

INTERRELATIONS SELF-HARM ACTS AND SUICIDES IN THREE MEDICAL UNITS

Lavinia Duică¹, Mihai Pîrlog², Elisabeta Antonescu¹, Alexandra Pop³, Călin Scripcaru^{4,*}

¹"Lucian Blaga" University, Sibiu, ²University of Medicine and Pharmacy, Craiova, ³"Babes Bolyai" University, Cluj Napoca, ⁴"Alexandru Ioan Cuza" University, Iași, Romania

Abstract: Suicide is a major health problem, and the global suicide mortality rate amounts to 1.4% of all deaths worldwide. Personal history of suicide attempts is an important risk factor for suicide. We analyze the association between self-harm acts and suicide exploring the socio-demographics, clinical factors and other characteristics of people doing self-harm.

Material and methods. We extracted from the records the different variables from all three medical services: Emergency Department (ED), the Emergency Psychiatric Service (PES) and from registered suicide deaths in the Department of Legal Medicine (DLM) in Sibiu in the period 2006-2016.

Results and discussion. The socio-demographic profile of our sample shows that a bit more male patients than female patients with suicide attempts, the ratio male/female patients is 1.05 at ED and 1.32 at PES. The distribution of age pointed out the following hierarchy of the age media: 50.37 (DLM), 40.19 (PES), 36.60 (ED). In a period of ten years were approximately 40 self-harm acts for every suicide death suicide. Suicide attempts are related with many psychiatric diagnostics, the most frequent associations are Depressive Episode (34.6%), Substance related disorders (22.5%) and Adjustment disorders (17.5%). Suicide attempts are more pronounced than among young people increasing with age, thus age becoming a predictor. There is a statistically significant link between the type of unit and the emergency diagnosis. Thus, most patients diagnosed with drug ingestion end up in the ED (459), and in psychiatry and DML most patients (308 and 223, respectively) end up following a mechanical asphyxia by hanging. Most patients (114) who were diagnosed with emergency mechanical asphyxia by hanging were hospitalized with a diagnosis of depressive episode.

Conclusions. Statistically significant results show that patients come to the ED mostly for drug overdose, while in the PES come predominantly for self harm by hanging. Self-harm by hanging can be corroborate in a significant statistically relation with depressive episode. Self-harm behavior isn't a predictor for suicide (28 suicides coming from 1115 self-harm acts), but age is a predictor for the risk both for self harming and suicide. Research on the suicide risk factors in the emergency departments can contribute to predict and prevent suicide death.

Keywords: suicide, suicide attempt, emergency department, psychiatric emergency service, department of legal medicine.

INTRODUCTION

Suicide is an important mental health problem that constitute a major concern for the society. The World Health Organisation estimates there are about one million suicides per year [1]. For every suicide there another ten to twenty suicide attempts [2].

Some researchers classify all forms of self-injury on a suicidal continuum (preceding suicidal ideation), regardless of the victim's intent. It consisted in a "progression" from less to more severe forms of suicidal ideation - passive and active suicidal ideation

and forms of behavior - non-suicidal self-injury, attempted suicide, suicide [3].

Others emphasize the marked differences between self-harm and attempted suicide as separate areas. The categorization of nonsuicidal self-injury behavior versus suicide attempt based on the patient's determination of any intent to die may be subjective and unpredictable [4]. This kind of approach errs on the side of safety due to the ambivalent behaviors as suicidal [5]. Inconsistencies in how self-harm and suicidal behaviors, in general are studied - has made it difficult to compare outcomes between studies and

*Correspondence to: Călin Scripcaru, E-mail: calinscripcaru@yahoo.com.

has therefore hampered progress in furthering our understanding of these constructs.

Many studies show that people engaging in a suicidal behavior send some signals of their feeling of desperation. Before committing suicide, approximately 64% of people who attempt suicide visit a doctor in the month before their attempt, and 38% in the week before [6]; 16% to 34% of suicide attempters repeat a suicide behavior within 1-2 years after the first attempt and a previous nonfatal suicide attempt is found in up to 40% of suicide deaths [7].

