (2.59-12.78)	<0.001	4.97 (1.63-15.20)	0.005
Age (Year)				
15-24	1		1	
25-34	0.88 (0.29-2.62)	0.823	2.52 (0.35-17.93)	0.355
35-44	0.89 (0.28-2.88)	0.857	1.84 (0.25-13.62)	0.547
45-54	1.39 (0.40-4.86)	0.605	2.85 (0.34-23.85)	0.333
55-64	2.47(0.45-13.72)	0.299	9.29 (0.49-175.6)	0.137
65+	3.65 (0.39-33.58)	0.253	24.75 (0.45-0.248.2)	0.115
Ethnicity				
Greek	1		1	
Non Greek	0.24 (0.10-0.56)	<0.001	0.71 (0.017-2.93)	0.641
Marital Status				

Married	1		1	
Unmarried	0.42 (0.19-0.93)	0.034	1.07 (0.30-3.81)	0.921
Separated/Divorced	0.35 (0.62-2.07)	0.251	0.78 (0.08-8.01)	0.836
Widowed	1.14 (0.24-5.66)	0.87	0.25 (0.02-2.72)	0.254
Occupation				
Employed	1		1	
Unemployed	0.31 (0.07-1.42)	0.131	0.26 (0.04-1.49)	0.131
Retired/Disabled	0.49 (0.08-3.15)	0.453	0.48 (0.27-8.59)	0.62
Student	0.47 (0.06-3.65)	0.471	0.33 (0.17-6.14)	0.455
Others	0.17 (0.003-0.10)	<.001	0.06 (0.007-0.46)	0.008
Education				
Primary/Illiterate	1		1	
Secondary	2.44 (1.13-5.27)	0.023	2.96 (0.88-9.90)	0.021
Higher	11.01 (2.71-50.59)	0.002	10.21 (1.65-63.10)	0.004

Discussion

The objective of this study was to describe the profile of attempted suicide patients presenting to a general hospital of Athens. In line with prior findings [9,10], we found a significantly higher rate in woman and younger age presented at emergency department. The female/male ratio in this study was 1.5:1 which lies in the range reported in other studies of 1.38:1 to 3.7:1 [17-19]. The highest number of patients who attempted suicide was found in the middle aged group (25-44 years) and the lowest in the 65 years age and over. This finding was consistent with evidence that suicide as a cause of death vary greatly by age. Globally, suicide was ranked as the second and fourth leading cause of death for age group 10-24 and 25-44, respectively. In contrast, it was the eighth leading cause for those aged 45–64 (3.1% of deaths) and was not among the 10 leading causes for the population aged 65 and over or 85 and over [20].

The findings related to ethnicity were generally in keeping with survey conducted in other European countries classifying migration as one major factor that contribute to attempted suicide [19,21,22]. However, it has been found that there is substantial heterogeneity of suicide risks among immigrants, relative to those local-born populations of European countries, depending on variations in country-of-birth suicide rates [23,24].

In our study, we found a nearly equitable frequency of presentation for attempted suicide among married and unmarried patients, suggesting that there was any relationship between marital status and attempted suicide. In similar studies there were conflicting results with most individuals with suicide attempt to predominately belong in unmarried [19,21,25] or married [18,26] group. Although literature has consistently shown that unmarried or single populations are at higher risk for suicide than married [27], it may vary between

countries with difference sociocultural contexts and marriage patterns.

Regarding educational status, we found the lowest rate among individuals who had higher education (22.6%). This result is corresponded with findings of two European studies [19,28], but not with the results from a Turkish study [25] which showed that higher educational levels are associated with a higher risk of attempted suicide. A comparative study between two European countries concluded that the influence of educational level on suicide attempt varies over time and across geographic regions and might possibly be influenced by the economic situation and general trends in educational system in any particular country [29].

Our study also confirmed previous findings that emergency department visit for suicide attempt were higher for unemployed individual [19,28]. However, a Greek study concluded that suicide attempts were inversely correlated with unemployment and that completed suicides were correlated with unemployment [12]. In particular, using data provided by the Hellenic Statistical Authority was found that each additional percentage point of unemployment was associated with a 0.19/100 000 population rise in suicides (95% CI 0.11 to 0.26) among working age men [13].

Psychiatric history was reported from about 40% of cases confirming numerous studies which showed that the presence of mental disorders is one of the strongest risk factors for suicide attempts [19,21,26,27]. Other consistently reported factor contribute to attempted suicide was alcohol consumption observed every fourth person in our study. This prevalence was similar to the 22% reported in USA [10] but lower than that in UK ranging between 54 and 57 [30] and Korea (51%) [17], reflecting different social drinking patterns. According to a meta-analysis, the risk of attempted suicide was estimated to be 3-fold in patients with alcohol use disorders

[31] and for every drink the risk of a suicide attempt increased by 30 percent in a dose-response relationship [32].