Failure to assess suicide risk was the most common root cause of suicides qualifying as sentinel events. The known risk factors that should trigger screening for suicide include mental illness or substance use diagnoses, psychosocial trauma or conflict, recent loss (for example, a job or the death of a family member), family history of suicide, and personal history of suicide attempts [8].

Emergency services should systematically screen for, identify, and assess suicide risk among people receiving care.

Medical services units

The Emergency Department is the frontline medical station of the people with suicide attempt or deliberate self-harm; in this place medical staff provide assessment of the current mental state or suicide risk [9] and treat injuries [10]. Before that, professionals from the Emergency Department must consider different physical consequences of their suicidal gestures. So, they had to treat physical conditions ranging from small external injury to life threatening medical or surgical emergency. In the case of the high level of suicide risk or if the mental health assessment provides a provisional diagnostic medical staff facilitate transfer to a mental health state unit [11].

Psychiatric Emergency Services is the medical unit where the main objectives are to assess the presence of a mental disorder, to estimate risk to self or others, and to initiate an intervention (including psychiatric hospital admission) [12]. In the first place, the psychiatrist diagnoses the patient on the base of his symptoms. Another important step in treating patients with suicidal behavior is the assessment of suicide risk. Assessing suicide risk aims to find a proper therapeutic modality for the patient, option from psychotherapy in community settings to treating the patient in involuntary hospitalization.

The Department of Legal Medicine investigates all the suicides in a circumscribed geographically area

to determine the cause of death, the circumstances of the death, the method of suicide, toxicological investigations and, eventually the presence of a suicide note, past suicide attempts, evidence of mental disorder, chronic pain or severe/ terminal physical illness; and evidence of considerable emotional distress at the time of death [13].

Aim of the study

Evidence indicates that a history of self-harm is an important risk factor for future suicide. It elevates the risk of suicide 50 to 100 fold within the year following self-harm [14].

In this study we'll examine the association between self-harm acts and suicide exploring the socio-demographics, clinical factors and other characteristics of people doing self-harm acts in the Emergency Department from the General Hospital and the Psychiatric Hospital and of the suicide cases in the Department of Legal Medicine.

These data could reveal if self-harm acts are a predictor for suicide and the vulnerability factors in order to find relationships between the groups (patients with self-harm acts and suicide cases).

MATERIAL AND METHODS

Present paper included a retrospective cross-sectional, cohort study conducted in Sibiu for the period 2006-2016. Data were collected from the records of suicide attempt in the Emergency Department (ED) - Emergency Clinical Hospital, the Psychiatric Emergency Service (PES) - "Dr. Gheorghe Preda" Psychiatric Hospital and from registered suicide deaths in the Department of Legal Medicine in Sibiu (DLM).

We extracted from the records the sociodemographic variables from all three medical services (sex, age, residence). Besides these, in the ED we registered the ED diagnostic (based on the methods of self-harming) and the types of recommendations - after the first aid and assisting emergency services - referral to PES, transfer to PES, hospital admission, self-discharge; in the PES our study included data the number of prior psychiatric hospitalizations and the psychiatric diagnostic; from the records in the DLM we inscribed the method of suicide.

Statistical analyzes were performed using Microsoft Excel 2010 and IBM SPSS 20.0. Descriptive analyzes (frequency/percentage, mean, minimum, maximum) and statistical tests respectively correlations (Crosstabs, ANOVA) were used for the synthesis of the

results. Tests were interpreted at a significance level $\alpha=0.05$. If a variable had missing data, percentages were calculated as per the remaining number of available data points. The results were described as odds ratios (OR) and their corresponding 95% confidence.

Although in the medical practice in Romania it is used the diagnostic “Suicide attempts” regardless of the intent to die, in this article the term “self-harm” is used, defined as direct self-injurious behavior regardless of the degree of suicidal intent.

RESULTS AND DISCUSSION

In this study we have collected data from three medical services in the same period 2006-2016. The socio-demographic analyze showed that the number of cases was: 1) in the ED - 696 cases; 2) in the PES - 538 cases; 3) in the DLM - 274 cases. In this perspective, the suicide attempts/suicides ratio is 4.5 (Table 1).

Of the 696 cases, 631 patients had only one presentation at the ED and 13 patients (2.06%) were found in the DLM registers as suicides deaths; 65 patients had more than two presentations and 4 patients (6.15%) later became suicidal. It follows that the ration between those who became suicidal from the patients with more than two presentations at the ED and the patients with one presentation is 2.98 (Table 1).

In the Psychiatry Emergency Service, from 538 patients who were presented, 491 patients were patients with only one presentation of which 8 (1.62%) patients became suicidal; 47 patients had presented at the PES more than twice and 3 (6.38%) patients had

registered at DLM. So, the ratio regarding the patients with more than two presentations and the patients with one presentation is 3.93 (Table 1).

The total number of self-harm acts are 1115 cases (there are 696 patients presented at the ED and 419 patients presented directed to PES). These means that in a period of ten years were approximately 40 self-harm acts for every suicide death.

Suicide attempts are far more common than suicide deaths. Each year in the United States, there are more than 30 suicide attempts for each suicide death (15). Overall, there may be between eight and 25 attempted suicides for every suicide death [16].

Self-harm is an important risk factor for suicide [17]. Although self-harm is not the same as suicide, self-harm can escalate into suicidal behaviours. In our study we have detected a number of 28 cases of suicides coming from self-harm acts in the same period 2006-2016. Self-harm acts didn't prove to be a predictor for suicide.

The socio-demographic profile of our sample shows that a bit more male patients than female patients with suicide attempts (51.29% at ED and 56.90% at PES) and many more male patients than female patients committed suicide (82.84%). In the suicide cases, the ratio urban/rural is 1.13 instead in the case of suicide attempts the ratio is increased in urban area than in rural area - 2.5 (ED) and 2 (PES) (Table 2).

The distribution of age pointed out the following hierarchy of the age media: 50.37 (DLM), 40.19 (PES), 36.60 (ED) (Fig. 1).

Suicide attempts are between two and four

Table 1. Distribution of suicide attempts cases and suicides case

	PES	T=696		ER	T=538	
		1 presentation	>2 presentations		1 presentation	>2 presentations
DLM		631	65	491	47	
		13	4	8	3	
		2.06%	6.15%	1.62%	6.38%	

Table 2. Distribution of our sample in relation of sex and residence in three medical services

	Residence			Medical unit				
	DLM %	PES	%	ED	%			
Urban	sex	male	116	80%	208	57.93%	259	52,11%
		female	29	20%	151	42.06%	238	47.88%
	Total	145		359		497		
Rural	sex	male	111	86.71%	98	54.74%	97	49,23%
		female	17	13.28%	81	45.25%	101	51.01%
	Total	128		179		198		
Total	sex	male	227	82.84%	305	56.90%	357	51.29%
		female	45	16.42%	231	43.09%	337	48.41%
	Total	274		538		696		

times more frequent among females [18], the overall gender rate ratio was 1.5 females to each male [19]. In adolescents, suicide attempts are 3-9 times more common in girls [20]. In an epidemiological study performed in 4 European countries (Germany, Hungary, Ireland and Portugal) the highest ratio in favor of female patients (2.12) was found in Amadora, Portugal and the lowest ratio (1.13) was registered in Szeged, Hungary.

In our study, the ratio male/female patients is 1.05, a slightly increased ratio in favor of male patients in ED and 1.32 in PES. This result is in contradiction with many data about gender differences in suicide attempts. It can be due to a higher prevalence of externalizing disorders (e.g., conduct disorder, substance abuse disorder, deviant behavior) [21] or due to other causes.