Our results also demonstrate that over half of the attempted suicide cases left the hospital without having had an assessment with a mental health specialist. Psychosocial assessment is central to the management of attempted suicide and appeared to be beneficial in reducing the risk of repetition [33,34]. Despite the prominence given to psychosocial assessment in clinical guidelines, the proportion of patients who underwent a psychosocial assessment ranges from 26% in USA to 57% in UK [35,36].

We found that about one in four patients who attempted suicide was discharged against medical advice. This rate of premature discharge is higher than rate reported in other studies ranging from 18.7% to 22.8% probably because psychiatric consultation is not always available in our emergency department [17,37].

Self-poison was the predominant method of attempted suicide, a finding comparable to previous research results reported in the USA (68%) [10], Europe (66%-86%) [5,9,26,28] and Asian (69-86%) [17,18] with the exception of Iran where the most common method of suicide was burning (53.4%) [38]. The most often used substances was benzodiazepines (36,6%), which is similar to previous studies ranging from 39%-61% [18,39] and the second most frequent substance was analgesic. This pattern was different from a study in the UK where the analgesic was responsible for the most self-poisoning cases [9], a study in the USA where poisoning by unspecified drugs or medicinal substances accounted for the highest number of self-poisoning [10] and a studies from Korea where the ingestion of pesticides is the principal agent of self-poison among patients over the age of 50 Year [17]. The variance probably reflects difference in availability of means for attempted suicide and local prescribing practices.

Over half of the attempted suicide cases in our study (59.6%) were a result of interpersonal problems and this finding was in line with a European multi-country study in showing interpersonal conflicts as the major reason for attempted suicide [26]. The second most common reason for attempted suicide was usually mental health problems [17,26,40]. Contrary to this, physical illness was found to be most frequent reason than mental for attempted suicide in our study. One possible explanation maybe is the differences in methodology and sample composition because a large body of literature supports the finding that the presence of physical conditions is a risk factor for suicidal behavior even in the absence of mental disorder [41,42]. In concordance with previous studies, financial problems were more frequent reason for attempted suicide in males compared with the female [25,26] and for those who are in the age range of 35 to 55 years old [17].

It was also observed seasonal variation with an increase in the rate of attempted suicide in spring and decrease in the autumn. The majority of studies converge to the fact that there is a peak of attempted suicides during the spring and summer [43]. The second summer peak was not observed at

that time, coincided with the results of two other studies [44,45]. The discrepancy in peak season is likely due to the biological, cultural, socio-economic and bio-climatic factors which involved in the seasonal pattern of suicidal behavior [46]. As regards the time of the day, the results of the present study indicate that suicide attempts occurred most frequently at night. Similarly studies from different countries reported that attempted suicide presentations are peaked at night and outside of normal working hours making it more difficult for emergency health care providers to obtain the relevant information and multidisciplinary consultation required for optimal treatment [18,47].

As evidenced by the study results, females are over 5 times more frequent to attempt suicide by poisoning than males. Gender differences in suicide-related behavior are well-known and among others things, be explained by the method of suicide attempt or completed suicide chosen by males and females [48]. Females are more likely to attempt suicide by poisoning than males, while males are more likely to use methods of suicide with high lethality like hanging than females [49,50]. However, even within the same method the outcome has been found to be more lethal for males [51,52].

Another factor founded that associated with self-poisoning was level of education. This findings was in line with a previous study concluded that hanging and self-burning are more frequently used by persons with lower levels of education, whereas poisoning is more popular with more educated individuals [53]. However in a multi-center study educational level were not significantly related to method used [54].

The findings of our review should be considered in light of several limitations. First, the cross-sectional nature of the study design does not allow for the determination of causal relationships. Secondly, data were collected from a single emergency department and covered only one year of time, which may not reflect the pattern of other attempted suicide patients nationally, thereby limiting the generalizability of these findings. Thirdly, a number of patients with self-poisoning or self-injury tend to mask their suicidal intent and were excluded from our sample. In addition, we only obtained data from patients who came to the emergency department, potentially missing patients who attempted suicide and never presented to the emergency department or who died before reaching the hospital. Considering that suicidal behavior in Greece is highly stigmatized, we assume that number suicide attempts may be underestimated.

Conclusion

Attempted suicide is a multi-determined act which results from an interaction between a wide range of socio-demographic and clinical factor. Our results confirm the current knowledge base in regards to the most significant patient's characteristic associated with suicide attempts. Continuing to build patients' profile that predispose to suicide attempt will help guide design and implementation of improved suicide screening and interventions in the emergency department.

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