In the western world, males die by suicide three

to four times more often than do females [22] and the male:female ratio of age-standardized suicide rates globally is 1.9 [23]. This kind of difference can be due to the suicide rates in non-Western countries, especially China where the ratio was around 8 males for every 10 females [24]. In the present study the ratio male/female is 5.022.

There is a statistically significant link ($p = 0.000 < 0.001$), at a 99% confidence threshold, between the type of unit and the age of the patients, so in the case of DLM patients have a higher average age (50.37 years), while in the case of ED average age is much lower (36.60 years).

Suicide attempts are more pronounced than among young people increase with age, thus age becoming a predictor (Sig. Test F ANOVA = 0.000 < 0.001)

The clinical characteristics of the samples show that in the ED the diagnostic is named accordingly the method used for suicide attempt, as: drug ingestion, (218) ingestion of non-drug substances (17), self-cutting (60) and other methods (23) (hanging, train accident, throwing on the window).

After the assessment and diagnosis, the ED physician made one of these recommendations, as follows: 46% receive PES referral (for consult), 19% are transferred to PES, making a hospital admission at 23% of them and the rest (12) are discharged on request (Fig. 2).

Sig = 0.000 < 0.05, there is an association between the two variables (diagnosis ED and recommendations). Most patients with drug overdose (218) and self-cutting (60) are sent with a referral to PES, while patients who have ingested non-drug substances (23) have been hospitalized.

In the PES self-harm acts are related with many psychiatric diagnostics, the most frequent associations are Depressive Episode (34.6%), Substance related disorders (22.5%) and Adjustment disorders (17.5%), followed by other diagnostics: Personality disorder (8.4%), Psychotic disorder (6.5%), Organic personality disorder (4.7%), Mental retardation (3.7%), Dementia (2%).

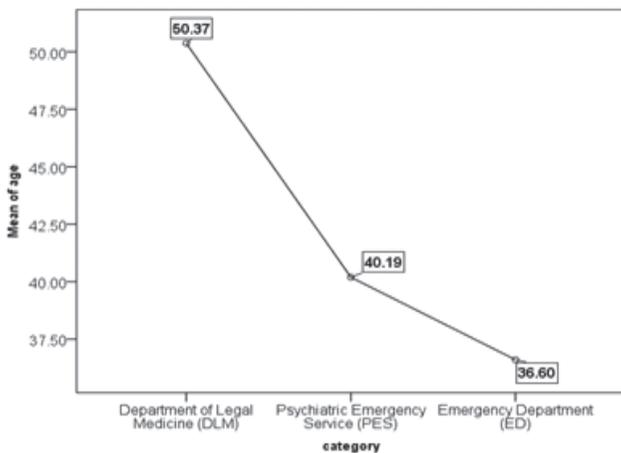


Figure 1. Distribution of our sample in relation with age.

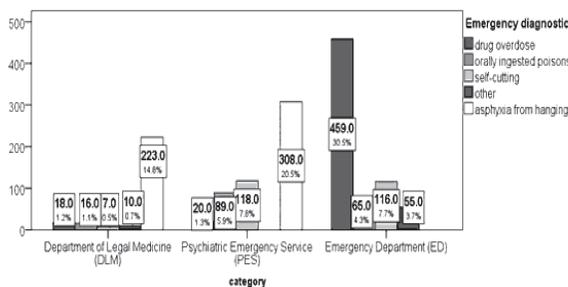


Figure 2. Association between the type of unit and diagnostic ER.

Table 3. Association of diagnostic ED and recommendations

ED Diagnostic	Referral to PES	Transfer to PES	Recommendations		Total
			Hospital admission	Self-Discharge	
	Drug overdose	218	95	85	459
	Orally ingested poisons	17	10	23	65
	Self-cutting	60	20	28	116
	Other methods	23	10	21	55
Total		318	135	157	696

Table 4. Relation between emergency diagnostic and admission diagnostic

Count		ED diagnostic * admission diagnostic Crosstabulation							Total	
		Admission diagnostic								
Depressive episode		Alcohol-related disorders	Psychotic disorders	Dementia	Mental retardation	Organic personality disorders	Personality disorders	Adjustment disorders		
Diagnostic urgenta	Drug overdose	5	7	1	2	2	0	1	2	20
	Orally ingested poisons	25	30	6	3	5	4	7	10	90
	Self-cutting	42	43	4	5	5	3	4	12	118
	Asphyxia from hanging	114	42	24	2	8	18	33	69	310
Total		186	120	34	11	20	25	45	93	538

In this regard the results of our study are similar with other studies. Mood disorders accounted for 52% of the subjects. According to the SCID-II 61% of the subjects and the SCID-II found in 58% personality disorders and 9% account for other pathology (schizophrenia, delusional disorder, alcohol related disorder, adjustment disorder) [25]. According to the WHO), mood disorders (especially depression) (30.2%), followed by substance use disorders (17.6%), schizophrenia (14.1%), personality disorders (13%) are most frequent diagnosis [26].

There is a statistically significant link between emergency diagnostic and admission diagnostic (Sig = 0.000 <0.05). Most patients (114) who were diagnosed with emergency mechanical asphyxia by hanging were hospitalized with a diagnosis of depressive episode.

There is a statistically significant link (p = 0.000 <0.001), at a 99% confidence threshold, between the type of unit and the emergency diagnosis. Thus, most patients diagnosed with drug ingestion end up in the UPU (459), and in psychiatry and DLM most patients (308 and 223, respectively) end up following a mechanical asphyxia by hanging (Fig. 2).

In the ED the most patients come for drug overdose, while in the PES patients come predominantly for hanging, this ultimate result resemble the situation in the case of suicides. Corroborating with the psychiatric diagnostic in the PES, the most patients were diagnosed with depressive episode.

In conclusion, in our study, statistically significant results show that patients come to the ED mostly for drug overdose, while in the PES come predominantly for self harm by hanging.

This means that in the PES patients are transferred from the ED for psychiatric disorders or come directly from home with the ambulance and the prevalent psychiatric diagnostic is depressive episode. Self-harm by hanging can be corroborate in a significant statistically relation with depressive disorder.

On the other way, most patients with drug overdose and self-cutting are sent with a referral to PES, while patients who have ingested non-drug substances have been hospitalized.

Self harm behavior isn't a predictor for suicide, but age is a predictor for the risk both for self harming and suicide.

There is not a standardized suicide risk assessment that accurately predicts suicide. Warning signs for suicide are neither sensitive nor specific enough to accurately predict who is at imminent risk for suicide, but it has generally been determined that risk for suicidal behavior increases with the number of risk factors present [27]. In conclusion, managing self-harm behavior or suicide risk is appropriately identifying the need of treatment in mental health services in emergency medical services.

Conflict of interest

The authors declare that they have no conflict of interest.

References

1. World Health Organization. Public health action for the prevention of suicide: A framework. Geneva, Switzerland, 2012.

2. Kutcher S, Chehil S. *Suicide Risk Management: A Manual for Health Professionals*. Blackwell Publishing, USA, 2009.
3. Posner K, Oquendo MA, Gould M, Stanley B, Davies M. *Am J Psychiatry*. 2007; 164(7):1035-1043.
4. Kapur N, Cooper J, O'Connor RC, Hawton K. Non-suicidal self-injury *v.* attempted suicide: new diagnosis or false dichotomy? *Br J Psychiatry*. 2013; 202(5):326-328.
5. Nock MK. Self-injury. *Annu Rev Clin Psychol*. 2010; 6:339.
6. Ahmedani BK, Simon GE, Stewart C, Beck A, Waitzfelder BE, Rossom R, Lynch F, Owen-Smith A, Hunkeler EM, Whiteside U, Operskalski BH, Coffey MJ, Solberg LI. *J Gen Intern Med*. 2014; 29(6):870-877.
7. Scoliers G, Portzky G, van Heeringen K, Audenaert K. Sociodemographic and psychopathological risk factors for repetition of attempted suicide: a 5-year follow-up study. *Arch Suicide Res* 2009; 13:201-213.
8. Joint Commission. *Detecting and treating suicide ideation in all settings*. Sentinel Event Alert 56. Oak Brook (IL): Joint Commission, 2016.
9. Shafiei T, Gaynor N, Farrell G. The characteristics, management and outcomes of people identified with mental health issues in an emergency department, Melbourne, Australia. *J Psychiatr Ment Health Nurs*. 2011; 18:9-16.
10. Olfson M, Marcus SC and Bridge JA. Emergency treatment of deliberate self-harm. *Arch Gen Psychiatry*. 2012; 69:80-88.
11. National Institute for Clinical Practice (NICE). *Self-harm: The short-term physical and psychological management and secondary prevention of self-harm in primary and secondary care*. British Psychological Society and RC Psych Publications, 2004.
12. Van Veen M, Wierdsma A, Boeijen C, Decker J, Zoetemen J, Koekkoek B, Mulder CL. Suicide risk, personality disorder and hospital admission after assessment by psychiatric emergency service. *BMC Psychiatry* 2019; 19:1.
13. World Health Organization. *Preventing suicide - a resource for suicide case registration*. Switzerland, 2011.
14. Chan MKY, Bhatti H, Meader N, Stockton S, Evans J, O'Connor RC, Kapur N, Kendall T. Predicting suicide following self-harm: systematic review of risk factors and risk scales. *The British Journal of Psychiatry*. 2016; 209 (4):277-283.
15. Han B, Kott PS, Hughes A, McKeon R, Blanco C, Compton WM. Estimating the rates of deaths by suicide among adults who attempt suicide in the United States. *J Psychiatr Res*. 2016; 77:125.
16. Mościcki EK. Epidemiology of completed and attempted suicide: Toward a framework for prevention. *Clinical Neuroscience Research* 2001; 1:310-323.
17. Hawton K, Saunders KE, O'Connor RC. Self-harm and suicide in adolescents. *Lancet*. 379 2012; (9834):2373-2382.
18. Krug EG. *World Report on Violence and Health*, World Health Organization. 2002: 191.
19. Hawton K, Harriss L. The Changing Gender Ratio in Occurrence of Deliberate Self-Harm Across the Lifecycle. *The Journal of Crisis Intervention and Suicide Prevention* 2008;29(1):4-10.
20. Wunderlich U, Bronisch T, Wittchen HU, Carter R: Gender differences in adolescents and young adults with suicidal behaviour. *Acta Psychiatr Scand*. 2001, 104: 332-339.
21. Mergl R, Koburger N, Heinrichs K, Székely A, Tóth MD, Coyne J, Quintão S, Arensman E, Coffey C, Maxwell M, Värnik A, van Audenhove C, McDaid D, Sarchiapone M, Schmidtke A, Genz A, Gusmão R, Hegerl U. What are reasons for the large gender differences in the lethality of suicidal acts? An epidemiological analysis in four European countries. *PLoS ONE*. 2015; 10:1-18.
22. Värnik P. Suicide in the world. *International Journal of Environmental Research and Public Health* 2012; 9(3): 760-771.
23. World Health Organisation. *Preventing suicide. A global imperative*. Geneva: World Health Organization. 2014; 92.
24. World Health Organisation. *2015 Suicide rates, age-standardized Data by country*, 2017.
25. Nuryil Y, Nesim K, Kavakci O, Dogan O. Psychopathology and sociodemographic characteristics in suicide attempters: a single center study *Cumhuriyet Medical Journal* 2018;40(3):215-225.
26. Wasserman D, editor. *Suicide, an unnecessary death*. London: Martin Dunitz, 2001.
27. Lewinsohn PM, Rohde P, Seeley JR. Psychosocial risk factors for future adolescent suicide attempts. *J Consult Clin Psychol*. 1994; 62(2):297-305.